



Dual Ports Fair Winds Trust Final Report

Overview of full project

2015 - 2022

1. Introduction

This report explains the activities and outputs of Fair Winds Trust in the Dual Ports project phase 1 and phase 2. In phase 1, the objectives were as follows:

- Fair Winds Trust would support the development of a network of ports and sail cargo vessels in the North Sea Region. It would develop a business case for sail cargo, using empirical data from sail cargo shipping.
- Fair Winds Trust would engage with relevant stakeholders and organisations in the shipping industry to address the issue of greenhouse gas emissions from shipping and develop ideas for the adoption of alternative, low carbon propulsion technologies for shipping. This would include wind propulsion technologies and alternative zero carbon fuels.

Because reliable empirical data for sail cargo activities could not be obtained, the objectives were updated in Phase 2:

- A case study approach for the development of sail cargo was adopted in collaboration with the sail cargo enterprise Celtic Cruises operating the sail cargo vessel LoEntropy. A pilot spreadsheet business model for sail cargo was developed. Further development of this work was prevented by the Covid-19 pandemic, which meant that the sail cargo pilot could not be undertaken.
- The stakeholder engagement activities were expanded, with the formation of the Zero Emissions Ship Technology association (ZESTAs) network. This culminated in the organisation of the ShipZERO events; ShipZERO26 at COP26 in November 2021 and ShipZERO26.5 in Amsterdam June 22.

2. Sail cargo network

2.1 Dual Ports Phase 1 SCN Activities 2015 – 2017

The NSR Sail Cargo Network (SCN) laid a strong foundation for its first pilot activities in 2017. The project team was collaborating with two sail cargo companies operating in the region and active in also bringing cargoes into the region. Fair Transport and Timbercoast



operate 3 traditional sail cargo vessels capable of carrying between 25-100 tonnes of break bulk cargo, delivering coffee, chocolate and rum from the Caribbean, along with wine and olive products from Portugal and France. Regional products are also transported including stockfish, beer and preserved foodstuffs. These companies were keen to expand their network and ports of call and scale up their cargo and passenger activities but have lacked the support structures and business models to enable them to do that, supported by the NSR SCN.

In 2016, SCN supported the arrival festival of the SV Avontuur, Timbercoast's vessel, with a delivery of 20 tonnes of ultra-low carbon transported coffee from Honduras to Northern Germany and this collaboration was increased with all three vessels in 2017. By tracking the ship, cargo movement and port activities, SCN started to capture best practice and highlight areas that need to change, and the tools that are needed to do the job more efficiently and sustainably. This data collection and evaluation was intended to assist in a more accurate carbon footprint assessment and full social accounting for the network and the ships.

As the pilot activities were starting to grow, so was the number of ports being brought into the network. Centred on the Port of Oostende, which pledged a dedicated cargo terminal and wharf to the project and planned to act as one of the transshipment hubs, the network was extending up the coast to Den Helder and Zwolle in the Netherlands, Hundested and Vordingborg in Denmark to the Swedish ports of Falkenberg and Halmstad and across the sea to Oban in Scotland. These ports are actively engaged in outreach to local chambers of commerce and potential cargo owners and SCN worked to extend that network further in Denmark, North Germany and along the East Coast of England.

SCN also reached out to regional and national associations involved with key niche and potential bulk cargo streams, including organics, the Fairtrade movement, Europe-wide cooperatives, brewers, winemakers and distillers.

Along with the first cargo delivery milestone and the engagement of the sail cargo companies, baseline development for a comprehensive business plan for the development of sail cargo in the region was initiated and SCN put together an expert team to further develop the sail cargo business proposition, analyse the barriers and drivers affecting the sector and to help develop the tools needed to scale up the project and create a template for other regions. The team included the port manager of Oostende port, an expert in cargo routeing, entrepreneurial seafarers with backgrounds in operations and commercial start-ups along with researchers from Fraunhofer ISI, specialising in bringing innovation and networks to market and Portsmouth University focused on alternative trade models and impacts. The team was complemented by two members of the executive committee of the International Windship Association, bringing with them a unique understanding of the latest developments in commercial wind propulsion and an extensive support network in the field.

Activities in 2017 focussed on developing the database for business cases for sail cargo activities in both hub ports and on routes between North Sea and North European regional



ports. Data collection was been initiated through contacts with ports that have expressed interested in sail cargo activities. Oostende (project partner and lead beneficiary for the DUAL Ports project) was planned to develop as a sail cargo hub. Further ports contacted for data were:

Organisation	Country
Halland Port	Swe
Helsingborg Port	Swe
Halland Port	Swe
Transportfortagen	Swe
Halland Port	Swe
Falkenberg Port	Swe
Samoe Island	Den
Copenhagen & Malmo Port	Den
Uddevalla Port	Swe
Palnackie Port Group	Scotland
Fowey	UK
Newlyn	UK
Ostende	Be
Skagen	Dk

In addition to data from these ports, operational sail cargo vessels were contacted in 2016 and 2017 for data on sail cargo ship operational expenses.

The first demonstration sail cargo activity was organised. This involved shipping goods from Norfolk, UK by river barge to the North Sea (Great Yarmouth). The goods were transferred to the sailing ship Excelsior and transported to St. Katherine's dock, London, for a sail cargo event.

Several meetings have been organised to develop the sail cargo network and promote the participation of further ports. These include a SCN workshop in Fowey, Cornwall, UK, where contact was established with the ports of Fowey and Newlyn. A joint meeting in Emden, Germany was organised with the MARIGREEN sail cargo project, to discuss further cooperation in developing the North Sea sail cargo network.

On 7th October 2017, the Sail Cargo Network held a sail cargo event at St Katherine's Dock, port of London in the city centre.

The sail cargo ship Excelsior was the centre of a demonstration of delivering commercial cargo by sail and of requirements for port facilities of sail cargo vessels.



A main milestone was the participation in the Oostende meeting 13th-14th April 2018. This was combined with a workshop organised by the DUAL Ports SCN in conjunction with the Sail Cargo Association on the 15th April 2018.

2.1.1 Software platform for sail cargo

At the SCN/SCA workshop, an agreement was reached to develop a Sail Cargo webbased Platform for matching sail cargo ships with cargo owners. A working group of the Dual Ports SCN project and the SCA was formed to jointly oversee the development of this platform. The Dual Ports sail cargo cost assessment tool was planned to be a part of this platform. It was agreed that Dual ports would develop a questionnaire in cooperation with the SCA, to identify the requirements for a costing tool for sail cargo shipping. A working group was formed to undertake this task. The questionnaire was completed and circulated to sail cargo operators and feedback given. A draft costing spreadsheet tool was developed.

Given the limited availability of actual sail cargo projects that were being initiated, Fair Winds Trust along with DUAL Ports project leaders undertook an assessment & reconfiguration of the Pilot Project Business Plan. The sailing vessel operator Lo Entropy agreed to cooperate with the project. Fair Winds Trust provided support to the Lo Entropy organisation for routing & operations assessment, also cooperating in refit preparation & support for Lo Entropy. LoEntropy also provided sample data for the sail cargo costing tool.

2.2 Strategy update for the Sail Cargo Network

The approach of the Sail Cargo Network activity was reviewed and updated. The reason for this was that the sail cargo activity was still at a formative stage in its development. The effect of this was that it was not possible to obtain detailed empirical data to develop business cases and extend shipping networks as originally planned. The new strategy for the extended Dual Ports project was to examine the impact of combining hydrogen as a fuel with wind propulsion technology as well as develop a single case in detail, based on the cooperation with the new Dual Ports partner Celtic Cruises, operators of the sail cargo ship LoEntropy. This change was agreed at the Dual Ports project meeting in Oostende in February 2019 and incorporated in the Dual Ports project update.

The development of a costing tool was continued, using estimated data for the Celtic Cruises ship, LoEntropy on the Oostende - Ramsgate and (to a lower confidence level) the Oostende - Great Yarmouth routes. Two estimates with two sets of assumptions on operating patterns and costs are available and these were compared. The assumptions determining the results in the two estimates were investigated to explain the differences between the two estimates.

2.3 Sail Cargo Phase I Achievements



The original objective of the DUAL Ports Sail Cargo Network (SCN) Phase 1 was to facilitate and support the development of a niche segment of the short sea shipping sector, transporting goods under sail in the North Sea region.

The focus of phase I was to create a baseline through analysis of current activities; costs, business plans, shipowners and companies, cargo owners, freight forwarders, and other stakeholders. The primary objective was to understand existing operations and trading practices, identify key routes and trades, and from this information to create operational profiles as well as recommendations for further reducing cost and carbon in and around NSR regional ports.

In the initial stage of phase I Fair Winds Trust (FWT) sought ways to support and scale up existing operations focusing on the transportation of higher-value consumer goods with the idea of constructing an alternative trading network, similar to the Fairtrade model. FWT was operating under an assumption, based on the Fairtrade model, that this alternative, highly ethical, low carbon option would bear higher costs: costs being offset by the added ethical & marketing value throughout the supply chain. It was found that the growth of that network model is hindered by a number of structural and operational challenges. These include; the very small volumes of cargo being carried, which limits the potential for large scale emissions reductions in seaborne freight transport; as the ships are owner-operated and almost all single ship operations, the resources to expand operations is also limited; the ships involved are built to 'traditional' sailing ship designs, which does not take full advantage of current technology to minimize operational and administrative costs.

Therefore, the adoption of a commercially focused business model for general cargo was identified as the best path forward for using wind propulsion to reduce cost and carbon in and around North Sea Region Regional Entrepreneurial Ports. This model is oriented to the movement of third party cargoes on regular, standardized routes at freight rates competitive with conventional shipping and logistics chains. This model as well as the incorporation of current technology was planned to be piloted in Phase II, but could not be undertaken because of the impact of the Covid-19 pandemic.

3. Stakeholder engagement activities for the promotion of wind technology and zero greenhouse gas emission fuels

3.1 Activities to 2019

Fair Winds Trust participated in the COP23 Bonn, Ambition 1.5 event 13 November 2017. The project team contributed information on the potential for both Wind propulsion and H2 fuel to allow commercial shipping to be zero CO2 emissions.



In 2018 and 2019, Fair Winds Trust engaged in a considerable number of communications activities, both conferences to present the Dual-Ports Sail cargo activities and to establish contact with stakeholders. These are shown below:

Conferences:

The International Bunker Industry Association (IBIA) Convention 7 – 8 November 2018

Motorship Propulsion and Future Fuels Conference, Hamburg 13 – 16 November 2018

Green Ship Technology Copenhagen 20, 21 March 2019

Marine Energy Transition Forum Antwerp 22 March

North-Sea Hydrogen Ports Conference Edinburgh 26 March 2019

Meetings attended:

IMO Pollution Prevention and Response, London, February 2019

H2EU maritime working group meeting, Brussels

IEA HIA Task 39 meetings on Hydrogen in the Maritime sector (throughout 2018/19 and 20)

Meeting and collaboration agreement with HYDROGEN EUROPE (H2EU) and FUEL CELLS AND HYDROGEN JOINT UNDERTAKING (FCHJU)

Initiation of a collaboration between the HYDIME project (funded by Innovate UK) and Dual Ports.

3.1 Zero Emissions Ship Technology Association (ZESTAs)

The main achievement in 2019 for Fair Winds Trust was the foundation of the Zero Emissions Ship Technology association (ZESTAs) and associated activities, from presentations at conferences to lobbying at national and international levels. On examining the barriers to the uptake of wind and hydrogen for propulsion, FWT found that the biggest blocks were perception, policy, and cost. By bringing together zero-emissions OEM's and projects FWT was able to take a sectoral approach to these issues, coordinating efforts between technology providers to design, build, finance, zero-emissions ships, and influence policy that will encourage their uptake. The establishment of the Scottish based ZESTAs also assures the legacy of the DUAL Ports project will continue to influence decarbonisation and connected economic activity in the North Sea Region while at the same time having an international reach. Within this claim period, ZESTAs was conceived, founded, and applied for consultative status at the International Maritime Organisation.



Representing a trade association gave the Fair Winds Trust DUAL Ports team a much stronger position when engaging with both industry and regulators, exemplified by the 59 organizations actively engaged since May 2019.

As “ZESTAs” the FWT DUAL Ports projet gained the industrial influence to draw people to workshops and events, as well as be invited to participate in seminars and speak at high-level proceedings, including the International Maritime Organisation.

This was used to create the foundations for a zero-emissions hydrogen framework in the North Sea Region including; renewable energy, ports, hydrogen fuel supply chains, and hybrid hydrogen windships, where, through compressed supply chains, interlinked business models and shifts in regulation, hydrogen fuel becomes economically competitive.

4. Dual Ports Phase II activities

4.1 Studies on alternative fuels

Fair Wind Trust conducted studies on alternative fuels, to define a pathway to the uptake of hydrogen as a fuel for shipping in the NSR and to examine the combination of wind and hydrogen propulsion and hydrogen production technology. The outputs are shown at section 4.3 below.

In this period, FWT completed work on the [IEA HIA TASK 39](#) report.

4.2 Stakeholder engagement activities

4.2.1 Activities in 2020/21/22

Workshops on Hydrogen Seaways were planned for March and November 2020, but were postponed due to COVID-19.

The aims of the workshops were to bring together a variety of innovators and thought leaders, active in the implementation of hydrogen and wind propulsion technology (WPT) to envision pathways to their uptake. Barriers as well as pinpoint development opportunities, with solutions leading to a clear trajectory of hydrogen and hydrogen wind-ship uptake in the North Sea and international shipping were to be discussed. The outcomes of the workshop were planned to be actions to support zero-emissions business cases, new partnerships on the voyage to zero, as well as a roadmap to shape the backbone of a Zero Emissions Shipping seminar to be organized in November 2020 during COP26 in Glasgow. Due to COVID19, FWT was not able to carry out their planned activities of a small workshop (indeed, COVID struck days before the fully organised event was to take place) and larger



event (planned for COP26 2020) to bring together actors in maritime hydrogen and wind propulsion technology.

In the time of lock down FWT focussed on gathering information on the technology readiness levels of marinized hydrogen ship technology, hydrogen shipping projects, green hydrogen supply and bunkering in the NSR. This research culminated in the Dual Ports Marinized H2 Technology report. The report has been broken down into four policy briefs; NSR H2 bunkering, production policy brief, Offshore green H2 production and bunkering policy brief-MHT, Onboard H2 Technology policy brief-MHT, and the Dual Ports green H2 bunkering, production presentation.

During the period of COVID lockdown, FWT presented at over 15 virtual events added 5 new members to ZESTAs.

Workshop activities continued with the organisation of an event coinciding with the rescheduled COP 26 which took place in Glasgow on 1,2,3 of November 2021 and a workshop in Amsterdam in June 2022.

Due to delays caused by COVID the 2020 ZESTAs IMO application was not reviewed. ZESTAs was requested to amend their application for consultative status at the IMO and submit an additional appendix before 31 March of 22. This entailed a lengthy process of reviewing changes to IMO policy, rules and regulations, as well as interviewing new members and updating information submitted by members for the original application. The 45-page appendix was submitted on the 31st of March 2022 and is included as an appendix to this report.

4.2.2 SHIP ZERO –

[ShipZERO26](#) workshop “**Charging to True Zero**” at COP26 November 21

ZESTAs “SHIP ZERO – Charging to True Zero” workshop at COP 26 in Glasgow 1-3 November, was the first ever shipping event to align with the IPCC “very low emissions scenario” by not contemplating the use of fossil fuels or any GHG-emitting fuel or technology.

This unprecedented three-day event brought together global thought leaders and top decision makers to brainstorm disruptive solutions with industry peers. Experts reviewed game-changing zero emissions innovations and state-of-the-art zero emissions technologies. Finance and policy experts shared the latest intelligence on the tools and mechanisms required to achieve “true zero” in this decade.

The SHIP ZERO 26 workshop examined the combining of zero-emissions technologies and design features, along with how regulations, classification, logistics, finance, insurance, and other factors interact with each other to impact shipping's voyage to TRUE ZERO emissions.



The opening Keynote was delivered by Peter Thompson, Ambassador to the United Nations for Fiji as well as the UN Secretary General's Special Envoy for the Oceans.

Headline Ship Zero speakers included:

- USA **IMO** Head of Delegation **Jeff Lantz, US Coast Guard**
- Poseidon Principles Chair and Vice Chair, Michael Parker, Paul Taylor
- International Chamber of Shipping, Deputy Secretary General, Simon Bennett
- **Head of Shipping and Technology, Wilhelmsen New Energy AS, Tomas Tronstad**

Notable outcomes of this event were the idea of cross sectorial collaboration to create true zero channels in the green corridors and establishment of a “navigational chart to true zero”

Ship ZERO workshop, ShipZERO26.5 “We’ve Got the Power!” June 2022

A further Ship ZERO workshop, ShipZERO26.5 “We’ve Got the Power!” was organised and held in Amsterdam in June of 2022.

This workshop, again brought together stakeholders from the wider shipping community; ports, ship brokers, shipowners, ship yards, designers, maritime insurers, maritime lawyers, venture capitalists, banks, etc., to discuss how to action the **navigational chart to true zero and true zero channels in the green corridors**.

The ShipZERO program including follow-on workshops, the development of the Navigational Chart to True Zero, and the implementation of True Zero channels in the Green Corridors are legacies of Fair Winds Trust contributions to the DUAL Ports project.

5. Summary

This report explains the activities and outputs of Fair Winds Trust in the Dual Ports project.

In phase I to 2019, the NSR Sail Cargo Network (SCN) was initiated. A pilot software platform for sail cargo and sail cargo costing tool were initiated. However, further development of these tools was not possible because of a lack of reliable empirical data. A detailed case study to provide data could not be completed because of the restrictions of the Covid-19 pandemic.



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Fair Winds Trust was successful in a major programme of engagement with the shipping industry and regulatory sector. The Zero Emissions Ship Technology association (ZESTAs) was founded and is currently in the process for award of consultative status at the United Nations International Maritime Organisation (IMO) as the representative for zero emissions technology providers and developments in shipping. A further major activity was the ZESTAs “SHIP ZERO – Charging to True Zero” workshop at COP 26 in Glasgow 1-3 November, the first ever shipping event to align with the IPCC “very low emissions scenario” by not contemplating the use of fossil fuels or any GHG-emitting fuel or technology.

Through the Zero Emissions Ship Technology Association, an international trade body, Fair Winds Trust has created a permanent legacy to the DUAL Ports Project and for the Interreg North Sea region, building on not only Dual Ports but also the NSR SAIL project, led by the province of Friesland, which ran from 2012 to 2015. As such, there is a DUAL Ports legacy page, where all FWT published reports, presentations and briefs will be permanently available on the ZESTAs website. But the real legacy will be the navigational chart to true zero and true zero channels that will begin in the North Sea region and reach round the globe.