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# Supporting sustainability within the Sail Cargo Alliance Ecosystem

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## ABSTRACT

This paper focuses on how transportation and marketing bespoke products as “sail cargo” can promote the common good. The context is the Sail Cargo Alliance’s, UK “Sail Cargo Divisions”, who each promoted trading of sail cargo in their locality. We assess the implementation of this aim in each division on a set of four *key sustainable development enabling factors*. The results reveal that inadequate performance on this factor set led to the failure, in 2023, of the operating companies for all Divisions except Sail Cargo London and Sail Cargo Kent whose operating companies merged in 2021 thereby gaining the complementary resources that enabled the merged operating Company (Raybel Charters) to bounce forward. We describe a proof-of- value use case initiated within the transformed Division: *Sail Cargo Channel* in collaboration with Raybel Charters, that can guide the future sustainable development of all the Sail Cargo Alliance’s Divisions for the common good.

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bottom-up; sustainable  
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## 1. Introduction: Sail Cargo for the common good

We tend to think that the days of sailing cargo goods across oceans were nostalgic, romantic, and very over. We can still imagine the time when local spices, new animal species and vegetables from the new world voyaged for months in sailing ships to European ports to replenish cities’ markets. Since the first large cargo ships were built in the 1930s, the days where cargo ships needed to rely on ‘wind power’ to cover long distances have been left behind. The Cargo container ships, currently a fleet of 90,000 vessels, switched from environmentally safe wind to relying on fossil fuel producing sulphur oxide air pollution and carbon dioxide emissions.

Since this form of transport currently contributes enormously to pollute not only our oceans but also all of our planet, we want to contemplate and support a re-introduction of transporting cargo by sailing ships through exploring and examining the value and contribution that the members of the Sail Cargo Alliance can make. We believe that the initiatives they propose and are now implementing will be successful: as evidenced by their performance on what Humphreys and Luk (2022) identified as *four key sustainable*

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*development enabling factors for bottom-up local development of SMEs (Small and Medium Enterprises).* That is, these initiatives collectively support all kinds of sustainability, from physical-environmental to social/cultural innovative forms that are financially sound and contribute to the real economy.

In the sections below, we present first the background context for the case study, followed by its assessment under our four key sustainable development enabling factors. Subsequently, we discuss the implications and significance for local economies and provide a pilot use case on *Regeneration of Sail Cargo SouthEast as Sail Cargo Channel*.

We end with conclusions about what we can learn and the benefits this case may bring in promoting the common good and informing our fight against climate change.

### **1.1. Air pollution problems resulting from carrying goods by sea**

Currently, large ocean container ships take enormous amounts of cargo to their destinations across the oceans, in colossal amounts and at economical rates. In the UK, 15% of all food we consume is imported this way. While this is good for food consumer's wallets, most of these consumers never find out about the negative effects this transport method has on the environment (George, 2013). In fact, the 15 biggest ships produce more sulphur oxide air pollutants than all the cars in the world (Topfler, 2019). Moreover, the European Union Climate Action (2020) has reported:

In 2018, global shipping emissions represented 1,076 million tons of CO<sub>2</sub> and were responsible for around 2.9% of global emissions caused by human activities. Projections show that these emissions could increase by up to 130% of 2008 emissions by 2050.

But when cargo is carried by sailing ships, there is very little air pollution generated from burning heavy fuel oil. When fitted with an electric motor propeller drive (in place of an oil-burning engine) that drive can also generate electric power, while the boat is moving under sail, which is stored for use when the boat is not under sail (i.e. when in port or manoeuvring against the wind). Thus, the sailing ship has zero consumption of fossil fuel, and it will generate no air or sea pollution.

### **1.2. Advantages of carrying goods as Sail Cargo**

By using the clean power of the wind, we create sustainable and healthy transportation trading as lightly as we can on the earth's resources, sailing ships facilitate a direct economic alternative for trade, shipping authentic, ethically and locally sourced, cargo of exceptional quality and providing a transparent, high quality and reliable service at a fair price that reflects the real value of the journey. This empowers communities and individuals and ensures the ability of future generations to enjoy the natural world that sustains us.

## **2. The Sail Cargo Alliance Ecosystem and its participants**

Sail Cargo Alliance is an informal membership association that brings together people *and organisations who share a passion for sail-shipped cargo, working together in an ecosystem*

with shared ethics to create a healthy transport culture that promotes the preservation of the environment for future generations. The Sail Cargo Alliance's objectives are:

- To develop an alliance of people and organisations who share a passion for sail-shipped cargo, working together with shared ethics to create a healthy transport culture that promotes the preservation of the environment for future generations.
- To support networks of farmers, sailing ships, traders and 'port allies' within an ecosystem that delivers food and drink across seas and oceans, emissions-free.
- To care about the quality of the produce shipped as Sail Cargo, prioritising organic, nature-friendly and fairly traded produce from small-scale farms and co-operatives, packaged that reaches end-user via a short and direct supply chain: a transparent way of trading that cares for both people and planet.
- To promote activities that are built on the realisation that the current system of global trading needs to change if we are to have a healthy planet that sustains all of nature, local produce and local suppliers which are crucial to this future and across the seas.
- To encourage the transport of this produce by Sail Cargo to customers: bringing us healthy commodities that we enjoy, are good for us, and what cannot be grown locally.
- To appreciate that sailing ships use the eternal power of nature's forces: the wind, the tides, the long ocean currents.

### 2.1. Varieties of participants in the Sail Cargo Alliance Ecosystem

Figure 1 illustrates the variety of participants in the Sail Cargo Alliance Ecosystem. The *Agents* participating in the Sail Cargo Alliance's Ecosystem include *bespoke food product Creators* located in small farms and cooperatives, *Sailing Ship Operators*, *Trading Hubs* (who package and distribute the live provenance Sail Cargo products for retail sale), and *Port Allies* (who publicise and sell certified Sail Cargo products to customers in the area where their port is situated).

The *Entities* involved in *Sail Cargo Activities* within this ecosystem are *bespoke food products* that are created by/originate from Agents with the ecosystem, carried on a *Voyage* in a *sailing ship*. The *Transactions* of these Product Entities between Agents within this direct supply chain serve to bring us (consumers/end users) healthy commodities that cannot be grown locally.

### 2.2. The Sail Cargo Alliance's UK divisions

In 2017, the Sail Cargo Alliance established geographically defined *Sail Cargo Divisions*. In the UK, the initial divisions were identified as Sail Cargo Bristol, Sail Cargo Southeast, Sail Cargo London, Sail Cargo Kent, Sail Cargo Southend-on-Sea and Sail Cargo Great Yarmouth.

These Sail Cargo Divisions were not operational companies themselves. Rather, they are trading names. Each trading name was appropriated by a company who arranged with New Dawn Traders (a *Trading Hub* in the Sail Cargo Alliance, located in Penrhyn,



**Figure 1.** Aspects of the Sail Cargo Alliance Ecosystem.

UK)<sup>1</sup> to operate the Sail Cargo division as the *Port Ally* in their area and, as such, to sell sail traded goods. Locally through (i) arranging quay-side marketing events to celebrate the arrival of a schooner carrying Sail Cargo products and (ii) arranging immediate delivery from the ship to local customers by carbon-free transport (electric vehicles, bicycles, rowing gigs, etc.), together with continuing sales at local food markets.

### **2.3. Sustainability problems faced by Sail Cargo division operating companies in the UK**

Throughout the period 2017–20 the Port Allies identified above succeeded in strengthening their *local food geographies* (Kneafsey et al., 2021), thus, providing the Port Allies with sufficient income to remain sustainable. But, during 2021–2023, nearly all the UK companies who had opted to operate a Sail Cargo Division as a Port Ally ceased trading as Sail Cargo divisions. The main reason for this was that these operating companies had gained their income solely from sales of Sail Cargo goods but, owing to problems emanating from COVID-19 lockdowns and rising Brexit-related inflation, quayside marketing events were cancelled and publicity about and local awareness of the attractions and availability of Sail Cargo products was reduced. So, the volume of Sail Cargo products that could be

sold by the Port Allies declined sharply, reducing their incomes, but not their costs, until they became nonviable.

The exceptions were Kent Sail Cargo and Raybel Charters, the operating companies for Sail Cargo Kent and Sail Cargo London, who merged in April, 2021 to operate the combined division 'Sail Cargo London and Kent'. The merged company, Raybel Charters CIC, remained healthy and able to 'bounce forward' during the period 2021–2023 when all the other Sail Cargo divisions failed to 'bounce back'.

## **2.4. How Raybel Charters survived as a successful Sail Cargo Division operating company**

While there has been some investigation of the contribution of local food systems to community resilience (Dombroski et al., 2020; Sonnino & Griggs-Trevarthen, 2013), insights into resilience of LFAs [like the Port Allies described in section 2.3 above] themselves, be they businesses or community organisations, are a new area of enquiry particularly prompted by the COVID-19 pandemic (Paganini et al., 2020; Tittonell et al., 2021). These analyses have, to date, focused on assessing local food system resilience as a bouncing-back mechanism. Here, we take the debates further by also investigating the bounce-forward potential of local food systems, i.e., their transformative resilience capacity. (Jones et al., 2022, p. 210)

While the other Division operating companies (Port Allies, identified in Section 2.3 above) failed to 'bounce back' at the Micro level within van Wijk et al. (2019)'s Micro-Meso-Macro model for social innovation (as described in Humphreys & Imas, 2022), Kent Sail Cargo and Raybel Charters remained healthy and able to bounce forward because in 2021 Raybel charters and Kent Sail Cargo had collaborated together successfully at the Meso level, facing and resolving together the key issues at that level that were identified by van Wijk et al.<sup>2</sup> As a result, they were able to integrate their respective business models into a comprehensive business model that was implemented successfully at the micro level from 2021 onwards. The details of how this was achieved are described below.

### **2.4.1. Kent Sail Cargo's original aims and business model**

Kent Sail Cargo was founded in 2020 as the operating company for the Sail Cargo Kent Division. Its initial post on Facebook stated:

Ahoy me Heartys! We are the Kent Hub for the sale and distribution of wonderful goods that will arrive by sailboat. Working closely with New Dawn Traders, an experimental business that trades in wild ideas and delicacies and import sfine produce from Europe & the Caribbean. The premise is simple: delicious food purchased directly from the Producers & transported directly to you completely carbon-free by the power of the sea, the sun & the wind. Our virtual shop front is now open for orders. The Ship will dock early in July and we will forward courier your produce to your door by electric vehicle, meaning the carbon footprint for your purchase is ZERO!<sup>3</sup>

When Sail Cargo schooner De Gallant<sup>4</sup> docked at Ramsgate in September, 2020, Kent Sail Cargo arranged onward transport of pre-ordered Sail Cargo that had been carried in De Gallant by sailing barge for local distribution via other Kent ports (Faversham, Whitstable). Kent Sail Cargo also commissioned local coffee roasters and (with the aid of Caravela Coffee<sup>5</sup>) found growers in Colombia producing excellent coffee that they could buy as Sail Cargo to be shipped directly to them for roasting an



distribution throughout Kent. These innovations enabled Sail Cargo Kent to gain sufficient income to be able to continue to bounce back during 2020–2021.

But Sail Cargo Kent anticipated that it would no longer be possible to bounce back in the changed context (post-COVID plus Brexit) in which the company would need to operate from 2022 onwards. Thus, in March 2021, Kent Sail Cargo posted on Facebook:

Brexit is seriously difficult for us to navigate as a small organisation, so much bureaucracy now we are no longer part of the single market place. We are attempting to do something positive, but it's not easy! . . . Last year's challenge was COVID, this year's challenge is COVID + Brexit.

The 'something positive' identified in the above quote was for Kent Sail Cargo to revamp and extend its original business model, together with gaining the necessary resources enabling Kent Sail Cargo to implement this enhanced business model immediately. Then Kent Sail Cargo would be able to bounce forward when it was no longer possible to bounce back.

To enable this realisation in practice, in April 2021 Kent Sail Cargo merged with Raybel Charters, with the founder of Kent Sail Cargo being appointed a director of Raybel Charters CIC. In a Facebook post made on 16 May 2021, Sail Cargo Kent identified the changed context for this new, enhanced business model as:

Sail Cargo Revolution: There are so many exciting projects around the world happening right now to promote & create emission free shipping and we are so excited to be part of this global movement. Our favourite projects are about heritage, community and sustainable futures. The greatest will address the history of colonialism and ensure a truly fair trade! Like our partners Raybel Charters who are all about heritage and community. Restoring a Thames barge (Raybel) in Sittingbourne that was built there 101 years ago. We see a bright future with fair international trade linked up with local coastal communities.

#### ***2.4.2. Raybel charters' original aims and business model***

Raybel Charters was conceived as:

A maritime heritage social enterprise – part business, part campaign, part arts project – born from a desire to inspire and create change towards a climate conscious and socially just system of trade. Their work is based around the themes of water, trade, transport, nature, heritage and people. They aim to work collaboratively, inclusively and creatively on a global and a local scale.<sup>6</sup>

Raybel Charters CIC was formed in January 2018 with the principal aim to of restoring the historic Thames Sailing barge 'Raybel'.<sup>7</sup> The income for this activity was gained between 2019 and 2023 through an initial Crowdfunding appeal<sup>8</sup> and grants from the National Lottery Heritage Fund, Swale Borough Council, Kent County Council and the Transport Trust. Raybel Charters also became the port ally in London and Sittingbourne for Sail Cargo London, although this was not prioritised as a source of income in their original business model. For example, in 2021 Raybel Charters arranged docking facilities in the Port of London for Schooner De Gallant, from where they transported pre-ordered Sail Cargo to Raybel Charters' warehouse in Euston by bicycle,<sup>9</sup> together with retail sales delivered by bicycle courier to customers throughout the Greater London area,

However, in 2021, anticipating the changed business context that would exist when Raybel's restoration was completed, Raybel Charters decided to extend their current

business model to include a wider variety of activities ‘based around the themes of water, trade, transport, nature, heritage and people’.<sup>10</sup> This required strengthening and diversifying the practical resources that would enable this enhanced model to be sustainable in practice and, in particular, to re-vamp its Sail Cargo operations in a way that would enable than to be an income-gaining source. In order to In order to achieve this, in 2020 Raybel Charters opened negotiations with Kent Sail Cargo that culminated in April 2021 with a merger between the two companies and the initiation of Sail Cargo London and Kent.

### **2.4.3. The merger into ‘Sail Cargo London and kent’: enabling bouncing forward**

By means of this merger ‘Sail Cargo London and Kent’ (operated by Raybel Charters CIC) gained the resources needed in order to ‘bounce forward’ in 2022–4 through

- Starting mid-2024 a programme of voyages on the Thames Estuary along the Kent Sussex, Essex and Suffolk coasts delivering Sail Cargo to, and receiving Sail Cargo from, Port Allies.
- On these voyages, Raybel will also carry paying passenger between ports along the English South coast, ranging as far West as Newhaven, and along the East coast as far North as Great Yarmouth.

Through activities like these, guided by its enhanced business model, Raybel Charters CIC now has a diverse income that allow the company to keep operating when income from one source declines. This is a deliberate strategy aimed at making Raybal Charters more sustainable. For example, Raybel Charters can now keep operating its Sail Cargo shop even when there is little or no stock left from that delivered via a previous Sail Cargo voyage. Also, Raybel Charters can run multiple funded projects addressing arts, theatre and environmental activities alongside the main Raybel restoration project.<sup>11</sup>

## **3. Assessment on four key sustainable development enabling factors**

Humphreys and Imas (2022) identified four sustainable development enabling factors for bottom-up local development of SMEs, enduring throughout history and across national, social and cultural contexts worldwide. When implemented together, these sustainable development enabling factors promote and ensure all kinds of sustainability (physical, environmental, social, cultural creative/innovative and financial within the real economy).<sup>12</sup>

In December 2023 a panel of four professional experts in small business development, provenance and sustainability assessed the Sail Cargo Division operating companies’ performance during 2017–2023 on each of these factors in terms of its potential for enabling future sustainable development, through assigning sustainability-enabling score on each of the four Sustainable Development Enabling factors described below.<sup>13</sup>

*Factor 1: The presence of a direct trading system together with safe transportation routes:*



All the Sail Cargo division benefited from the safe direct trading system established by the Sail Cargo Alliance, and the use of voyages on schooners to transport these products.

*Factor 2: The ability to build an entrepreneurial innovation cluster:*

By following the guidelines established by the Sail Cargo Alliance, each Division's operating company succeeded in actualising an informal "port ally" entrepreneurial innovation cluster, consisting of Sail Cargo product producers/originators, product processors (e.g., a local coffee roaster), local specialist retailers, event organisers and logistics experts.

*Factor 3: The ability to promote transaction-based sustainable tourism within the local community:*

All the UK Sail Cargo Divisions engaged in local promotion of facilities supporting sustainable tourism by attracting visitors and resource providers to activities coordinated by their port allies and involving, resource providers. These activities included Sail Cargo delivery events publicised locally (e.g., when a schooner arrives at the port) and displays of 'certified Sail Cargo' products by local retailers and market stallholders. Here, local resource provider can interact with visitors: 'showing and telling' about their products and services, sharing know-how and transacting together in a way that meets their needs. The visitors also gain the opportunity to participate in local events and initiatives promoting sustainable development. However, this kind of transaction-based tourism attracts mainly day visitors rather than visitors who stay for longer periods. The exception here was Sail Cargo London and Kent who, in 2021–3, attracted longer-stay visitors successfully by publicising the opportunity for them to visit historic sailing barge Raybel and participate in her restoration.<sup>14</sup>

*Factor 4: The presence of communication facilities for provenance exploration, authentication and demonstration:*

The Port Allies needed to establish the good provenance of the 'certified Sail Cargo' bespoke products that they were considering procuring and selling to customers. However, under the typical trading conditions in each Port Ally's location, the provenance of a Sail Cargo product, under consideration by a potential buyer, is explored and authenticated primarily through 'word of mouth' techniques involving a face-to-face chat with the seller and seeking 'reputation' opinions from friends attending local events promoting Sail Cargo.

The information about any particular Sail Cargo product's provenance, gained in this way, is likely to be uncertain, impoverished and unverified, so gaining it adds little to increase the utility (subjective, virtual value) of a potential buyer's appraisal of the particular product. However, Raybel Charters also placed a brief provenance-certifying statement on the retail packaging of each 'Sail Cargo coffee' product that it sold identifying 'Variety, Process, Altitude, Roaster'. But this statement did not identify the ship or voyage on which this particular product gained the right to be called 'Certified Sail Cargo'

#### 4. Implication of assessment of Sail Cargo divisions: the universal need to support provenance building an exploration throughout the Sail Cargo Alliance Ecosystem

The Panel of experts mentioned in Section 3, above carefully reviewed each profile in order to make a holistic assessment of the nature the resources and potential for continuing sustainability, indicated on the five-point scale: failure > inadequate > sufficient > good > excellent. Table 1 gives the summary assessment scores, unanimously agreed by the panel of experts, for each UK Sail Cargo Division on the four sustainable development enabling factors.

This table reveals that Raybel Charters (the operating company for Sail Cargo London), through merging with Kent Sail Cargo in 2021 and integrating their complementary innovative business models to form ‘Sail Cargo London and Kent’, gained a sufficiently good sustainability-enabling scores for them to *bounce forward* during 2021–24, whereas none of the other Sail Trading Division operating companies could *bounce back* as they had insufficient overall sustainability-enabling scores. The biggest sustainability-enabling problem identified in Table 1 is the universal need to support provenance- building and exploration throughout the Sail Cargo Alliance Ecosystem’s Divisions in order to ensure that its remaining and future Divisions are sustainable.

To appreciate this claim subjectively: imagine the increase in the utility of a ‘Certified Sail Cargo Product’ that would be gained for a customer considering buying it if he or she was able to explore the *live provenance* of the product in rich audio-visual language (Humphreys & Brezillion, 2002; Lorac, 2020) creating a virtual world bringing alive the stories about the transactions and activities in which that product was involved. (e.g., harvesting and washing the product’s constituent coffee beans on a family’s farm in Colombia, transporting them on a voyage across the Atlantic on schooner De Gallant to a port in Sussex, UK, followed by carbon-free delivery to a local coffee roaster for packaging for retail sale).

The customer-explorer can now imagine his or her own participation in this provenance -building world (Berger, 2008) and this creates real added value in the mind of the potential customer which can be reflected in an increase in the ‘reasonable selling price’ for each live provenance-certified Sail Cargo product, and also an increase in the volume of products sold at that price.

Hence, in Section 4.1, we describe the ontology that needs to be incorporated in an App that could provide interactive support effectively for a user desiring to explore live provenance in the way that we indicated above. This is a particularisation of the World Wide Web Consortium’s *Provenance Ontology*, PROV-O (Moreau & Groth, 2013). Then, in

**Table 1.** Summary assessment scores.

Sustainability-enabling Factor	Assessment score for Sail Cargo London and Kent	Assessment score for all other Sail Cargo Divisions
1: Direct trading system with safe transportation routes	Good	Good
2: Support for entrepreneurial innovation cluster building	Good	Sufficient
3: Promote transaction-based sustainable tourism within the local community	Good	Sufficient
4: Facilities for provenance exploration, authentication and demonstration.	Sufficient	Inadequate

Section 4.2, we describe how the Sail Cargo version of the Provenance Creator App, founded on PROV-O, enables us to establish and explore the live provenance of any *Sail Cargo Product Entity* of interest to the explorer.

#### 4.1. PROV-O: modelling and structuring provenance

The process of investigating provenance and creating transaction provenance records, with the aid the provenance Creator App and platform, builds on PROV-O wherein provenance is defined as ‘a record that describes the people, institutions, entities, and activities involved in producing, influencing or delivering a piece of data or a thing, which can be used to form assessments about its quality, reliability or trustworthiness’. PROV-O is a set of recommended standards that define a data model, serialisations, and definitions to support the interchange of provenance information on the Web. The starting point of PROV-O is a small set of classes and properties that can be used to create simple initial provenance descriptions.

In PROV-O, provenance is established through representing and exploring all entities, agents and activities that have been influential through involvement and interactions in the historical provenance chain. The starting point of PROV-O is a small set of classes and properties that can be used to create provenance descriptions, thus:

- A *prov: Entity* is a physical, digital, conceptual, or other kind of thing with some fixed aspects; entities may be real or imaginary.
- A *prov: Activity* is something that occurs over a period of time and acts upon or with entities; it may include consuming, processing, transforming, modifying, relocating, using, or generating entities.
- A *prov: Agent* is something that bears some form of responsibility for an activity taking place, for the existence of an entity, or for another agent’s activity.

The three primary classes relate to one another and to themselves using the properties shown in the entity-relationship diagram in Figure 2, where the particular types of Entities, Agents and Activities represented in the Sail Cargo Alliance Ecosystem are shown in square boxes.

Figure 2 also identifies the metadata type attributes (Subramaniam et al., 2023) instantiated in the interactive views employed in the Sail Cargo Provenance Creator App and platform described in Section 5 below.

#### 4.2. Implementation of Provenance Creator App within the Sail Cargo Alliance Ecosystem

Founded on PROV-O, the version of Provenance Creator App implemented within this Sail Cargo Alliance Ecosystem enables us to establish and explore the live provenance of any *Sail Cargo Product Entity* of interest to the explorer, revealing its involvement in particular *Activities (Transactions and Voyages)* by conducting historical provenance searches right back to the first transaction in which the entity was involved, marking that entity’s creation, and to the first voyage that established it as a *Sail Cargo Product*. This trace provides the Historical Entity-Provenance Chain for that entity: a time-ordered sequence of the complete set of Activity records involving the specific product entity. In a similar



*Live Provenance* is an internet-based search process that reveals the 'live' (historical plus present activity) provenance context within and beyond the ecosystem where it addresses participants' activities. Within the Sail Cargo Alliance ecosystem, these involve a bespoke 'Sail Cargo' product's creation and the transactions, events and voyages on ships in which it is involved. This exploration process also serves to detail and enhance the provenance of the agents participating in these activities.

A Live provenance search may be continued through the material referenced in the transaction record at this location in the provenance tapestry. This material includes:

- Stories relating to the particular *Entities* and *Agents* engaged in an *Activity* of interest to the explorer.
- Stories expressed as interpretive material in various kinds of media that address 'How' and 'Why' for a particular *Activity*.
- Stories relating to the enactment of the *Activity* in the first place and its consequences.

## 5. Features of the Sail Cargo Provenance Creator app

The *Sail Cargo Provenance Creator* App is designed for use by the members the Sail Cargo Alliance Ecosystem. It is a multisided interactive app: supporting all types of *Agents* participating in the full variety of roles within the Sail Cargo Alliance Ecosystem. It enables the live provenance of each Sail Cargo products transacted in the ecosystem to be certified and enhanced, together with its the creator's live provenance, and that of any sailing ship in which a Sail Cargo product travelled on a voyage.<sup>15</sup>

A major feature of the Sail Cargo Provenance Creator App is that it enables its users to use their personal computers to print QR codes on 'Live Provenance Certification' labels that can be attached to each Sail Cargo certified product created and transacted within the ecosystem. This means that everyone and anyone, especially potential customers viewing a Sail Cargo product on display at a publicity event (e.g. associated with a Sail Cargo schooner's arrival port) or offered for sale at a Sail Cargo market stall, retail boutique or online shop, is able (and encouraged) to scan these QR-coded labels on the ecosystem's Sail Cargo certified products, using their own mobile phone.

When they scan the QR code on the Live Provenance label, they are taken to a URL where they can immediately access the web-based 'Sail Cargo Provenance Explorer' App's facilities. This app provides provenance -exploring facilities similar to those incorporated in Provenance Creator, but with restrictions that protect the integrity of the Ecosystem's database and meet GDPR conditions with regard to accessing from the internet personal information about the agents involved in the ecosystem. However, the Provenance Explorer App also offers its user the possibility to apply for membership of the Sail Cargo Alliance, where they can then access the full range of facilities of the Provenance Creator App.

### 5.1. Interactive views provided by the Sail Cargo Provenance Creator app

The Provenance Creator App comprises eleven interactive views each actualising one of the functionalities that are described above. There are three main categories of views:

- (I) Views focusing on creation of Agent, Entity and Activity records<sup>16</sup> (i.e. 'Register as an Agent and Create Profile'; 'Create a Sail Cargo product's Profile and Live Provenance Certification label'; 'Create a Sailing Ship's Profile'; 'Record New Voyage'; 'Record New Transaction').
- (II) Views focusing on reviewing Agent, Entity and Activity records (i.e. 'View an Agent's Profile'; 'View a Sail Cargo product's Profile and Live Provenance Certification label'; 'View a Sailing Ship's Profile'; 'View a Voyage'; 'View a Transaction').
- (III) A View focusing on exploring and assessing the Live Provenance of Activities and their associated Agents and Entities along the relevant threads in the Provenance Tapestry.

### 5.2. The linkage between implementing this App within the Sail Cargo Alliance ecosystem and reducing global pollution

Fossil fuel transport today is up against a grim carbon reality. If ocean shipping were a country, it would be the sixth largest carbon-emitter, releasing more co2 annually than

Germany ... Winds of change, especially triggered by international commerce, could soon push us rapidly beyond carbon into a new age of sail with the need for a planet-wide sail cargo fleet rebuilt from the keel up'. (Willner, 2022)

Precey (2024) identified two distinct but interlinked Sail Cargo markets as shown in Figure 3. In Sections 4 and 5, above, we explained how Port Allies, using the Sail Cargo Provenance Creator App to place live Provenance certification labels on the Sail Cargo products they offer for retail sale in Market 1, enable potential purchasers to explore and identify the provenance history of these now-certified products. Potential purchasers are also given the opportunity to identify with the social innovations that they encounter through audio-visual success stories revealed in their explorations. This increases the attraction of these live provenance certified Sail Cargo products to purchasers, with the result that the price

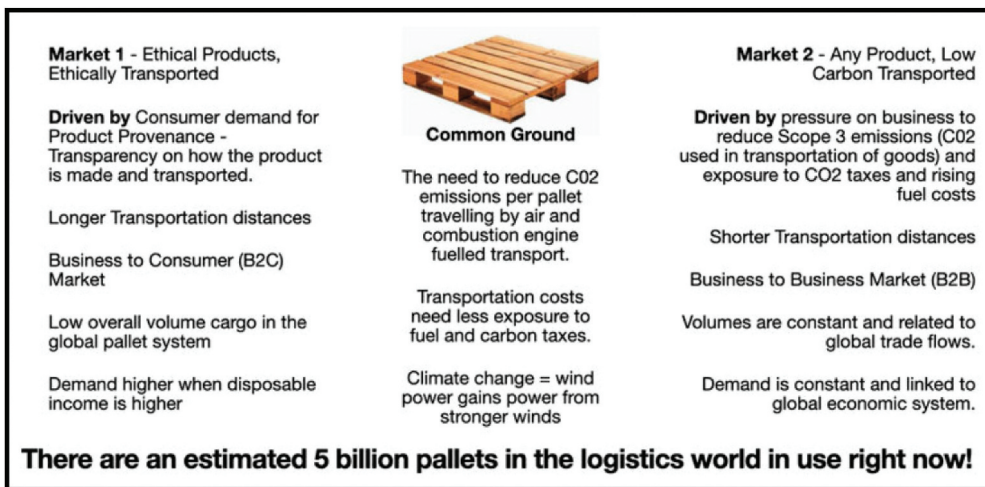


Figure 3. The two distinct Sail Cargo markets.<sup>17</sup>



x volume factor of the retail sales of these Sail Cargo products increases substantially.<sup>18</sup> In [Section 3](#), above we indicated that the resulting increase in Port Allies incomes the key sustainability-enabling resource that port allies needed to survive in changing contexts, thus ensuring the continuing health and growth of Market 1, although the size of Market 1 will always be considerably smaller (measured in terms of pallet volume transported) than Market 2.

However, [Figure 3](#) also indicates that purchasers (end-users) in Market 1 are likely to have a higher level of disposable income and to support initiatives whereby Sail Cargo products are ethically transported, reducing CO2 emissions per pallet, and also have the opportunity to influence the winds of change in the much larger (5 billion pallet) Market 2 identified by Willner (2022) in the quote mentioned above. The audio-visual stories about the live provenance and social innovations resulting from transportation of live provenance certified products as Sail Cargo that are accessed through the QR codes are also distributed in media channels world-wide.<sup>19</sup> This provides the impetus, resources and evidence that these influencers need to promote Sail Cargo initiatives that reduce Scope 3 emissions in Market 2 and strengthens the winds of change that Willner (2022) talks about.

## **6. Pilot use case: regeneration of Sail Cargo SouthEast as Sail Cargo channel**

### **6.1. History of Sail Cargo SouthEast**

In 2017, 'Sail Cargo Southeast' was created as a UK Division of the Sail Cargo Alliance. Its operating organisation was Sailboat Project Brighton, which was formed as a Community Interest Company in 2009. Sail Cargo's South East's home port was Newhaven. The practical activity of Sail Cargo Southeast started in October 2017, when the classic sailing ketch Nordlys<sup>20</sup> shipped 1000 litres of olive oil, destined for Sail Cargo Southeast, into Newhaven from Porto, Portugal, marking the first Sail Cargo to arrive at the Sussex coast this century. Retail sales of the olive oil were made directly from the ship to local customers.

Between 2019 and 2021, the Blue Schooner Company's Sail Cargo Schooner De Gallant<sup>21</sup> crossed the Atlantic from the Caribbean three times each year, visiting after her transatlantic voyage various ports in France and England, including Newhaven. At each port, De delivered part of its Sail Cargo to Port Allies including Sail Cargo Southeast.

In June 2021, Sail Cargo Southeast piloted a new route between Newhaven and Dieppe, employing Sailboat Project's yacht Jalapeño: exchanging Sail Cargo products (food and drink sourced locally in Sussex and Normandy).

Another Sail Cargo visit from De Gallant was planned for July 2022, but this did not happen as Sailboat Project was experiencing financial sustainability problems due to failure to find sufficient customers for its Sail Cargo products, either via delivery events or via its online shop on the Open Food Network. Sail Cargo Southeast commissioned no further Sail Cargo voyages between Newhaven and Dieppe, after the June 2021 pilot voyage, as Sailboat Project Ltd had become inactive and was wound up in October 2023.

## 6.2. Transformation into Sail Cargo channel

In October 2023, 'Sail Cargo Channel' was created as a new Sail Cargo Alliance Division. The transformation of the Sail Cargo Alliance's division 'Sail Cargo Southeast' into 'Sail Cargo Channel' linked in bespoke food producers and consumers of Sail Cargo certified goods located in Normandy, France and Sussex, England. Sail Cargo Channel's Port Allies (operating companies) will include Oree Transports and Comptoir des Normandies in France and The Sussex Peasant<sup>22</sup> in England. Starting in May 2024, Sail Cargo Channel's constituent ports in England (Newhaven) and France (Le Tréport) will be linked by regular Sail Cargo voyages on the Schooner 'Vega'<sup>23</sup>

## 6.3. Immediate aims of Sail Cargo channel: supporting its port allies in France and England

Sail Cargo Channel's immediate aims are designed to support the long-term sustainability of its Port Allies at the micro level, informed by the results of our assessment of the performance of the existing Sail Cargo divisions 2017–2023, as described in [Section 3](#) above. In March 2024, Sail Cargo Channel formed a collaboration with Raybel Charters CIC (the operating company for Sail Cargo London and Kent) where both organisations plan to implement complementary activities within the framework of the comprehensive business model established in 2021 through the merger of Kent Sail Cargo and Sail Cargo London described in [Section 2.4](#), above, thus promoting the sustainably in practical and varied contexts in accord with this comprehensive business model.

The activities planned to realise Sail Cargo Channel's aims during 2024 are:

- Develop links to local producers in Sussex and Normandy of bespoke single origin products (cheese, charcuterie, confectionery, etc.) which can be traded as 'live provenance certified Sail Cargo'.
- Initiate a collaboration with Oree Transports and Raybel charters involving the carrying of Sail Cargo destined for retail sale by and/or sourced from Sail Cargo London, Kent and Channel's port allies within a programme of thrice weekly voyages of Schooner Vega between Newhaven (Sussex) and Le Tréport, (Normandy) with delivery of Sail Cargo by low-carbon transport (including voyages on S/B Raybel) to local communities in Normandy, in France and Sussex, Kent, Essex and Suffolk in the UK.
- Activate the Sail Cargo Provenance Creator App for use within the Sail Cargo London, Kent and Channel ecosystem by means of a Proof of value and use trial.<sup>24</sup> This will enable Sail Cargo London, Kent and Channel's Port Allies to place a QR code on each of the 'sail traded' products that they offer for retail sale that, when scanned, takes one to the Sail Trading Provenance Explorer website<sup>25</sup> where the explorer will be able to view the full activity history of the 'Live Provenance certified' bespoke product, now including the sailing ships and voyages involved transporting and distributing this bespoke product. In this way, the live provenance of the products in the ecosystem to be certified, together with that of the individual creators, is publicised and enhanced.

- Initiate a 'Creative Innovators Club' be based in Newhaven and supported by Sail Cargo Channel's creative multimedia production platform. The young people participating in this club will work collectively to promote social innovation within the Sail Cargo London, Kent and Channel ecosystems. This platform provides creative facilities for making media productions involving story-telling in a synthesis of rich (audio-visual) and restricted (textual) language (Humphreys & Brezillion, 2002) that show-case current expertise, know-how and innovation within the local ecosystem (including sail-cargo carrying voyages) that are then publicised and distributed via channels that are freely accessible worldwide (Lessig, 2008) attracting visitors, collaborators and clients, thus sustaining transaction-based tourism within the local community.

## 7. Conclusion: increasing sustainability in an ecosystem promoting the common good

Our assessment in Section 3, above, of the performance of the Sail Cargo Alliance's UK Divisions on the four sustainable development enabling factors identified by Humphreys and Imas (2022) revealed that the principal reason for the lack of long-term sustainability was inadequate performance on factor 4: *Facilities for provenance exploration, authentication and demonstration*.

However, Raybel Charters, the operating company for Sail Cargo London and Kent, was able to compensate for this threat through implementing in 2021 an enhanced business model that merged the complementary business models developed and tested successfully by Sail Cargo London and Kent that enabled Raybel Chartres CIC to 'bounce forward' when the other Sail Cargo Division were unable to 'bounce back' (Jones et al., 2022).

In Sections 4 and 5, we described how the future sustainability of every Division of the Sail Cargo Alliance' ecosystem will be enhanced by implementing the *Sail Cargo Provenance Creator App* throughout the Sail Cargo Alliance's ecosystem thus enabling all the port allies in this ecosystem place live Provenance certification labels on the Sail Cargo products that they offer for retail sale in Market 1 ('ethical products, ethically transported'). We explained how this activity also provides the impetus, resources and evidence that influencers need to promote Sail Cargo initiatives that reduce Scope 3 emissions in the much larger Sail Cargo Market 2 ('Any product, low carbon transported'), thus strengthening the winds of change in that market.

In Section 6, we specified the activities involved in initiating a 'proof-of-value' use case: focusing on activities performed within the *Sail Cargo Channel* division in collaboration with Sail Cargo London and Kent. The plan for activities within this use case to be carried out during 2024 capitalises on the research findings reported in Sections 2 and 3 of this paper. Implementing this plan should increase substantially the retail selling price and volume of Sail Cargo bespoke products traded within and beyond Sail Cargo London, Kent and Channel's local ecosystems thus making 'being a Port Ally' financially viable again, even in difficult times. Thus, the results from this use case will be able to guide the future sustainable development of all the Sail Cargo Alliances' divisions for the common good.

## Notes

1. See <https://www.newdawntraders.com/> (accessed 21 December 2023).
2. van Wijk et al. (2019) state: 'It is at the Meso level where we see how actors' interactions and framing produce the frictions, highlight the tensions, and identify or create the cracks behind the new opportunities for social innovation'.
3. <https://www.facebook.com/p/Kent-Sail-Cargo-100046135096482/>.
4. The **Gallant**, built in Holland in 1916, first sailed as a fishing lugger on the North Sea. After a varied career spanning a century, the ship was bought by the Blue Schooner Company who now operates the schooner *De Gallant*, carrying Sail Cargo and fee-paying sail trainees and leisure passengers. The company also functions as a Port Ally in Finisterre, where, in November 2023, it opened its own Sail Cargo boutique in the port of Landéda and on the Internet Each year De Gallant carries Sail Cargo on voyages to and from the Caribbean an Colombia (Santa Marta) and distributes this sailcargo,with the aid of Port Allies, through voyaged to ports located along both sides of the Channel (See <https://www.bsc.sc/en/> for details).
5. See <https://caravela> coffee (accessed 31 March 2024).
6. See <https://www.nationalhistoricships.org.uk/shipshape/projects/raybel-charters-kent> (accessed 31 March 2024).
7. Built in 1920 by Wills and Packham at Milton Creek, Sittingbourne, as a coasting barge for G F Sully, of London, Raybel is 86 feet in length and of composite construction, mainly of wood but with iron beams and steel keelson, knees and carlings. Raybel was designed to carry up to 85 tons of cargo. The Sully family intended to have the ideal barge for their increasing trade to and from Belgium, France and Holland. But they also wanted to use Raybel for family leisure trips, so Raybel was fitted with a large saloon with seating on each side under a skylight of teak and brass. The Sully family continued to operate Raybel as a cargo carrying vessel under their ownership until 1974 when she was sold to Ian Houston, who continued to operate Raybel as a Sail Cargo ship at a time when sailing barge cargo contracts were becoming increasingly difficult to find. In 1977 Raybel retired as a cargo carrying barge and was partially laid up. In 2010, master shipwright Rob Sargent bought Raybel for £1 (saving her from becoming a floating tea shop) and, in 2011, restored and refitted her Gardner 6LW engine. In 2018, Ian Houston, Rob Sargent and Gareth Maer came together to form Raybel Charters CIC (For details see <https://www.nationalhistoricships.org.uk/register/225/raybel>).
8. The video made for the crowdfunding Appeal can be viewed at <https://raybelcharters.com/restoration/> (accessed 1 April 2024).
9. For details, see <https://spitalfieldslife.com/2021/12/01/the-return-of-sail-cargo-to-thames/> (accessed April 3 2024).
10. See <https://raybelcharters.com/our-story/> (accessed January 10, 2024).
11. For details, see <https://raybelcharters.com/risky-business/> (accessed 28 December 2023).
12. Humphreys and Luk (2022) describe powerful bottom-up methodology for promoting and securing Sustainable development goals (SDG's) in a wide variety of entrepreneurial innovation contexts where the four sustainable development enabling factions addressed in Sections 3 and 4 of the present paper are implemented together. Opportunities for sustainable development decision support are a identified, together with specifications for decision support that can usefully be provided within these four sustainable development-enabling views.
13. The data corpus for this assessment consisted of a detailed provenance profile for each the operating company of each Sail Cargo division. This profile was formed from the material that was published on the operating company's website; the full set of its Facebook posts from its initiation to its closure (or util December 2023 in the case of still posting); the full records of the operating company filed at Companies House UK; and any activities refereeing the company published in local a newspapers for the area where the Sail Cargo division traded.
14. See <https://raybelcharters.com/volunteers/> (accessed 30 December 2023).
15. The Sail Cargo Provenance Creator App is currently being implemented within the Sail Cargo London, Kent and Channel ecosystems on a 'proof of use and value' trial (detailed in section

- 6.3 below). From 2025 onwards, the Sail Cargo Provenance Creator App will be available, under licence from Raybel Charters and Sail Cargo Channel, for use within the full range of Sail Cargo Divisions within the Sail Cargo Alliance.
16. See [Figure 2](#) in [Section 4](#), above for details of the Agent types, Entity types, Activity types and Activity metadata attributes incorporated in these views.
  17. Picture source: Graham Precey: reproduced by permission.
  18. The size of the increase in price x volume factor is currently being confirmed within the 'proof of use and value' trial described in section 6.3, below.
  19. See [Section 6.3](#) for a description of how this can be achieved via the formation of young people's Creative Innovators clubs, where participants, supported by Sail Cargo Channel's creative multimedia production platform, work collectively to promote, record and publish audio-visual stories about social innovations.
  20. See <https://fairtransport.eu/en/our-fleet/nordlys/> (accessed 12 December 2022).
  21. See <https://www.bsc.sc/gallant/> (accessed 12 December 2022).
  22. See <https://thesussepeasant.co.uk/about-us/> (accessed 12 December 2023).
  23. Vega is a three-masted, square top sail wooden cargo schooner originally built in Sweden in 1909. Vega successfully served as an industrial cargo ship for nearly 60 years. The new Vega retains just 15% of the original vessel – preserving the rich history, inside a ship built to exacting modern standards. Vega was restored by the Swedish ship-building family the Bergstroms and was relaunched in 2006, after which she won the sail training Tall Ships Races several times. The family now want to see the ship return to her original purpose, as a Sail Cargo schooner.
  24. This 'proof of use and value' trial involves interviews with the Sail Cargo Provenance Creator App's users (including producers in the ecosystem registering their products; port allies making Sail Cargo 'live Provenance certified' labels for placing on the products they will offer for retail sale, and customer considering buying a 'live Provenance certified' Sail Cargo product, who investigate its "live provenance" by scanning the QR code in the label to see what they might find out about that product. Then, from 2025 onwards, the (now tested and validated) Sail Cargo Provenance Creator App will be available, under licence from Raybel Charters and Sail Cargo Channel, for use within the full range of Sail Cargo Divisions within the Sail Cargo Alliance.
  25. See <https://www.london.multimedia.org> > initiatives > live provenance >.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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