

Stena Rederi AB

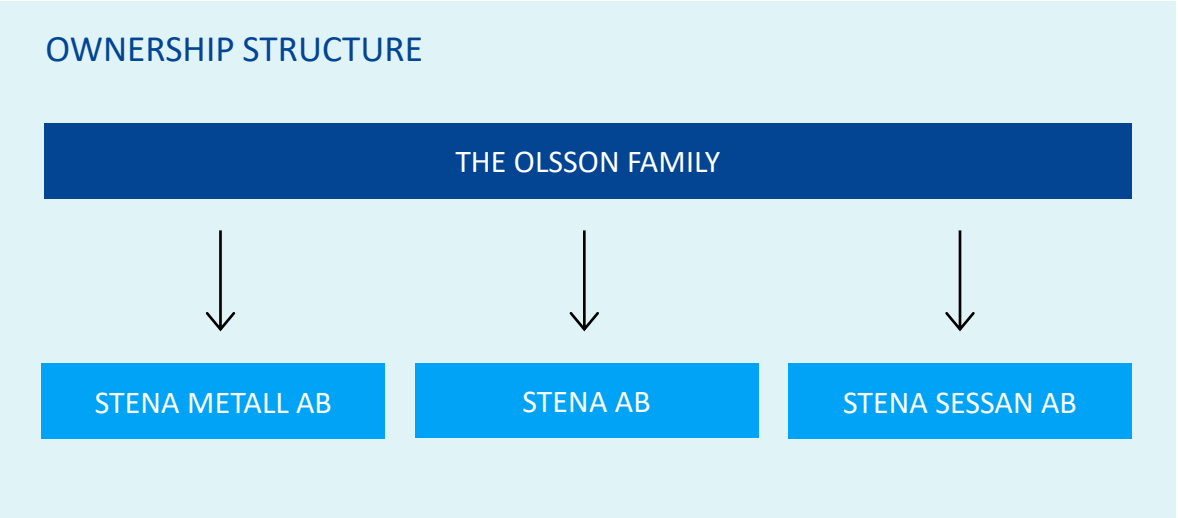
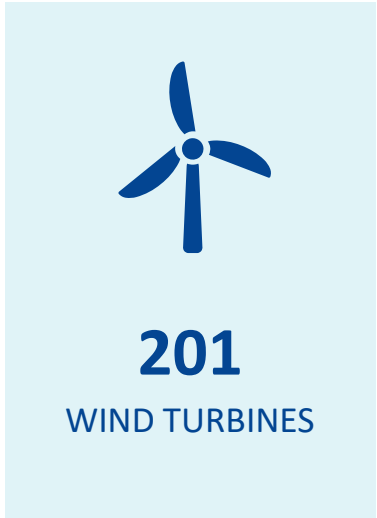
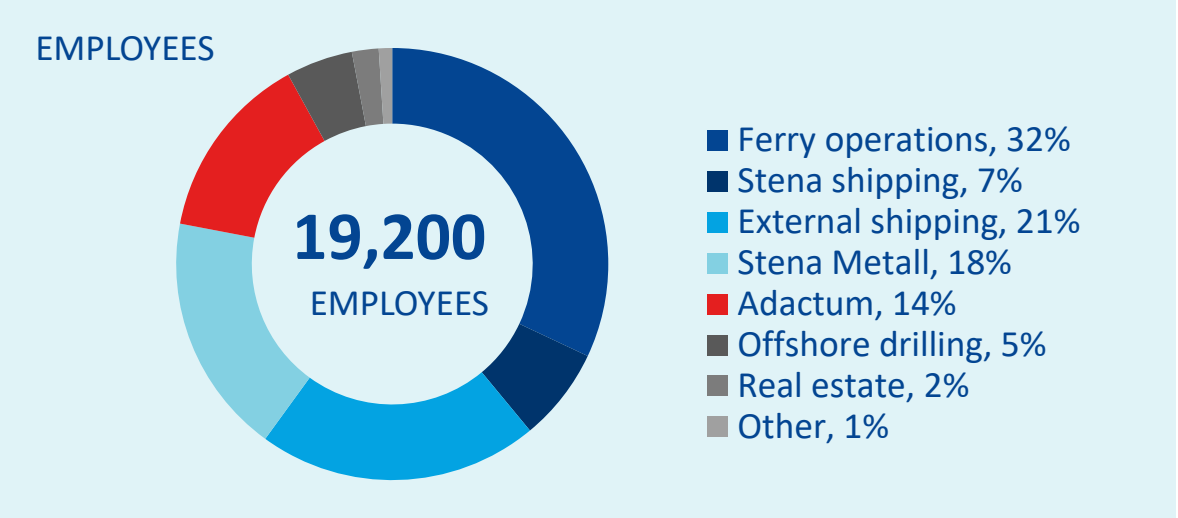
Thoughts on Decarbonisation



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2023-04-20

The Stena Sphere



STENA AB CONSISTS OF A DIVERSIFIED SET OF BUSINESS AREAS

OPERATING MATURE INDUSTRY SEGMENTS



FERRIES



OFFSHORE DRILLING



SHIPPING



PROPERTY



ADACTUM

Restricted Group

- Tankers
- LNG
- RoRo & RoPax
- NMG
- Logistics

Revenue and EBITDA split per business area LTM Q4 2021



Note: USD/SEK 8.5815 (average rate) current year-to-date period

Stena Teknik

PURPOSE

To be the center of excellence for technology and innovation, guiding and supporting Stena's continued success and future relevance.

24 EMPLOYEES with key competences including:

- Vessel Concepts & Newbuild Project Management
- Fire Safety (RoPax electric vehicle transportation)
- Science & Life Cycle Analysis of Future Fuels
- Energy Efficiency
- Contract Management
- Navigation & construction for ice conditions
- Lightweight Structures & Protective Coatings
- Fuel Cell & Battery Technology
- Smart Vessels & Automisation

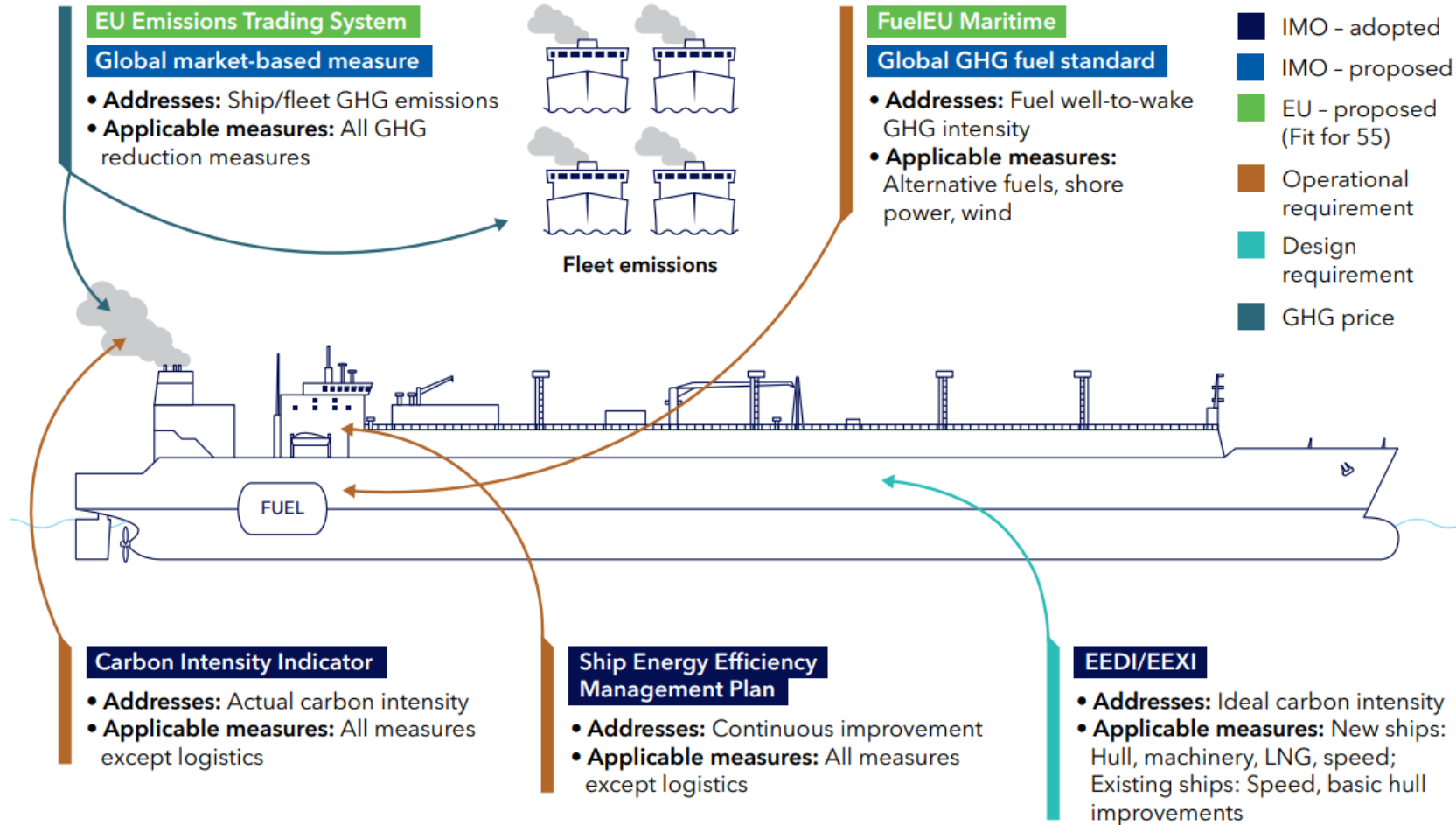


CURRENT SUSTAINABILITY WORK

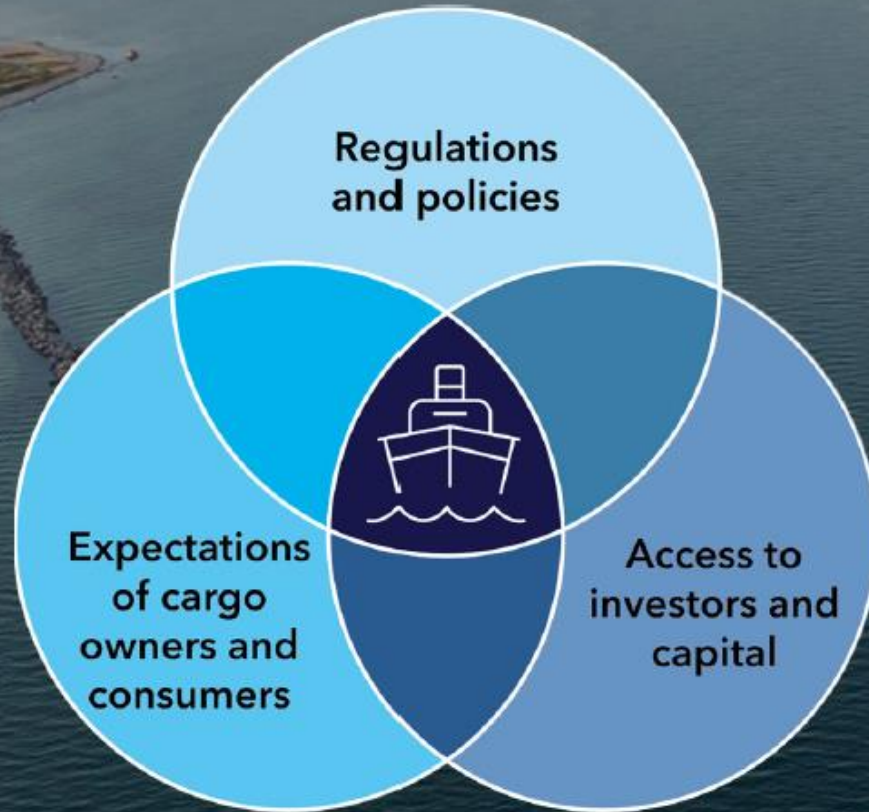
- Drive research & innovation
- Coordinate & consolidate knowledge on energy groupwide
- Focus on energy efficiency and future fuels
- External R&D network with industry partners & academia
- Offer data-driven decision-making tool for investments in energy efficiency systems & future fuel application
- Encourage pilot projects
- Evaluate technical and commercial viability
- Establish a fuel supplier database
- Life cycle assessment of future fuels and technologies



IMO & EU Regulations Overview



Three fundamental key drivers are increasing the pressure for decarbonization for shipping



IMO regulations and EU regulations

Commercial pressure push shipowners to decarbonization.

Poorly performing shipping companies will be less attractive and may struggle to gain access to capital.



Stena Carbon Road Map

- Pathway consists of 4 main building blocks:
 1. Focus on energy efficiency operationally
 2. Implementation of energy efficiency technology
 3. Usage of alternative fuels
 4. Electrification (Battery / hybrid, fuel cells)
- To ensure availability of future fuels, cooperation models with related fuel suppliers are being developed.
- Stena Teknik supports with a digitized decision tool to enable vessel specific carbon road map, including aggregated investment overview, to ensure regulatory compliance and meeting of set out decarbonisation targets.

Energy improvement on four different levels

1. Operational

- Speed
- Trim
- Load planning
- Route planning
- Hull Cleaning

2. Technical

- Hull Optimization
- Engine Efficiency
- Propeller/Rudder
- Air Lubrication
- Sails
- Battery / hybrid

3. Tactical

- Load rate
- Vessel Utilization
- Customer demand
- Logistics set up
- Crew changes

4. Strategic

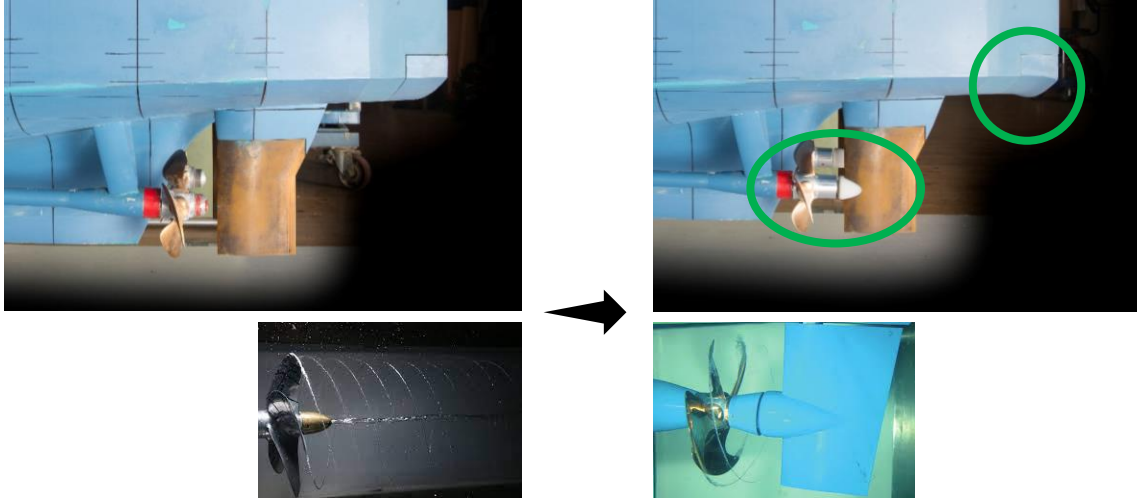
- Type of vessel
- Business model
- Cooperation
- Development projects

We are probably just in the beginning of using AI and digitalization to save energy

Energy Efficiency

Modifications to the hull and propeller/rudder

10-13% less propulsion power



Air Lubrication

3-4% total savings



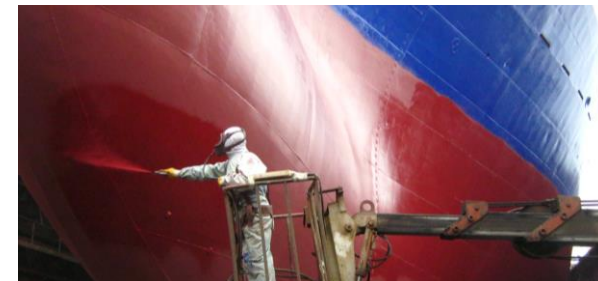
Wind Assisted Propulsion

Up to 15% total savings



Silicone Hull Coating














2-3% total savings



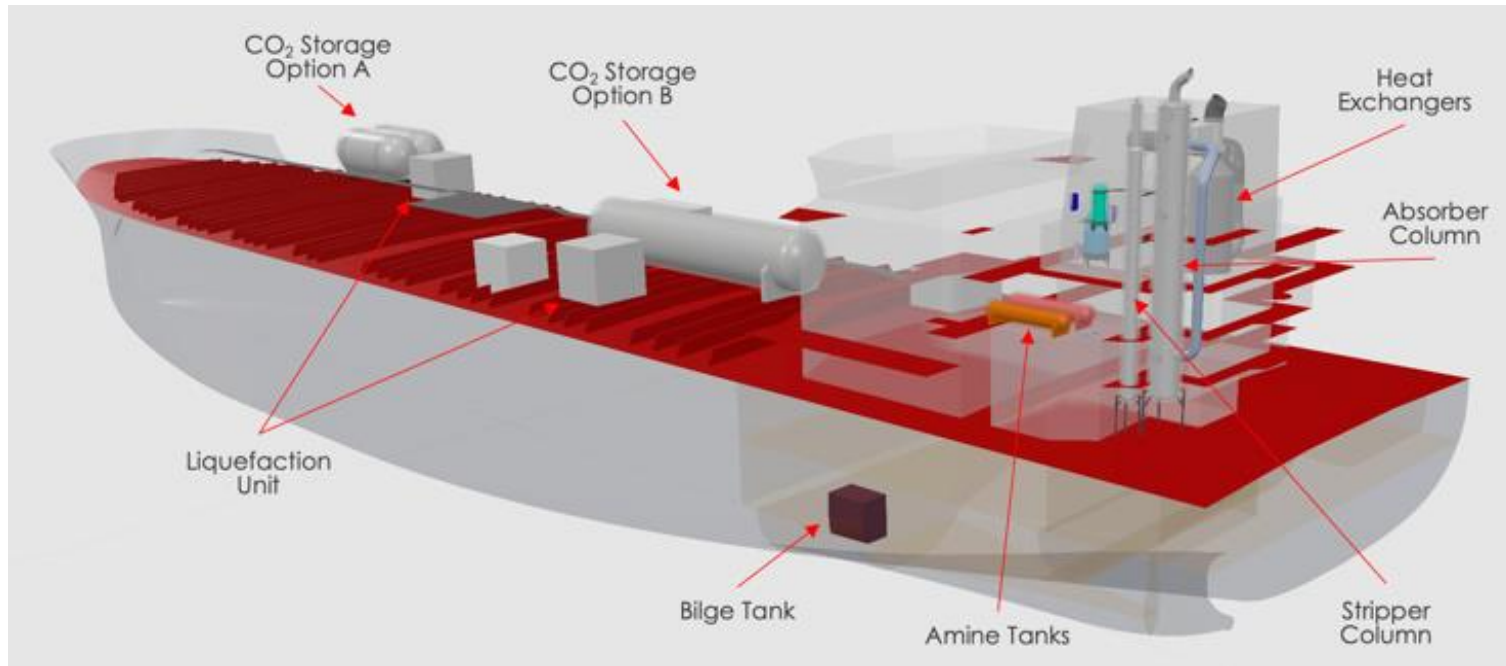
Electrification



Green Energy Carriers: Comparison

	 Feedstock	 Production	 TRL-9 Year	 Storage T °C	 Heating value MJ/kg	 Energy density MJ/liter	 GHG reduction	 2030 total cost of ownership
 Ammonia	Yellow	Red	2026	-30	19	19	Green	Red
 Hydrogen	Yellow	Red	2028	-253	120	8.5	Green	Red
 Battery	Yellow	Green	<2020	5 to 20	N/A	1.7	Green	Red
 Methanol	Green	Green	<2020	- to 25	20	16	Yellow	Yellow
 Biodiesel	Green	Green	<2020	7 to 50	44	44	Yellow	Yellow

Carbon Capture Systems (CCS)



Project ReMarCCABLE: Realising carbon capture onboard ships to decarbonise

1. Carbon capture might be a **transition approach** before green fuels at scale, and long-term allow for **negative emissions** (combined with renewable fuels).
2. Project on IMOIIIMAXX tanker (Stena Impero) for deep-sea voyages to **capture at least 30%** of CO₂ in total exhaust.
3. Target an initial cost ~€200/tCO₂, but show a viable pathway towards an **ultimate target of ~€125-€150/tCO₂**.
4. In collaboration with value chain, demonstrate feasibility of **off-loading and storage**.
5. Consortium awarded \$15-20 million dollars from Oil and Gas Climate Initiative (OGCI) and the Global Centre for Maritime Decarbonisation (GCMD).



A Stena Shipping Strategy

Pathways

Biomethanol, biodiesel and battery electrification – available now, most cost effective, less risks.

Key aspects to consider

- Intermediate targets (2030, 2035, ..., 2050) and alignment with science-based targets (required in CSRD)
- Brand Image

Parameters to consider

- Locality – likeliness of infrastructure/bunkering available at given ports
- Age of vessel (avoid expensive conversions for older vessels to minimize CO₂ abatement cost)
- Define flexibility need for given route/vessel
- Fuel availability, fuel cost, fuel flexibility, agility to reduce impact by black swans



A Stena Shipping Strategy (contd.)

Recommended approach

- Build hands-on expertise by trialing and evaluating new energy carriers.
- Robust scenario and system evaluation, and risk management (based on science, commercial and regulatory aspects)
- Long-term thinking (slow thinking, fast action)
- Modularity/flexibility (not all eggs in one basket)
- Smart pathways with suppliers, cargo owners and passengers (sharing the burden of decarbonization, providing green certificates)
- Prioritizing maximizing CO₂e/USD abatement over other parameters (e.g, branding) to reduce risks.

Stena Teknik supports with system- and market evaluation, projections of fuel availability, fuel evaluation, with a strong data-driven science-based approach.



Thank you

