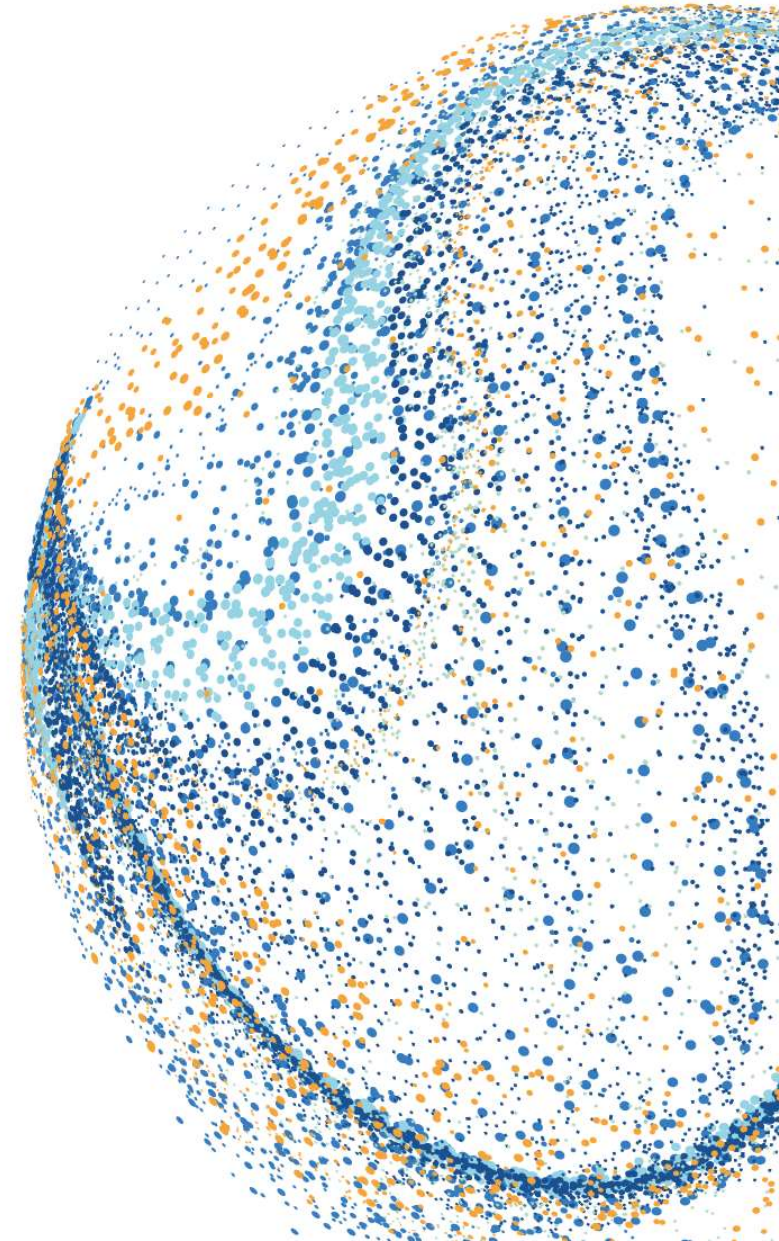


Optimal Routing under the EU Emission Trading System

Hamburg, 06.09.23



Agenda

World ECDIS Day

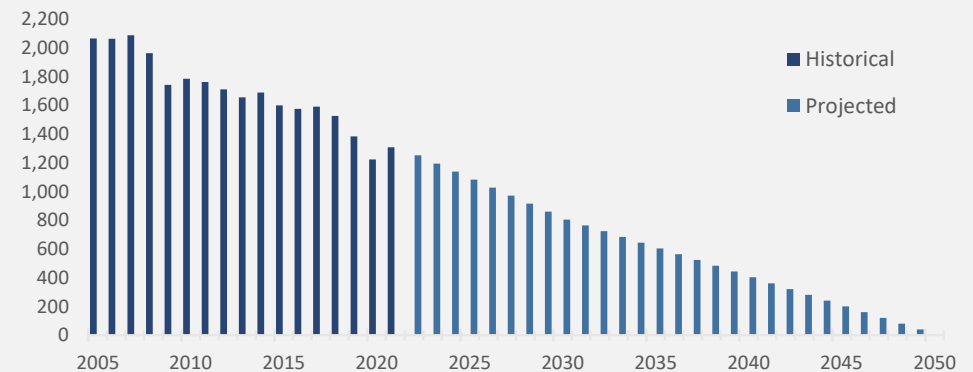
- EU ETS - general update on regulations
- Interpretation of ETS as a ship manager
- Challenges and ongoing ETS discussions for ship owners
- Wilhelmsen's approach to support ship owners
- Future steps for optimal routing under EU ETS



Overview of the EU ETS

- The European Union Emission Trading System (**EU-ETS**) is the most sophisticated and liquid carbon market in the world.
- It covers approximately 40% of EU greenhouse gas emissions and over 10,000 installations.
- Launched in 2005, it is a **cap-and-trade** system that requires polluters to purchase a number of carbon allowances - **European Union Allowances** or **EUAs**.
- **One EUA = Permission to emit One ton of carbon dioxide.**
- EUAs are stored in **registry accounts**, which are digital warehouses for EUAs. They must be surrendered to the EU before the annual compliance deadline.
- Failure to surrender the requisite number of EUAs leads to a fine equal to €100/t-CO₂ not accounted for; however, non-compliant company must still make good on its obligations the following year by purchasing those missing EUAs.
- The volume of EUAs released onto the market is controlled by the EU, and is reduced overtime so that there is a with a rate of around 4 %.

ETS Verified Emissions, 2005 – 2050 (MM tCO₂)



European Union Allowance (EUA) Price, 2012 – Present



Shipping in the ETS

- Start date is 1st January 2024, with a phase-in period of 40% of applicable emissions liable in 2024, 70% in 2025 and 100% in 2026 and each year thereafter.
- The shipping company, defined as either the owner or the entity responsible for the ship under the ISM Code, is responsible for surrendering EUAs.
- Shipping companies are liable for:
 - 100% of emissions on intra-EU voyages
 - 50% of emissions on inbound/outbound EU voyages
 - 100% of emissions at EU ports.
- Carbon dioxide (CO₂) is subject to the ETS from 2024, methane (CH₄) and nitrous oxide (N₂O) emissions are subject to the EU-ETS from 2026.
- Punishments for non-compliance include penalty charges and blacklisting



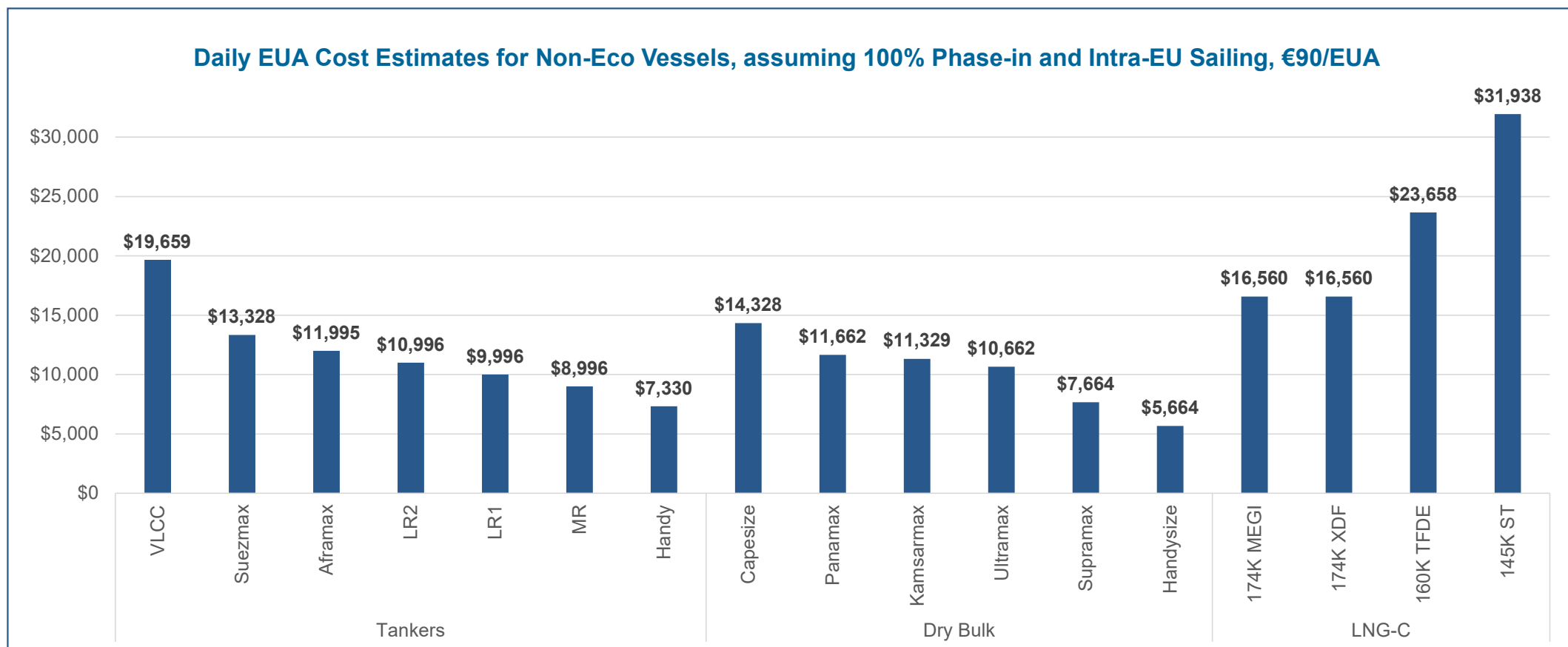
MRV and ETS compliance cycle



* Source: DNV

Future cost for emitting CO2 in European waters

Presented Oct. 2021



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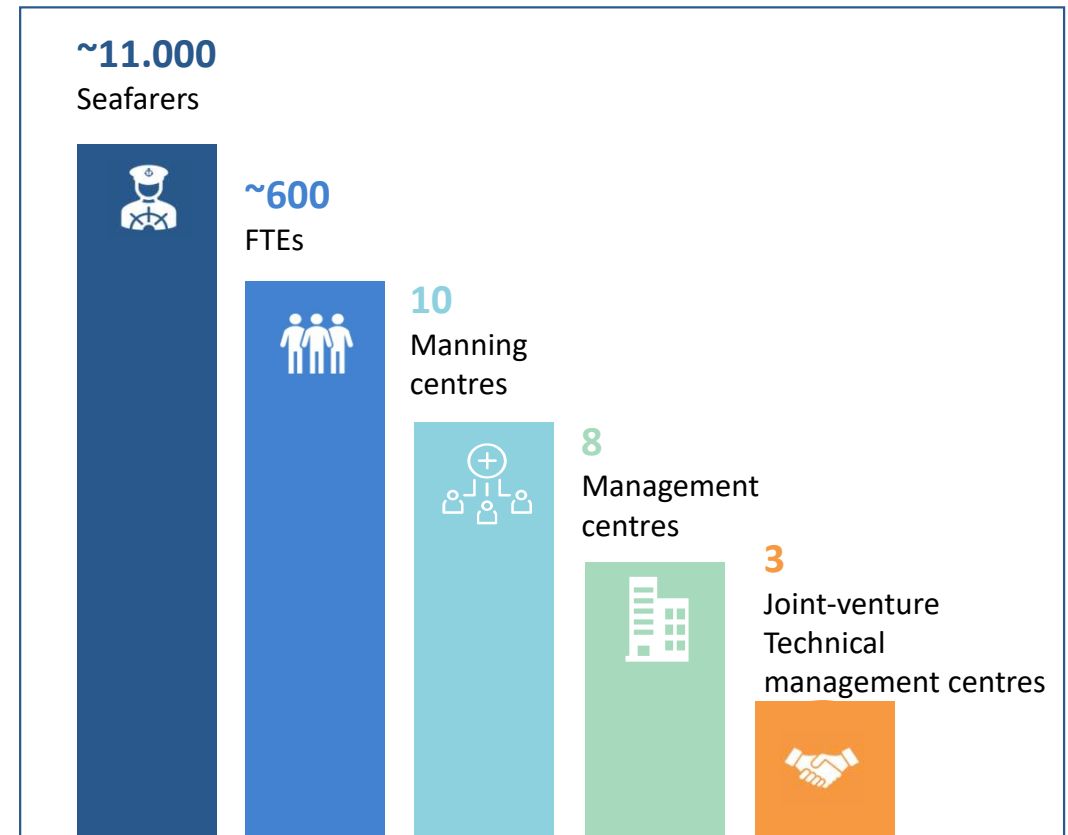
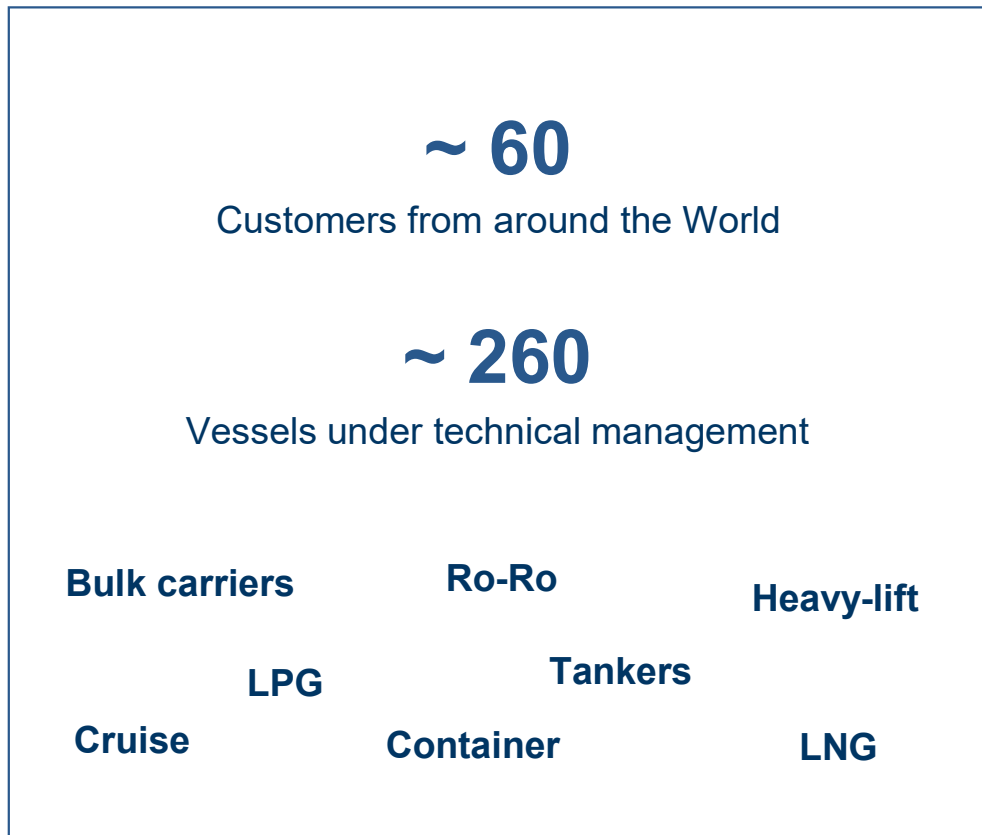
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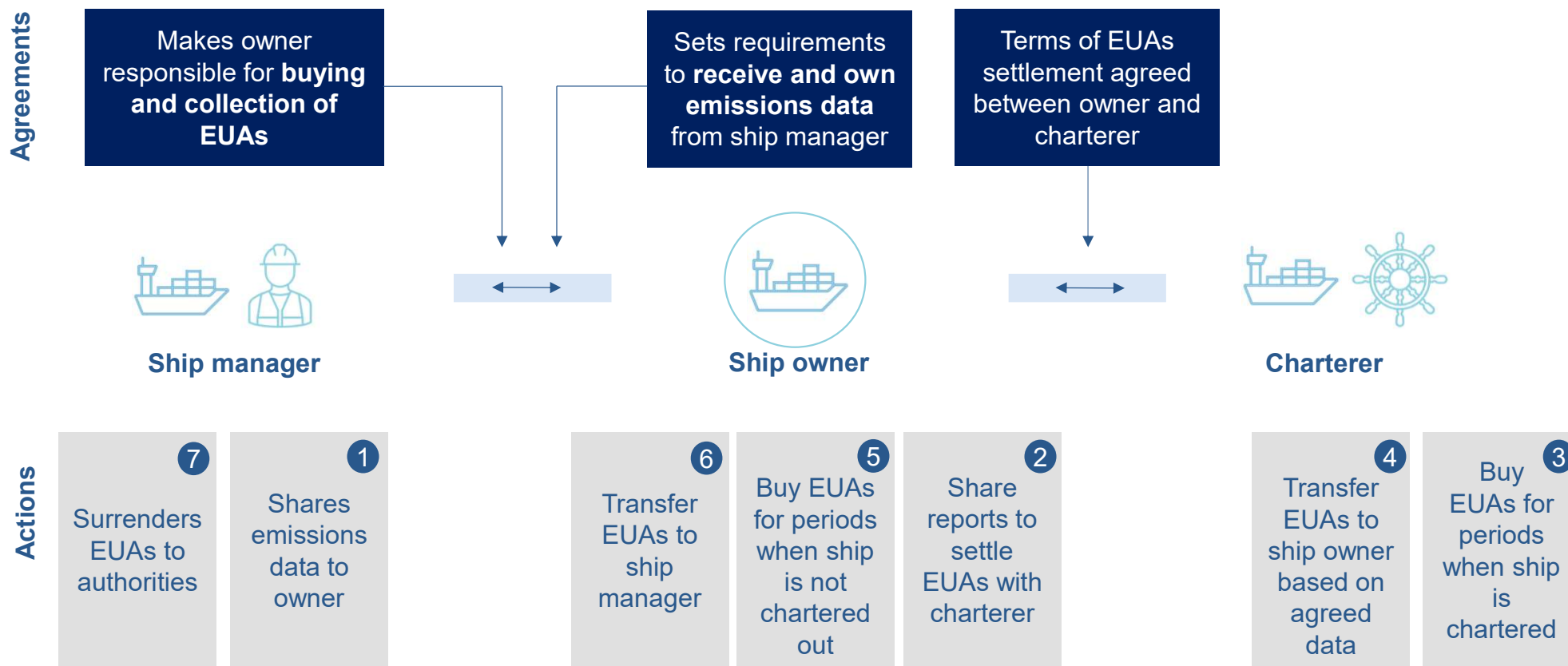
Key facts

Wilhelmsen Ship Management



Simplified interpretation of EU ETS regulations

...as a ship manager*



* Based on similar overview from DNV, but adjusted and simplified. Subject to regulatory changes and development of industry best practices



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Current EU ETS challenges

...for ship owners

Administrative

- **Setting up trading accounts** to be able to send / receive EUAs
 - Fulfilling national registry requirements
 - Appointing account representatives
 - Be ready with trading accounts by Q1 2024
- **Ensuring high data quality** from onboard noon reports – need to be “bankable”
 - Is **high frequency data validation** from a independent third party required?
- Develop a **robust ETS governance structure** to secure required amount of EUAs are collected / bought to ensure compliance
- **Advise and prepare counterparts** on ETS plans and processes

Commercially

- Identify commercial **settlements for ETS in various scenarios**
- Agree on **legal terms between different counterparts** – e.g. charterers – on how to solve ETS contractually
 - Passing on emissions cost to counterparts – end consumer shall pick up the bill
- **Keeping sufficient flexibility** to be ready for “curve-balls”
 - Cash settlements in USD
- **Understanding the EUA market** – different market drivers than in shipping
- Develop a **EUA procurement strategy** and acquire EUAs at the right time



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Main actions related to upcoming EU ETS regulations

Wilhelmsen Ship Management

Assumptions:

- Due to high emissions cost focus from ship owners on **emission reduction will be significant**
- **Data quality on fuel consumption and emissions** will be very important
- ETS will be an **administrative challenge** for the industry



- Establishment of a **performance management department** analyzing vessel data and communicating with stakeholders - including crew – **bridging data with actions.**
- Development of a **vessel performance software** where noon data and sensor data can be visualized.

- Establishment of Hecla Emissions Management - a **turn-key provider of EU ETS services.**
- Company is a JV between Affinity Shipping and Wilhelmsen Ship Management

HECLA
Emissions Management



Service Offering

Hecla Emissions Management has been created to assist clients with all the compliance obligations associated with managing the EU ETS.

Hecla centralises the ETS value chain within one workflow and allows the customer oversight through its digital platform.



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Future steps for optimal routing under EU ETS

...to reduce overall emissions

Weather routing

- Utilizing weather forecasting data to identify routes with favorable wind and current conditions to reduce fuel consumption.

Current and Tide Analysis

- Helps ships navigate routes that take advantage of these natural forces, reducing the need for excessive engine power.

Speed Adjustment

- Optimize the speed of the vessel to ensure cruising speed with lowest environmental impact given

Port Call Optimization

- Efficient scheduling of port calls and on-time-arrival to reduces idling time at anchorage or in the line-up.

Performance monitoring

- Trim and ballast optimization and analysis of fuel consumption to reduce the emissions from the vessel.



One thing is certain under EU ETS

...for industry as a whole

**Cross industry cooperation is going to be
key to succeed commercially and administratively under EU ETS.**



Thank you!

