

Ponant islands' maritime service and adaptations of island firms: a first step towards ecological transition?

Marie Guingot^{1*}, Eric Foulquier¹, Louis Brigand¹, and Jean Boncoeur²

¹ UMR LETG 6554, IUEM, University of Western Brittany, Rue Dumont d'Urville, 29280 Plouzané, France

² UMR AMURE 6308, IUEM, University of Western Brittany, Rue Dumont d'Urville, 29280 Plouzané, France

Abstract. In Brittany (France), which ensures the territorial continuity of eleven Ponant islands, maritime island transport accounts for 9% of greenhouse gases emissions among regional jurisdictions. Coastal and island territories are particularly affected by climate change (erosion, sea flooding, degradation of marine ecosystems...). At a time of decarbonization, this article examines, through the analysis of field observations and interviews, the transport system in the face of the transition challenges. What practices already in place today can fall under adaptation to climate change, both for the transport system and for professional users such as island firms? Transport services to the Ponant islands are adapted to small and vital flows, with a reduced fleet, limited-service consistency, and micro-ports. Sailing transport initiatives, for passengers or freight, are emerging to decarbonize transport. As for island firms, in order to adapt to the small size of their territory and the maritime disruption in reaching the mainland, they already seem to be adopting an approach of sobriety, favouring short supply chains and resource circularity, and adapting to the recurring bad weather that disrupts connections. These elements of logistical resilience help reduce the ecological cost of maritime transport to the Ponant islands. While these adaptive behaviours are a first step toward ecological transition, the latter must also include broader adaptations concerning the fleet and port infrastructure in order to achieve carbon neutrality in the sector.

Keywords: ecological transition; logistical resilience; island service; maritime service; territorial continuity

* Corresponding author: marie.guingot@univ-brest.fr

1 Introduction

In the light of the urgent need to decarbonise human activities, we are examining the practices of professional users and maritime transport stakeholders at a local level, with the Ponant islands' maritime service. Islands are particularly affected by climate change (erosion, coastal flooding, degradation of marine ecosystems, etc.) [1] and numerous initiatives are already in place in these territories to facilitate innovations for the transition [2]. While the transport sector is energy-intensive and a significant source of carbon emissions [3], it remains vital for islands [4], where freight flows are particularly unbalanced between imports and exports, revealing a strong dependency to the mainland [5].

1.1 The context of decarbonisation in the maritime sector

Globally, with nearly one billion tonnes of CO₂ equivalent emitted annually, maritime transport accounts for 3% of GHG emissions [3].

Decarbonisation targets have been set at international level. The International Maritime Organisation has been tasked by the United Nations with accounting for and regulating the sector's GHG emissions. Following the Paris Agreement in 2015, the IMO committed in 2023 to reducing the sector's emissions by 20% by 2030, by 70% by 2040, with the final aim of achieving net-zero GHG emissions by 2050 [6]. The carbon neutrality is also targeted by the European Climate Law (2021), with a more ambitious target: a 55% reduction by 2030 through the "Fit for 55" legislative package for all sectors, of which maritime transport [7].

In France, the logistics sector is responsible for 16% of national GHG emissions. The National Low-Carbon Strategy aims to decarbonise all emitting sectors. Stakeholders in the maritime sector are embarking on the transition to reduce their environmental footprint through an action plan [8] including improvements to ships' energy efficiency, energy and infrastructure, fuel efficiency, strengthening the regulatory framework and the operational implementation of the roadmap. However, these legal provisions do not yet apply to certain segments of the maritime sector, notably domestic merchant vessels with a gross tonnage of less than 5,000 UMS [8], which excludes all vessels serving the Ponant islands.

At a regional level, GHG emissions in Brittany have fallen by 8% since 2010, reaching 24 million tonnes of CO₂ in 2020 [9]. The GHG emissions balance within the remit of the Brittany region, which ensures territorial continuity for the eleven Ponant Islands since 2017, stands at nearly 18,000 tonnes of CO₂ equivalent for island maritime services, representing 9% of the regional balance including all the authority's responsibilities [10]. The Region has expressed its commitment to a decarbonisation strategy for the regional fleet and port handling operations [11], as it is also managing all the ports serving the Ponant Islands.

1.2 Maritime service and economic fabric of the Ponant islands

Along the English Channel and Atlantic coasts of France, the Ponant islands, which are small in size (ranging from 0.6 to 85 km²), are home to small communities: between 100 and over 5,000 inhabitants. Remoteness is one of the defining characteristics of insularity, and the distance to the nearest mainland port seems a relevant measure: the crossing takes between 5 minutes and 1½ hours for a passenger. Regardless of this distance from the mainland, all of these islands are separated from the mainland by sea.

The islands are connected to the mainland on a daily basis by a maritime transport system, and the schedules of the ships set the rhythm of island life [12]. There are around forty permanent and regular island routes, for passengers and/or freight [5]. These routes are operated by 15 shipping companies (Figure 1), with around fifty vessels.

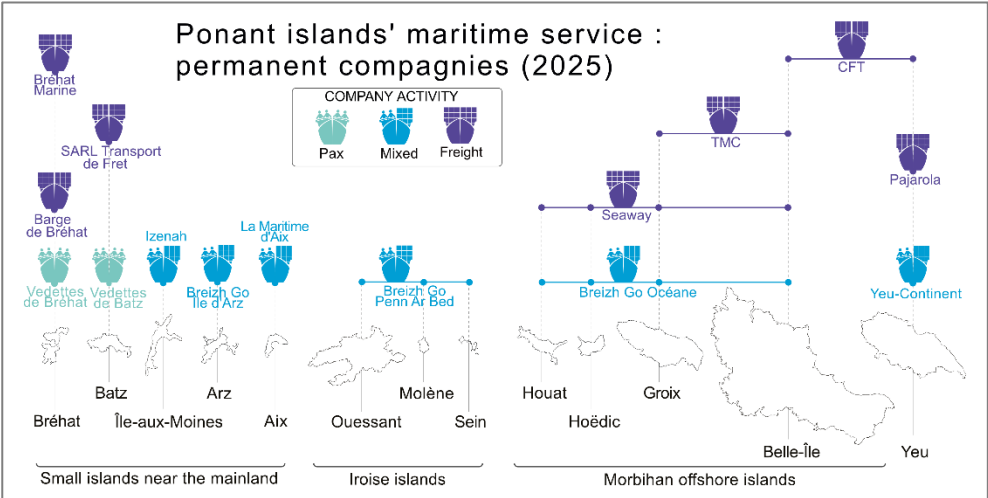


Fig. 1. Permanent and regular maritime service in the Ponant islands (2025) (M. Guingot & L. David)

There are between one and thirty average daily ship rotations, depending on the island and the season. Public service routes account for 60% of rotations, 76% of passenger transport, 34% of freight transport and 98% of vehicle transport. The service is therefore largely organised, institutionalised and public.

As the Ponant Islands are inhabited, an economy has developed. In 2015, there were more than 2,000 active businesses, ranging from 20 to 700 per island [13]. Employment in the on-site service sector is more prevalent than on the mainland [14], reflecting the predominance of tourism-related activities. However, the primary sector benefits from the proximity of fisheries resources and favourable conditions for agriculture, as seen in Batz. On larger islands, the economy is more diversified, with secondary activities linked to crafts, construction, or the agri-food industry. Entrepreneurs mention transport and supply as the main constraint for their island-based activity [13].

Given that supply and logistics already place a heavy burden on the islands' economic activities, and that transport companies are not yet required to make efforts to reduce their emissions, what actions have transport operators and economic stakeholders in island territories already implemented to support the green transition?

1.3 Methodology

In the light of an approach focusing on the global footprint of the world's maritimisation [15], the aim here is to examine, through the analysis of field observations and interviews, the transport system in the face of the challenges of the transition, as well as its use by professionals. This data is drawn from observations and interview surveys conducted between 2016 and 2026 across all thirteen inhabited islands of the Ponant region, involving island entrepreneurs, shipping companies and delegating authorities.

After outlining the constraints facing the island activities and how businesses have adapted to transport arrangements, this article examines the practices already in place today to facilitate adaptation to climate change, both for the transport system and for professional island users.

2 Professional island users adapting to challenges of maritime service

2.1 The challenges of maritime service between islands and the mainland

While island location may offer advantages (tourist market, affluent clientele, island image, barrier against mainland competition, preferential rates for islanders etc.), there are also difficulties associated with logistics and transport between the island and the mainland for island businesses. We have identified four key constraints imposed by transport links.

The first constraint is the cost associated with transport links, which includes the cost of the crossing, but also all related costs: suitable vehicles or containers for the maritime crossing, in-house or outsourced handling, delivery tariffs charged by mainland suppliers, parking on the mainland, etc.

The second constraint is the time allocated to transport: travelling to the mainland for routine tasks, enduring congestion on island roads and on mainland car parks, providing transport where no service is available, coping with longer delivery times, facing delivery delays with more significant consequences... Managing freight takes up the island entrepreneur's time, which is not spent on core business.

The third constraint relates to damage to the goods, particularly in the cold chain. Using the transport service may result in a deterioration in the quality of goods due to transport conditions or handling issues, particularly with lifting rather than rolling handling.

Finally, the fourth constraint is the complexity of transport management. Ensuring the smooth running of the supply chain and acting as an intermediary between various parties, tracking the progress of goods along this chain, managing any damage to the goods, adapting working methods to the dimensions of ships and island roads... Any trade with the mainland requires a great deal of organisation the island firm.

2.2 Adaptations to the maritime service

The island firm adjusts to the transport system in order to alleviate these constraints, with four objectives: reducing transport costs; optimising the time spent on logistics and its management; minimising damage to the goods; and to simplifying organisational processes.

The numerous adaptive responses, shaped along the firm's transport needs, can be classified according to a typology inspired by Schumpeter's theory of entrepreneurial innovation [16]:

- Product adaptation: choosing an activity involving small-sized or high added value products, in order to minimise costs and the proportion of transport expenses. As one wine merchant puts it, "*wine doesn't taste of transport*".
- Production adaptations: the activity, particularly in craft and construction sectors, is adapted to specific professional practices in order to reduce the supply of heavy materials from the mainland or to address the impossibility of loading conventional bulky equipment onto ships.
- Supply adaptations: it involves limiting and optimising mainland supply by selecting accommodating suppliers; developing reuse; consolidating orders to maximise pallet or lorry capacity and benefit from more favourable tariffs; or promoting electric vehicles (as additional cost applies for fuel but not electricity).
- Marketing adjustments: the island firm can prioritise local sales on the island, optimise logistics for mainland sales, adjust pricing, or recycle waste locally rather than having to ship it to the mainland.
- Logistical adaptations: this involves anticipating and managing the timing of the supply chain, negotiating rates or optimising rate application, and adapting packaging (to protect goods from sea conditions, simplify handling, etc.).
- Organisational adaptations: aligning business hours with maritime service schedules, recruiting logistics staff, or optimising mainland business-related travel.

The distinctive island element lies in the scale of the challenges and the adaptations required, and thus in the scope and extent of those adaptations. Insularity acts as a catalyst for logistical challenges, and maritime service enhances adaptive responses.

It is also important to highlight the interaction between the maritime service and the Ponant firms. While these adapt to transport services, the latter is also trying to adjust. Despite operational challenges faced by transport companies, transport arrangements facilitate access to the islands and limit the roughness along the course. These are levers for improving transport services and facilitating the island's economic activity. It is a technical, political and economic issue, as the maritime service fulfils a dual role: ensuring territorial continuity while also promoting tourism, the latter being able to finance the former.

3 The need for sobriety and the ambition for decarbonisation

Maritime service is partly shaping the island's firms. Can the adaptations lay the groundwork for ecological transition of island maritime service?

3.1 Firm's sobriety as a driver for deceleration

Interviews with island business owners in 2026 on Ushant (8) and Groix (7) reveal that environmental issues related to the logistics of their activity are not a priority and are partially addressed. Six entrepreneurs mention some efforts, primarily regarding packaging, such as a deposit-return system in discussion with suppliers, reducing the weight of shipments by limiting excess packaging, or eco-friendly packaging and its re-use. Waste recovery is also being implemented in industrial and construction businesses, reducing export flows to the mainland. A transition from just-in-time to just-in-case logistics or the pooling of orders are practised to optimise loading and limit deliveries. Finally, the geographical suppliers' proximity is considered, and sea freight is preferred to air freight, where an air link exists.

Behaviours are therefore deliberately adopted to benefit the environment. But most adaptations to maritime service (see 2.2) also constitute steps towards ecological transition. By seeking to optimise the logistics of their activity, island entrepreneurs are opting for more sustainable practices and sobriety behaviours.

This may involve functional or operational sobriety, where a firm reduces its transport needs by restructuring its supply chain or sales operations to minimise freight volumes or shorten the supply chain. It includes circular economy practices, such as deposit-return systems, re-use or waste recovery, as well as limiting supplies from the mainland and promoting local marketing. It also applies to the repair of refrigerated cabinets, which requires the intervention of a technician from the mainland: the entrepreneur first seeks to avoid this by acting as a DIY handyman, demonstrating the island resourcefulness system and solidarity, in order to avoid being charged for a technician's full day's travel for a simple repair. By seeking to minimise transport costs, the island entrepreneur contributes to reducing the demand for transport. Many of the adaptations to the maritime service fall within the scope of functional sobriety. The first way to reduce the financial and mental burden of supply chain through the maritime service is to limit its use.

If island entrepreneurs coordinate and pool their goods flows, it constitutes cooperative sobriety. For the regulatory inspection of refrigerated cabinets, island restaurateurs and grocers agree to share the technician's visit and pay for just one call-out.

By adapting special containers to the ship's capacity, the firm demonstrates dimensional sobriety. This is the case for craftspeople who have adapted custom-made transport crates to fit the width of the boat's door, enabling them to load their goods onto passenger lines.

Finally, structural sobriety involves organising activities in space and time in order to reduce logistics or mobility. An example is the search for the most effective pricing, which

encourages island entrepreneurs to move away from just-in-time delivery to consolidate orders and thus optimise the use of transport capacity. The rationalisation of orders and the optimisation of loading contribute to stock economy rather than flow economy.

These adaptations ultimately constitute measures of sobriety for the maritime service.

3.2 The decarbonisation target versus operational constraints

Local authorities responsible for territorial continuity are aiming to decarbonise their activities. For example, according to its website, “*Vendée department is preparing for the green transition by planning to decarbonise the vessels operating maritime services within its territory*”, which includes Yeu island. The Brittany Region requires, as a selection criterion for candidates for maritime public service contracts, the completion of a carbon footprint assessment and the support for the reduction of GHG emissions for the renewal of the regional fleet. Breton ports are also considered, both in terms of adapting infrastructure to climate change – such as the project for a new ferry terminal in Brest – and the ongoing trial of alternative fuels for land-based port operations (Saint-Malo).

Freight shipping is energy-efficient compared to other modes of transport: it accounts for over 70% of tonne-kilometres, yet its share of total freight emissions is only around 20%, due to its high capacity and low carbon intensity [17]. But the Ponant islands’ maritime service is the antithesis of the global maritime transport model, characterised by massification, gigantism and standardisation. Its fleet has reduced capacity to suit the low volume of traffic and the infrastructure of micro-ports, and is equipped with powerful engines despite the short routes in order to cope with the possible difficult navigation conditions, particularly in the Iroise Sea. Within delegating authorities, there is a gap between the regional policy stance on decarbonising transport services and the operational reality of the constraints faced by technical staff, who highlight obstacles relating in particular to alternative energies and their supply, and initiatives that are difficult to implement, such as sailing rotations for freight (Figure 2), which require, in particular, port acceptance [18].



Fig. 2. Unloading of pallets on Sein island from the old sailing ship Notre-Dame-de-Rumengol, during the experiment led by the Penn Ar Bed maritime company (2025) (Credit: Marie Guingot)

Reducing speed is not widely supported outside of periods of fuel shortages. On permanent routes, the few decarbonisation measures that have been implemented can be highlighted in communications materials. Penn Ar Bed publishes CO₂ emissions per passenger and per journey on its website. The Vedettes de Bréhat share their environmental

commitments, mentioning in particular eco-piloting, the organisation of schedules and the optimisation of load factors to reduce the number of rotations on peak days, and the renewal of the fleet to make it more energy efficient, announcing a 30% reduction in GHG emissions. Finally, Yeu-Continent promotes eco-friendly crossings with the recent *Insula Oya III*, which entered service in 2023, and is equipped with a filter to treat sulphur and nitrogen emissions, as well as a system enabling it to connect to shore power while at berth, allowing both ramps and cranes to be used as the engines are switched off. It is the smallest vessel fitted with such a system, but the largest vessel in the Ponant islands' fleet. Finally, the oil tanker *Anatife* now runs on HVO (hydrotreated vegetable oil), a more expensive synthetic fuel that enables a 78% reduction in CO₂ emissions.

Initiatives to drastically decarbonise the fleet are emerging only on seasonal passenger routes, operating only in fine weather, with sail or hybrid transport on several island routes.

4 Conclusion

The maritime barrier and the necessity of relying on maritime services place constraints on the island firm, which is implementing adaptations throughout the supply chain to reduce transport costs, simplify logistics, minimise time of logistics management and avoid damage. By seeking to optimise the logistics of its activity, the island entrepreneur is already adopting more sustainable practices and reducing transport demand. Thus, some of the adaptations to island maritime service align with the ecological transition, through sobriety and deceleration. As for shipping companies and delegating authorities, the political stance is fairly clear in favour of decarbonisation, with some promising initiatives, but operational challenges remain to be overcome. Two distinct approaches can thus be observed: the deceleration and sobriety practices of island businesses, as a pragmatic response to logistical constraints; and the decarbonisation of maritime services, with actions that have not yet been sufficiently implemented.

In order to reach decarbonisation targets at regional, national and international level, transition cannot rely solely on these adaptive behaviours and still tentative initiatives from the island maritime service sector. It must explore other options such as adjusting the size and capacity of the fleet to freight and passenger demand, developing sailing freight transport, as well as encouraging more interaction between maritime companies and island activities and offering support to sustainable logistics practices. The underway consultation initiative on a islands' sustainable logistics charter might contribute to ecological transition.

Aknowledgements

This article is primarily based on a doctoral thesis defended in 2019 (funded by the University of Western Brittany and the Brittany Region), carried out as part of the ID-Île 2 project (Initiatives & Development on islands, 2015–2018), funded by the Fondation de France. The study also draws on fieldwork carried out in 2022 on the Iroise islands rough consultancy assignments carried out on behalf of the shipping company Penn Ar Bed company, whom we would like to thank here for its collaboration over the years. It also draws on surveys conducted in 2026 on Groix and Ushant, as part of a research carried out thanks to the ID-Îles association and its Synerg'îles project, funded by the Fondation de France. This work takes inspiration from informal meetings with stakeholders, with whom it could not have been completed: island entrepreneurs, freight transport companies, regional shipowners, logistics managers, seafarers on board the vessels or dockworkers on the quays of islands' ports. We would like to disclose that this article was partially translated using DeepL.

References

1. IPCC, Climate Change 2023: Synthesis Report. Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva, Switzerland, pp. 35-115 (2023) DOI: 10.59327/IPCC/AR6-9789291691647
2. M. Turck, L'innovation dans les îles du Ponant : enjeux, dynamiques et perspectives. Rapport préparatoire à une recherche menée à Groix et Ouessant. Programme FREIIA, Association des Îles du Ponant, 82p (2023)
3. IMO, Fourth IMO GHG Study 2020, Executive Summary, 46p (2021)
4. E. Foulquier, Les géographies du transport maritime. In Géographie des mers et des océans. Armand Colin, pp67-90 (2014) <https://hal.science/hal-01108080v1>
5. M. Guingot, L'île, l'entreprise et le navire : étude de la desserte insulaire et des adaptations des entreprises du Ponant, Ph.D. thesis, University of Western Brittany, (2019) <https://theses.fr/2019BRES0052>
6. IMO, Strategy on reduction of GHG emissions from ships, 17p (2023)
7. UE, Règlement du parlement européen et du Conseil relatif à l'utilisation de carburants renouvelables et bas carbone dans le transport maritime et modifiant la directive 2009/16/CE (initiative Fuel EU Maritime) (2023)
8. Région Bretagne, Feuille de route de décarbonation de la filière maritime. Proposition de plan d'action pour décarboner le maritime national, assurer la souveraineté d'approvisionnement de la France, 154p (2024)
9. Observatoire de l'Environnement en Bretagne, Mémento des Chiffres clés en Bretagne en 2020 - Conférence bretonne de la transition énergétique du 21 juin 2022, 8p (2022)
10. Région Bretagne, Bilan des émissions de gaz à effet de serre, 23p (2020)
11. Région Bretagne, Délibération n°21_DCEEB_SERCLE_01 « La Région renforce son engagement face au dérèglement climatique » (2021)
12. L. Brigand, Enez Sun, Carnet d'un géographe à l'île de Sein. Dialogues, 127p (2017)
13. L. Brigand, A. Chailloux, L. Corsi, G. Lavalie & al, Entreprendre sur les îles, du constat aux témoignages, de l'expérience aux projets. Rapport du projet ID-Îles, 106p (2014)
14. J. Boncoeur, Perspectives économiques pour les îles du Ponant, 13p (2013)
15. E. Foulquier, Transport maritime et changements climatiques. Mise en perspective en géographie. Le Droit Maritime Français, Les transports maritimes face aux changements climatiques, **815**, pp581-589 (2019) <https://hal.science/hal-02173150v1>
16. J.A. Schumpeter, Théorie de l'évolution économique. Dalloz, 371p (1911)
17. FIT, *Perspectives des transports FIT 2021*, Éditions OCDE, Paris, 279p (2021) <https://doi.org/10.1787/3dd41b17-fr>
18. E. Foulquier & T. Terrier, Ré-envisager la desserte des îles du Ponant à la voile : quelles perspectives ? quels enjeux ? Communication lors de la journée Panorama de la recherche nantaise, cluster CARGO (décembre 2023)