



Prospective study of the Breton industrial sector wind propulsion for ships

Overview and Key Figures

2022 Edition

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de développement régional

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**Size of the Market
for Companies
and Key Figures**

Introduction

At the crossroads between ship-building, sailing and offshore racing, the new Breton sector “wind propulsion for ships” includes a large number of companies in the region. It relies mainly on the excellence of companies in the Bretagne Sailing Valley® and their ability to innovate with agility, from design to construction. The know-how in avant-garde technologies developed in this unique industry, combined with Brittany's maritime excellence, is a source of inspiration for meeting the maritime transport decarbonization targets set by the International Maritime Organization. I would like to warmly thank everyone who helped in making this study, for the data provided and the quality of the work carried out under the guidance of Bretagne Développement Innovation

Hugues MEILI
President of Bretagne
Développement Innovation

Wind propulsion for ships, along with the development of a green hydrogen industry, intermodality, soft mobility and public transport, is an excellent basis for the decarbonization of transport and travel in Brittany. It is also in line with the region's ambition to reduce greenhouse gas emissions, develop jobs in Brittany and develop new industrial sectors as a source of excellence in the region. The industrial sailing sector is already a reality in Brittany; companies have been working in this industry for several years and maritime sailing lines from Breton ports already exist. This study commissioned by Bretagne Développement Innovation lays the foundation stone for the Region's goal to promote wind-powered maritime transport.

Loïc CHESNAIS-GIRARD
President of the Regional Council of
Brittany

Context and Methodology



This study concerns the expertise of Breton companies transferable to an industrial sector devoted to wind propulsion for ships.

This study echoes:

- The **need** to design and develop **new technological solutions** in propulsion methods to meet the strategy adopted in 2018 by the International Maritime Organization to **reduce CO2 emissions** compared to 2008, by at least **40% by 2030** and by at least **50% by 2050**. Wind propulsion, which includes sails and hulls, is one possible answer.
- The desire of the **Region of Brittany** to push forward with ecological transition by means of **Breizh Cop**, its roadmap “**decarbonized mobilities**” and the **regional research and innovation strategy** (S3 -DIS Maritime economy for blue growth - ship of the future). It has decided to develop **a policy to promote wind propulsion for shipping, in all its forms.**

This study was carried out between May and July 2021, **jointly with several partners*** whom **we would like to thank**. This collective effort enabled us to invite **425 Breton companies** to participate. **236 of them responded**, making it possible to draw up the **first regional panorama** of the sector and to identify:

- Companies active or interested in this market
- Their skills in the value chain
- Their commercial position in this market and projected growth
- The profile of projects and propulsion technologies used

Scope of the Study

Any company located in Brittany, having skills in the value chain of the sector consisting of 6 areas:

- Charter company
- Ship owners
- Ship building and retrofitting of wind-powered ships
- Maintenance / Support
- Wind propulsion project engineering and services
- Manufacture / Supply of components or sub-assemblies for wind propulsion projects

*See list at the end of the brochure

Executive Summary

With **strong participation (236 companies responding)**, the first results of the prospective study for a Breton industrial sector dedicated to wind-powered shipping, are promising.

156 companies mainly from the **ship-building, sailing and offshore racing sectors**, mainly located in the **Morbihan department**, make up this emerging sector. For **55%** of them, this new market ranges from **priority to important** for their growth.

With **80 companies** positioned in the **manufacture of components or subassemblies** for wind-powered systems and **61** in **architecture, engineering and modelling** of wind-powered systems, these two areas of expertise would appear to be the **strengths in this industrial sector**.

There are also 19 companies positioned as shipowners and 9 chartering companies.

The study reveals that of these 156 companies:

- **95** have shown **an interest in this market**. More than **75%** of them have **planned their entry into the market**: 44% in less than 3 years, 25% in 3 to 5 years and 7% in the long term.
- **61 companies** already have some business at varying degrees of **maturity** including **invoiced business (44), non-validated projects (38), demonstrators (37) and bids (20)**. The projects are located in **Brittany (45)**, in **France (41)** and **internationally (13)**.

It is the main market **for 20%** of them. **For 70%** of companies, this market is seen as priority to important for their **growth**.

These businesses give rise to an estimated **155 jobs and €28 M in sales**.

Wind propulsion is the **main method of power in projects for 64%** of the companies surveyed. Hydrogen, electricity and LNG are the additional power sources cited by 38%, 36% and 25% of companies respectively.

For wind propulsion technologies, 70% of companies are working on **thin profiles** (flexible sails or rigid panels), **49%** on **thick profiles** (flexible, rigid, inflatable and multi-component wings), **34%** on **kites**. Rotors, hull shapes, airfoils and wind turbines account for 16 to 20%.

Breton companies are working mainly on **cargo ships (37)** and **passenger ships (32)** and their projects will mainly be used **long-distance journeys (39), offshore (37)** but also for **coastal navigation (30)**.

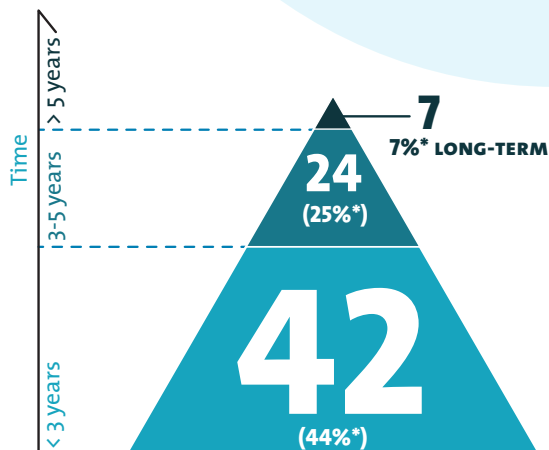
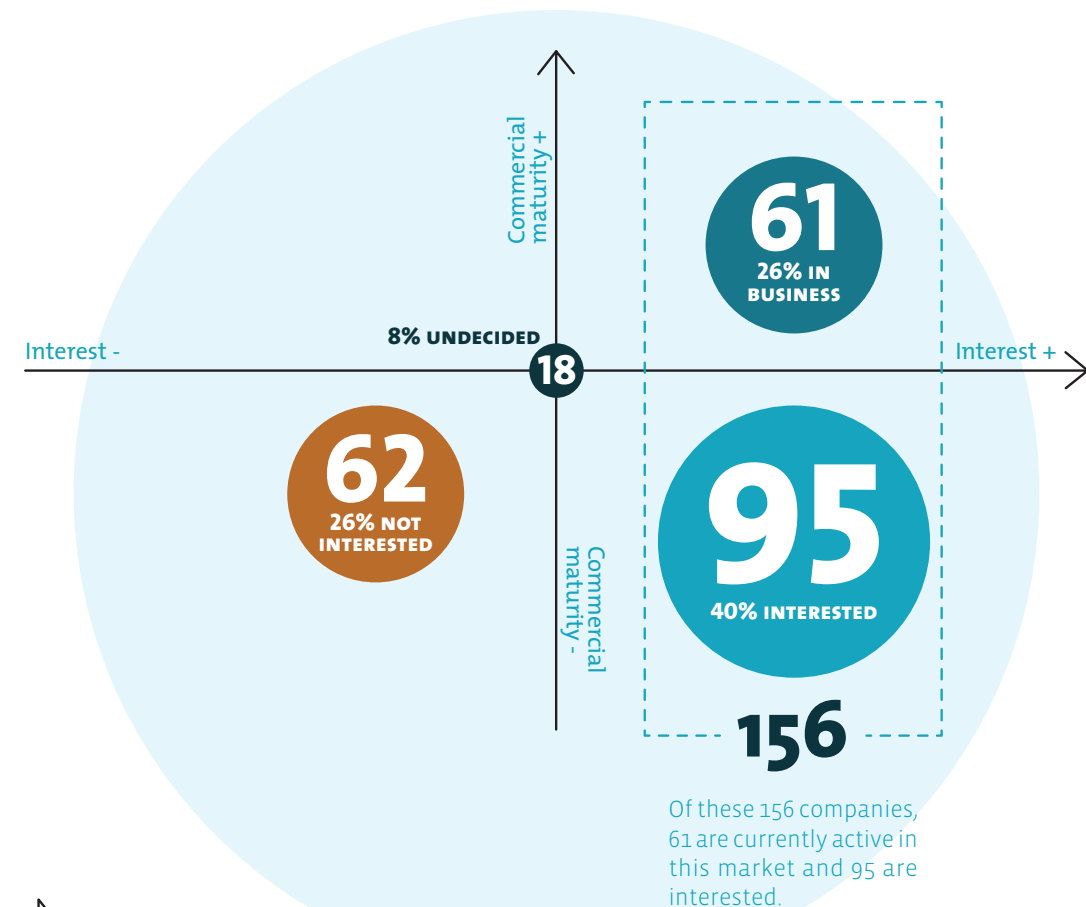
The results of this study confirm **the emergence** of a promising wind-powered shipping market, its **rapid growth with mature projects and also inherent challenges**.

The study also reveals all the **industrial potential of Brittany** in this market identified by companies as **vital for their growth**.



Portrait of an Emerging Industry

Level of interest of the 236 respondent companies in this market

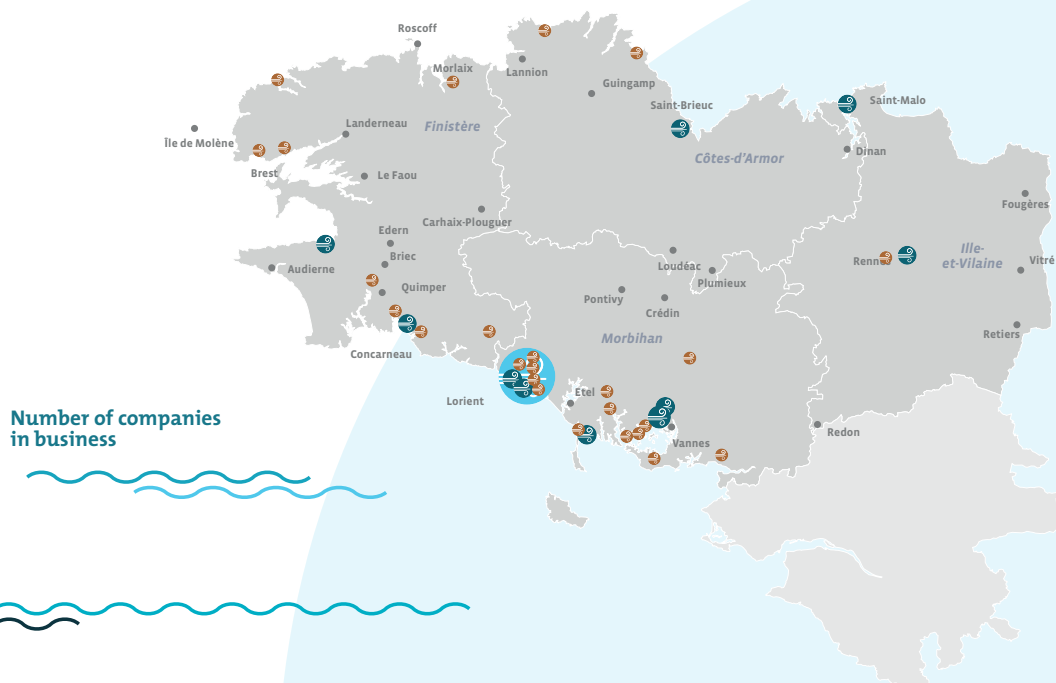


73 of the interested companies have planned their entry to the market, including 42 within 3 years.

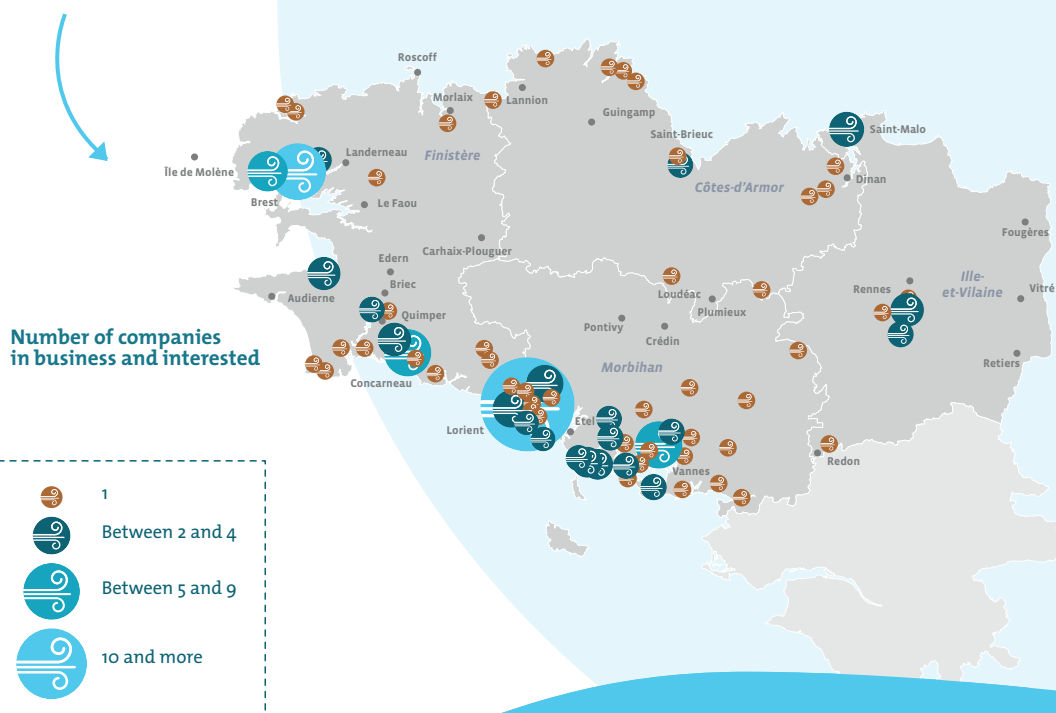
*Of the 95 companies interested

Geographical Distribution of Companies

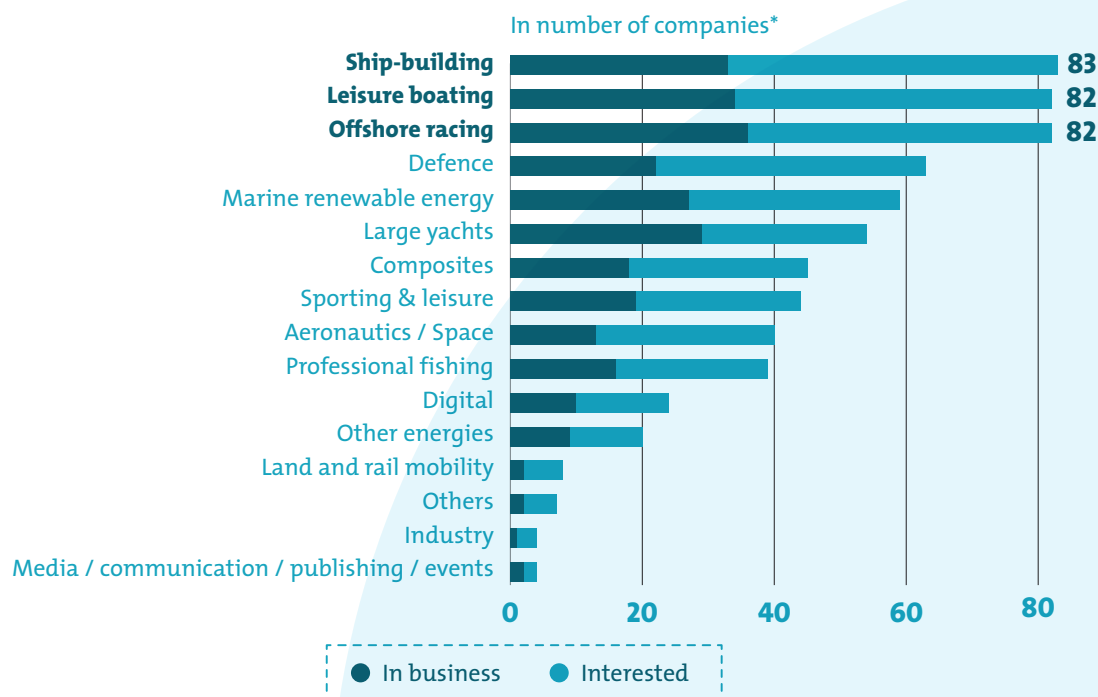
Currently, 61 companies are in business, most of them located in Southern Brittany



In the coming years, 156 companies will form a sector, strengthened by the emergence of a cluster located around Brest

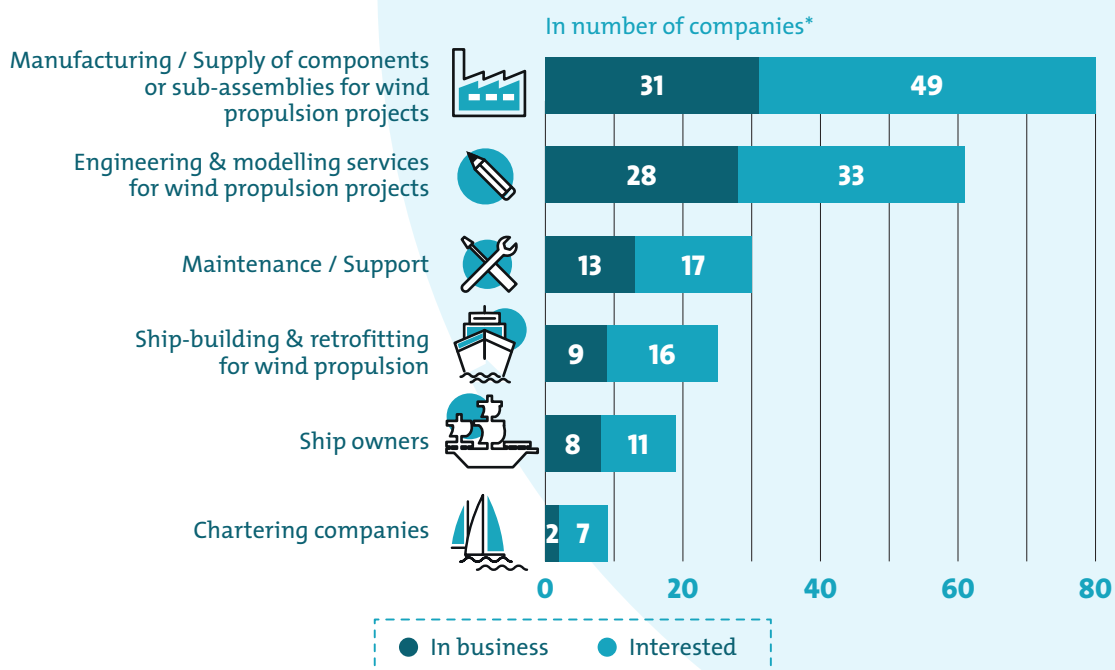


Top 16 Markets



*Multiple answers possible.

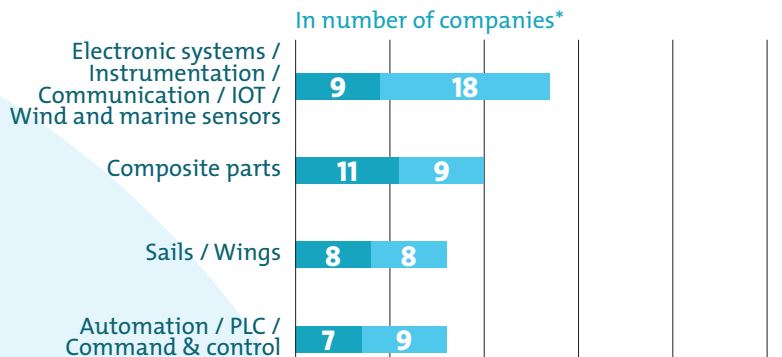
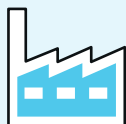
Main business of companies



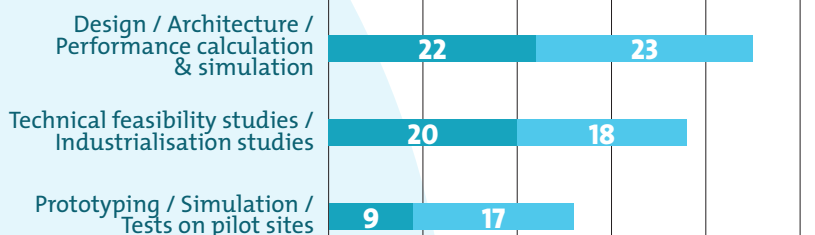
*Multiple answers possible.

Top 3 Skills

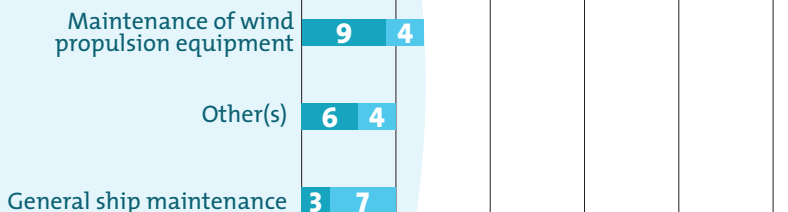
MANUFACTURING 51% (80)



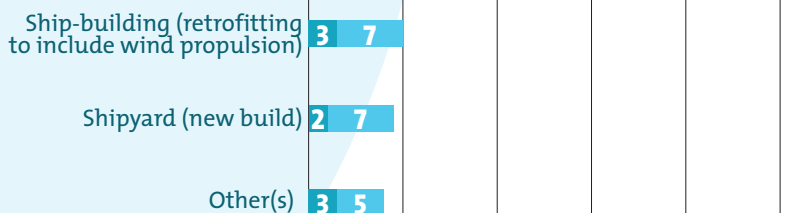
ENGINEERING SERVICES 39% (61)



MAINTENANCE 19% (30)



SHIP-BUILDING AND RETROFITTING 16% (25)



● In business ● Interested

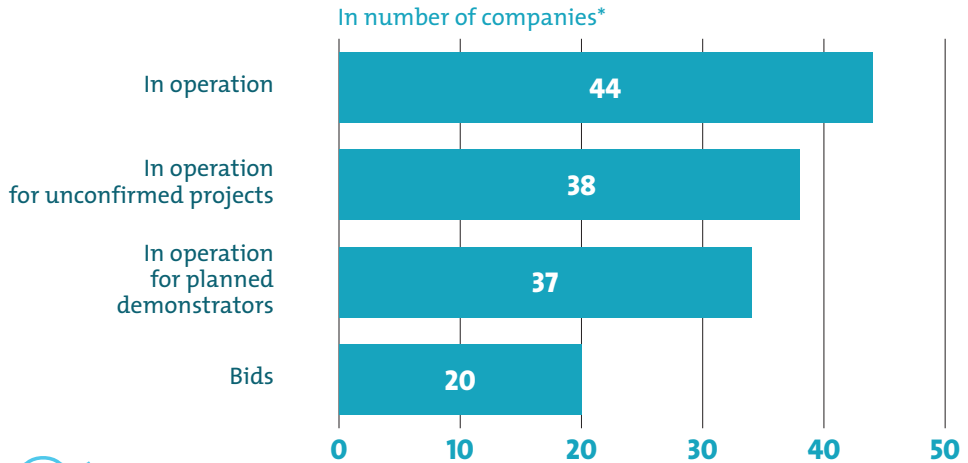
Although manufacturing of components is the main business in the sector, architecture and feasibility studies are the most represented.

*Multiple answers possible.

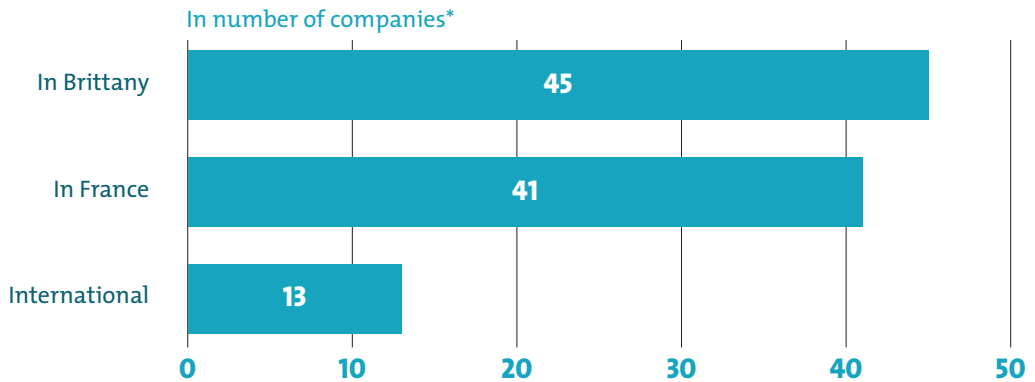
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Profile of Projects by the 61 active companies

Commercial activity

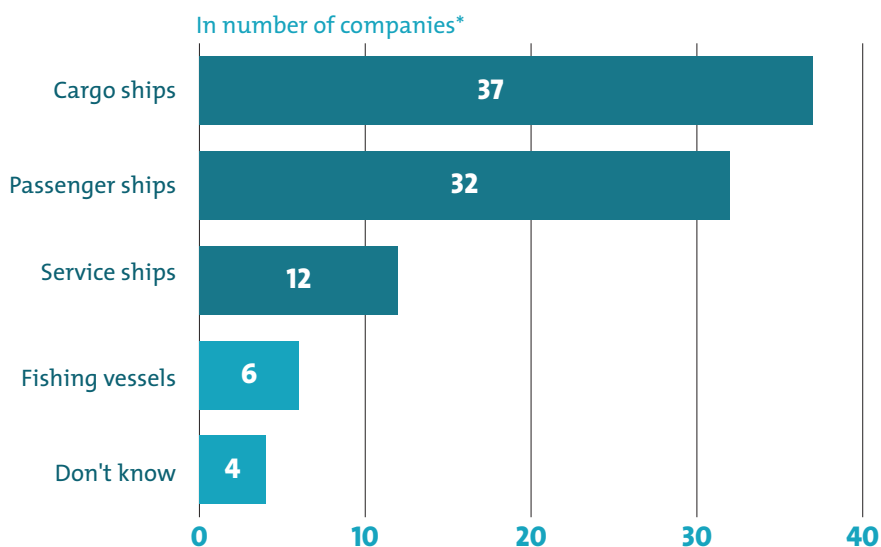


Origin of Projects

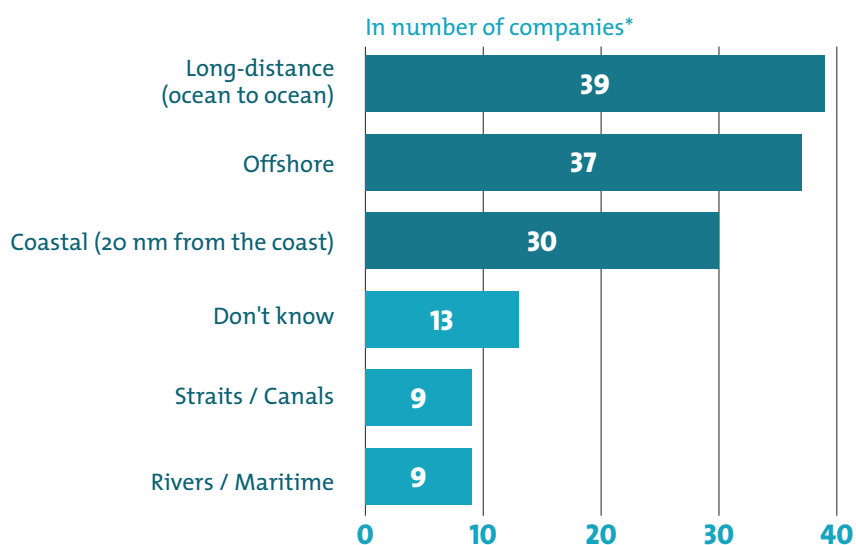


*Multiple answers possible.

Types of vessels



Types of journeys



*Multiple answers possible.

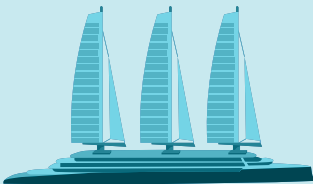
Classification of Wind Propulsion Technologies

Wind

Deck-mounted systems

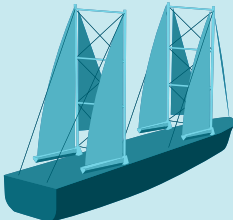
THIN PROFILES

70% (43)



Soft sails

79% (34)

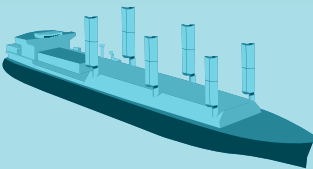


Rigid wing sails

56% (24)

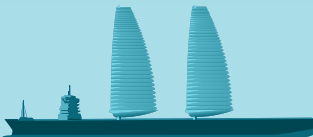
THICK PROFILES

49% (30)



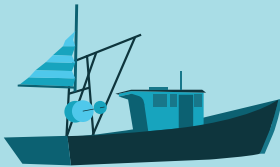
Asymmetrical rigid wings

57% (17)



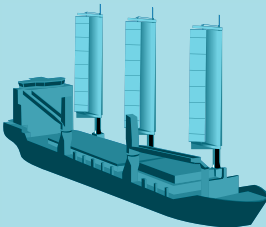
Inflatable symmetrical wings

43% (13)



Semi-rigid symmetrical wings

67% (20)



Complex wings

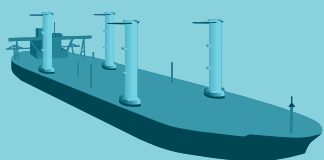
50% (15)

Deck-mounted systems

OTHERS



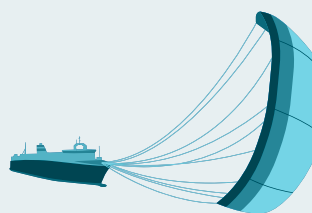
Rotors
20% (12)



Turbo sails
16% (10)

Aerial systems

KITES (MULTI-CELL...)



Self-stabilizing kite
34% (21)

Other categories

Wing-shaped ships
18% (11)

Wind turbines to drive electric propulsion
16% (10)

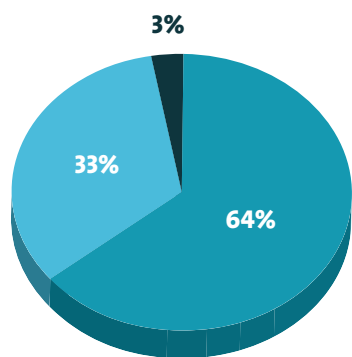
Project technologies on which companies are working

Of the 61 companies currently in business:

- **70%** of them are working on projects with **thin profiles** (flexible sails or rigid panels),
- **49%** on **thick profiles** (soft, rigid, inflatable and multi-element wings)
- **34%** on **kites**. Rotors, hull shapes, airfoils and wind turbines account for **16 to 20%**.

Illustrations: ©Wind Ship

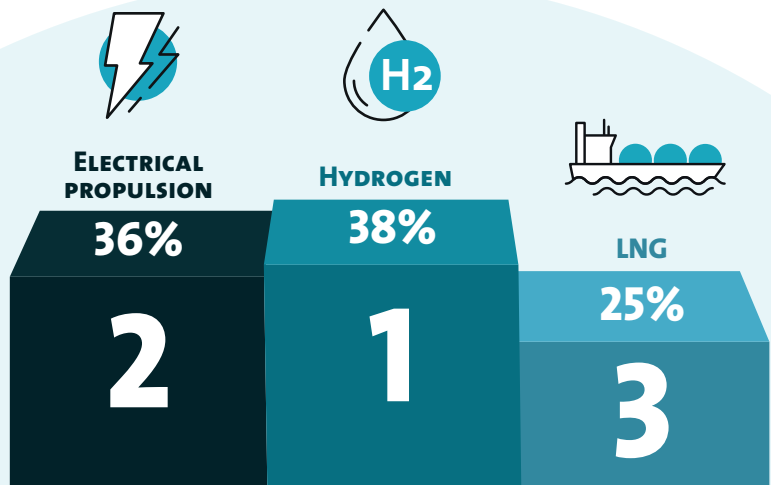
Place occupied by wind propulsion in projects



- Main propulsion
- Auxiliary propulsion
- No answer

64% of active companies report that **wind propulsion is the primary propulsion technology** in the projects they are working on.

Place occupied by additional propulsion technologies in projects



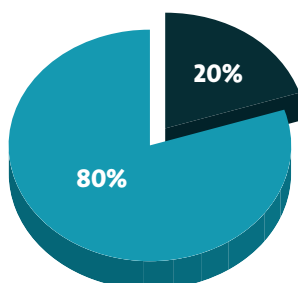
- Other fossil fuels **23%**
- Battery **23%**
- Solar energy **20%**
- Wind energy **18%**

- Biofuels **13%**
- Combustion generator **10%**
- Ammonia **8%**
- Tidal energy **3%**

38% of companies say that H2 is the most frequently used additional technology, followed by electricity and LNG (Liquefied Natural Gas).

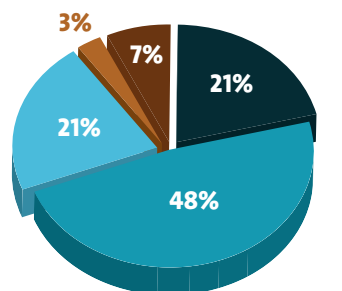
3 Size of the market for companies and key figures

Wind propulsion: main market for 20% of companies in business



- Main market
- Secondary market

For 70% of companies, this market is seen as priority to important for their growth.



- Priority
 - Important
 - Secondary
 - Don't know
 - No answer
- 70%

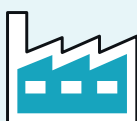
2021 Key Figures

An emerging sector with already significant results



2404 jobs including
155 (6.5%)
in wind propulsion

61
economic
actors



€305M sales including
28 (8%)
in wind propulsion

AT THE INITIATIVE OF



PRODUCED BY

BRETAGNE^{BE}
DÉVELOPPEMENT
INNOVATION

AND WITH THE HELP OF



DIRECTORY AND MAPPING



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