

How can you retrofit your OSV fleet to future proof your competitiveness?

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Premier partner



Panellist documents

Page 2: Svein Mannes, Wärtsilä Project Services

Page 7: Arnstein Eknes, DNV GL

Page 13: Egil Arne Skare, Østensjø Rederi

Page 18: Wärtsilä corporate literature

Part of
Offshore
Webinar Week

19-21 January 2021



riviera >>>

CAPTURING MARKET OPPORTUNITY

ENVIRONMENT

- Reduced Emissions
- Reduced Noise/Vibration
- New Regulations
- Customer Requests
- Funding

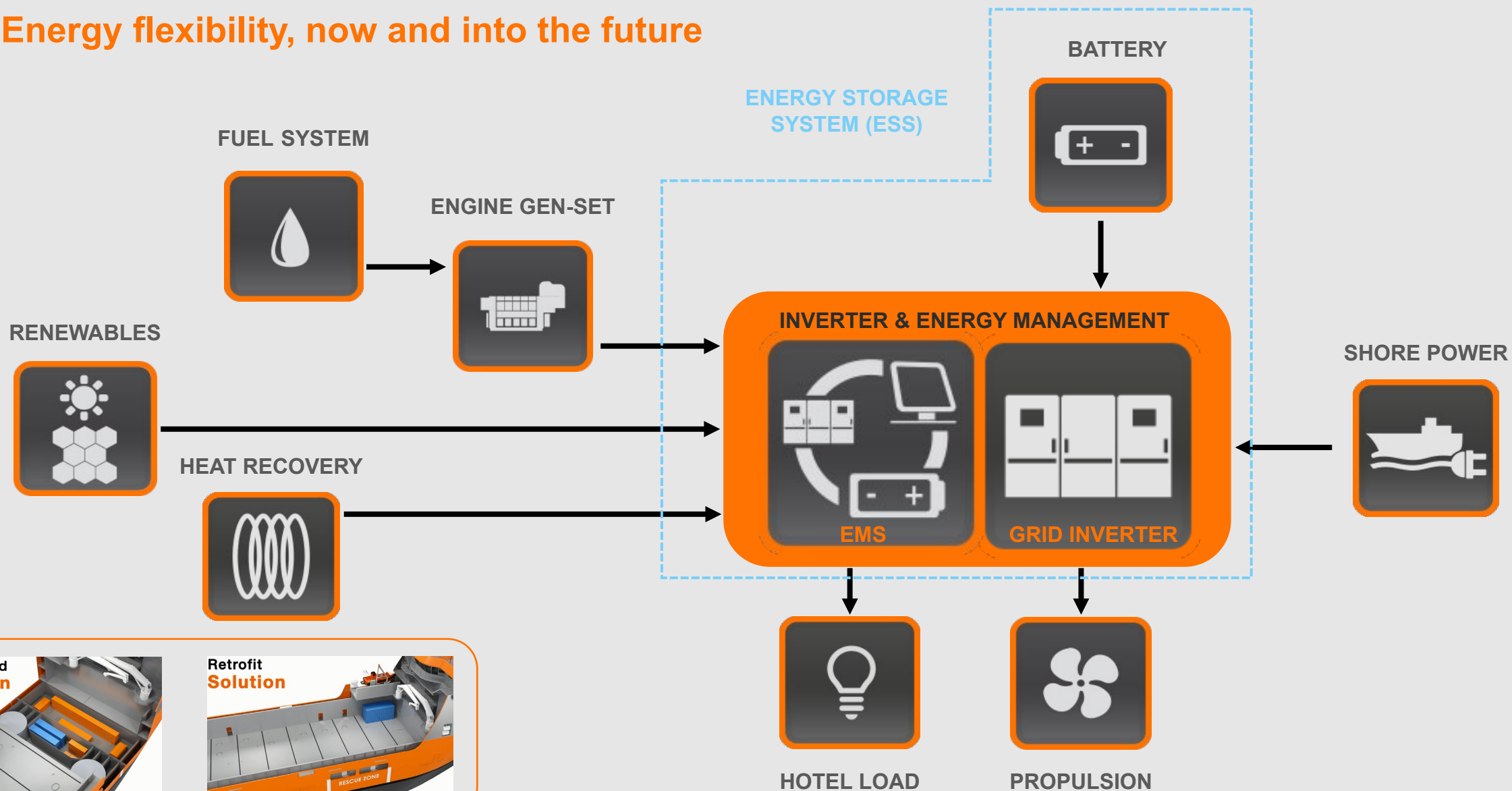
OPERATION

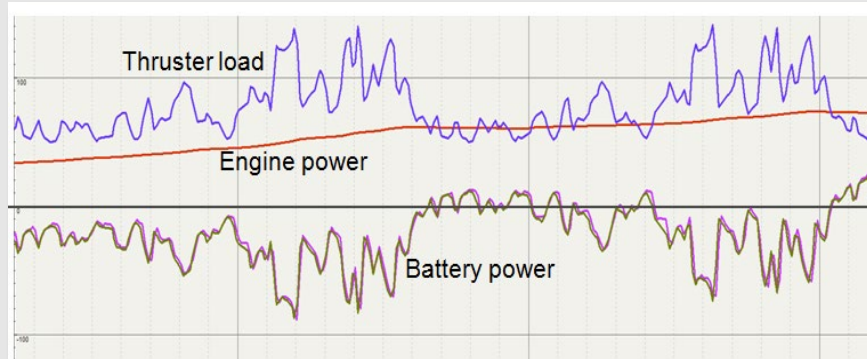
- Reduced Running Hours
- Less Engine Power
- Economical Incentives
- Low Energy Cost
- Renewable Energy

FLEXIBILITY

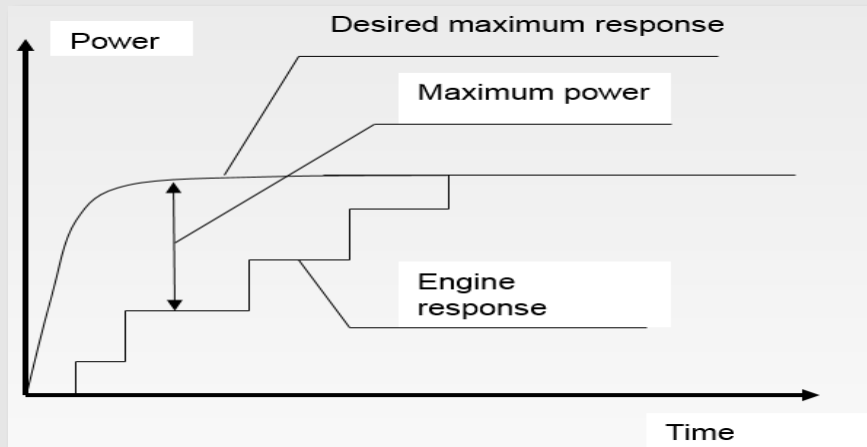
- Energy Flexibility
- Increased Redundancy
- Back-Up Power

Energy flexibility, now and into the future

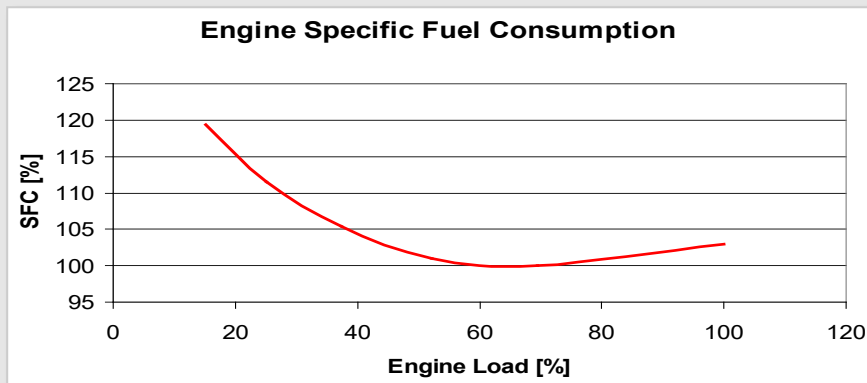




Peak shaving



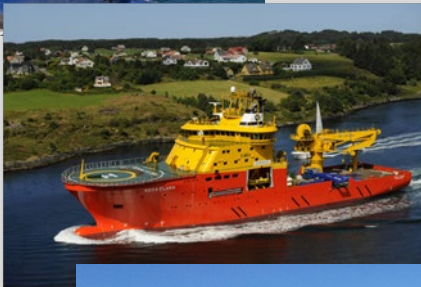
Spinning reserve



Optimized engine operation



PSV DP2 – Closed Bus



OCV DP2 – Open Bus



OCV DP3 – Open Bus

- Spinning reserve
- Peak shaving
- Optimized load
- Fuel savings
 - ~10 - 20% overall
 - ~25 - 30% in DP Operation
- Reduced maintenance
- Running hours 30% - >50%

THE HYBRID TRANSITION IS MOVING FAST

A SAMPLE OF WÄRTSILÄ PROJECTS



MARITIME

Retrofitting OSVs to increase competitiveness

Riviera Offshore Webinar

Arnstein Eknes, Segment dir. OSV and Special ships, DNVGL

19 January 2021

Market development; global energy transition giving new opportunities

OSVs servicing customers under changing market conditions

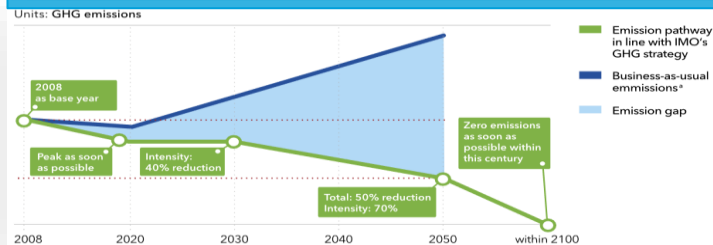
Traditional O&G markets – long term uncertainty



Renewables & new offshore markets emerging



Regulatory ambitions



Charterer expectations



SEA CARGO
CHARTER

[Sea Cargo Charter](#)

Banks assessment



POSEIDON
PRINCIPLES

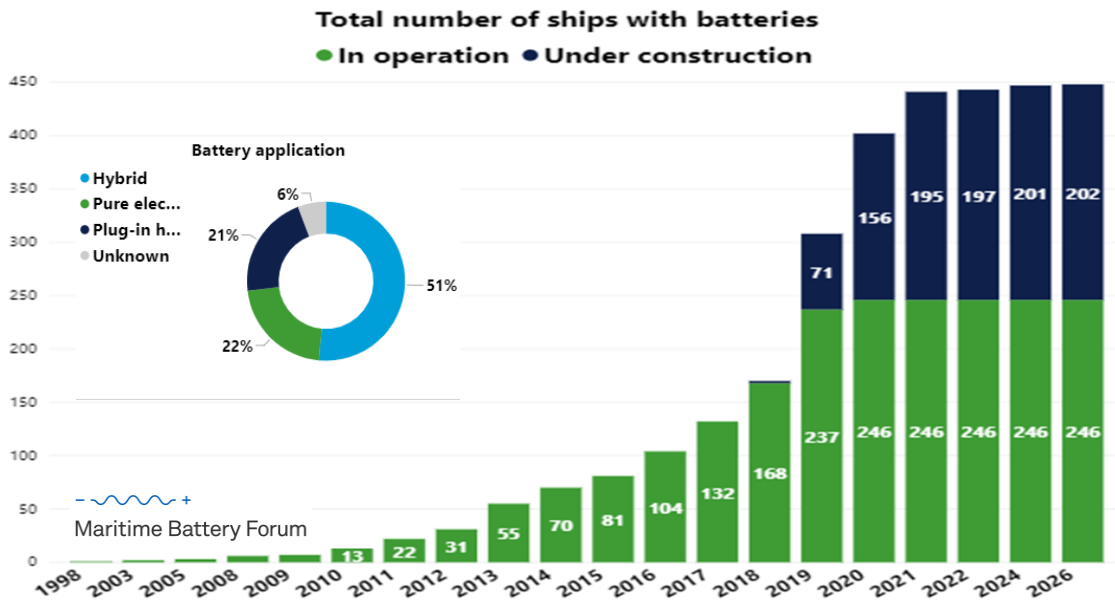
[Home - Poseidon Principles](#)

Energy and emissions

Preparing for retrofit will become the new normal towards decarbonisation

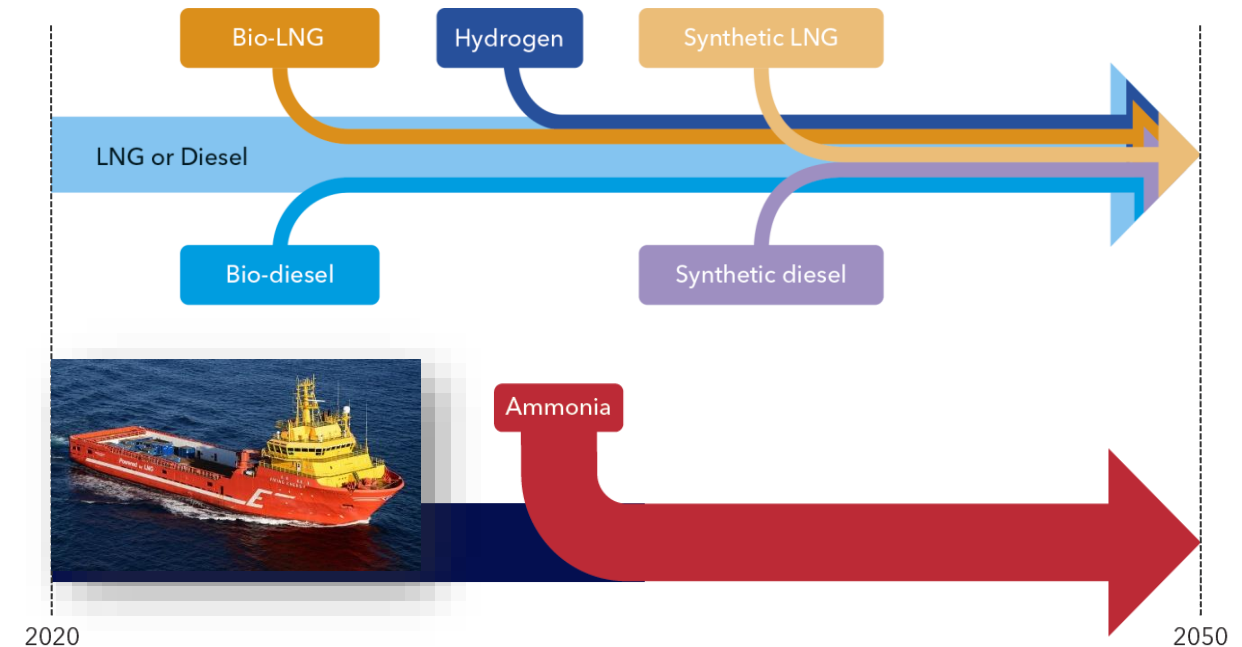
Prepare by thinking hybrid

- Improve competitive position
- Operational cost-benefit considerations (emissions, maintenance & fuel cost)
- Retrofit of systems / modules very likely to occur
 - E.g. electrification / Shore power / Offshore power?



Alternative fuels – introduce as retrofit?

- Many considerations:
 - Source of fuel, onboard containment, infrastructure and availability, compatibility with onboard systems
- MGO/MGO + LNG available today
- LOHC / Hydrogen / Ammonia being piloted now



Connected & Digitalized, strengthen operational decisions

Many searching for smarter use of technology & better processes

Energy efficiency through data driven optimization



10%-15% less emissions

Centralization of tasks, remote monitoring and control



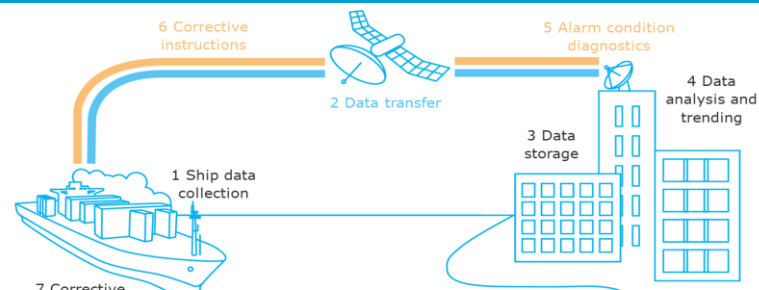
10%-15% less cost (20-30% including fuel cost)

Remote inspections (condition status)



Less cost, reduce downtime

Smart Maintenance (CBM/CM etc)



Less cost, significant impact on availability

Operational readiness



Safer operation, transparent status

Future operations within companies & the industry;

Adapting & capitalizing on multiple opportunities provided by new technology

Increased **transparency**
*operations / emissions
condition / availability*



Decision support

Digital twins

Cyber security



*Integration
verification*

*Performance
simulations*

*Machine
learning*

Predictions

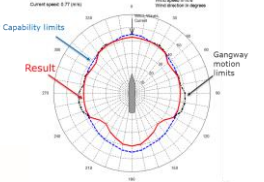


Seakeeping capability



Connected

Manual - automatic -
remote - autonomous..?



Gangway

DP

Motions





Our vision

A trusted voice to tackle global transformations

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Efficiency at sea



Electric and hybrid propulsion

Batteries and shore power

Current projects

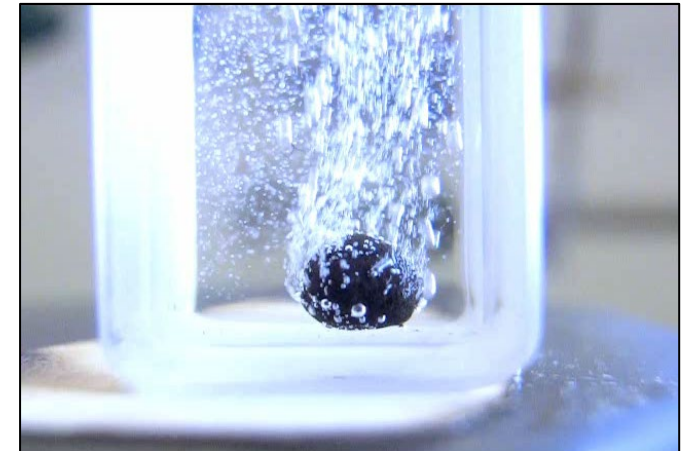
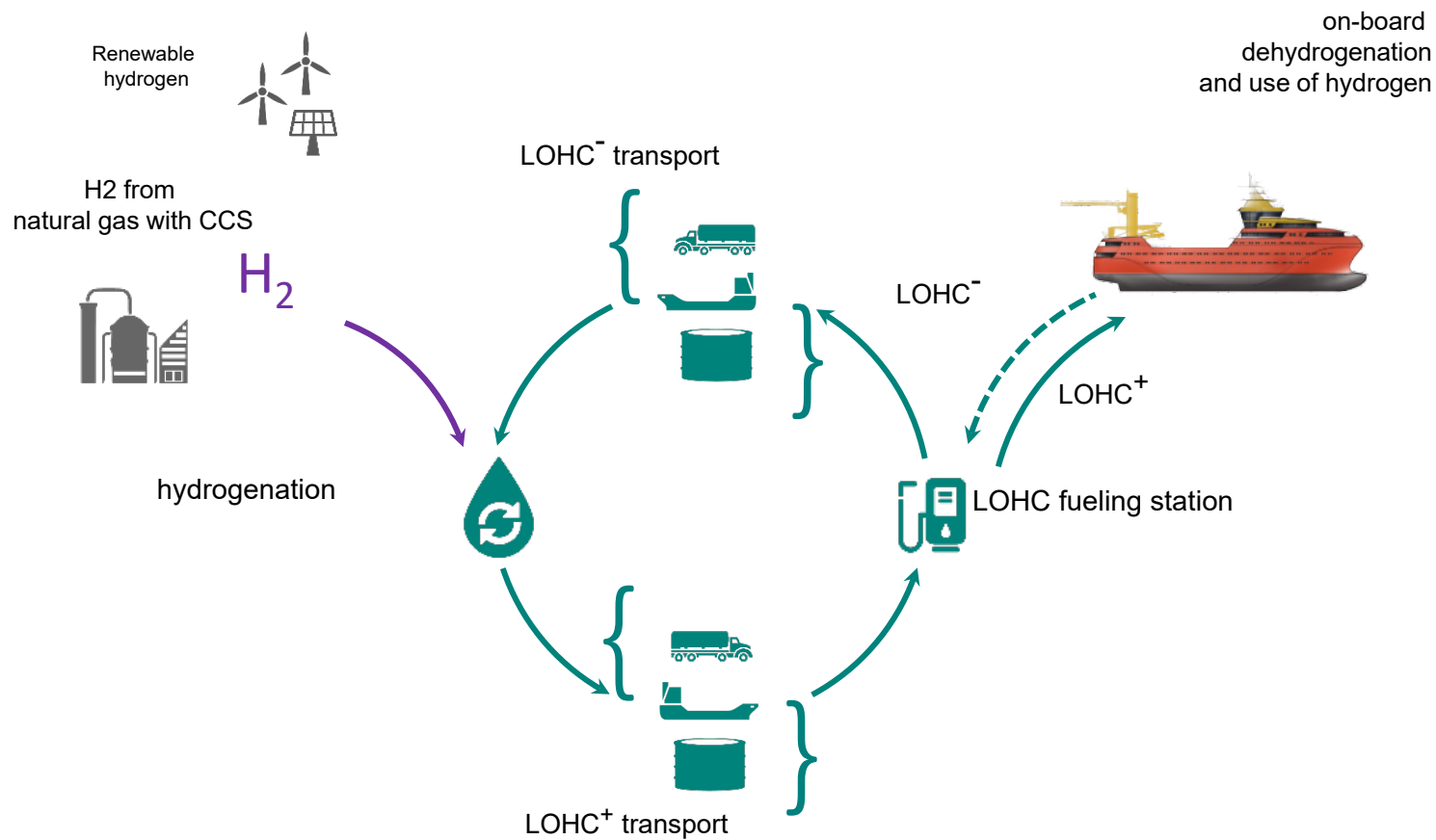
- Edda Fauna – Battery hybrid and shore power (Battery Power)
- Edda Flora – Battery hybrid and shore power (Battery Power)
- Edda Ferd – Shore power
- Gondan C489 – Battery hybrid and shore power (Battery Power)
- Gondan C490 – Battery hybrid and shore power (Battery Power)
- Balenciaga C415 – Battery hybrid and shore power (Battery Power)
- Balenciaga C416 – Battery hybrid and shore power (Battery Power)

- All projects with support from Enova



Fuels and emissions

LOHC - Hydrogen stored as an oil



Maintenance

Reduced cost - battery power and design

- Battery as spinning reserve - Gensets running hours with reduced by 50% in DP-mode
- Reduced number of diesel engines installed for DP system with battery power
- Variable speed diesel gensets – increased TBO at low average load (rpm)
- Gearless Main Thrusters – eVSP main propulsion
- Propellers mounted from below – replacement units for main overhauls



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Thank you for your attention

For further information visit ostensjo.no



Østensjø Rederi

Offshore Service Vessels

Optimising efficiency and performance



By combining the advantages offered by Wärtsilä's single-source supplier capabilities, the flexibility and benefits of its broad portfolio, and its range of solutions designed to achieve significant fuel savings and emission reductions, optimal performance of your vessel can be realised. Regardless of your operating profile or specific application requirements, our approach can help you to identify both available and future opportunities to streamline your business, whilst at the same time reducing your environmental footprint.

Market trends & drivers

1. Reducing environmental impact – the need to meet stringent 2030 & 2050 IMO regulations
2. Further exploration of new offshore resources
3. Development of new offshore fields
4. Extending the life of existing fields
5. Maximising opportunities in new and developing markets

Who we serve?

Wärtsilä delivers optimised ship design and integrated solution packages for a variety of Offshore Service Vessels:

- Anchor Handling Tug Supply vessels (AHTS)
- Offshore Construction Vessels (OCV)
- Inspection Maintenance Repair Vessels (IMR)
- Well Intervention Vessels (WIV)
- Platform Supply vessels (PSV)
- Diving Support vessels (DSV)
- Research vessels (RV)
- Cable Laying Vessels
- Pipe Lay/Reel Laying Vessels
- Heavy Lift & Jack Up Vessels
- Emergency Rescue and Respond Vessels (ERRV)



Energy Efficiency & Decarbonisation

The varying operational modes of OSVs require a unique design in order to achieve valuable fuel efficiency. The starting point for this is to have an optimised hydrodynamic ship hull design, and a fully integrated package of smart solutions featuring highly efficient products. At Wärtsilä we offer advanced propeller designs, some of the industry's most efficient engines, propulsion systems, thrusters and other prime movers, as well as robust and state-of-the-art electrical and automation systems. With a smart vessel design based on Wärtsilä's extensive industry experience and deep in-house expertise, your OSV can operate with almost a third less fuel consumption than the average vessel in operation today.

Wärtsilä at the forefront of developing environmental solutions for OSV's

Wärtsilä is the clear market leader in supplying environmentally friendly propulsion solutions for LNG-fuelled OSVs. Wärtsilä has to date delivered approximately 300 gas engines for various vessel applications, and has designed several LNG-powered vessels, either contracted or already in service. We emphasise unmatched energy efficiency by designing unique hull forms, with fuel flexibility and fully integrated systems and solutions. The result is outstanding vessel performance in areas such as fuel economy and cargo capacity. With LNG as fuel, carbon-based greenhouse gas emissions can be reduced, while sulphur and nitrogen oxide emissions are virtually eliminated.



Why choose hybrid?

Hybrid power systems for both new build and retrofit projects are becoming more necessary and increasingly popular throughout the maritime industry. This trend is largely driven by the demand for greener solutions, and the need to meet stringent IMO regulations. Wärtsilä's hybrid power systems are fully integrable, combining our engines and energy storage management offering, with optimised power electronics to ensure seamless, reliable, and sustainable performance. What may once have been a complex system has been moulded by Wärtsilä into an innovative, highly efficient solution that delivers unrivalled benefits. In fact, Wärtsilä's Low Loss Concept and diesel-electric machinery are already installed on construction vessels currently in operation, and achieving fuel consumption savings of up to 25%, depending on the operating mode of the vessel.



A proven track record

Wärtsilä has been pushing the boundaries of engineering and driving change since 1834. Our track record is second to none, and throughout our long history we have continued to innovate and deliver products, systems, and integrated solutions that fully meet the needs of our customers. We learn by listening to our customers, determining what those needs are and how best to address them. This approach can be seen in our published Smart Marine Ecosystem vision, wherein we strive to overcome built-in wasteful practices to achieve even greater levels of efficiency, safety, and environmental performance.

Voyage optimisation – uncovering the potential in your fleet, today

Our Smart Marine Ecosystem approach starts with optimising your fleet, whereby your vessels are interconnected to services and solutions that make voyages safe, secure, efficient and more environmentally friendly. Wärtsilä's infrastructure of innovative solutions includes navigation systems, dynamic positioning systems, route planning and performance optimisation. We offer smart, advanced vessel operational support, connecting equipment for analytic purposes to save costs and achieve optimal vessel operations.

Digitalisation – reshaping the maritime industry

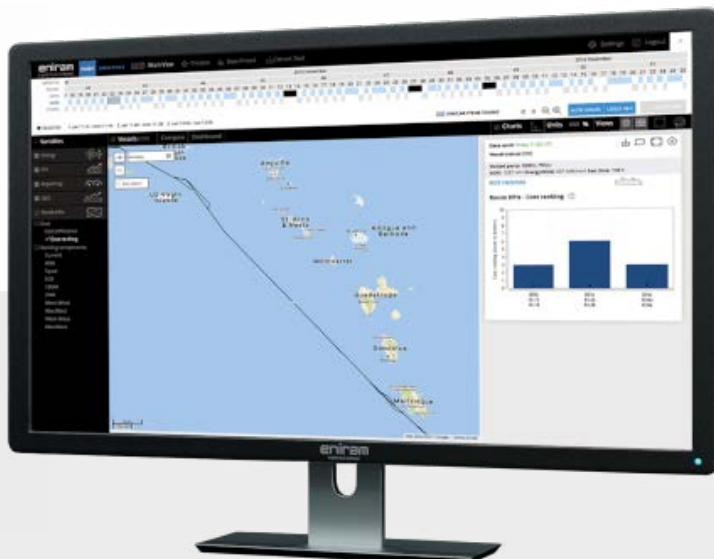
Digitalisation has become a critical part of the maritime infrastructure and will continue to reshape our industry. With the vast amounts of data available today, a vessel's performance can be measured and monitored in real-time throughout its entire lifecycle using a variety of digital tools. By actively measuring fuel consumption against performance, fuel savings and lower emissions of up to 10% can be expected. Furthermore, maintenance can be carried out based on the actual condition of the equipment rather than on pre-determined schedules, thus minimising downtime and reducing costs.

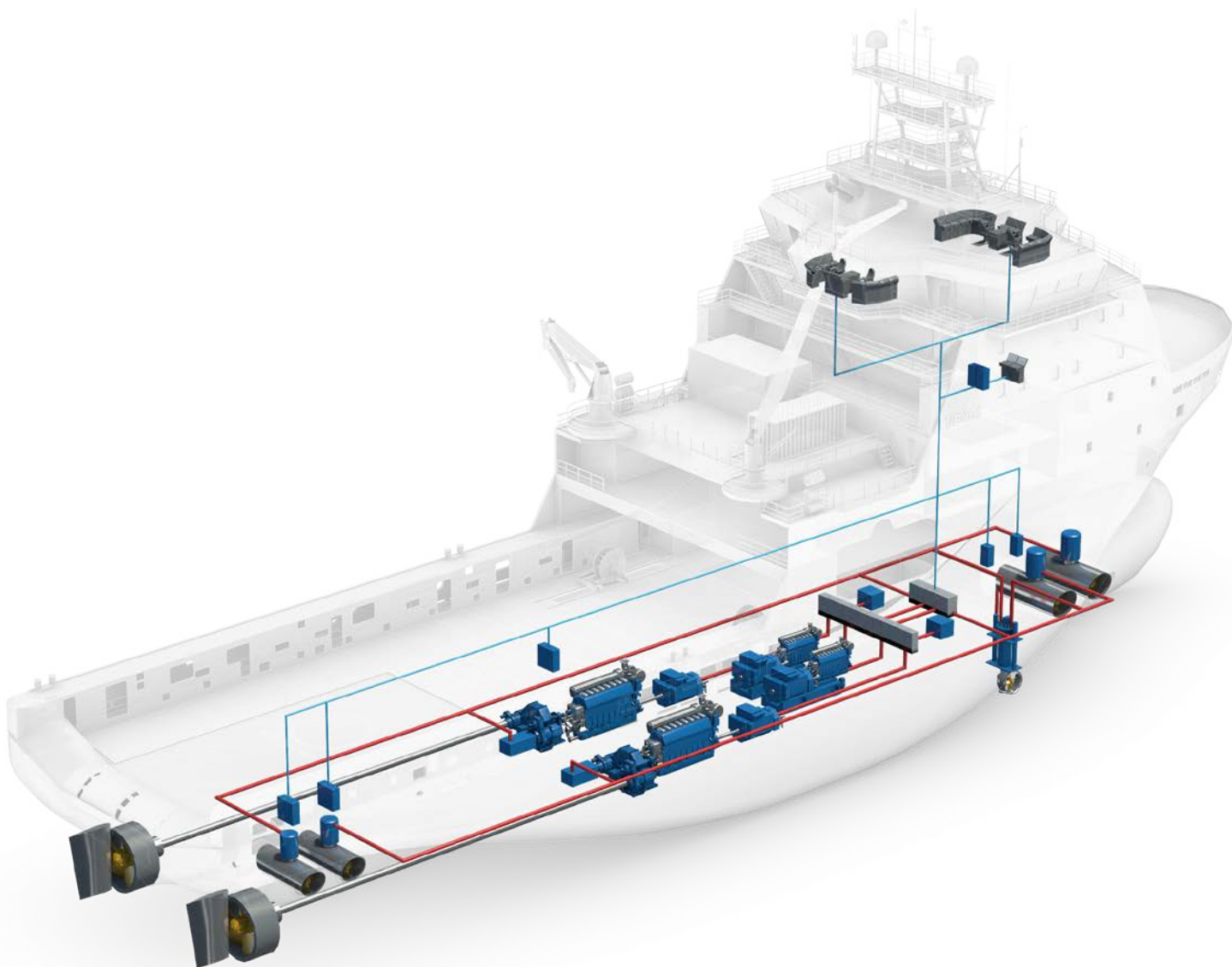
Design Engineering & Conversion Services

Wärtsilä offers a wide range of engineering services, covering the entire cycle from initial evaluation and tendering, to the design and building phases of your project. The project scope can vary depending on the complexity of your project, from a simple vessel modification or upgrade, to complete equipment integration of your retrofit project. Our experience and expertise within this field of conversions, upgrades, modifications, retrofits and shipyard design support, includes the following applications:

- Lengthening
- Widening to increase vessel capacity
- Structural reinforcements
- Integration of new equipment – batteries, winches, towers, cranes etc.
- Upgraded propulsion and machinery systems for better fuel efficiency to meet stringent IMO regulations (ducts, fins, propeller tuning, scrubbers, ballast water management systems, LNG/dual-fuel propulsion) as well as improved performance (speed, bollard pull, manoeuvring, dynamic positioning etc)
- Shipyard design support for engine room and detailed vessel design and configurations.

Additionally, we also provide feasibility studies for hydrogen and fuel cell technologies.





Wärtsilä lifecycle efficiency & optimisation

Operational optimisation and preventing the unexpected is what we do, and we do it well. We are here to serve you – whenever, wherever. Maximising efficiency and lowering operating costs is essential in all sectors of the maritime industry today, and Wärtsilä is committed to serving its customers with support and solutions that respond effectively to these needs. We offer full-service support throughout the product lifecycle, backed by our continuously developing and industry leading global network of repair, maintenance and overhaul facilities. We specialise in the following areas of expertise:

- Engine services
- Propulsion services
- Electrical & automation services
- Boiler services & Environmental services
- Service agreements
- Service projects

- Training services
- Engineering services

Why Wärtsilä is your best service partner

The choice available to you extends from parts and maintenance services to a variety of comprehensive, customised, long-term service agreements, including performance and operations & management agreements. Additionally, we are continually broadening our offering range by adding valuable solutions and specialist services to our portfolio. In this way we can support you in ports around the globe, regardless of your equipment make. Wärtsilä adds value to your business at every stage in the lifecycle of your installation. With us as your service partner, you receive many measurable benefits, such as availability and performance, productivity gains and cost benefits. Above all, peace of mind in the knowledge that your installation is being serviced by the most experienced partner you could have – Wärtsilä.