



# THE FUTURE OF SHIPPING!

## Wind + Solar + Battery Hybrid

**Sea-Cargo has completed the comprehensive rebuilding of its vessels Trans Hav and Trans Sol, marking a major milestone in the company's long-term strategy to modernise its fleet and significantly reduce emissions in short-sea shipping.**

### Significant emission reduction

What began as a structured fleet development programme has evolved into one of the most comprehensive retrofit projects in Northern European short-sea liner trade.

#### The result:

- **35% reduction in CO<sub>2</sub> emissions per tonne transported from the latest rebuild**
- **50% total emission reduction across Sea-Cargo's upgraded fleet**

### A transformation built on experience

Trans Hav and Trans Sol have been part of Sea-Cargo's system since 2020. Originally chartered to strengthen liner services between Norway and continental Europe, the vessels were acquired in early 2025 to enable a carefully planned and phased rebuilding programme.

Sea-Cargo's experience with wind-assisted propulsion began in 2020 with the installation of rotor sails on SC Connector.

The operational data and commercial insights gained from that project laid the technical and financial foundation for expanding the concept to two additional vessels.

With the completion of Trans Hav and Trans Sol, wind-assisted hybrid propulsion is no longer a pilot concept - it is a proven, scalable solution in fixed liner trade.

The rebuilding was carried out in carefully sequenced stages during Q2 and Q3 at Western Shipyard in Klaipeda. With the foundations in place, the rotor sails were installed one at a time in Rotterdam during the normal schedule, allowing the vessels to remain in operation between installation phases.

## Integrated energy platform

Originally built with two 7,500 kW main engines on each vessel, they were designed for conventional propulsion only. Following the rebuilding, energy optimisation is so advanced that the ships can now sail at service speed using less power than a single main engine previously required. The transformation combines multiple technologies into one coordinated energy platform:

- 3 rotor sails per vessel
- 1,600 m<sup>2</sup> of solar panels integrated into a covered weather deck
- Battery storage and frequency converter systems
- New optimised propellers designed for 14-knot efficiency
- Advanced power management system
- Upgraded machinery, bridge and control systems
- Shore power connectivity
- NOx scrubber technology

Under optimal wind conditions, the rotor sails generate thrust equivalent to approximately 7,500 kW (10.000 hp), effectively substituting substantial engine load. Solar panels generate renewable electricity while simultaneously increasing protected cargo capacity with a built-in garage - combining commercial and environmental gains in one structural solution.

Battery systems enable peak shaving, optimised load distribution and reduced engine strain, ensuring smooth integration between wind propulsion, engines and onboard power systems.

## A practical pathway to decarbonisation

Sea-Cargo has taken a deliberate approach to emission reduction by prioritising solutions that are available, scalable and effective today.

At the core of this strategy is wind power. As a naturally available and emission-free energy source, wind represents one of the most environmentally responsible forms of propulsion in maritime transport. By integrating wind-assisted propulsion as a primary component of the vessels' energy system, Sea-Cargo has reduced fuel consumption while maintaining stable and predictable liner services.

The rebuild confirms that substantial emission reductions can be achieved through retrofit when advanced propulsion, energy storage and power management systems are combined into a consolidated operating platform. It also demonstrates that wind-assisted solutions can function reliably within fixed sailing schedules and long-term industrial transport agreements, where operational consistency is essential.

Trans Hav and Trans Sol continue to operate on their established routes between Norway and continental Europe, now delivering significantly lower emissions per transported tonne while upholding the regularity and service reliability required by modern industry.

## Why the rebuild was possible

The investment required to install rotor sails and integrate hybrid energy systems depends on long-term stability in cargo volumes and trading patterns, as well as owners willing to commit capital ahead of regulatory requirements. Parts of the project have been supported by the NOx Fund.

The rebuild of Trans Hav and Trans Sol has been carried out on the basis of secured industrial contracts, including a long-term transport agreement with Hydro. Stable volumes and fixed routes provide the predictability needed to justify upgrades of this scale.

The trading pattern and way of transport have been optimised to increase both operational efficiency in ports and environmental performance at sea. Allowance for more time at sea, requires lower speed and improved work conditions for wind-assisted propulsion. Moreover, the North Sea trading area is a perfect place for such alternative.

***"This investment reflects our long-term commitment to more sustainable shipping. By upgrading these vessels in a structured way, we have improved performance while significantly reducing emissions. It shows that real progress can be achieved today through targeted investments and close cooperation with customers and partners."***

- Ole Sævild, Managing Director, Sea-Cargo

Hydro is working continuously to decarbonize its logistic operations without compromising safety, quality or delivery precision. Long-term cooperation with shipping partners is essential to ensure reliable deliveries to customers, while steadily lowering the environmental footprint of how products are transported.

***"Reducing emissions from our logistics chain is a key priority for Hydro. As a global aluminium producer, we depend on reliable shipping to serve our customers, and it is essential that this is done with the lowest possible environmental impact. Long-term collaborations with forward-leaning shipping companies like Sea-Cargo enable concrete emissions reductions, and this project is a strong example of what can be achieved through close cooperation between industry and maritime transport."***

- Gerd Aalborg Aas,  
Vice President for Logistics & Metal Management, Hydro

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