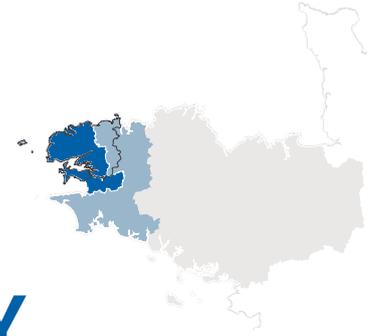


THE MARITIME ECONOMY IN AND AROUND BREST



#2 | January 2022

OBSERVATORY | Analytical note



Credit photo : Brest métropole, François Lehmann

A flourishing private sector, drop in public employment

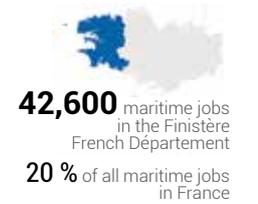
In Finistère, the maritime sector employs about 42,600 people, or 20% of the sector in mainland France, excluding tourism. It is made up of a community of people supporting innovation with notably more than 1,700 working in maritime research and looking into the challenges of the future: environmental transition, energy, health, materials, etc. Our higher education curriculum has been enriched in line with these issues and gathers 1,860 students.

Between 2016 and 2020, 150 projects were certified by the Bretagne Atlantique Sea Cluster. Sixty percent of these innovative projects were designed by people from Finistère. Furthermore, international cooperation with European countries but also with the United States of America, Canada or China has intensified.

28,350 jobs have been accounted for in the Brest area, or 2.7 times as many as in the construction industry. This is representing 40% of all Breton jobs in this sector and makes the Brest area the 1st maritime employment basin of the region. As from 2016, it has been one of the few territories that lost jobs, essentially in the public sector. In the private sector, we can highlight an employment growth in the ship building and seaweed processing industries.

The fishing harbours of the Brest area are focusing on high added value species such as scallops or monkfish. Furthermore, harvested seaweeds give this sector a national and even a European recognition.

The Brest commercial port represents 6,250 jobs. Even if the service sector is developing, the port of Brest has substantial industrial and technical expertise as well as a strategic location enabling it to concentrate many of the region's challenges at a local or European level. One of the latest examples is the construction of a polder to position the area on the sector or marine renewable energies.

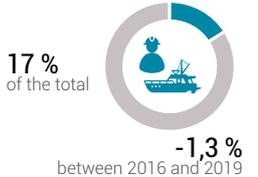


MINISTÈRE DES ARMÉES
Liberté Égalité Fraternité
2.2 billion euros worth of benefits for the Brest-Lorient naval base

1st employer of the maritime region



1,770 people work in research in the Finistère French Département and the Université Bretagne Sud, out of whom, nearly half are teacher-researchers



159,250 tonnes of fish products unloaded in the Brest area ports in 2020



1,000 publications per year, on average

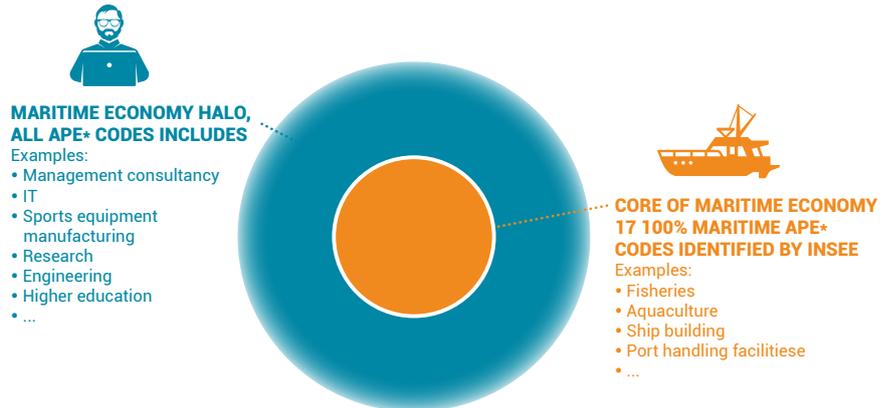
1,850 students take a course in sea and coastal studies

Maritime economy - What are we talking about?

In a world with no sea, the question would be: what are the economic activities that would not survive? This could be the dystopian question to summarise maritime economy. Thus, to be considered by the maritime ecosystem, a company needs the sea for its activities. This is, for example, the case for a maritime freight transport company. Yet, a food company that uses this company to transport its products, will not be considered.

Some economic entities are however only partly maritime. For example, the Ensta Bretagne engineering school, a higher education and research institution, works largely with the maritime sector but also with the transport, airspace, energy or digital industries. Regionally, a threshold has been set for the definition of what maritime economy is. Only those entities for which at least 25% of their activity (according to experts or by asking the company) depends on maritime economy are considered. This threshold is in fact commonly used in competition law to define the notion of economic dependence. To come back to our example, the Ensta Bretagne is thus included in the maritime economic sector since more than a quarter of its activity is connected to the marine environment.

The maritime economy according to the Chambers of Commerce and Industry and the urban planning and development agencies networks



*APE: Activity principale de l'entreprise / Company's main activity

This definition had already been used for the first economic assessment. It remained the same for this second assessment; the objective being to compare the sectoral developments of this economic sector over time. Moreover, this definition is regionally

accepted thanks to the collaboration of the Breton urban planning and development agencies networks and the Chambers of Commerce and Industry.



Crédit photo : Dogmay Olivier (2021). Petite roussette et plongeur. Ifremer

The maritime economy for The Campus mondial de la mer (World maritime campus)

42,600 maritime jobs in Finistère

At the end of 2019, 42,600 jobs were accounted for in Finistère, or 20% of all maritime jobs in mainland France¹, excluding coastal tourism. Brittany is commonly considered as the second maritime French region in terms of jobs, just after the PACA region (Provence Alpes Côte d'Azur). Regionally, Finistère represents 60% of the Breton maritime jobs. Out of the 21 Breton areas, the Brest area is the first maritime economic basin with 28,000 jobs. The Cornouaille area ranks third with 9,000 jobs and the Morlaix area fifth with 4,600 jobs.

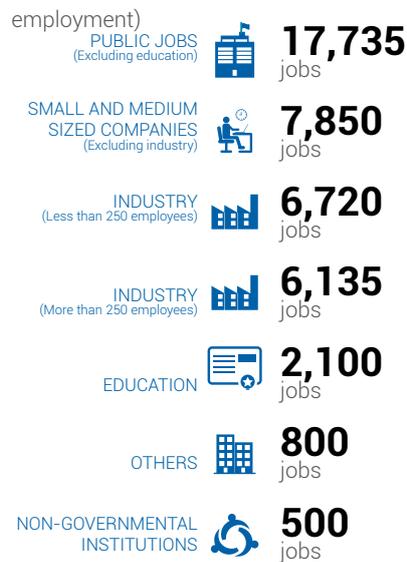
Forty two percent of the Finistère maritime jobs are in the public sector. The presence of the French Navy explains this figure. The maritime industrial network represents 30% of these jobs and more than half are in companies with fewer than 250 employees, i.e. SMEs (small and medium-sized enterprises). These companies, excluding the industrial sector, represent 18% of maritime jobs. They include wholesale trade activities related to seafood products, maritime transport services or consulting and engineering activities.

The top five maritime employers in Finistère in 2019 :

- **Ministry of the armed forces: 17,300 jobs, first maritime employer in Brittany**
- **Naval Group: 2,800 jobs in Brest**
- **Thales: 1,500 jobs in Brest**
- **Ifremer: 970 jobs in Plouzané**
- **Conserverie Chancerelle, a canning company: 755 jobs in Douarnenez**

Distribution of jobs in Finistère as per OECD categories

(31/12/2019 – excluding temporary



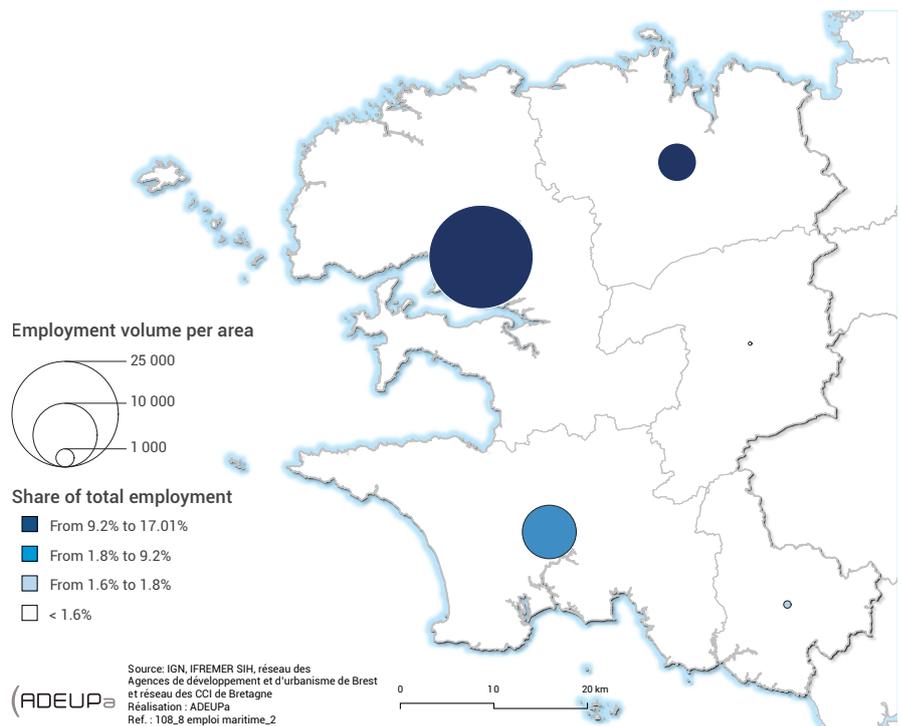
THE CAMPUS MONDIAL DE LA MER, THE FIRST FRENCH COMMUNITY FOR MARINE SCIENCES AND TECHNOLOGIES

The Campus mondial de la mer network is dedicated to the knowledge and development of marine resources. It is part of a territorial initiative in Western Brittany, underpinned by the activities of Brest, Roscoff, Morlaix, Quimper and Concarneau.

The campus community benefits from the complementarity of its network of academic, scientific, economic and institutional stakeholders working on the topics and markets of the future: marine biotechnologies, aquaculture and seaweeds, sustainable fishing, marine drones, maritime cybersecurity, sustainable maritime transport, maritime special planning, marine renewable energies, etc.

The campus aims to favour the research-company acculturation and to raise the attractiveness and awareness of the territory internationally.

Employment in maritime economy per areas in Finistère in 2019



¹ - Source: Insee, Clap, DADS

A slight increase in employment between 2016 and 2019

Between 2016 and 2019 the number of maritime jobs slightly increased by 1% or 227 additional jobs. This average is however hiding sectoral differences. The public sector, excluding education, experienced a loss of 1,560 jobs during that period. This decrease was essentially due to a reduced number of staff in the French Navy. The number of staff in governmental departments such as Customs, the DDTM² - or the Dirm Namor³ is also decreasing.

Conversely, other maritime sectors are thriving. The industrial SMEs are posting nice employment curves (+1,200 jobs). Several activities or companies can explain this growth such as ship building and repair (Navtis, Piriou Naval, Oximax), seafood products processing (Saupiquet, MerAlliance Armoric), energy (Entech smart energies) or seaweeds (Lessonia, Technature). Four hundred and five additional jobs were accounted for in the academic sector, partly due to the move of Ifremer's head office. Furthermore, various companies in the engineering sector are also posting job increases, such as Eolink, a company that designs floating wind turbines.

Higher education and research in Finistère and the UBS (Université Bretagne Sud)

One thousand seven hundred and seventy people work for maritime research in Finistère and at the Université Bretagne Sud (UBS), or 26% of national staff. More than half are researchers or teacher-researchers. They work in 25 research units and 22 interdependent institutions. The move of Ifremer's head office to Brest in 2019 confirmed the national expertise of West Brittany in this sector. The research topics about the sea are numerous. A greater knowledge of the marine environment is one of the objectives of research. It can be monitoring and measuring marine biodiversity, modelling the dynamics of the ocean floor or identifying thermal accumulation in the oceans. For example, the Argo international programme, of which Ifremer is a major player, aims to collect data about the temperature, water

Evolution of maritime employment by OECD categories in Finistère between 2016 and 2019



+227
jobs in Finistère
between 2016 and 2019

+1 %
relative evolution
A relatively stable level
of employment
over 3 year

Evolution of maritime employment by OECE categories in Finistère between 2016 and 2019 (excluding temporary maritime jobs)

Negative evolutions

PUBLIC EMPLOYMENT
(excl. Education)



-1 560
jobs

NON-GOVERNMENTAL INSTITUTIONS



-10
jobs

Positive evolutions

INDUSTRY
(Less than
250 employees)



+1 200
jobs

EDUCATION



+405
jobs

SMALL AND MEDIUM SIZED COMPANIES
(hors industrie)



+253
jobs

INDUSTRY
(More than
250 employees)



+100
jobs

OTHERS



+40
jobs

Source: Network of development and urban planning agencies of Brittany and network of Brittany's Chambers of Commerce and Industry ADEUPa processing ADEUPa's higher education and research observatory

salinity or currents, in real time, thanks to autonomous robots. Research applied to marine bioresources or to more sustainable sea exploitation practices is another subject considered by the Finistère researchers. Renewable marine energies or materials better adapted to marine environments are other topics whose industrial applications can be seen in the naval sector notably.

All the research units publish about 1,000 articles on these topics per year, out of which 780 are from researchers working in Brest or Roscoff. Globally, and by considering the main territories that publish in the field of marine sciences, the North Finistère research ecosystem ranks 17th (according to the number of publications between 1975 and 2019), ahead of capital cities like Rome or Stockholm, or even ahead of leading locations such as Bergen or Kiel. Compared to the 14th rank for the 1975-2013 period, a small decline was observed over the past years to the benefit of three sites, among which Sydney and Madrid. The regularity of the Brest and Roscoff scientific productivity is taking place in a more and more competitive environment. At the same time, the Chinese and Brazilian sites, notably, published at a particularly high rate in the field of marine sciences.

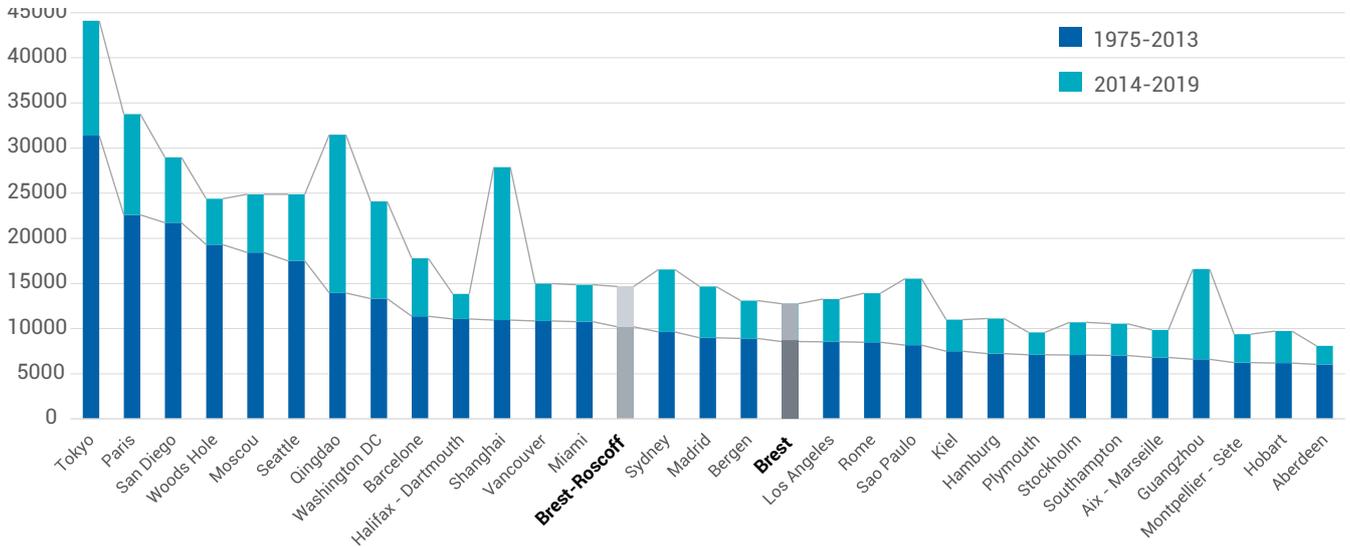
Another signal pointing to the excellence of research in the maritime field could be the Shanghai⁴ ranking. In 2021, the UBO (Université de Bretagne Occidentale - University of Western Brittany) ranks 13th on the topic of oceanography.

2 - Direction départementale des territoires et de la mer du Finistère - Departmental Directorate for Territories and the Sea

3 - Direction interrégionale de la mer Nord Atlantique-Manche Ouest- Interregional Directorate for the Sea - North Atlantic and Western Channel

4 - This ranking establishes a list of the 200 best universities in the world based on six criteria. Some examples of indicators: number of teacher-researchers, number of graduates who have received the Nobel Prize or Fields Medal, number of articles published in scientific journals, etc.

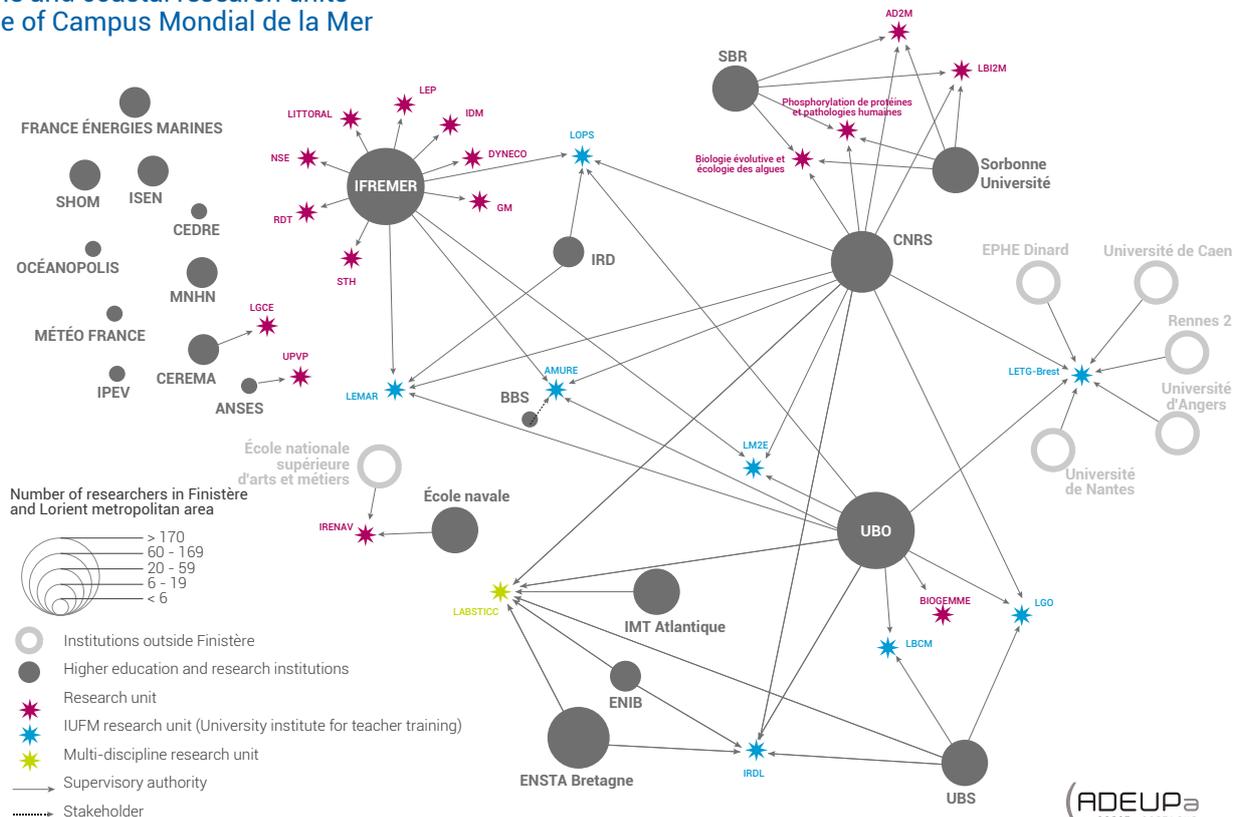
Major sites publishing in marine sciences globally (number of Web of Science publications, 1975-2019, study update 2013)



Source: UBO

CAUTION: CONNECTING A SCIENTIFIC PUBLICATION TO A CITY MAY INVOLVE A BIAS. INDEED, THE LOCATION OF THE PUBLICATION MAY BE ATTRIBUTED TO THE HEAD OFFICE OF THE INSTITUTION. THUS, THE VOLUME CONSIDERED FOR THE CITIES OF BREST AND ROSCOFF MAY BE UNDERESTIMATED, ESPECIALLY SINCE IN 2019 IFREMER'S HEAD OFFICE WAS NOT YET LOCATED IN BREST.

Marine and coastal research units Scope of Campus Mondial de la Mer



More than 1,800 students in maritime studies.

1 857 students in higher education are enrolled in sea and coastal studies in Finistère and in the Lorient metropolitan area. The Mainstrance school, training the future non-commissioned officers of the French Navy, has the highest number of students. The UBO, the naval school or the Ensta Bretagne engineering school are also part of the main higher education institutions for maritime studies. The training offer has been growing in Finistère, notably in areas of high strategic importance. The IMT Atlantique school has opened a master's degree on cybersecurity of maritime and port systems, in collaboration with Ensta Bretagne and the École nationale supérieure maritime - National Maritime High School (ESSM). In September 2021, Ensta Bretagne and the Naval School added a second curriculum dedicated to ship maintenance to their master's degree in maritime project management.

These two examples highlight the concerns of the Campus mondial de la mer ecosystem and particularly their desire to structure, strengthen and complete the overall training offer of the territory to meet the needs of the maritime economy sectors, in volume as in qualification levels.

Institutions	Headcount 2020-2021
Mainstrance school	825
Université de Bretagne Occidentale - European Institute for Marine Studies	422
Naval School	270
National High School for Advanced Technologies - Brittany / ENSTA BRETAGNE	62
Roscoff biological station	62
Université de Bretagne Occidentale - Law and economic sciences unit	46
Université Bretagne Sud	40
Université Bretagne Sud - Technological University Institute of Lorient	40
Industrial training centre for apprentices of Lorient	30
Hydrography and oceanography department of the French Navy	24

1 857

students enrolled in sea and coastal studies in Finistère and in the Lorient metropolitan area



Including **154** foreign students



Credit photo : Brest métropole, Simon Cohen

The Pôle mer Bretagne Atlantique, a Western Brittany player with international reach

An international project catalyst for the benefit of Finistère

Fifty projects are supported by a Finistère company, like Drestop, for a total budget of 53.7 million euros. This partnership is only a local one with companies like Le Drezen, Saupiquet, Bopp and Ifremer. Its objective is to improve the seining fishing technique (to catch tunas) and to make it more sustainable right from design and connected to be adapted to the fishing regulations for this species.

Between 2017 and 2020, the Pôle mer Bretagne Atlantique (Atlantic Brittany maritime cluster) certified 149 new projects for a total budget of 250 million euros. Finistère stakeholders are involved in 86 of such projects, or 60% of them. Sixty-six are involved as sponsors or partners.

Among the most substantial ones in terms of budget is TNTM (Transformation numérique du transport maritime - Digital transformation of maritime transport), a project sponsored by CMA-CGM with a consortium notably including Ifremer. Its objective is to make maritime transport more efficient and safer in the interest of

economic efficiency and ocean protection.

The Piaquo project, with the support of Quiet Oceans, helps to reduce the acoustic impact of maritime transport by adapting it to the fauna around the ships in real time.

The diversity of projects supported by the Pôle mer Bretagne Atlantique reflects the wealth and the variety of the local maritime ecosystem. In the field of health, Hemarina supported two projects: Hemdental-Care whose objective is to treat periodontitis using haemoglobin of marine origin, and Hemlyo which aims to use marine worm blood, both to make up for the shortage of human blood but also to protect organs awaiting a transplant.

At the crossroads of fishing and boating, Fiiish is a company that supported the Gwalenn Du project to design fishing rods and masts exclusively from recycled materials. The objective was also to recall products at the end of their life and reintegrate them into a new life cycle for a circular economy approach.

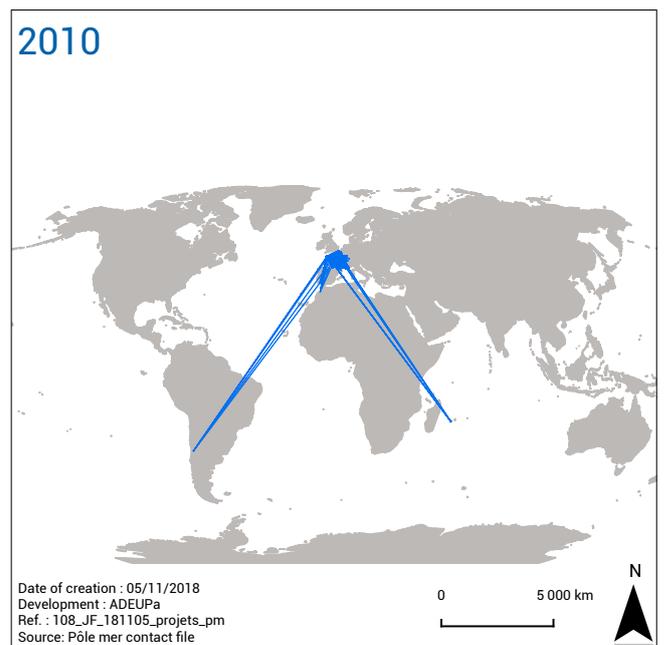
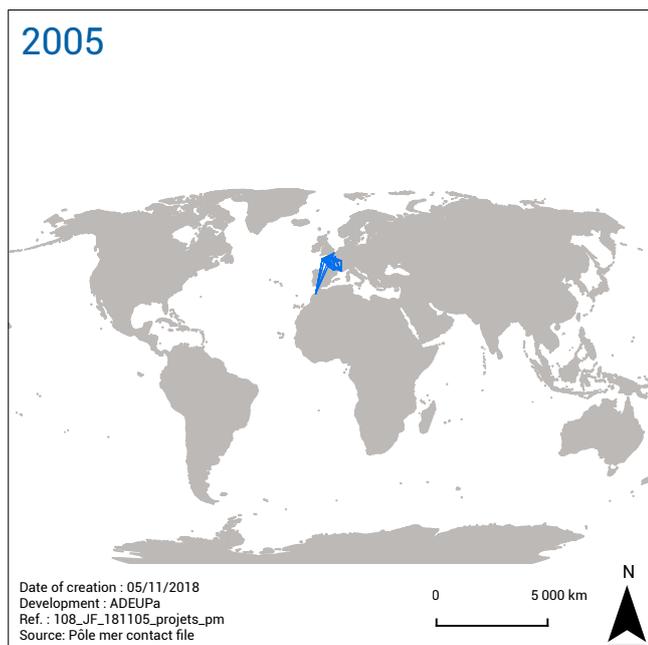
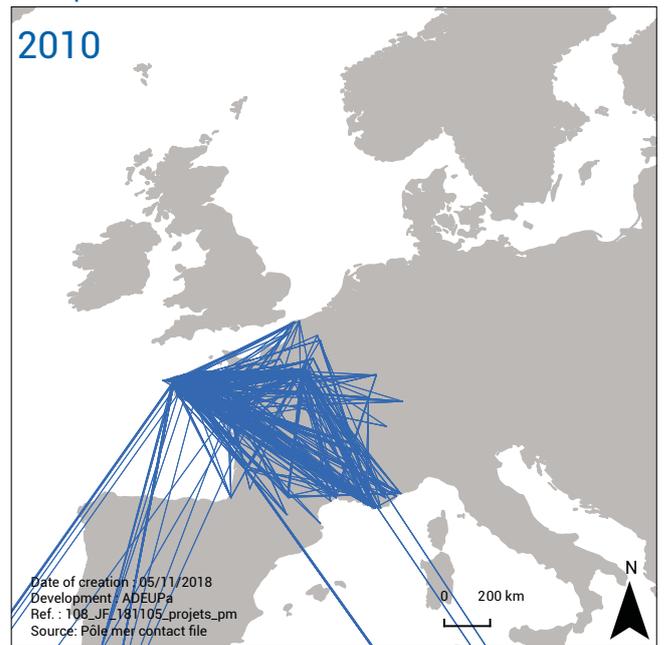
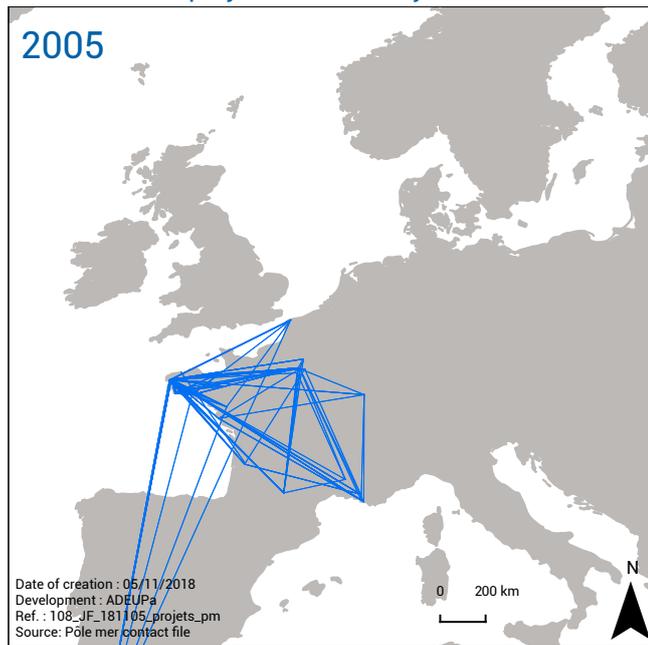
From an energy standpoint, the Species project, sponsored by the Institut de recherche France énergies marines (French institute for energy transition dedicated to offshore renewable energies) investigates the potential impact of electric power cables of offshore wind turbines on the ecosystem at the bottom of the oceans by analysing electromagnetic fields.

Between 2017 and 2020, the Pôle mer Bretagne Atlantique certified 149 new projects for a total budget of 250 million euros..

Entity	Number of participants in projects
Ifremer	21
France Energies Marines	14
Université Bretagne Occidentale	14
ENSTA BRETAGNE	8
IMT Atlantique, Roscoff biological station	8

Entity	Number of sponsored projects
France Energies Marines	11
Ifremer	5
Roscoff biological station	4
IMT Atlantique	3
Regional committee for shellfish farming in North Brittany, Hemarina ; Hytech-Imaging ; Institut agro ; IUEM/UBO ; UBO	2

Partners in the projects certified by the Pôle Mer Bretagne Atlantique.



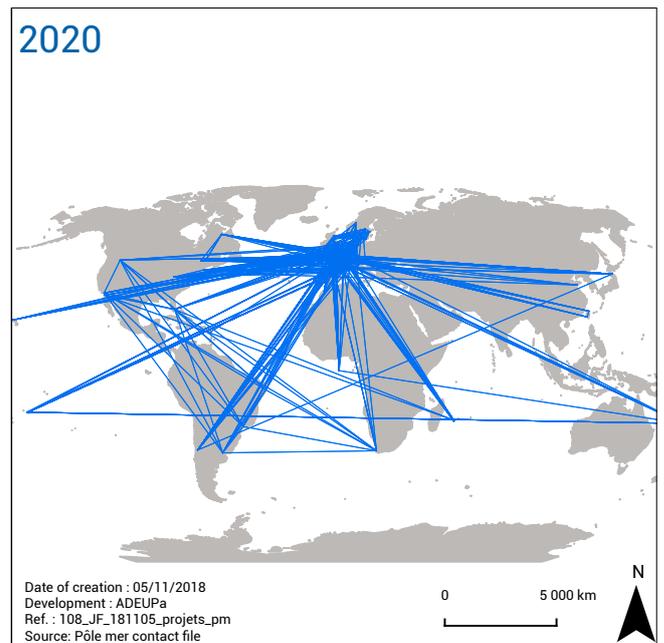
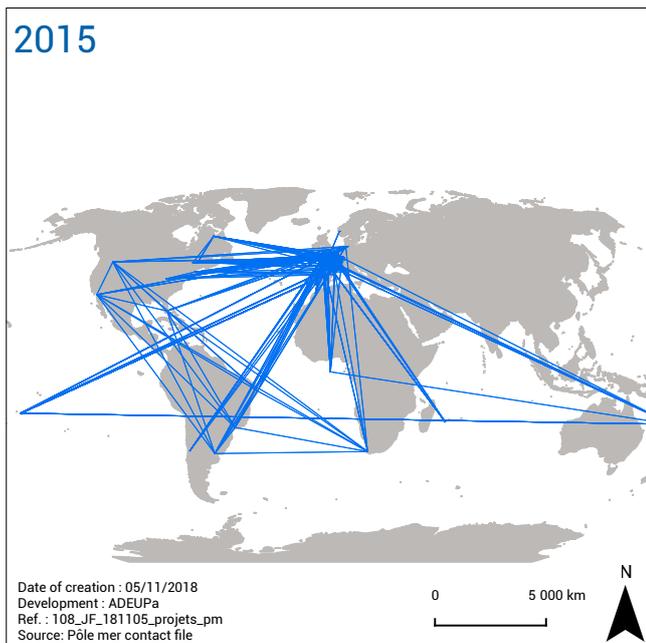
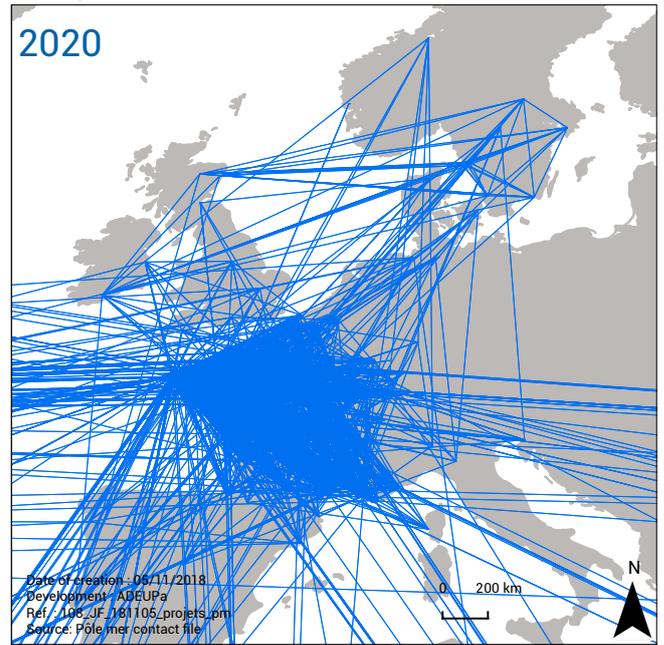
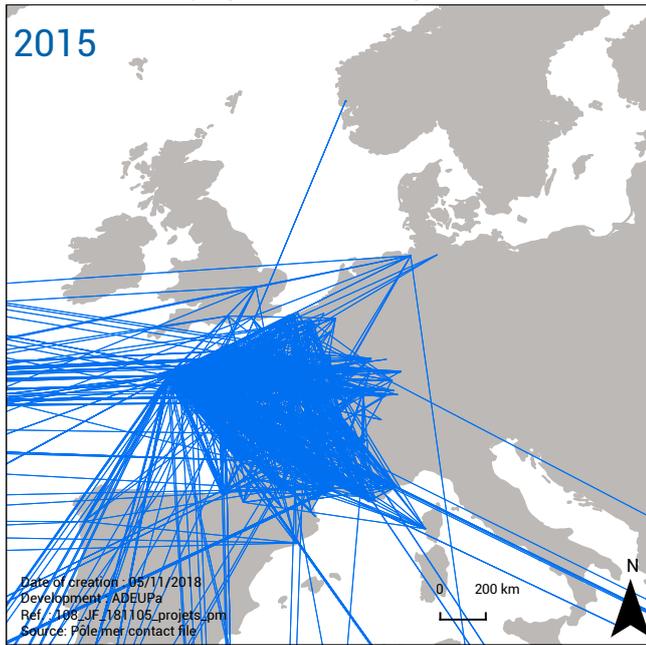
THE PÔLE MER BRETAGNE ATLANTIQUE FOR MARITIME INNOVATION

The competitiveness cluster dedicated to the economy of the sea, the Pôle mer Bretagne Atlantique, is a driving force in the maritime ecosystem and a promoter of collaborative innovation for blue growth. It organises many events and lobbying actions: participation in exhibitions, international study trips or organisation of thematic events.

Thanks to these actions, the Pôle mer actively contributes to the emergence of efficient and competitive solutions in all areas of maritime activity. Its main assignment is then to support these projects looking for certification: advice and expertise, networking, financing, visibility and promotion ...

The major expertise areas of the Pôle mer Bretagne Atlantique are maritime security and safety, naval and nautical activities, marine energy and mining resources, ports, maritime infrastructures and transports. Beyond these strategic areas of action, the Pôle has structured and is committed to two cross-cutting areas: environmental transition and digital transformation.

Partners in the projects certified by the Pôle Mer Bretagne Atlantique.



Project globalisation

The scope of the Pôle mer Bretagne Atlantique has become more international over time. Thirty-eight international partners are involved in 12 projects certified between 2017 and 2020, or 8% of the projects. Most are in Europe (87%). Swedish players alone represent 24% of the foreign partners. They are particularly involved in the Seasnake

project whose objective is to improve the performance of electric power cables for applications in the sector of floating offshore wind turbines. Italian, British and German players also take part in consortia on a recurring basis. The international dimension also extends to the rest of the world as partnerships have been signed with the United States of America, Canada and even China for projects like Surimi whose ambition is to develop sensors to monitor

the metal content of fresh and sea water or the level of pollution; or Mycoplast aiming to better understand the development of marine fungi and to stimulate enzymes capable of breaking down plastic polymers.

The Ministry of the armed forces: 1st employer in the maritime sector in Brittany, many benefits

Defence, 1st employer in the Brest area, all sectors combined

The Ministry of the armed forces is a leading employer and contractor in Western Brittany. For the entire Brest-Lorient defence base, this player generates 58,400 direct, indirect and induced jobs⁵, and 2.2 billion euros of economic impact annually for the local economy. This amount corresponds to the salaries paid to the employees of the defence base, the pensions as well as orders placed with companies. Seven hundred and fifty-two billion euros can be attributed to Naval Group and Thalès. This is an overall stable amount compared to the latest assessment made in 2014 (€ 2.3 bn).

Workforce per town



5 - Direct jobs: these are jobs directly attributable to the sector under study. In this case, these are the jobs assigned to defence activities.
Indirect jobs: these are jobs in sectors of activity dependent on the direct sector, i.e., dependent on defence. These sectors can be suppliers, service providers and subcontractors of the direct sector, but also players located downstream of the industry.
Induced jobs: these are the jobs generated by household expenditure employed in the direct and indirect sectors.

Financial flows generated by the defence industry (defence base and industry), in million EUR

	DEFENCE BASE	NAVAL GROUP AND THALES
Orders placed to local companies (in M €)	212*	423
Net payroll (in M €)	640	329
Pension payment (in M €)	625	Not documented

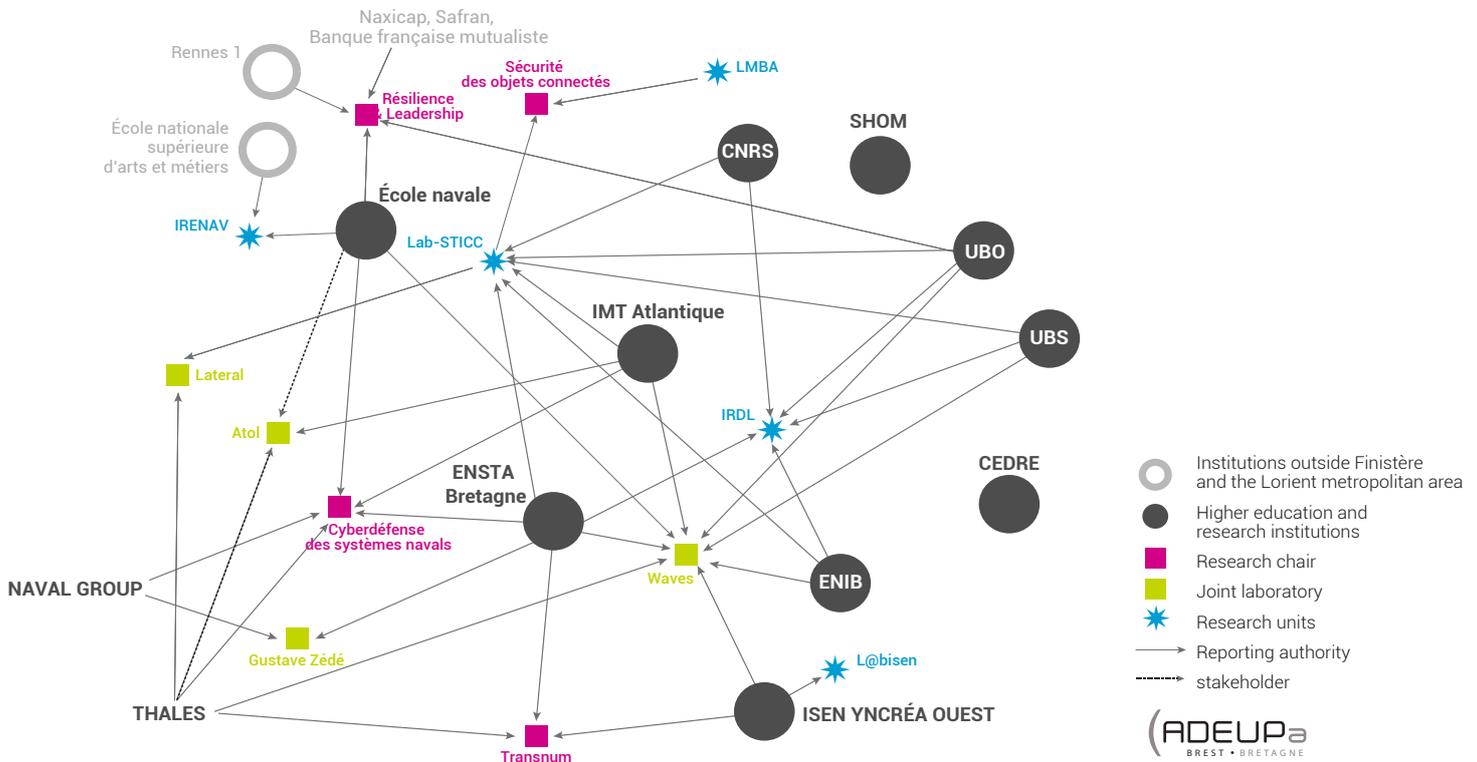
*Orders with local companies, excluding Naval Group and Thales

A total of **2.2 billion euros**

	JOBS		
	DIRECT	INDIRECT	INDUCED
DEFENSE BASE			
Employees	21,280	-	12,770
Pensioners	-	-	6,170
Orders excluding defence industries	-	1,710	1,030
INDUSTRIES			
Employees	7,290	-	4,370
Orders placed to local companies	-	2,360	1,420

Or **58,400** direct, indirect and induced jobs

Defence and security research cooperation programmes



Twenty thousand seven hundred and thirty-five full-time equivalent jobs (21,283 total estimated jobs) were identified in 2019 in the Brest-Lorient defense base. The city of Brest is the first employment centre with 11,130 FTE jobs. Next come the Crozon peninsula (3,920), the Lorient metropolitan area (3,770), Landivisiau (1,450) and Loperhet (190). Since 2014, total employment (direct, indirect and induced jobs) decreased by 1.9%, or 1,300 jobs less for the defense base. This decrease can be explained by the reduction in the number of defense employees (-3%); it corresponds to direct jobs and represents a loss of 650 FTE jobs in five years. However, some territories such as the Crozon peninsula and the Lorient metropolitan area are growing. Compared to the other armed forces in France, these drops remain modest, and the current trend is that of a stabilisation of employment. Furthermore, the 2019-2025 defense programming law provides for the creation of 6,000 jobs in France, including 3,000 in the intelligence and digital sectors.

Some perspectives for the Brest-Lorient defense base focusing on innovation

Innovation, the key word for the Ministry of the armed forces, takes on its full meaning in Western Brittany. It brings together academic and industrial players who are used to cooperation. Universities and engineering schools are committed to research with applications in defense. About 200 researchers, PhD and post-PhD students work in that sector, mainly in four research units: Lab-STICC, the Dupuy de Lôme research institute, the research institute of the Naval school and the research laboratory of ISEN.

By relying on the expertise of the local players and by considering the challenges identified by the Ministry of the armed forces, several topics are offering promising perspectives, such as the ship of the future, maritime cybersecurity (for which Brest has been hosting the National Cyber Security Coordination Centre for the maritime sector since the end of 2020), autonomous submarine systems, man-machine interface, maritime surveillance and intelligence.

The challenges identified by the Ministry of the armed forces, several topics are offering promising perspectives, such as the ship of the future, maritime cybersecurity

Brest area: 1st maritime employment basin in Brittany

In 2019, more than 28,300 maritime jobs in the Brest area

For 2019, the number of maritime jobs in the Brest area can be assessed at 28,351, or 17% of total employment. This figure is higher than the regional average of 5% and represents 2.7 times more jobs than in the construction sector. The Brest area still ranks first in the region. Seventy-eight percent of the maritime activities are in the Brest metropolitan area. The Crozon peninsula-maritime Aulne group of municipalities is the second largest in the Brest area with 14% of all jobs.

More than half of the jobs are in sea-related defense activities. The Ministry of the armed forces remains the major economic player of the Brest area, all sectors combined. It is also the leading employer in the maritime sector in Brittany. The ship building and maintenance activities account for more than 20% of jobs.

Higher education and maritime research rank third with 7% of all maritime jobs in the Brest area. If this figure may seem low at first sight, it is above the average in Brittany (3%). Furthermore, 80% of regional jobs in this maritime sector are in the Brest area.

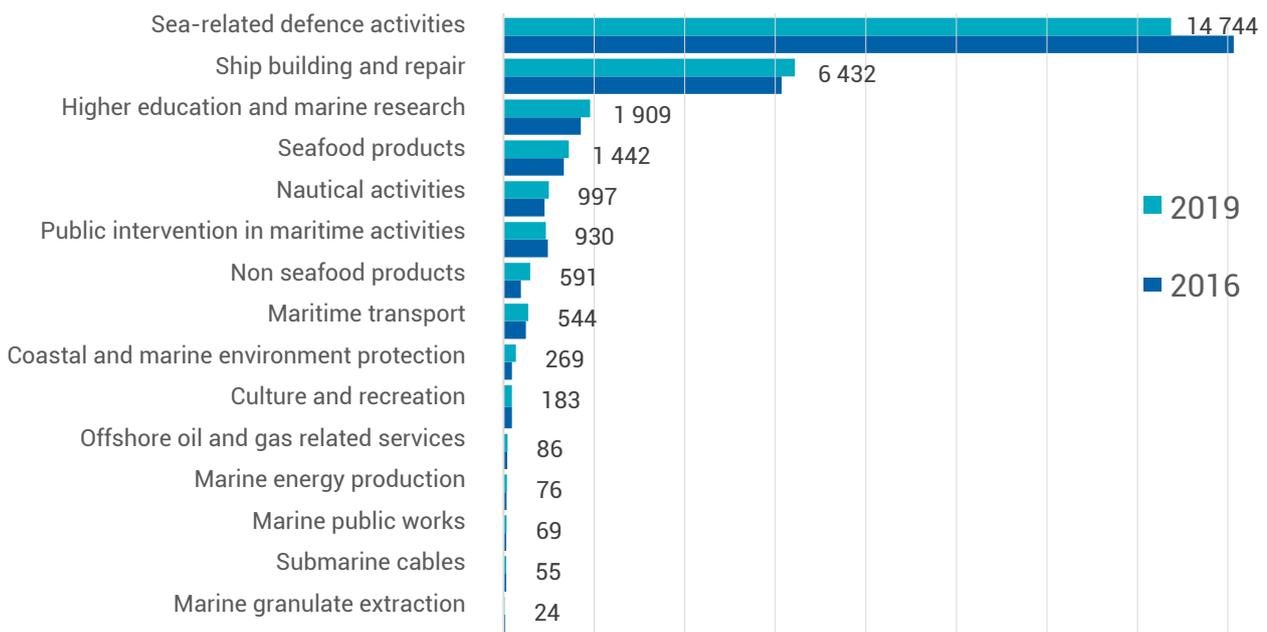
Decrease in the number of maritime jobs, essentially in the public sector

For the Brest area, the number of maritime jobs decreased by 1.3% between 2016 and 2019, which represented 383 fewer jobs, contrary to the trend observed in Brittany (+3%). The public sector was particularly affected by this decline and more specifically the defense-related activities with 1,387 fewer jobs. This decrease concerned almost exclusively the city of Brest. However, and given the perspectives of the 2019-2025 defence programming law, this sector should stabilise in the coming years.

Other sectors have experienced an increase in employment. Firstly, the sector of ship building and repair with 289 additional jobs in three years. The Navtis Group was particularly dynamic as, amid the health crisis, it managed to secure 22 million euros worth of contracts in the field of defense and marine renewable energies⁶. Non-food product companies also experienced a growth in employment (+209). Seaweed companies working notably for the cosmetics industry, as Lessonia, are developing too. This company is now part of the ten leading employers of the maritime sector in the Brest area. With the arrival of Ifremer's head office in Plouzané, the number of jobs in higher education and marine research increased. Except for the latter, the evolution of the maritime economy is particularly supported by employment in the private sector. Focusing on the evolutions of private jobs, the Brest area ranks first for the creation of jobs between 2016 and 2019 with 674 additional jobs. The Lorient area ranks second with an increase of 652 jobs.

⁶ - Source: le Journal des Entreprises, article published 10th December 2020

Breakdown and evolution of maritime jobs per activity sector between 2016 and 2019



Source: network of development and urban planning agencies & CCI network of Brittany. Development ADEUPa
 *Excluding Shom and Enstra, listed as public intervention and marine research and higher education respectively
 Caution: the elements transmitted by the Defence authorities allow us to assess the evolution between 2014 and 2019. Yet, as the information is communicated from 31.12.2016 to 31.12.2019 for most institutions, the same period has been retained by the observatory.

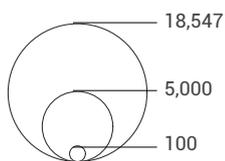
The ten leading employers in the maritime sector

Institutions	Maritime sector	Location	Headcount 31/12/2019	Evolution of employment between 2016 and 2019	Evolution of jobs
Ministry of the armed forces,	Sea-related defense activities	11 towns	15,737	-8,3 %	-1,415
Naval Group	Ship building and repair	Brest and Guipavas	2,786	+0,6 %	+16
Thales Dms France Sas	Ship building and repair	Brest	1,538	+7,2 %	+108
Institut Français De Recherche Pour L'exploitation De La Mer	Higher education and marine research	Plouzané	829	+15 %	+107
Navtis	Ship building and repair	Brest	268	+62,4 %	+103
Moulin de la Marche	Seafood products	Châteaulin	248	-3,5 %	-9
Research vessels management Group - Genavir	Higher education and marine research	Brest	297	0 %	+3
Lessonia	Non seafood products	Saint-Thonan	199	+161,8 %	+123
Océanopolis	Culture and Recreation	Brest	170	0 %	0
Damen Shiprepair Brest	Ship building and repair	Brest	170	-10,5 %	-20

Breakdown of maritime jobs in the Brest area in 2019 and evolution between 2016 and 2019

Jobs per municipality

(excl. Interim workers, fishermen and fish farmers)

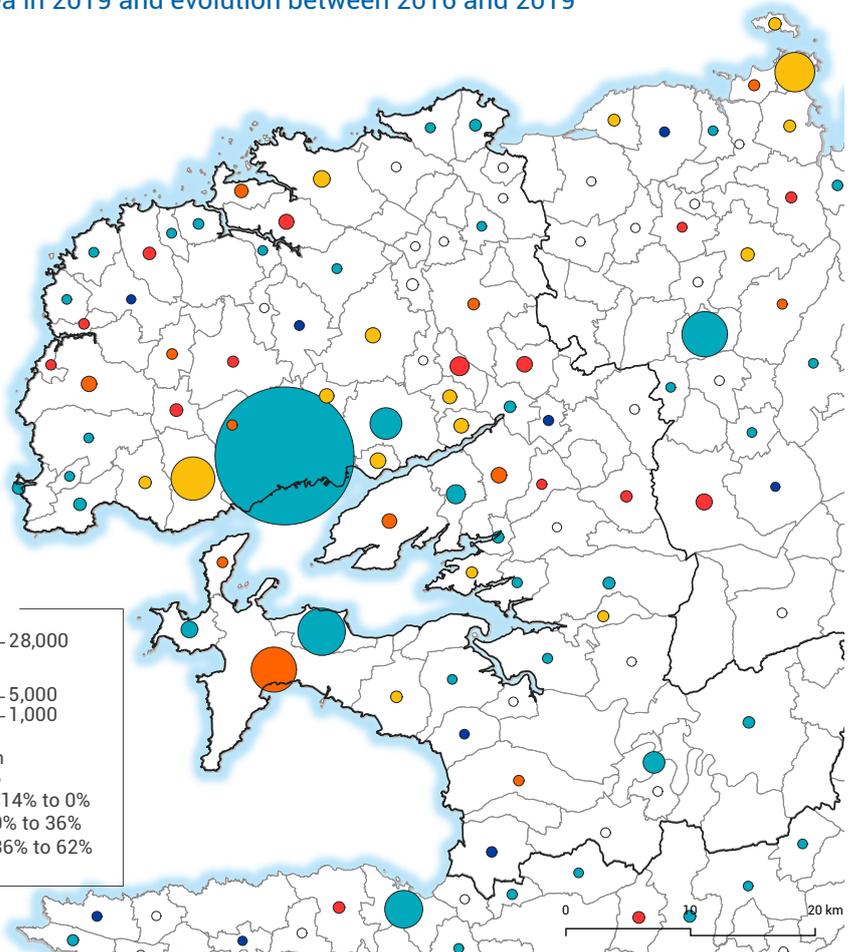
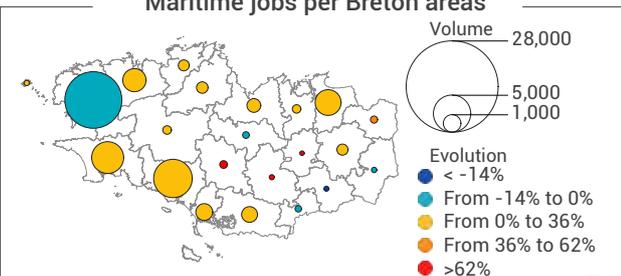


Evolution of employment between 2016 and 2019

- < -25%
- From -25% to 0%
- From 0% to 25%
- From 25% to 50%
- >50%
- No evolution

218 maritime interim workers – 19% drop
529 fishermen and fish farmers – stable evolution

Maritime jobs per Breton areas



Fisheries and aquaculture in the Brest area

Affected by the Covid crisis, professional fisheries faced many difficulties in 2020. The successive health constraints slowed down the activities of fishermen, thus reducing the volumes of fishing, production and sales of seafood products. Furthermore, the 2020 statistics should be considered with caution due to the difficulties in collecting and reporting fishing statistics.

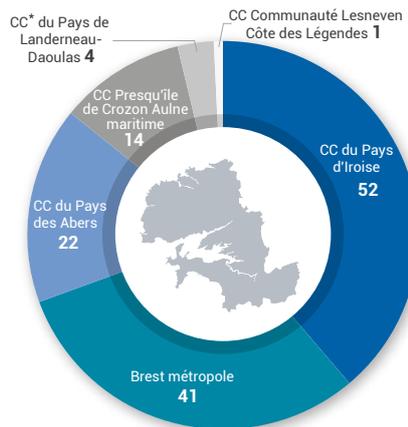
Boat fishing: a diversified activity in the Brest area

Professional fisheries in the Brest area are characterised by a diversity of jobs. In 2020, five main categories of jobs and ships were represented: gillnetters⁷ represented most ships (34%), dredgers⁸ (19%), troller-longliners⁹ (21%), pot vessels¹⁰ (13%) and seaweed harvesting ships¹¹ (13%).

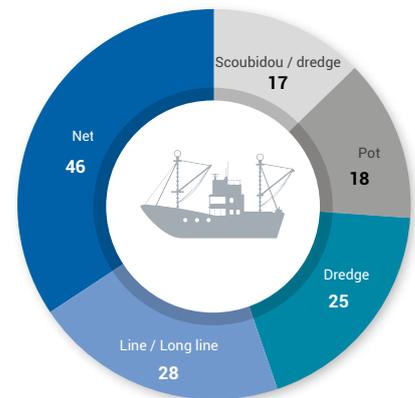
This multiplicity of fishing methods can be notably explained by the presence of species in the local waters that need different fishing methods. For example, noble species like monkfish, seabass or pollack are caught by boats using lines or nets. The importance of shell fishing in the bay of Brest is the reason for the presence of dredging boats. The latter usually carry out a second activity with the harvesting of kelp in the Molène archipelago kelp beds and are equipped with scoubidou and kelp dredges. Finally, the pot vessels more specifically target near-shore species such as crustaceans, molluscs and cephalopods (octopus).

Hundred and thirty-four boats (or 24% of all the boats of Finistère) were registered in the Brest area in 2020. The ports located in the Iroise inter-municipal area represent 39% of this fleet. The ports of the Brest metropolitan area come next with 31% of the boats, then those of the Pays d'Abers (16%). The rest is distributed to a lesser extent in the ports of the other inter-municipalities.

Number of boats by inter-municipal bodies in the Brest area in 2020



Distribution of boats in the Brest area by fishing methods in 2020



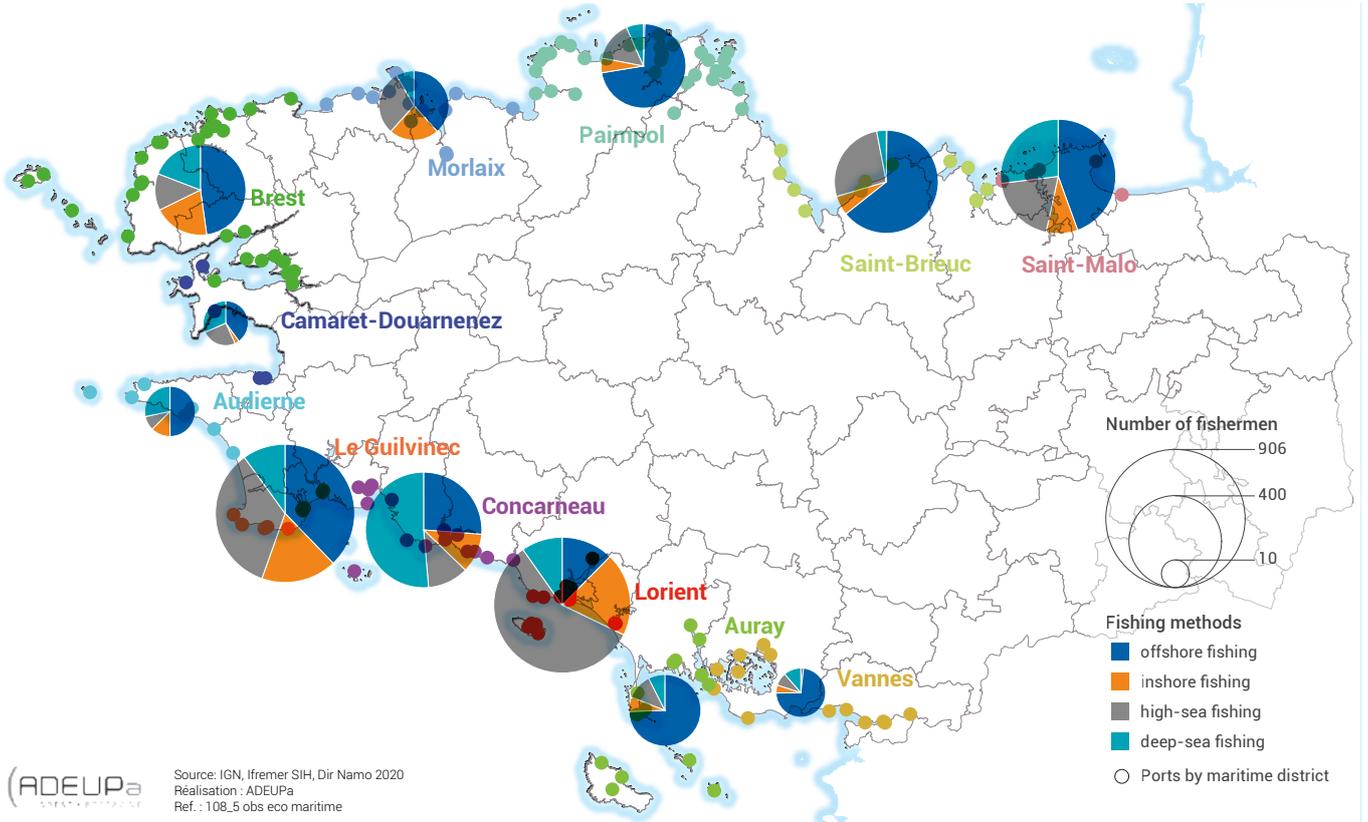
Source: CDPMEM 29
*Community of municipalities

7 - Gillnetters fish with nets set on the bottom or left drifting between two waters and retrieve them later. Several types of nets are used (trammel nets, floating nets, etc.).
8 - Dredgers are boats that use a dredge, mainly for shell fishing.
9 - Trollers are boats that use several fishing gears: handlines, trolling lines, rods or longlines and fish mainly for sea bass and pollack. Longliners are generally larger and can set very long lines to catch both bottom and near-surface species.
10 - Pot vessels use traps to catch edible crabs, spider crabs, lobsters and swimming crabs
11 - The kelp harvesting boat is specialised in harvesting seaweed with a scoubidou or a kelp dredge.



Crédit photo : ADEUPa, port du Conquet

Number of fishermen by maritimes districts in Brittany and distribution by type of fishing in 2020



Brest fishermen focusing on small boat fishing activities

In 2020, out of the 5,064 Breton fishermen, 387 were registered in the Brest maritime district, or 8% of the regional headcount and 16% of the Département headcount¹². In Finistère, the Brest maritime district was behind that of Le Guilvinec (38%) and of Concarneau (27%). Since 2015, the headcount of the Brest maritime district has decreased by 5%, or 19 professionals less in 5 years.

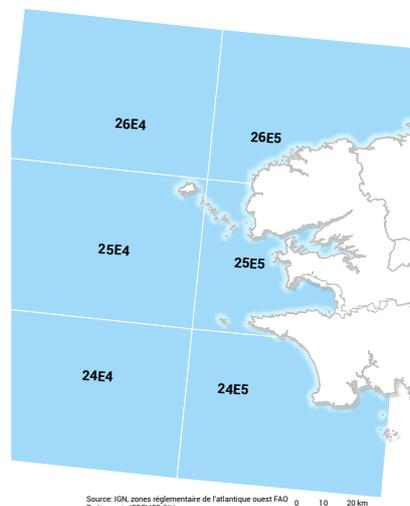
Sixty-eight percent of the Brest maritime district fishermen work for small boat or inshore fishing compared to 53% on average in Finistère. These fishing campaigns are characterised by short navigation periods, below or equal to 24 hours for small boats or below or equal to 4 days for inshore fishing. The fishermen may be alone on their boat or embark a few people at most. The boat is often less than 12 meters long and lands only fresh products. Conversely, offshore fishing and deep-sea fishing only account for 32% of the Brest workforce compared to 47% on average in Finistère.

These practices are characterised by longer navigation periods and allow crews of 10 to 60 fishermen for the largest and best equipped boats (factory ships). A first processing of the products caught can be carried out onboard. A fishing campaign can last 10 to 15 days or even several months for deep-sea fishing.

74,685 tonnes caught off the Finistère coasts.

Nationally, Ifremer reports an overall decrease in production in the fishing industry for 2020. Production started to drop at the beginning of the year (before the first lockdown) and fell by 60 to 75% depending on the boats and regions. This deficit in production was not made up after the first

MARITIME SPACES CLOSE TO THE COASTS OF WESTERN FINISTÈRE



The FAO (Food and Agriculture Organisation)¹, for scientific and statistical purposes, releases a regulatory map of fishing zones, particularly for the North-East Atlantic and the Mediterranean zones. This tool makes it possible to monitor the species and quantities caught by the professionals, thanks to a specific breakdown. The six maritime zones highlighted on the map show the data collected by Ifremer's FIS (Fish Information System) services².

1 - Also known in France as Organisation des Nations unies pour l'alimentation et l'agriculture (United Nations Farm and Agriculture Organisation)
2 - The elements described here refer to resources fished in the 26E4,25E4,24E4,26E5,25E5 and 24E5 regulatory zones

12 - Source: DIRM-NAMO (Direction interrégionale de la mer Nord Atlantique-Manche Ouest)

lockdown and the 2020 indicators were down compared to 2018-2019¹³. However, the decline observed on the national territory is to be qualified for each of the six maritime zones of Western Finistère.

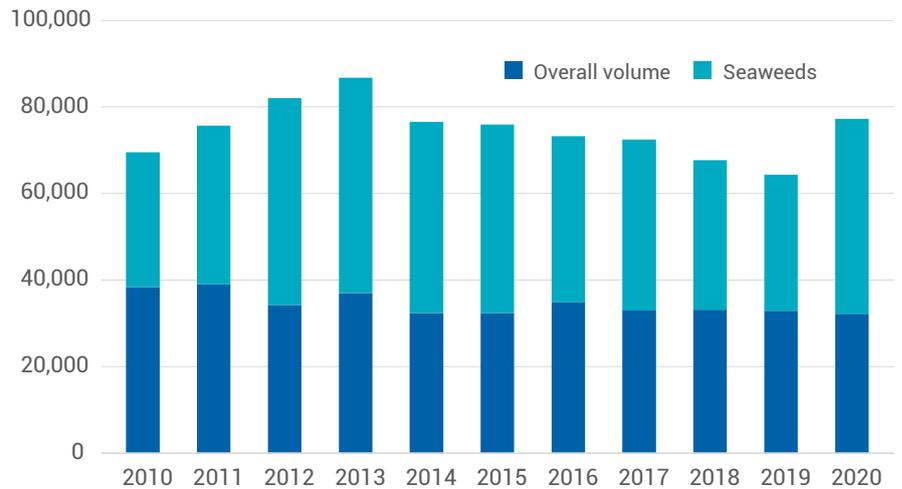
For the 2010-2020 period, the overall volume of fish resources caught in the Finistère maritime zones remained relatively stable, with an annual average of 74,685 tonnes. The year 2020 was therefore a good year for fishermen with 77,279 tonnes of marine resources produced. Despite lockdown and selling difficulties (closing of bars, restaurants and auction halls), the professionals increased their production volume by 20% compared to the previous year (64,332 tonnes in 2019). Although the volumes caught may indicate a healthy local industry, the increase concerned only some species and varied according to the maritime zone considered. Indeed, three zones out of six experienced a decrease in volumes, -26 % (sector 24E4), -32 % (sector 24E5) and -5 % (sector 25E4) respectively, while the other sectors increased by 47% (sector 26E4), 55 % (sector 25E5) and 19 % (sector 26E5). This increase in volumes caught in these zones can be notably

explained by the harvesting of kelp, which is less likely to have been affected by the crisis on market outlets than other fish resources.

An analysis of caught resources, excluding seaweeds, shows a 2% decrease in production between 2019 and 2020, while that of kelp increased by 43% over the period. However, not all the Finistère areas were concerned by this Iroise Sea specific harvesting. At the same time,

other well-known species of the region, such as scallops, weathered the 2020 crisis rather well, while other resources experienced a drop in produced volumes. Between 2019 and 2020 the production of scallops increased by 6% confirming the low production variation for this species since 2015. Conversely, the volume of European hake, monkfish or spider crab fell by 34%, 17% and 29% respectively.

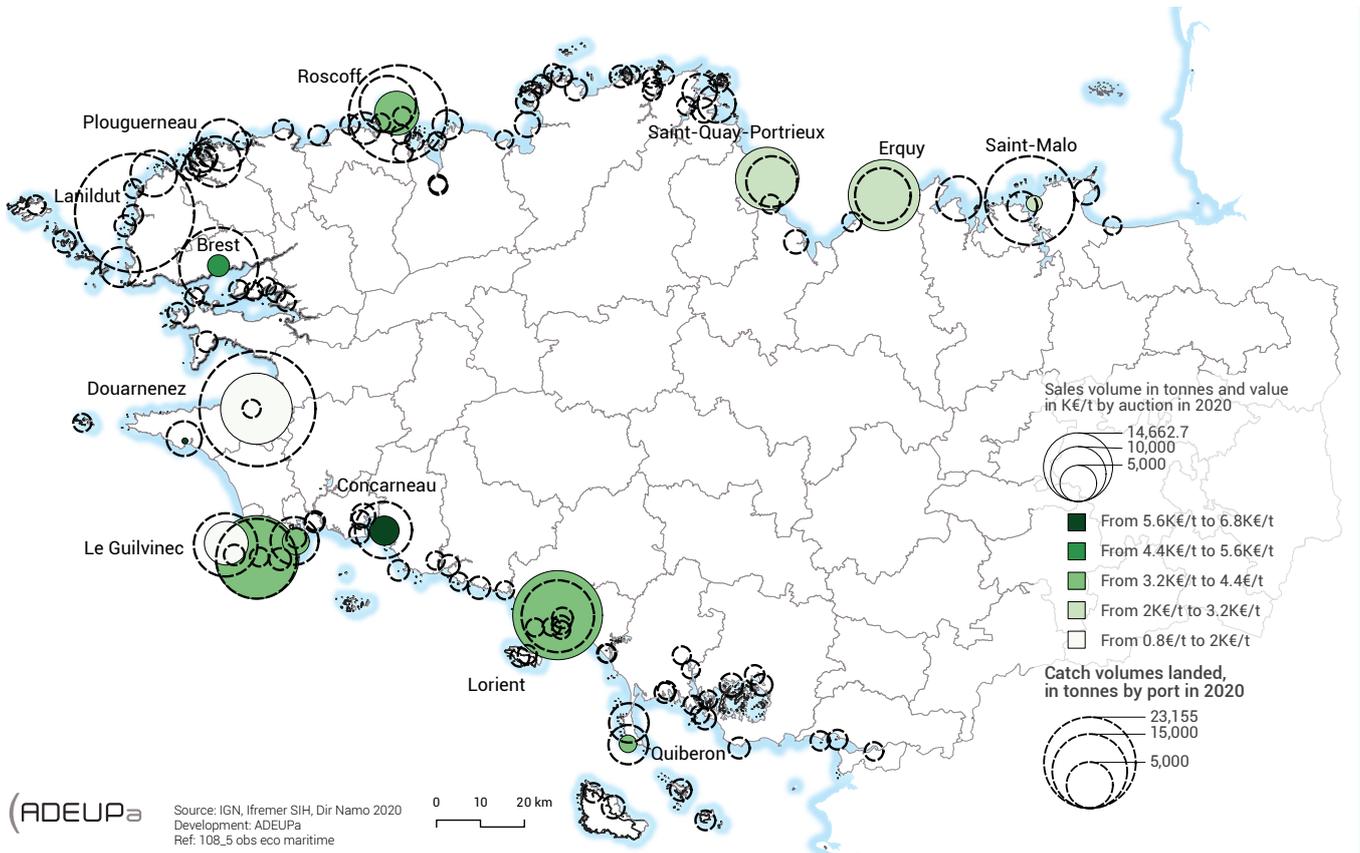
Volume of fish resources caught in the Finistère regulated zones (in tonnes)



Source: Ifremer - SIH

13 - Ifremer: how has the sector sailed through the Covid storm? 10/02/2021

Volume of sea products landed by port and volumes auctioned in Brittany in 2020



Seaweeds, monkfish, spider crab and edible crab, the main species landed in the Brest area

Historically speaking, Brittany is the first French region in terms of professional maritime fishing activities and landing of fish, crustaceans and other fish resources¹⁴. With 159,250 tonnes of seafood products landed in 2020, its weight was greater than that of other French regions (including the French overseas territories) in 2020 (38% of the national total figure). The products landed in the ports of North Brittany are essentially fish and seaweeds. Inshore fishing activity along the coast of Southern Brittany is dominated by fish and crustaceans.

On a regional scale, the Brest area ranked second in Brittany for the volume of seafood products landed in 2020, accounting for 28% (44,348 tonnes), just after the Cornouaille area (29%) and before the Morlaix area (13%). The good kelp harvesting season allowed the Brest area to better withstand the 2020 health crisis than the other

Breton areas, with a 40% increase in overall volumes landed between 2019 and 2020. Over the period, it was the only Breton area, along with the Dinan (+1%) area, to show an increase in landed volumes in ports.

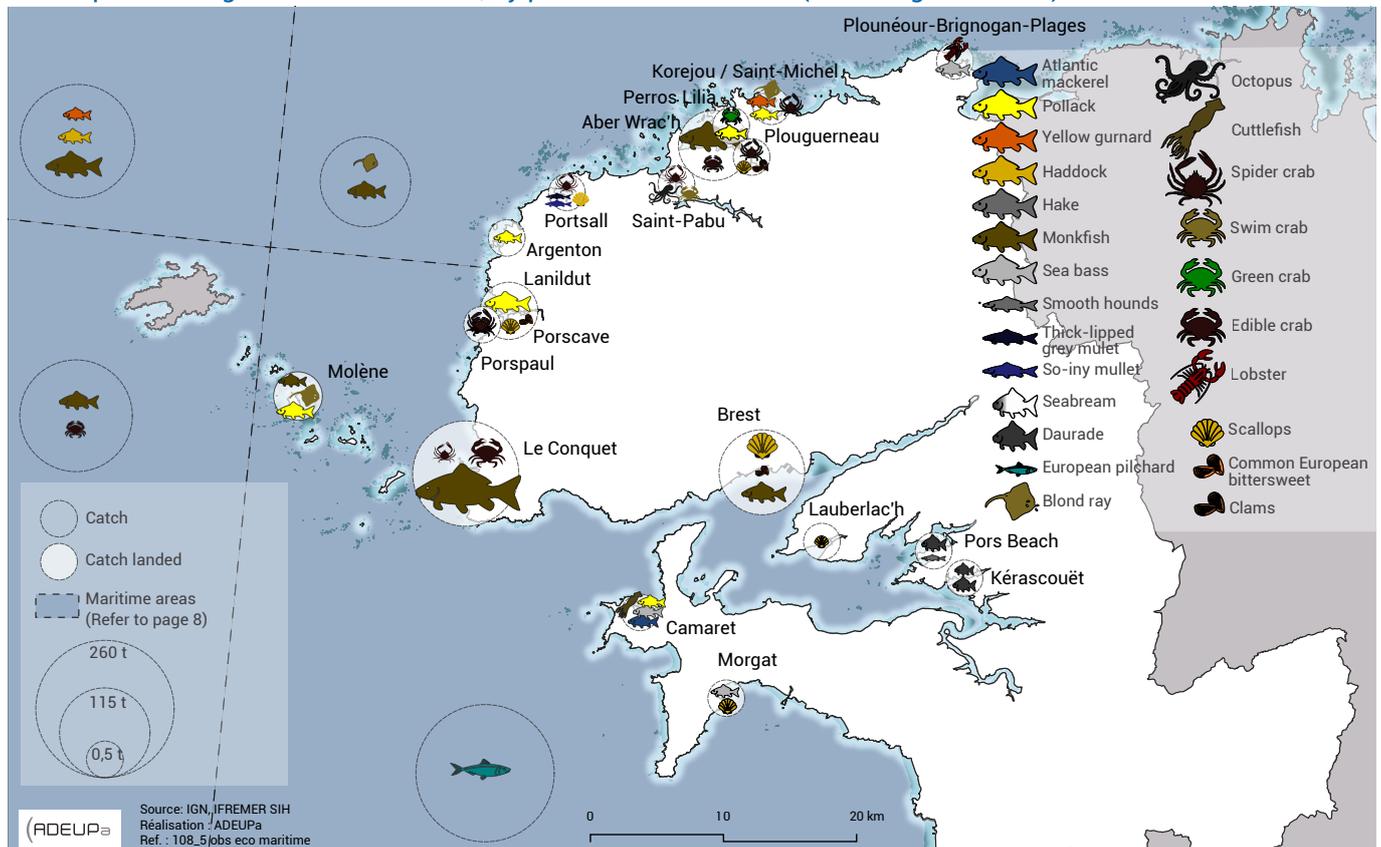
Thanks to a rich variety of local resources, no less than 126 fish species were landed in the Brest area in 2020. The largest volumes were of kelp (*digitata* and *hyperborea*), amounting to 40,997 tonnes, or 92% of the total volume, which makes it a real specificity of the territory. Freshly harvested seaweeds are weighted still wet and influence greatly the overall production results of the local fisheries. If we exclude seaweeds, the landed volumes amounted to 3,351 tonnes and were mainly made up of monkfish (31%), edible crab and spider crab (19%), scallops (8%) and pollack (6%). The Conquet port was the leading fishing port of the Brest area in terms of landed volumes with 1,587 tonnes in 2020, or 47% of the overall total, excluding seaweeds. The volumes were distributed as follows: Brest (24%), Aber Wrac'h (12%), Lanildut (5%) and Molène (3%). The 14 other ports represented less than 2% each of the landed volumes.

Each of the Brest area port has its own landing characteristics. However, several ports have the same major landed species. This is the case for scallops, the species most landed in the ports of Brest, Portsall (Ploudalmézeau), Morgat (Crozon) or Lauberlac'h (Plougastel-Daoulas).

Monkfish is the main species for the ports of Porspaul (Lampaul-Plouarzel), Conquet and Aber Wrac'h (Landéda). Pollack is the species most landed in the ports of Lanildut, Molène, Argenton (Porspoder) and Perros Lilia (Plouguerneau). Guilthead seabream is more characteristic of the ports of Pors Beach (Logonna-Daoulas) and Kérascouët (l'Hôpital-Camfrout). Common cuttlefish is the main species for the port of Camaret, spider crab for Porscave (Lampaul-Plouarzel), seabass for Plounéour-Brignogan-Plages, skate for Korejou (Plouguerneau) and finally octopus for Saint-Pabu.

14 - The elements described here refer to the resources landed in all Breton ports.

Main species caught at sea and landed, by ports in the Brest area (excluding seaweeds)



Aquaculture in the Brest area : an activity dominated by oysters and mussels

In 2013, 416 companies had a seashell activity (production of edible seashells), the main activity for aquaculture¹⁵ in Northern Brittany. This activity has been possible thanks to the farming of maritime areas under licence. If a few species dominate largely in terms of production volumes, such as the Portuguese oysters or mussels, the professionals have been diversifying their activities with other productions like abalones, clams and cockles, whose volumes remain marginal. More precisely, 13% of seashell production companies are in the Brest area: 38 in the bay of Brest and 16 in the Abers area. These companies produced 3,726 tonnes of seashells, or 9% of the production of the Northern region.

The Brest area's activities are based on two high added value species, Portuguese oysters and mussels. The first local seashell production is that of Portuguese oyster with 2,324 tonnes produced in the Brest area, or 10% of North Brittany production. The major part was produced in the Abers area (68%), the rest coming from the bay of Brest. Conversely, a major part of mussel local production was coming from the bay of Brest with 69% of the 1,370 tonnes produced, or 8% of the Northern regional production.

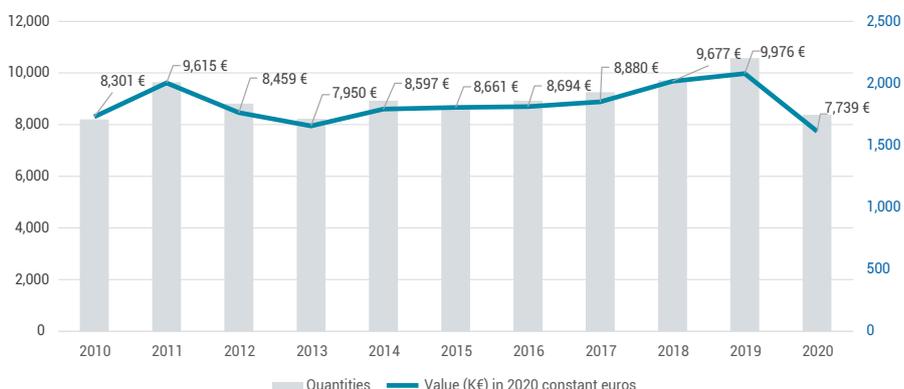
Comparatively to other territories of Northern Brittany, the Brest area stands out with a more diversified production of species. For example, five hectares under licence in the Abers area are dedicated to the production of abalones for a 6.1 tonnes production per year. This is a unique activity for Northern Brittany. Furthermore, the bay of Brest is hosting a one-hectare area under licence for clams, with a production of 2.2 tonnes or 20% of the production in Northern Brittany. Most of the volumes come from Cancale. Finally, the only regional production of cockles is in the Abers area with 3.4 tonnes produced on 3.5 hectares in the intertidal zone.

The Brest auction hall: high value products

In Brittany, seafood products are sold in 15 halles à marées, commonly called criées or auction halls. More than half of the Breton auction halls are in Finistère (Brest, Roscoff, Douarnenez, Audierne, Saint-Guénolé, Le

15 - Source: CRC Bretagne nord

Evolution of quantities and sales value in the Brest auction hall between 2010 and 2020



Guilvinec, Loctudy, Concarneau). Distributed all along the regional coasts, they allow boats to land their productions, distribute the different species and auction them to wholesalers and fishmongers. In 2020, out of the 83,778 tonnes of sea products auctioned in Brittany, two auction halls particularly stood out: Lorient and Le Guilvinec. They were respectively the first and second regional halls with 14,662 tonnes and 13,037 tonnes sold. They were also the first two auction halls in terms of total sales values, amounting to M€ 51, 9 for Lorient and M€ 48 for le Guilvinec, out of the M€ 255 for the overall Breton value. The health crisis has impacted this sector since some auction halls were closed during the successive lockdowns, leading to a 12% decrease in volume and a 15% decrease in Breton sales between 2019 and 2020. The same is true for the average prices per kilo, with a 3% decrease.

The only auction hall of the Brest area, located in Brest, represented 2% of the Breton sales and 3% of the sales value. Despite increasing sales results since 2015, the crisis has not spared the Brest auction hall, with a 21% decrease in sold volumes, compared to 2019 and a 22% decrease in the overall value. The average price, however, remained stable, with a small 1% decrease over the period.

The Brest auction hall is now meeting the European regulations. Optic fibre

has been installed on that occasion and distance auctions via videoconferencing is today representing 90% of all sales (as in Roscoff). This allows 100 wholesalers to connect simultaneously. The 2,500 sqm hall was designed for a processing capacity of 2,500 tonnes of fish products per year. Additional investment was also planned for 2020 (automation). In 2020, 1,744 tonnes of seafood products were thus sold in the Brest auction hall for a total value of M€ 7,700.

The Brest auction hall, compared to other Breton and Finistère halls, is characterised by the sales of high added value products. Monkfish, considered a noble fish, was the most sold species with 407 tonnes (23%), or a total value of more the M€ 1,668. The second most sold species was scallops, € 925,509 (196 tonnes), followed by lobster € 601,906 (29 tonnes). Thus, the average price of sales in Brest in 2020 was €4.41/kg, €1.41 more than the average price in the Département and €1.36 more than the regional average. As the only auction hall of the Brest area, it is having a local monopoly, yet directly competing with the other auctions of Finistère, notably Concarneau, Saint-Guénolé and Douarnenez. These auctions offer other products, that are less present than those landed in Brest and the available volumes are greater, making it possible to reach lower prices or to buy in bulk for wholesalers and fishmongers.

Volume and value of auction sales

	Volume (tonnes)		Value (K€)		Average price (€/kg)	
	2020	2020/2019	2020	2020/2019	2020	2020/2019
Brest auction hall	1,744.65	-21 %	7,700.47	-22 %	4.41	-1 %
Finistère auction halls	39,272.54	-12 %	11,7974.14	-17 %	3.00	-6 %

Source: Ifremer - SIH

Port of Brest: challenges and perspectives

Port of Brest: a driving force for the local economy

6,250 jobs in the port

The port of Brest is the leading port of Brittany in terms of traffic and activities. It is also unique in its position at the heart of the Brest metropolitan area, as it is both a district of the city and an industrial area dedicated to sea-related activities and to companies that chose a maritime location. As a flagship of the city of Brest, the port was able to renew itself and to attract lovers of a maritime atmosphere. The substantial increase in the number of jobs is the sign of this attractiveness.

In 2019, the port area, including the commercial port and the marinas of Le Château and Le Moulin Blanc, represented 2,260 jobs. If they are indeed located in the port, this does not mean that they offer maritime jobs exclusively. Indeed, the criterion used is simply space related and not activity related.

Although the number of employees in the area has been relatively stable over a long period of time (about forty years), their types and geographical distribution have significantly evolved, as has the versatility

of the port site. After a continuous 36% decrease in jobs between 1975 and 1989, notably due to the decline in industrial activities, the commercial port has gone through a significant development since 1989. The number of jobs thus increased by 73% between 1989 and 2019, or +1.8% annually over the past 12 years.

Despite the opening of new public services in the port (French Agency for Biodiversity, Ordinary court, etc.), the distribution between public and private jobs has remained stable since 2006. Today, private jobs represent about 88% of total employment.

A SPATIAL DISTRIBUTION OF SPECIFIC JOBS

The relatively clear spatial distribution of activities in the port territory, reflects its recent history, and a progressively imposed specialisation of spaces.

Service activities are concentrated in the Western part of the port, on its historical sector more particularly. Yet some "port" service companies are scattered in the industrial port area, close to their customers. Conversely, the so-called industrial activities are in restricted areas and close to port specific equipment and infrastructures (warehouses, dry docks, quaysides, etc.). These companies, representing about 25% of jobs listed in the port, also require substantial areas of land. The land and building footprint of these activities is characterised by lower

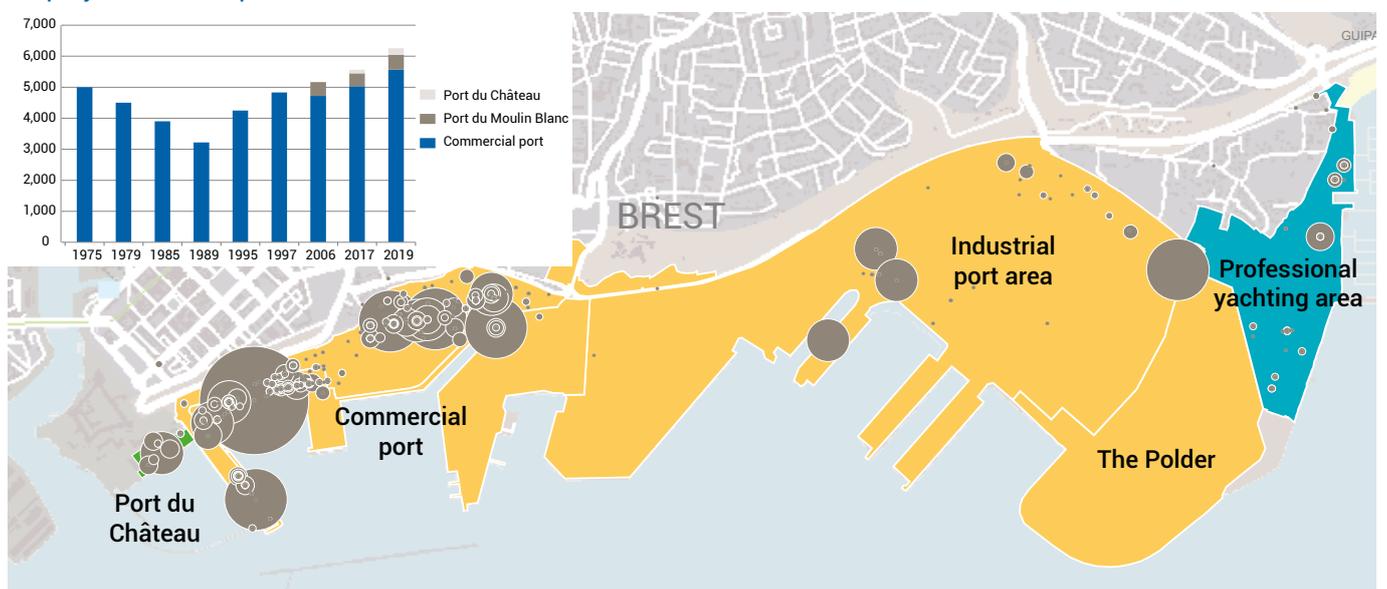
employment densities than in other areas of the port. It should be remembered that the industrial sector generates other economic activities (services to these companies, services to the employees). Its multiplying effect is often greater than that of other sectors. The so-called "general public" activities (retail trade, catering, services to individuals) are located on the parts accessible to the public, that is on the Western part of the port and marinas. Finally, the presence of some specialised shops (personal and household goods) should be noted.

AN ONGOING SERVICE SECTOR DEVELOPMENT

Although some companies have left the port for other zones of the metropolitan areas (Froustven and Kergaradec notably) the trend toward more service companies is still going on in the port. These settlements may compete with port activities as such in terms of space; those which fall under the sectors of industry, wholesale trade, services to companies for example and which, by nature, cannot be easily relocated.

This range of activities requires some organisation in terms of space and functions, otherwise potential conflicts of use may arise. The challenge in this case is precisely not to set one activity against another but to allow fair judgement when locating activities.

Employment in the port of Brest in 2019

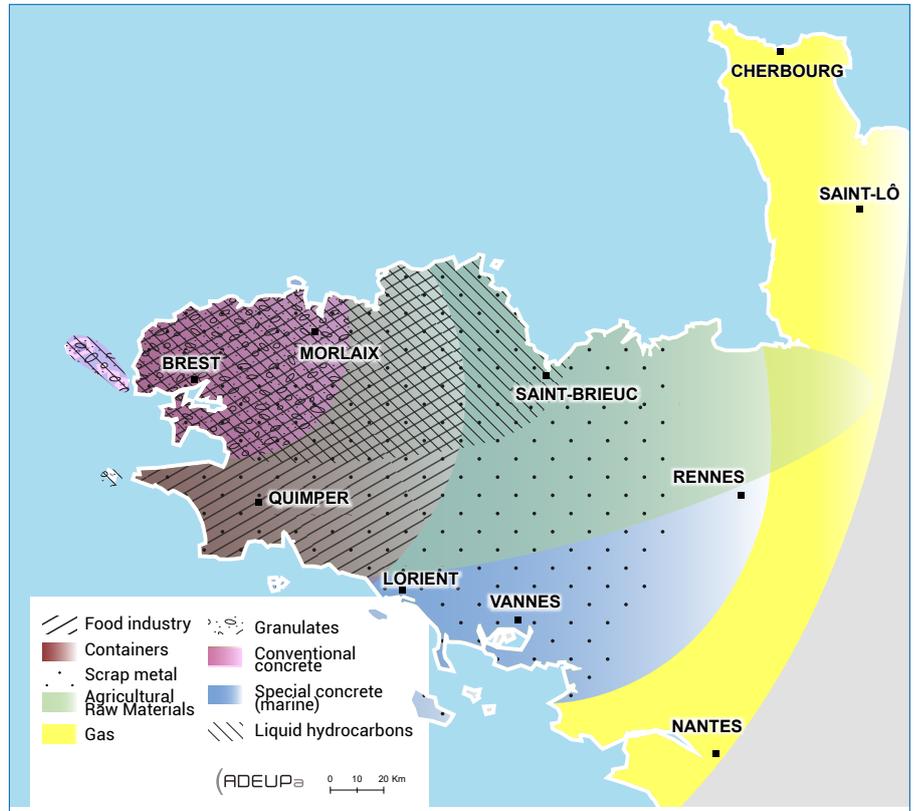


Maritime accessibility for Western Brittany

The hinterland can be defined as the geographical area supplied and fed by a port. It often varies according to the types of goods transported. For the commercial port of Brest, it is limited to Finistère for granulates, conventional concrete, hydrocarbons and the agri-food industry. The coverage is regional for special concrete and scrap metal. It goes beyond the Breton territory for agricultural raw materials and gas.

As the only Breton port for containers, Brest benefits from a feeder route which enables it to be directly connected to the major international hubs, Le Havre, Antwerp and Rotterdam, for both imports and exports activities. The port of Brest benefits from an interesting positioning in terms of feeder lines. For imports, it is the first stop on the feeder line serving Antwerp; for exports, Brest is the last stop before Le Havre. In both cases, transit time is made as short as possible. In the long term, the rise in containerisation of goods, to the detriment of conventional traffic, suggests that this type of traffic will increase.

A hinterland organised by product

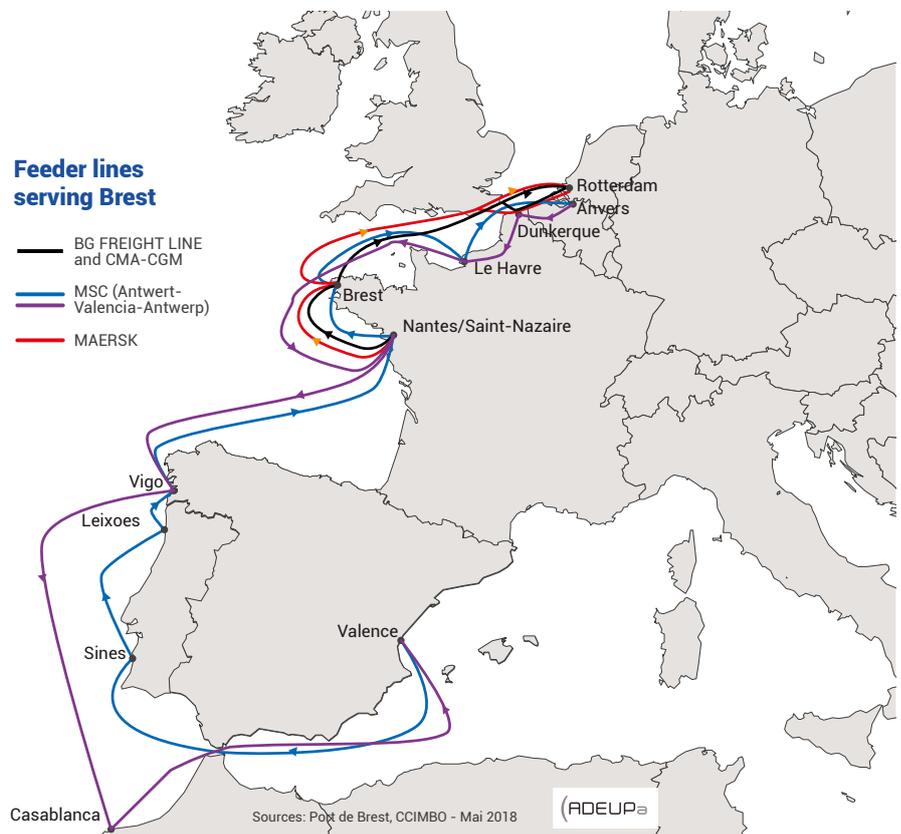


A European sized ship repair industry

With nearly 800 jobs dedicated to ship repair (essentially non-military), the port of Brest makes the most of its position close to one of the world's most important maritime routes. Brest's strengths are diverse: a recognised expertise, and quality and large-scale infrastructures. The major ship repair industry has an international reach with Damen, a Dutch shipyard.

As for small ship repair, the market is more local with players like the French Navy and the Guip shipyard.

A container traffic connected to the main European Hubs



The integration of the ports of Brest and Roscoff into the trans-European transport network (TEN-T)

The trans-European transport network is an infrastructure development programme from the European Union. With a multi-modal approach, its objective is to facilitate the deployment of sustainable and efficient freight services. The final aim is to turn the current patchwork of routes, railways, airports and ports into a unified European transport network that would meet the objectives of cohesion, efficiency, sustainability and user satisfaction.

Since the Nomenclature of Units for Territorial Statistics (NUTS) was revised in 2016, Brittany has reached the level of NUTS116. Such a rank justifies the inclusion of the port of Brest into the central TEN-T network. Indeed, criterion B317, developed by the European Commission for integration into the central network, retains the largest seaport of island member states and non-island NUTS 1 regions having access to the sea and where no port is listed under criteria B1 or B2. It is also specified that this criterion only applies to relevant European seaports.

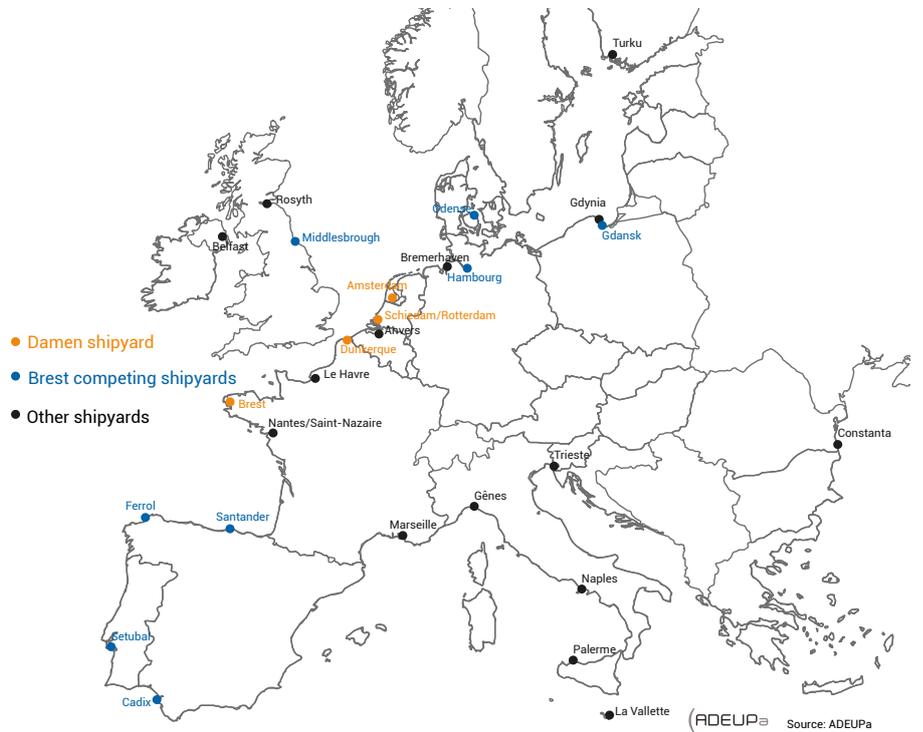
The port of Brest, located on one of the world's busiest maritime routes meets all these conditions and justifies its listing into the central network. This is even more true since Brexit was confirmed. The Western part of Brittany is the European continental area closest to Ireland and thus is the best alternative to crossing the United Kingdom.

The port of Roscoff is already a connexion to the other side of the Channel thanks to passenger transport and its maritime links with Ireland and the South of England. Each year, during the pre-covid and pre-Brexit periods, more than 500,000 passengers were making the crossing to Cork and Plymouth.

16 - The NUTS 2021 classification, valid from 1 January 2021 for data transmissions to Eurostat, lists 104 regions at NUTS 1 level, 283 at NUTS 2 level and 1,345 at NUTS 3 level. NUTS 1 corresponds to the large socio-economic regions, NUTS 2 to the core regions for the application of regional policies and NUTS 3 to small regions requiring specific diagnoses.

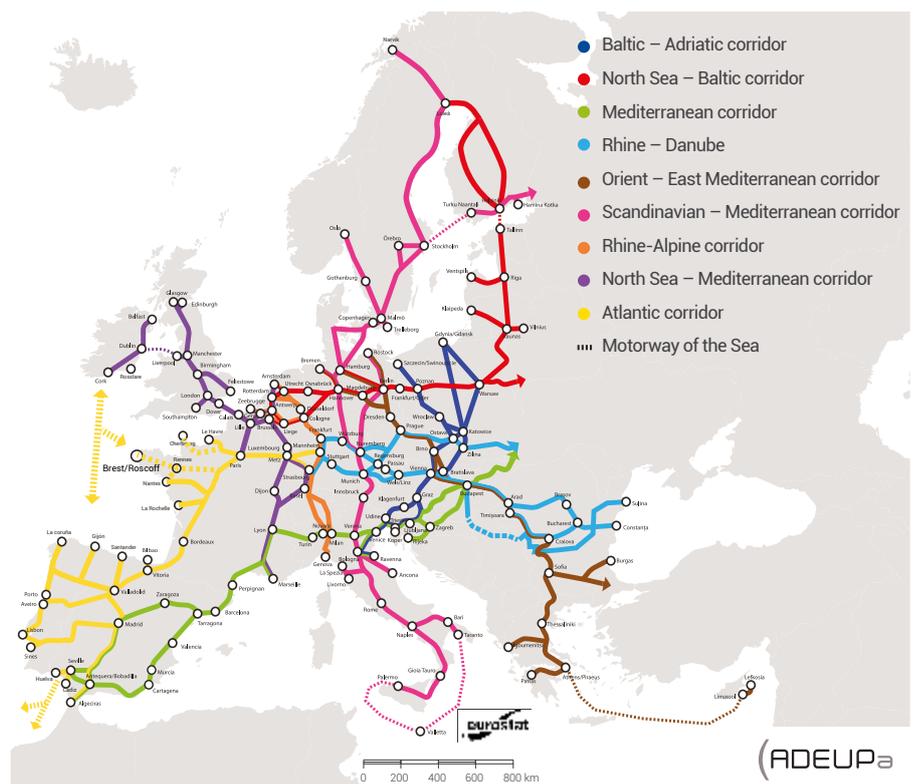
17 - The Commission working document, dated 07.01.2014, "The Trans-European Transport Network (TEN-T) Planning Methodology" SWD (2013) 542, supporting the final document "Building the Core Network in Transport: Core Network Corridors and Connecting Europe Facility" (COM (2013) 940), mentions several criteria defining the main nodes for freight traffic. This is a list of various characteristics of seaports, inland ports and rail terminals. The different criteria are not cumulative. Each type of criterion implicitly stands on its own. Criterion B1 is "a seaport or inland port or a road-rail terminal of a main urban node..."; B2 is "a seaport or inland port with a transshipment volume of at least 1% of the total transshipment volume of all EU seaports".

Large ship repair:
European shipyards with at least one dry-dock of more than 300 meters long and 28 m wide



Extension project for the Connecting Europe Facility (CEF) Atlantic corridor and registration of the Breton ports into the TEN-T

Map sent to the European Commission and the French Prime Minister on 5th and 16th May 2021



Brest, a service port

Close to one of the world's main maritime routes, the port of Brest is characterised by a wide range of activities: commercial, military, repair, scientific, yachting, fishing, etc. It is above all a major service port as illustrated by the positioning of Brest in various fields.

Brest is a major French naval base and the Atlantic maritime security centre. The area of responsibility of the Préfecture maritime Atlantique covers the entire French Atlantic EEZ¹⁸ off the coast from Hendaye to the Western part of the English Channel. In terms of surveillance, the Navy's Operational Centre monitors all traffic off the French coasts and even beyond. The ships of the French Navy are called upon for surveillance interventions, to fight against illicit trafficking and to patrol against piracy, sometimes far from their bases (West Indies, Gulf of Guinea in the Atlantic). It is also a major maritime security centre with, in addition to the frigates and patrol ships of the French Navy, a deep-sea patrol ship for the Customs authorities and launches and boats from the Maritime Affairs, the maritime Gendarmerie and the National Gendarmerie. It is also the centre of expertise dedicated to maritime security with a worldwide reach, the "MICA Center". This centre was set up in 2016 and brings two main structures together: the "Gulf of Guinea" cell¹⁹ and the MSCHOA²⁰. Since 2020, the head office of the association France Cyber Maritime has been preparing the settlement of a

national coordination Centre for maritime cybersecurity in Brest in 2022.

As a major centre for maritime security, Brest is also home to a sea rescue and accidental pollution response centre. For maritime safety, the Préfecture maritime atlantique, within the framework of its assignments related to the State's action at sea, coordinates the actions of various players: Maritime affairs, Dirm Namo (Direction interrégionale de la Mer Nord Atlantique Manche Ouest - Interregional Directorate for the sea - North Atlantic and Western English Channel), Dirm SA Direction interrégionale de la Mer - Sud Atlantique - Interregional Directorate for the sea -South Atlantic), Customs authorities, Gendarmerie, the Regional operational centres for surveillance and rescue (CROSS) of Corsen²¹ and Etel and SNSM (Société Nationale de Sauvetage en Mer - National Society for Sea Rescue²²)

Brest is the first French base for the prevention of maritime accidents and fight against accidental pollutions. The Préfecture maritime has one of the most powerful high sea tugboats (the Abeille Bourbon) and deep-sea anti-pollution support vessels. It houses an important coordination unit, the Ceppol (Centre d'expertise pratique de lutte anti-pollution - Anti-pollution fight and practical expertise centre) which coordinates the French Navy's resources for combatting various types of sea pollution. Brest is also home to a specific organisation,

the Cedre (Centre de documentation de recherche et d'expérimentation sur la pollution accidentelle des eaux - Centre for documentation, research and experimentation on accidental water pollution) whose expertise is recognised worldwide. It is also the seat of one of the three French courts dealing with marine pollution cases.

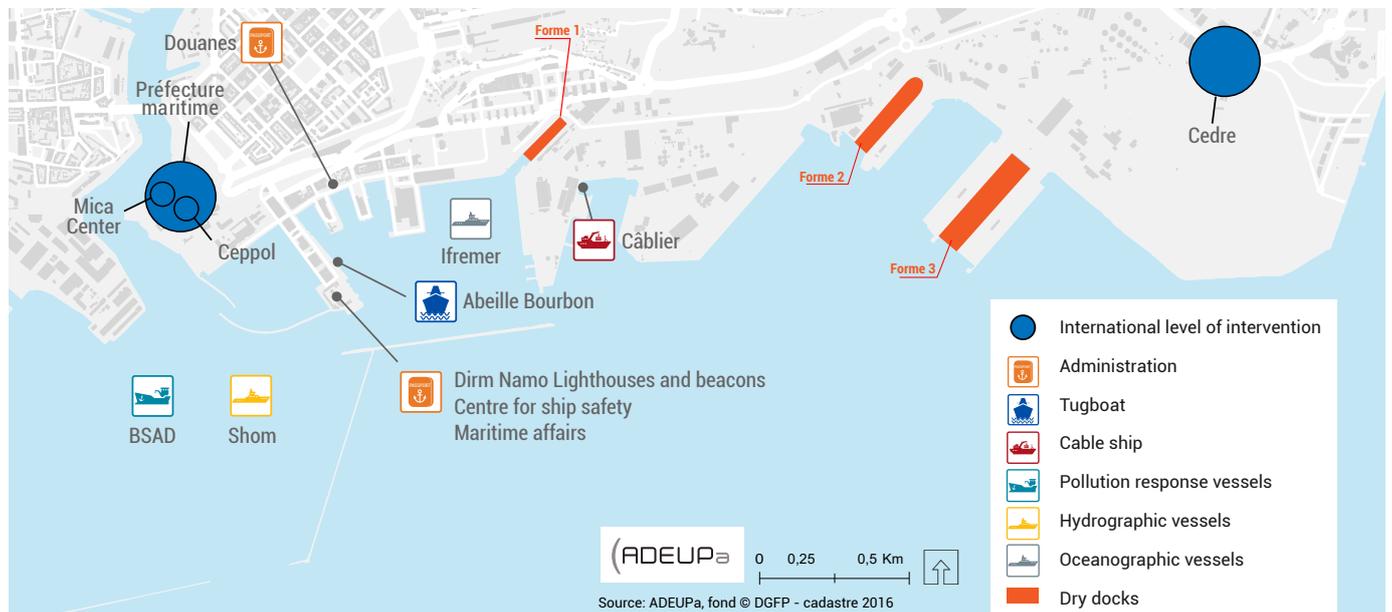
The Brest area has the highest concentration of lighthouses in Europe and the only satellite image reception station in mainland France (Vigisat). It is also a major equipment centre for maritime signalling with Cerema (Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement - Centre for studies and expertise on risks, the environment, mobility and urban planning) and the home base of one of the main lighthouse and beacon maintenance vessels. All these actions ensure Brest's reputation in this field which is best represented by the Saferseas event held in Brest for 20 years.

As the French leading naval repair centre for civilian and military vessels, Brest has dry docks and wharves for ships up to 550,000 tonnes, as well as ship recycling facilities. Brest is also the French leading base for hydrographic and oceanographic vessels, home to the national head offices of Shom and Ifremer and has the only French university institute fully dedicated to marine sciences (IUEM). It also hosts the head office of all the marine research units of the French oceanographic fleet. Brest is the major Atlantic base of Orange Marine for submarine cable repair and home to the ship that carries out the submarine cable repair operations in the Atlantic Ocean.

18 - Exclusive economic zone
 19 - The unit monitors and deals with acts of piracy and banditry through the Franco-British Maritime Domain Awareness for Trade - Gulf of Guinea agreement
 20 - Centre for maritime security for the Horn of Africa, transferred from London to Brest after Brexit in 2019.

21 - The Cross Corsen (Regional Operational Centre for Surveillance and Rescue), monitors traffic in the Channel (more than 110 ships per day) and is a component of the French Spationav system as well as of LRIT or SafeSeaNet
 22 - The National Sea Rescue Society is using several boats as well as the French Navy's ocean and coastal tugboats.

Brest, a service port



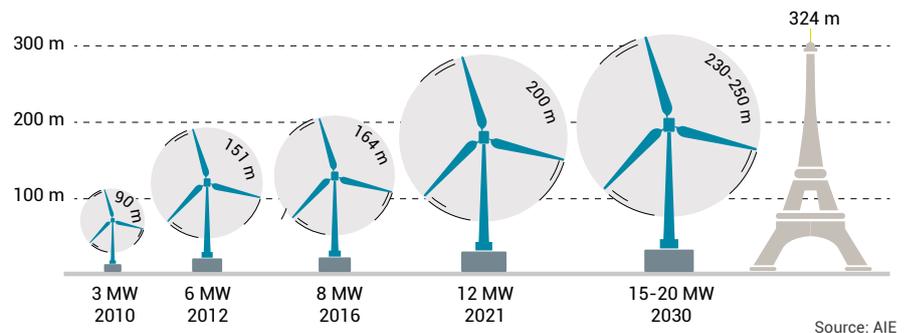
Marine renewable energies, what perspectives?

The objective of the Port of Brest polder project, currently being finalised, is to boost and host activities related to the production of marine renewable energies (MREs). Since the 2018 Maritime Economy Conference, the uncertainties about the development of these energies have been gradually lifted thanks to the potential put forward by the industry. The State's multi-annual energy programme (PPE²³) plans to reduce carbon-based energy consumption and diversify the energy mix by doubling the capacity of electric renewable energy between 2017 and 2028. The share of nuclear power would fall from 71% in 2020 to 50% by 2035. The contribution of MREs can be considerable. There are at least seven different sub-sectors, of which wind turbines, and floating wind turbines show the greatest potential. However, other technologies are still relevant: tidal turbines (tidal currents), wave power generation (wave energy) and ocean thermal energy (temperature differentials between the surface and the seabed). For the latter, there is still a lot of research and development work to be done.

For mature technologies, the potential for job creation is significant. For example, for certain types of floating wind turbines, the construction of two to three floating stations²⁴ requires the equivalent of a Terenez bridge (a bridge in Finistère), in

23 - Published by decree in April 2020
24 - A base that allows the wind turbine to float

Evolution in size and power of new offshore wind energy production units



steel and concrete tonnage. The French maritime space and coastline could enable the country to position itself in this emerging sector. Eighty percent of MREs are produced in Europe. Although the continent is the leader, France is clearly behind its neighbours. The multi-annual energy programming is considering this energy more favourably. A 250 MW floating wind farm is planned in Southern Brittany (i.e. 20 floats) in 2021. Six new calls for tender for offshore wind power are planned by the multi-annual energy programming before 2028. For Brittany, still struggling to produce its own energy, MREs could be an interesting avenue. MREs are gradually being introduced via the Saint-Brieuc offshore wind farm and the experiments off the island of Groix.

The question of conflicts of use at sea and the impact of these installations on marine biodiversity remain. However, the capacity to produce energy at a cheaper cost would be a real alternative or complement to nuclear energy.

To date, on a regional scale, marine energy production represents a niche of 250 jobs. A few examples of players: Electricité de France - Rance dam (60 jobs), Entech SE (49 jobs located in Quimper), Naval énergie (39 jobs), France énergies marines (21 jobs), or Sabella (21 jobs), Eolink, but also Navantia, which has set up on the Brest polder.



Credit : Ideol_BYTP_Centrale_Nantes_Above_all Floatgen_sur_SEM-REV

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January 2022

ISSN

2425-9608

Reference

21-149

Cette version de janvier 2022 restitue des données et éléments mis à jour suite à la version française imprimée en octobre 2021.

This january 2022 version restores datas and elements update following at the french version printed in october 2021.

