French Marine-Related Economic Data 2005

Under the scientific responsability of Régis Kalaydjian
Marine Economics Department

Ifremer

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Foreword

At the moment in time when the European Commission has begun work on an all-embracing maritime policy, stimulated by the publication of the Green Paper, Ifremer is more than ever duty-bound to provide its contribution and expertise.

As a centre of excellence for marine research in France, it works to promote knowledge of the oceans in both scientific and economic terms. The “French marine-related economic data” fulfil part of this demanding requirement. The assessment, drawn up in 2005 and published today, comes at the right time in this vital phase of reflection.

I believe that we can learn three things from this new publication. First of all, the significant opening up of the French marine economy to world markets should be emphasized. Shipping and tourism services, as well as financial and energy services are export activities and therefore sensitive to the global economic situation. The same is true of manufacturing activities such as shipbuilding and naval equipment and fittings. Therefore, it is no surprise that the French marine economy has been affected by the uncertainties marking the early decade of the year 2000. It will no doubt take advantage of growth in Asia and the United States and of the upswing in Japan and in some European countries. For in most cases, this international opening up means opening up to Europe, the top ranking region for our exports. Discussions on the European maritime policy are all the more vital for this reason.

The second lesson concerns the strategic importance of balanced management of our coastal areas for the French marine economy to succeed. Coastal tourism, cruises, and yachting all drive the marine economy which is directly dependent on leisure spending and hence on the quality of coastal areas and their environment. Concurrently, the economic weight of the seafood sector in France has remained strong, leading us to put effective monitoring and management of environments, resources and ecosystems high on the list of maritime policy objectives. Now more than ever, Ifremer’s entire range of expertise must contribute to the effective management of coastal zones.

Good stewardship of coastal areas is an integral part of economic development. The effort to promote shortsea shipping in Europe and the Member States at a critical time of congested road traffic and difficulties in controlling carbon gas emissions, as the Kyoto protocol’s 2010 deadline approaches, is a good example of this: Europe’s coastal policy cannot be drawn up without considering the financial effort required.

The third lesson concerns the decisive importance of research and innovation for the marine economy. If the offshore oil-related industry, boat building and cruise ship building in France have stayed competitive in an uncertain world economic situation, it is thanks to their capacity for innovation and the leading-edge techniques they use to serve their strategies. If our German, Spanish and Norwegian friends have been able to consolidate strong positions in harbour activities, shipbuilding or offshore energy services, close cooperation between industry and research organisations in maritime regions has certainly been a determining factor for their success. We must learn from this as regards the maritime policy.

Lastly, I am pleased to remind you that this report would not have existed without the generous and skilled assistance we have received from administrations, companies and professional associations. My special thanks go to the DAM, DTMRF, DPMA, Insee, French Naval staff, research organisations, the French institute of the Sea, with my hopes that our profitable cooperation will continue.

J.Y. Perrot
Chief executive officer of Ifremer

Introduction

This edition of "French marine-related economic data" was prepared in 2005. It completes our monitoring of the French marine economy for the period of 2001-2003. A considerable amount of information, although still incomplete, is given for 2004 and much sparser information for 2005.

The first part of this decade has been marked by the world economy's relatively fast growth phase (since the early 1990s) running out of steam. The slowdown has been significant in Europe and the United States since 2001, and earlier in Japan, for reasons specific to the latter. International trade was affected for a short time. It quickly got back on a clearly rising track, particularly with the impetus of developing Asian countries' expansion (China, India and ASEAN). According to available data, these Asian countries did not experience a fall in growth.

The highly export-based French marine economy was affected by this downturn, all the more so in that the majority of its exports are to Europe. This is one of the features setting France apart from its European counterparts: with coastal tourism accounting for nearly half of production and employment, developing still further with the cruise ship niche, and a strong industry of boatbuilding and specialised cruise ship building, recreational spending makes up a significant part of the French marine economy. It is clear that leisure spending is a reconciliation item used by consumers to quickly adjust their expenditure in times of uncertainty. However, the slowdown has affected a number of other maritime activities, particularly through changes in investment strategies, as we can see from the curve of investments for exploration and production of energy.

The following panorama's interest is that it highlights how various marine sectors behave in the context of a slowdown in the west and growth in Asia. It should be noted that the context was also characterised by a dollar-euro exchange rate that was more favourable than today's for European competitiveness. Furthermore, the high prices of energy sources and raw materials have now placed governments and consumers in a new situation, not unrelated to Asia's sustained pace of growth and its production factor requirements.

To monitor these impacts, this overview of marine activities has the same structure as previous publications. It describes the industrial sector (primary sector, manufacturing, energy provision, tourist services, financial services and shipping) and the public sector (French Navy, State intervention at sea, education, environmental protection and scientific research). Insofar as possible, the same statistical series have been used, to enable long-term follow-up, but sometimes technical adjustments have been unavoidable. This is particularly true for military shipbuilding, the French Navy and for public intervention budgets, each for quite different reasons.

Our assessment shows that marine economic growth was small from 2001 to 2003 in terms of value added, but the rise in employment was maintained. Apart from purely statistical adjustments whose effect often brought the figures down, the value-added increase, lower than the national average, was affected by European growth and by a specialised market apparently less buoyant than a few years ago.

As usual, we propose an "introductory chapter" to shed light on a particularly significant sub-issue. In this case, we felt that it would be useful to collect data on cruise activities in France. It is a small, but promising, sector both in terms of international clientele calling in French ports and French clients enjoying this type of leisure activity.

Régis Kalaydjian

Sea cruises

THE INTRODUCTORY CHAPTER PROVIDES THE OPPORTUNITY TO FOCUS ON A SPECIFIC ASPECT OF THE MARINE ECONOMY. THE CURRENT GROWTH IN DEMAND FOR CRUISES PROMPTS US TO FOCUS ON THE IMPORTANCE OF THIS ACTIVITY. IT AFFECTS THREE REALMS OF THE FRENCH COASTAL AND MARINE ECONOMY: TOURIST DEMAND, CRUISE SHIPBUILDING AND ECONOMIC SPIN-OFFS FROM CALLS IN FRENCH PORTS.

INTERNATIONAL SITUATION

The world cruise market continued to develop dynamically in 2004 and still has very high growth potential, according to insurers. The offer is characterised by increasingly large cruise ships, diversified services and more market segmentation.

Passengers

In 2004, the number of passengers (13.4 million) was up 8.4% from 2003 and 30% from 2000. It has trebled since 1990 (4.4 million).

North America drove the world market with 9.8 million cruise passengers in 2004, i.e. 1 out of 40 inhabitants. Europe is far behind, with 2.8 million passengers in 2004 (one out of 187 Europeans). Of the latter, British passengers were the most numerous, with one million in 2004 (+7% from 2003) ahead of the Germans (+4%), the Italians (+16%), the Spaniards (-2%) and the French (+5%).

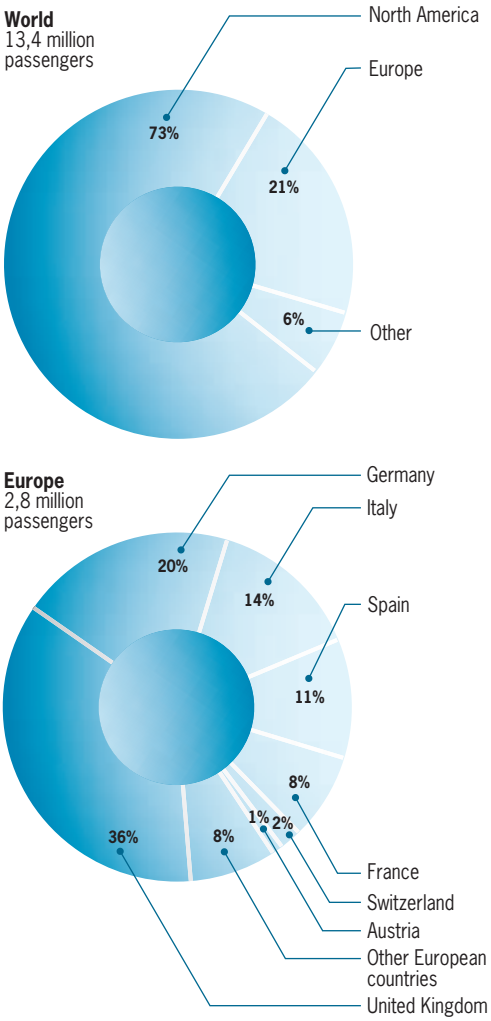
Cruise operators

The world cruise offer is concentrated. The top three companies (American, American-Norwegian and Malaysian) hold nearly 80% of the market, out of a fleet of 200 vessels operated by 25 companies. Along with this concentration, is greater massification of the activity and larger vessels: the carrying capacity of the three leading firms worldwide is 70% of ships of more than 2,000 passengers and 24% of ships accommodating 1,500 to 2,000 passengers. This concentrated supply coexists with other cruise offers aboard smaller vessels.

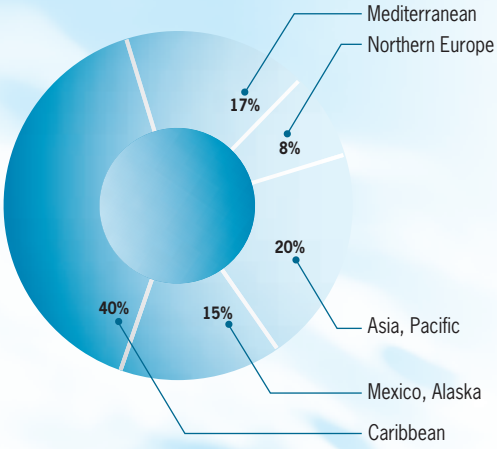
Destinations

The destinations market is also concentrated, between two main regions: the Caribbean and Europe (particularly the Mediterranean). Although the lower-bed capacity for the Caribbean is much higher than that of Europe-Mediterranean, the latter destination experienced the greatest growth between 1995 and 2002, with 15% per year, compared to 7% for the Caribbean. 59% of Europeans prefer the Mediterranean and 15% Northern Europe. French cruise passengers also choose European itineraries (the Mediterranean for 65% and Northern Europe for 8%).

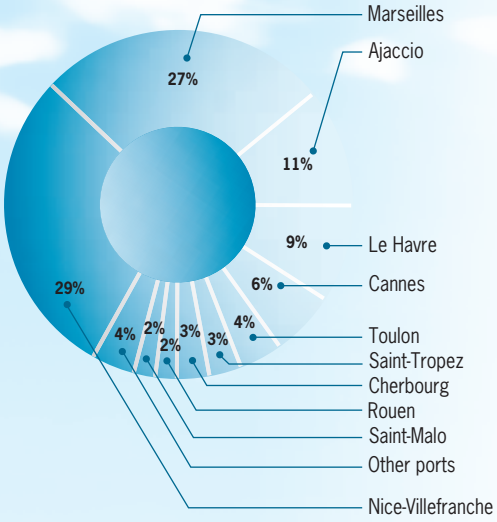
2004 world sea cruise market
Sources: European Cruise Council, IRN Research.



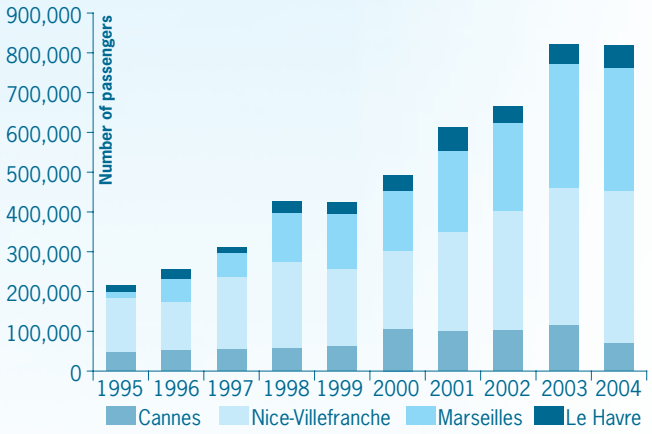
Breakdown of sea cruise destinations
Source: CCI Nice-Côte d'Azur, Port directorate.



Breakdown of number of passengers on call in French harbours in 2004
Source: ShipPax 2005.



Trends in passenger counts in four metropolitan ports
Sources: CCI Nice-Côte d'Azur, Marseille-Provence cruise club, Le Havre tourist board.



THE FLEET

General features

Tourist activity slackened in the years from 2002 to 2004. Previously ordered vessels joined the fleet, but few new orders were taken. In 2003, an unprecedented increase in capacity was recorded, with 24,000 lower beds on vessels delivered. In particular, the largest cruise ship ever built, the Queen Mary 2 was delivered. She displaces 150,000 tonnes and has 2,620 lower beds. In 2004, Italian shipyards recorded the largest number of orders. There was a drop in the labour force of the world fleet, which had 391 vessels in mid-2005 (source: Lloyd's Register Fairplay). The largest fleet is that of the United States, made up of 79 ships operated by twelve companies. It represents 45% of world capacity.

Vessel size is increasing, to attain economies of scale and diversification of onboard services: 12 ships currently on order have a capacity of 3,000 passengers or more. Although the technical limits of vessels' sea keeping have apparently not been reached, the port capacity and shore-based logistics are limiting factors for ship size.

Cruise ship building

This shipbuilding is dominated by European shipyards. Out of the 120 largest liners delivered by 1995 and 2003, 105 were built by shipyards in five European countries. France built 28 and Italy 27, making respectively 23 and 30% of tonnage. Four main shipbuilders worked on this market in 2003 (Italian, German, Finnish and French). The takeover of the French shipbuilder by a Finnish firm, announced in early 2006, is perceived by the industry as a consequence of concentration amongst cruise companies.

Building cruise ships is a significant activity for European yards. Cruise operators have invested 3,757 million dollars, i.e. 27% of the total turnover of the members of the Community of European Shipyards' Associations (CESA) in 2003 and 2004, according to European Cruise Council estimations.

SITUATION IN METROPOLITAN FRANCE

Passenger numbers

The cruise market makes up only 1% of the French tourist market. French passenger counts have shown average growth, in European terms, over several years now. Some professionals feel that the specific offer is not attractive enough.

Calls

Five ports receive most of the activity: Nice-Villefranche, Marseilles, Ajaccio, Cannes and Le Havre. In 2004, 1278 cruise calls and over 1.27 million passengers disembarking were counted. Driven by the dynamic approach of the Nice-Villefranche and Marseilles harbours, and to a lesser degree, the three others, the activity progressed by more than 280% in 10 years time (125% for North America) and by 67% since 2000 (30% worldwide).

The favourable outlook has encouraged major enterprises to invest in France. New operators have appeared on the luxury cruise market, with smaller vessels and departures from Mediterranean ports.

82% of calls are made in the Mediterranean, with 80% of passenger counts. The PACA region receives a total of 780,500 passengers in transit, and almost all the boardings and landings, making nearly 70% of passengers on calls in the metropolitan French territory. Variable rises were noted depending on the harbours in question for the period from 2003 to 2004.

ECONOMIC IMPACT OF PORT VISITS

Economic impacts of calls by cruise vessels in harbour areas include direct spending by passengers and crew (including transportation to the embarkation site and expenditure for stays on shore), shore-based services provided to the companies, expenditure for provisions and supplies and related services to vessels, as well as harbour services.

The North American example

The direct economic impact for the United States has been estimated at 12.26 billion euros for 2004, 20% of which involves direct spending by passengers and crew during call visits. Direct expenditure was estimated at 253.80 euros upon boarding and landing and at 105 euros per passenger during calls in transit. That means that a 2,000 passenger ship with 950 crew members generates about 200,000 euros of spending in each US harbour (2004). The average per passenger and per port of embarkation or call in transit is 85 euros. This makes a strong economic impact, particularly for Florida, California, New York and Alaska.

Spending and services in ports in metropolitan France

Economic impacts vary with respect to:

- where the ports are located, in the Mediterranean, Channel-Atlantic, deep in an estuary;
- tourist destinations: either local (for instance southern France) or of major interest (for instance, Paris or the beaches of the Normandy landing);
- services provided by port cities: ease of access, international airport, tourist accommodation capacity, logistics;
- the nationalities of passengers and types of cruises: luxury cruises, floating residence-style hotels with visits on shore.

A transit passenger who disembarks spends from 50 to 140 euros per call, depending on estimations. Taking account of the percentage of passengers who actually do spend, an average expenditure per cruise passenger in transit could be set at 52 euros. In the case of passengers on initial boarding or final disembarkation, estimates made by the two main French harbours set local spending directly linked to the cruise at 50 to 300 euros. This varies with respect to the type of services requested and the length of pre-cruise and post-cruise stays. Harbour and tourist services related to cruise ship calls are estimated at 30 to 60 euros per passenger. Based on these figures, the spending and services directly related to cruise calls in France, can be estimated at over 100 million euros. Mediterranean ports make up approximately 80% of this total; and Nice-Villefrance, Marseilles and Cannes harbours, over 60%.

OUTLOOK

The CLIA Cruise Line International Association estimates announce very good results for 2005 in Europe. By 2010, an annual rise in the number of cruises of 6% is foreseen (source: CCI Nice-Côte d'Azur, Port directorate).

INDUSTRIAL SECTOR

Seafood products

THE SEAFOOD PRODUCT SECTOR DESCRIBED HERE COMPRISES A WIDE RANGE OF PRODUCTS AND MIDDLEMEN:

- **MARITIME FISHERIES, MARICULTURE (FISH FARMING AND SHELLFISH FARMING), SEAWEED PRODUCTION;**
- **FISH AUCTIONS AND FISH WHOLESALERS;**
- **THE SEAFOOD PROCESSING INDUSTRY.**

THIS CHAPTER ALSO DEALS WITH FOREIGN TRADE IN SEAFOOD.

MARINE FISHERIES

Definition

All categories of marine fisheries (from small coastal fisheries to high seas tuna fisheries) are taken into account here. They land fresh or frozen fish, cephalopods, crustaceans, shellfish and seaweed.

Trends in activity

French marine fisheries include a wide range of types of vessels and species caught. Two thirds of French catches are made in EC waters (Celtic Sea, Western Scotland, English Channel, North Sea and the Bay of Biscay). The fleet also operates in many other regions of the world. In the framework of the European Union fisheries agreements, the French fleet mainly catches cod and ling off Norway and the Faeroe Islands and tropical tuna off Africa and in the Indian Ocean. It fishes in the French overseas "départements" and territories (DOM-TOM): French Guyana (prawns), Reunion Island (tuna and swordfish), and the waters of France's southern and Antarctic territories (Patagonian toothfish and spiny lobster). This diversity is further reflected in the fisheries techniques used: dragnets, pots, trawls, nets and lines.

Assessed by the Fisheries ministry at approximately 1 billion euros, French marine fisheries production was distributed over the entire French coast, led by the Brittany region (32%), well ahead of the Pays de la Loire (11%) and the Nord-Pas-de-Calais (10%) regions. The production's value has grown since 1997, even though the real drop in volumes landed in 2001 is a factor of concern.

Since the turn of the 1990s, the structure of marine fishery production has hardly changed. Fresh fish holds a predominant position for gross income generated by the marine fisheries sector. It accounts for nearly 62% of amounts landed and 85% of total turnover, due to a relatively high average landing price.

Fresh fish make up 44% of landings in terms of tonnage, and over 60% of turnover. In the fresh fish category, the species with the highest tonnage caught in 2003 were the sardine, cuttlefish and scallops. The most important species in terms of turnover are sole, monkfish and hake (so called noble species, averaging high prices) along with Nephrops prawns and scallops. In frozen fisheries, tropical tuna is the species caught most.

French marine fisheries structure in 2003

Source: Ofimer.

	Yield (t)	Turnover (M€)	Average price (€/kg)
Fresh fish	276,906	700	2.5
Crustaceans	19,286	98	5.1
Shellfish	48,710	87	1.8
Cephalopods	28,764	79	2.7
Seaweed (1)	14,023	3	0.2
Sub-total fresh fish	*387,690*	*967*	*2.5*
Tropical tuna (2)	161,499	120	0.7
Other frozen fish (3)	78,289	58	0.7
Sub-total frozen fish	*239,788*	*177*	*0.7*
Total fisheries	**627,477**	**1 144**	**1.8**

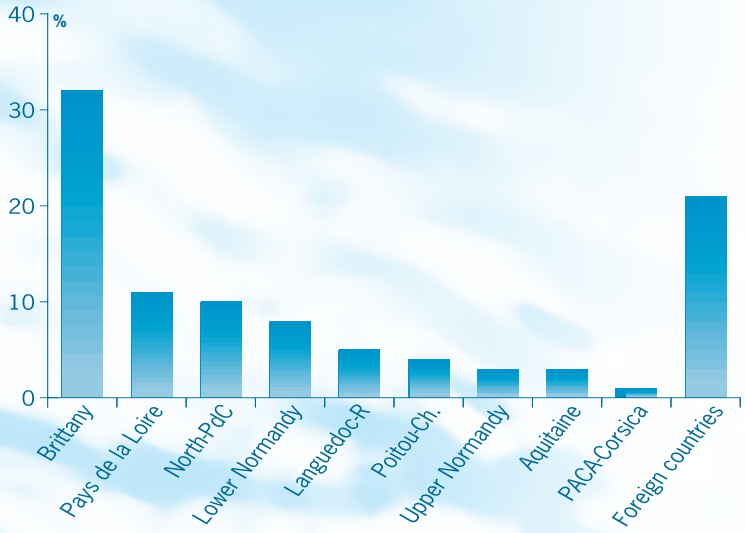
(1) Amounts expressed in dry weight.
(2) Including amounts landed in countries near fishing zones and counted as exports in foreign trade statistics.
(3) Landings of deep-sea fisheries in the form of frozen filets are measured in the equivalent whole (gutted) landed weight.

KEY FIGURES FOR MARINE FISHERIES

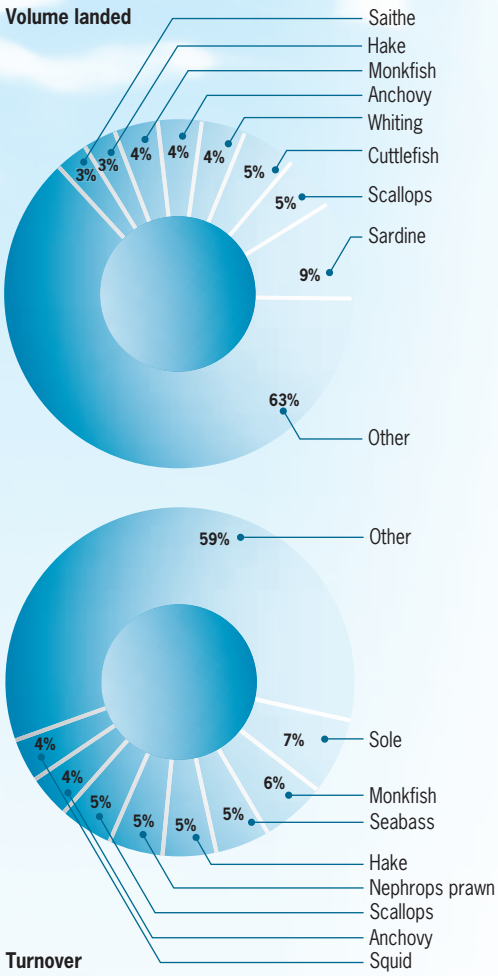
	1999	2000	2001	2002	2003
Yield (tonnes)	599,644	620,630	606,456	621,673	627,477
Turnover (M€)	971	1,034	1,069	1,134	1,144
Value added (M€) (1)	563	620	684	760	721
Labour force (2)	13,763	13,934	13,824	13,651	13,532
Fleet (3)	5,906	5,815	5,686	5,628	5,556

Sources: Ofimer, ministry of Agriculture and Fisheries, *Ifremer*.
(1) Value added rate: 58% until 1999, 60% in 2000, 64% in 2001, 67% in 2002 and 63% in 2003 (Ifremer estimations).
(2) Number of seamen working aboard for at least 9 months.
(3) Number of fishing vessels as of 31st December that year.

Value of production of metropolitan French marine catches per region
(fresh, frozen, processed catches, not including seaweed). Year 2003.
Source: Ofimer.



Breakdown of fresh fisheries turnover and landings by main species in 2003
Source: Ofimer.



French production in overseas "départements" and territories is assessed at 25,000 tonnes (source: Ofimer) and available information giving breakdowns in volume and value.

Fisheries and aquaculture production in the DOM-TOM in 2003
Source: Ofimer.

	Yield (t)	Value (M€)
Guadeloupe	10,100	82,0
Martinique	6,200	52,4
Reunion island	4,444	22,0
French Guyana	3,565	21,7

On the European Union scale, France ranks third and provides 16% of total production in value, estimated at over 7 billion euros. The two leading producers are Spain (2 billion euros) and Italy (1.5 billion), totalling 46% of EU production in terms of value.

Fleet

The French fisheries fleet, totalling 5,556 vessels as of 31 December 2003, is mostly made up of boats less than 12 meters LOA. In terms of vessel engine power, the coastal and high sea fleets are equivalent.

The diagnosis of over-fishing established for a great majority of commercial stock resources led to the setting up of regulatory and incentive measures within the framework of the European Union's Common fisheries policy (CFP). They aim in particular to reduce fishing fleets' catch capacity through fleet exit plans based on the specific or general objectives set out in the MAGP "multi-annual guidance programmes" and, more recently, in the framework of the restoration plan for some specific species like North Sea cod and hake. Other measures aim to reduce catches of juvenile fish (for instance, setting minimum mesh sizes for fishing gear and boundaries for protection areas).

The need to adapt the catch capacity to the condition of European fish stocks has led to French fishing fleet capacity reductions since the early 1990s (26% in installed power and 28% in gross registered tonnage). This has been largely supported by public aid plans to decommission vessels.

Employment

French fisheries labour force trends are closely linked to fishing capacity cutbacks. Employment data (in full time equivalents) are difficult to determine on a national level. Ifremer's surveys made it possible to estimate a total of 11,564 seamen in full time equivalents working on the Channel, North Sea and Atlantic seafronts in 2003.

Outlook

The European Commission's green paper began by highlighting the large number of stocks which are now under reasonable biological limits. It also emphasizes the need to reform the CFP by integrating both economic and social dimensions and environmental aspects, when analysing situations and implementing measures. It has been compulsory since 2001 for Member States to collect biological and economic data on the sector to meet this objective. This improves our knowledge about fishing fleets' activity and the economic situation.

One of the main components of the CFP in 2002 was the creation of RACs, or regional advisory councils. In July 2004, the European Council decided to create seven RACs for the Baltic Sea, Mediterranean Sea, North Sea, north-western waters, south-western waters, pelagic stocks and the high seas/long distance fleet. The RACs will prepare recommendations on cases of the fisheries sector within their jurisdiction, in response to outside requests or on their own initiative. The RACs will be made up of representatives from the fisheries sector and other groups affected by the CFP. Scientists will be invited to take part in meetings as experts and the EC and regional and national representatives will be able to attend as observers. It remains to be seen how the RACs will operate, but in this early phase, it should be noted that they provide a way to involve the professionals in European management of fisheries.

European marine fisheries production in 2003

Sources: for all countries except France, EAEF (2004). For France, Ofimer, DPMA.

	Turnover (M€)	Landings (tonnes)	Average price (€/kg)	Labour force	Number of vessels
European Union total including	**7,126**	**5,221**	**1.4**	**181,060**	**79,607**
Spain (1)	1,850	930	2.0	49,400	14,877
Italy	1,466	312	4.7	38,157	15,602
France	1,144	627	1.8	13,532	5,556
United Kingdom	755	631	1.2	11,774	6,735
Denmark	371	1,033	0.4	3,506	1,244
Netherlands	394	523	0.8	2,249	388
Portugal	358	179	2.0	20,033	10,262
Greece	271	89	3.0	30,208	19,135
Ireland	196	299	0.7	6,000	1,391
Germany (1)	182	249	0.7	2,473	2,212
Sweden	95	285	0.3	2,360	1,712
Belgium	90	24	3.8	615	124
Finland	20	73	0.3	462	285
Others European countries					
Norway (1)	1,328	2,514	0.5	12,233	2,205
Iceland	808	1,980	0.4	4,615	1,490

(1) Data for 2001 or 2002.

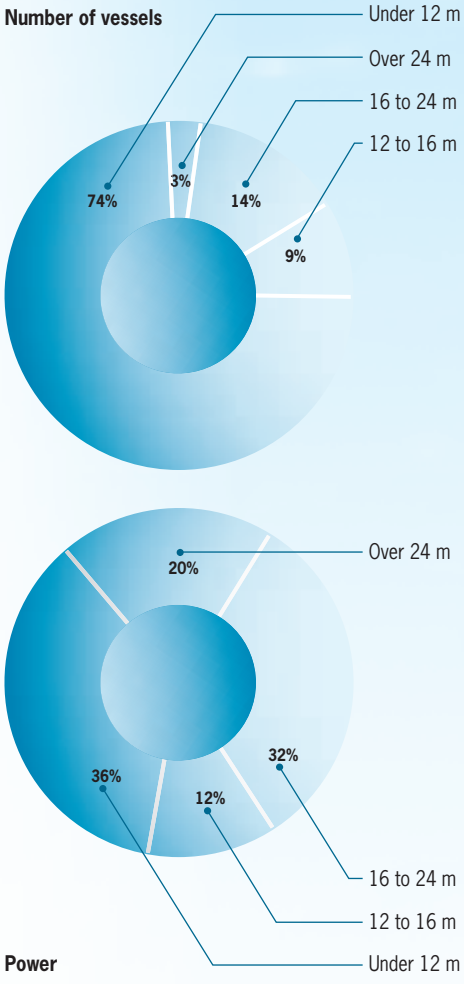
French fisheries fleet trends between 1990 and 2004

Source: ministry of Agriculture and Fisheries.

LOA category	Number of vessels	Tonnage	Power (kW)
Under 12 m	-38%	-30%	-21%
12-16 m	-44%	-38%	-37%
16-24 m	-34%	-20%	-27%
Over 24 m	-18%	-30%	-25%
Total	**-37%**	**-28%**	**-26%**

The French fisheries fleet structure as of 31 December 2003

Source: ministry of Agriculture and Fisheries



MARICULTURE

Definition

The mariculture sector producing food for humans is composed of two sub-sets:
- shellfish farming or rearing (mainly oysters and mussels);
- "new" mariculture to produce fish (sea bass, bream, salmonids, turbot) and shrimp or prawns (principally tropical shrimp in New Caledonia).

Oysters are also farmed in French Polynesia pearls.

Trends in activity

Worldwide, aquaculture supplied 42.3 million tonnes of fish, molluscs and crustacean in 2003, i.e., a share of 32% of total fish farming and mariculture production (not including seaweed) (source: FAO). In value, aquaculture yields reached 61 billion dollars (51.3 billion euros) in 2003. The ratio between marine and land-based aquaculture did not change much between 1994 and 2003. Marine aquaculture, totalling 17 million tonnes and nearly 32 million dollars in 2003 (ibid.), represented about 40% in volume of farmed aquaculture products (excluding seaweed) and a little over half in value.

On the European scale, marine aquaculture is most widespread (75% of aquaculture value overall) and reached a yield of 1.7 million tonnes in volume and 3.2 billion euros. Over the past ten years it has risen significantly (+71% in volume, +57% in value) although a bit less than growth worldwide. Marine finfish farming and shellfish farming are the two poles of mariculture in Europe, the latter having been overtaken by the former. From 1994 to 2003, finfish farming has increased its share of European mariculture, going from 37 to 56% in volume and from 67 to 75% in value.

The growth dynamics of European marine finfish farming is mainly based on salmon farming, followed by rearing of sea bass and bream. Salmonid production (included sea-reared trout), representing 86% of the volume of European marine finfish farming is particularly well established in northern Europe. Norway is leader in Europe and worldwide (with Chile), concentrated 70% of supplies in 2003; followed by the United Kingdom (18%), the Faeroe Islands (9%) and Ireland (2%). Seabass and bream are farmed in countries around the Mediterranean; making up 11% in volume and 21% in value of European farmed marine finfish yields. This more recent activity, which only really took hold in the early 1990s, recorded higher growth from 1994-2003 than for salmonids (+184% in volume, compared to +73%). This was particularly due to Greek, Italian and Spanish farms. Greece was clearly the top ranking European farmed seabass and bream producer in 2003 (57% in volume), followed by Italy (17%) and Spain (15%), not counting the development of farming in Turkey which increases the supply on European markets. The drop in production costs, combined with relative overproduction of seabass and bream led to a crisis in 2001-2002 in the sector, which should entail slowing of investments and stabilisation of supply, at least in the short term.

France owes its position amongst the top European mariculture production countries to the scope of its shellfish farming sector. French oyster farming, making up 90% of European oyster production, accounted for half of French mariculture turnover in 2004. Mussel farming is also an important component (17%), followed by pearl farming in French Polynesia (16%). French marine finfish farming, mainly turned towards rearing seabass, bream, turbot and sea trout and salmon, is an activity providing nearly 11% (including hatchery activity) of the sector's turnover. Trends in production volume over the past five years reflect the fluctuations of farmed mussel inputs, especially from the Mediterranean, the rise in marine finfish farming in metropolitan France after a slump in 2000-2001, and the increase in tropical shrimp production in New Caledonia. In value, the development of aquaculture in the DOM-TOM overseas "départements" and territories was affected by the collapse of pearl prices on the world market, made worse by the euro/dollar rate. However, pearl farming's situation was recovering in 2004, with prices beginning to rise. In metropolitan France, the rise in oyster farming turnover from 2002 on was not, however, due to better paid production, but rather caused by a break in statistical series. Estimated yield prices have been replaced since 2002 by prices at shipment (packaged products for consumer sales) to assess the value of commercialised production. Lastly, the increase in turnover achieved by the hatcheries sector, for both finfish and shellfish, should be noted.

Employment and companies

Enterprises and employment in mariculture mainly come from shellfish farming (94% of jobs).

According to the MAP-DPMA survey on aquaculture, there were 3,719 shellfish farming companies in 2002. The survey showed a labour force of 19,329 permanent, part time or seasonal jobs in 2002, corresponding to a total of 10,542 full time equivalents. These firms, most of which (78%) have sole proprietor status, widely use a family-based labour force. The heads of operations, co-operators and other working family members (including salaried staff) make up 74% of all jobs. Nearly three-quarters of shellfish farms are also involved in shellfish trade and thus have been approved by health authorities to sell their finished products for human consumption.

KEY FIGURES FOR MARICULTURE

	1999	2000	2001	2002	2003	2004
Turnover for metropolitan France (M€)	378	377	394	458	451	483
Turnover for DOM-TOM (M€)	164	186	139	141	101	112
Total turnover (M€)	542	563	533	599	552	596
Value added* (M€)	380	394	373	419	386	417

Sources: Ofimer, Ifremer, SFAM, CNC.
* Average value added rate estimated at 70%.

One third of shellfish farms are found in the Poitou-Charente region. The Mediterranean and southern Brittany regions are next, with respectively 18% and 13% of French firms. In terms of jobs, the Mediterranean region, owing to a large number of small enterprises, ranks only third for shellfish farming regions, tied with the Northern France-Normandy sector which has the highest jobs/enterprise ratio.

In addition, 67 enterprises in metropolitan France involved in sea-farming activities (finfish, prawns, seaweed) were recorded in that survey. They employ 645 people in full-time equivalents. Most of their activity is in the fish farming field (52 firms), which covers both the hatchery and grow-out sectors. Seabass and bream farming are mainly done in the Mediterranean and North of France regions. Turbot farming, which has fewer people involved, is done on the Atlantic seafront (Pays de la Loire, Poitou-Charente) while salmonid production, on the rise since salmon rearing was boosted, is concentrated in Brittany and Normandy.

Outlook

In metropolitan France, the context of regulations and policies for use of the coastal zone limits mariculture's expansion. Marine finfish farming, the most recent activity to get a foothold on the coastal area coveted by many users, has not been able to develop like that of Greek or even Italian and Spanish fish farming, in spite of its lead in terms of scientific research. Yet, market access remains another crucial issue for the development of seabass and bream growout in France, in a context of increasing competition from Greece and Turkey on European markets. The companies use strategies like diversification of production with large-sizes or new species like meagre, as well as developing quality approaches to adapt to competition and ensure their market outlets. In the medium term, efforts in genetic selection research should provide significant production gains, while consolidating the advance held by French hatcheries. In the DOM-TOM, along with shrimp farming, which is well established in New Caledonia, new aquaculture streams based on fast-growing marine finfish are emerging, like that of red drum and perhaps cobia, in Martinique, Reunion and Mayotte. Providing that the access to foreign markets improves, these new productions could offer perspectives for considerable growth for French marine finfish farming.

Problems related to the coastal area also affect shellfish farming. They could lead the profession to ask for new authorisations to extend seaward (deep water farms) or to some restructuring on state-owned land on the seafront. The environmental constraints (degraded coastal water quality, climatic factors, toxic plankton blooms) will also influence the cost-effectiveness of shellfish farming enterprises in the long term, especially if health standards regulating the sale and consumption of live shellfish become more stringent. As in the finfish farming sector, genetic selection research programmes are expected to provide solutions to improve animal's survival rate and growth conditions. Monitoring coastal water quality and problems of development and planning of the public maritime domain remain, all the same, at the heart of the system set up by the public authorities and Ifremer to manage the shellfish farming activity.

Production volumes in French mariculture
Sources: Ofimer, Ifremer, SFAM, CNC.

tonnes	1999	2000	2001	2002	2003	2004
Oysters	139,000	135,500	128,500	131,100	129,300	128,500
Mussels	62,500	68,000	59,500	64,500	56,000	64,180
Other shellfish	3,400	2,900	5,100	4,000	3,500	5,000
Prawns in metropolitan France	24	28	20	30	41	50
Marine and amphihaline finfish	6,738	5,701	5,605	6,943	6,748	7,229
Tropical marine finfish	49	53	163	269	383	391
Farmed pearls	9	12	11	11	10	9
Tropical shrimp	1,845	1,763	1,854	1,860	1,748	2,256

Turnover in French mariculture
Sources: Ofimer, Ifremer, SFAM, CNC.

M€	1999	2000	2001	2002	2003	2004
Oysters	229	230	238	287	286	289
Mussels	76	83	85	91	82	97
Other shellfish	11	9	17	17	16	23
Prawns in metropolitan France	0,4	0,4	0,4	0,7	1	1
Marine and amphihaline finfish	43	38	34	40	41	48
Tropical marine finfish	0,3	0,4	0,9	1,5	2,1	2,1
Farmed pearls	149	173	125	124	86	94
Tropical shrimp	15	13	14	16	13	17
Marine finfish hatcheries	13	13	14	15	17	16
Shellfish hatcheries	4	4	6	8	9	10

Geographic breakdown of companies and employment in the shellfish farming sector
Sources: DPMA - BCS - Aquaculture survey 2002.

	North-Normandy	Northern Brittany	Southern Brittany	Pays de la Loire	Poitou Charentes	Aquitaine	Mediterranean
Number of companies	311	258	493	376	1 249	368	664
Percentage of total number of companies	8%	7%	13%	10%	34%	10%	18%
Number of jobs (full-time equivalents)	1,327	960	1,642	884	3,639	746	1,327
Percentage of total jobs in shellfish farming	13%	9%	16%	8%	35%	7%	13%

LANDED PRODUCT TRADE: FISH AUCTIONS

Definition

Fish auctions are where the fishermen offer their supply to buyers, fishmongers and wholesale traders. They are also the place producer organisations exercise their authority and control to set the withdrawal price.

Situation and trends in activity

Operating conditions for fish auctions are governed by local regulations. They are managed by chambers of commerce and industry (80% of cases), by cooperatives, local marine fisheries committees or semi-public companies.

EIn 2004, there were 44 fish auctions in France. Nearly 40% of landings are processed by the top five auctions. Fish auction turnover rose between 2000 and 2002, in spite of lower quantities sold, due to price rises in current euro value. Since 2003, amounts sold have continued to decrease (-8% in 2004) along with turnover (-3%). Withdrawals also dropped between 2002 and 2004 (-7%). The turnover of auctions is made up of charges, fishing harbour facility fees and fees for use, paid by both sellers and buyers. They are on average 8.5% of the landed value, but the services provided by different auctions vary. Ad valorem taxation creates an incentive for fishermen to sell outside of the auction (source: Montane *et al.*, 2000). Some auction places are moving to a computerized system.

Fish auctions are not only points of sale, but also points where catch statistics are recorded. In some fisheries, like that of scallops in the Saint-Brieuc bay, sales can only be made through fish auctions.

KEY FIGURES FOR FISH AUCTIONS

	1997	1998	1999	2000	2001	2002	2003	2004
Amounts sold (tonnes)	283,837	296,264	282,442	285,512	289,193	281,462	276,642	253,143
Withdrawals (tonnes)	10,021	7,561	10,274	9,153	8,650	11,920	11,364	11,004
Value (M€)	626	662	647	675	704	711	715	691
Average price (€/kg)	2.21	2.23	2.29	2.37	2.43	2.53	2.58	2.73
Auction turnover** (M€)	53.3	56.2	55.0	57.4	59.8	60.4	60.8	58.7
Auction value added** (M€)	45.3	47.8	46.8	48.8	50.9	51.4	51.7	49.9
Number of auctions	42	44	44	44	44	44	44	44
Employment in full-time equivalent***	798	832	794	802	836	845	850	820

Sources: Ofimer and Ifremer fish auction surveys.
* Estimated on the basis of an 8.5% tax ** Value added rate of 85% (Ifremer estimation) *** Ifremer estimation, not including dockers.

FISH TRADE

Definition

Wholesale fish trading companies are, along with processing firms and wholesale purchasers, the main middlemen between fishermen and seafood distributors. They carry out technical (batching, processing, packaging, etc.) and commercial tasks, and are a link in the French fisheries chain. However, this type of intermediary does not exist in other European countries or exists in other forms, similar to wholesaling or processing activities. Their status is set out in the 1997 framework law on marine fisheries and mariculture.

Situation and trends in activity

For the year 2003, OFIMER estimated the turnover and added value at about 2,100 and 283 million euros for firms which are only wholesale traders or those which also process. In 2003, there were 380 enterprises in wholesale fish trading.

Past trends have highlighted considerable restructuring since the late 1980s. The number of firms fell from 680 in 1989 to 322 in 1997, then to 308 in 1999 (source: Ofimer). Along with this concentration, the average size of firms grew, particularly to become compliant with health standards for wholesale fish trade workshops.

In 2003, there were an estimated 5,000 jobs in the 380 enterprises. The firms are mainly located on the Atlantic-Channel-North Sea seaboard, but a large part of the sector's turnover is made in the Nord-Pas-de-Calais region and in Brittany.

FOREIGN TRADE FOR SEAFOOD PRODUCTS

In 2003, the French trade balance deficit for products from the sea amounted to about 2.15 billion euros. Half the value of imports is concentrated in four products: prawns or shrimp, salmon, tuna and non-pelagic fish filets. 45% in value of French seafood imports come from European Union countries. The United Kingdom, Norway, Spain and the Netherlands are the top four suppliers.

Breakdown of fish trading companies, by turnover category in 2003*

Source: Ofimer.

Category of turnover	Percentage of total number of companies	Percentage of total turnover
Under 3 M€	51%	14%
3 to 9 M€	34%	29%
Over 9 M€	15%	57%

* Out of 273 companies who filed their accounts in 2003.

Breakdown of companies by region in 2003

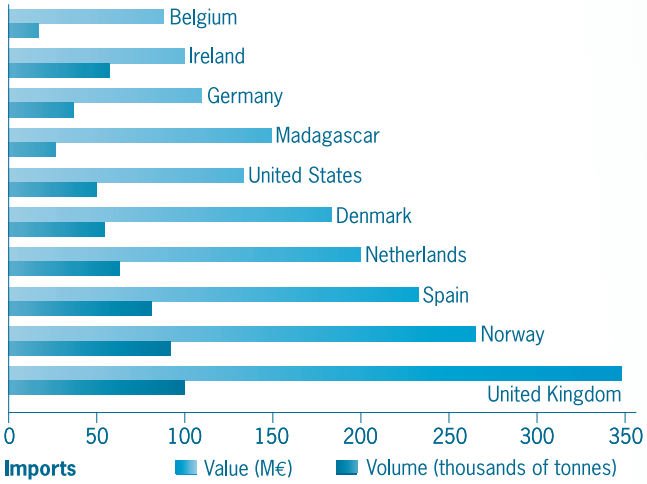
Source: Ofimer.

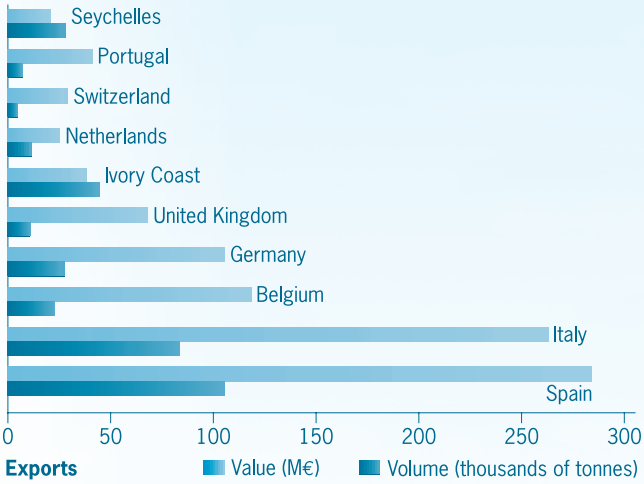
	Number of companies	Percentage of total turnover
Nord-Pas-de-Calais	47	25%
Normandy	53	11%
Brittany	139	24%
Aquitaine/Poitou-Charentes Pays de la Loire	92	20%
Mediterranean (PACA and LR)	44	10%
Others	5	10%
Total	**380**	**100%**

France's main foreign trade partners in 2004

Source: Ofimer, based on Customs service data.

Imports from	Volume (mt)	Value (M€)	Exports to	Volume (mt)	Value (M€)
United Kingdom	100.0	347.9	Spain	105.4	283.9
Norway	91.9	265.4	Italy	83.3	262.9
Spain	81.1	232.7	Belgium	22.9	118.5
Netherlands	62.7	199.9	Germany	27.6	105.3
Denmark	54.3	183.6	United Kingdom	10.8	68.1
United States	50.0	133.5	Ivory Coast	44.6	38.3
Madagascar	26.7	149.2	Netherlands	11.3	25.3
Germany	37.1	109.8	Switzerland	4.5	29.2
Ireland	57.2	99.7	Portugal	7.1	41.1
Belgium	16.9	87.8	Seychelles	28.0	20.8





Main products imported and exported in 2004
Source: Ofimer, based on Customs service data.

Imports	Amounts (t)	Value (M€)
Shrimp	101.4	532.5
Salmon	124.7	406.6
Tuna	133.5	324.4
Unspecified filets	90.9	275.7
Cod	57.3	230.5
Scallops, queen scallops	21.7	149.1
Alaska pollack	52.7	95.3
Mussels	60.1	87.2
Spiny lobster	3.5	70.9
Exports	**Amounts (t)**	**Value (M€)**
Tuna	193.8	222.1
Shrimp	14.8	123.8
Unspecified filets	18.3	82.4
Salmon	16.8	70.6
Cuttlefish	19.3	49.9
Anchovy	10.4	38.2
Eel, glass eel	1.1	40.6
Sole	2.8	28.9
Toothfish	2.8	24.6

The top French seafood export item is tuna. Much of this is tropical tuna caught and frozen by French shipowners, landed in foreign ports near the fishing areas to be processed in local canning plants (Ivory Coast, Madagascar and the Seychelles). Guyana shrimp also contributes in value to export flows. Southern European countries (Spain and Italy) are the leading customers for French seafood, particularly fresh fish with high market value.

EXPLOITING AND PROCESSING SEAWEED

Definition

Seaweeds are marine plants gathered on the shore or harvested at sea. The production is mainly used for extracting gelling agents (colloids), and has outlets in farming, para-pharmaceuticals and the food industry.

Situation and trends in activity

Conditions for seaweed exploitation are regulated by decree; moreover, their harvesting is subject to inter-professional regulations. A large part of the national supply is provided by the mechanised harvesting of laminaria beds. This is mainly done in the Finistère region, while fucus, chondrus and other species are collected on foot in scattered sites along the coast. Their yields reached 65,000 tonnes in 2004, for a turnover of approximately 3 million euros. The production covers about two thirds of processors' requirements. Seaweed farming has remained a very marginal activity in France, with less than 100 tonnes produced, whereas seafood farming and harvesting respectively produce 11.5 and 2 million tonnes worldwide.

Seaweed processing (including maerl) generates turnover of 293 million euros for an added value estimated at approximately 185 million euros. This processing mainly concerns macro-algae (97% of firms' turnover) and 72% of the enterprises are located in Brittany. The main market outlets are cosmetics, colloids and to a lesser degree, agriculture.

The "seaweed" sector employs nearly 1,800 people. There is a very wide range of types of firms working in the various market segments. In fact, colloids are produced by three establishments belonging to international chemical groups, while small-sized enterprises are involved in processing of edible seaweed.

KEY FIGURES FOR SEAWEED PROCESSING (YEAR 2003)

	Macro-algae						Micro-algae	Total
	Colloids	For food	Cosmetics	Farming (including maerl)	Miscellaneous	Total macro-algae	Miscellaneous	
Turnover (M€)	58.4	3.0	182.8	30.7	10.4	**285.2**	7.5	**292.7**
Value added (M€)	35.0	2.2	144.7	21.8	7.3	**179.3**	5.9	**184.4**
Number of companies	4	11	12	8	9	**44**	9	**53**
Employment	270	42	579	706	92	**1,689**	86	**1,775**

Source: Seaweed technology research centre (CEVA).

KEY FIGURES FOR SEAWEED HARVESTING

		1999	2000	2001	2002	2003	2004
Employment	Sea-going	57	57	48	48	47	47
	Fishing on foot	60	60	60	40	20	20
Yield (t)	all species	70,997	68,224	66,283	80,366	69,863	64,723
Turnover (M€)	all species	2.9	2.4	2.5	2.9	3.0	2.7
Value added* (M€)	all species	1.7	1.4	1.4	1.7	1.7	1.6

Sources: Ifremer, CEVA.
*Value rate of 58% (Ifremer estimation).

SEAFOOD PROCESSING INDUSTRY

Definition

The seafood processing industry includes companies whose activity consists in manufacturing products for human consumption from fish, crustaceans, molluscs and cephalopods. It uses various conservation techniques and manufacturing processes. This scoping does not include those enterprises which only fillet fish (fish traders) or those specialised in seaweed processing.

Trends in the sector: activity indicators on the upswing

The seafood processing industry is a small component of the French food processing industry. In 2003, with 3.1 billion euros, the turnover from seafood processing accounted for 2.5% of the food processing industry turnover (124 billion euros). These data come from the yearly company survey carried out by the SCEES central statistical studies and surveys service on firms in the food processing industry with over 20 employees or making more than 5 billion euros in turnover. They highlight the dynamic nature of the seafood product sector. Between 1998 and 2003, turnover for the seafood industry on the whole rose by 30%, twice as fast as that of food processing industries overall (+15%). However, the export rate, down from 1998, stabilised slightly under 10%, which is much less than that of food processing industries overall (18%). Slightly higher French consumption of aquatic products, with an increasing preference for prepared products, supported the activity.

Indicators for the seafood processing industry

Due to the selection criteria used, the SCEES surveys of agri-food processing companies do not perfectly overlap with the seafood processing industry. To better study this sector, Ifremer made a branch study in 2001 which included small enterprises and those for which seafood processing is not the main activity. The survey was based on 277 firms and was able to reconstruct a turnover of 2.8 billion euros, for 13,300 jobs generated and an export rate of 16% (9.4% for the SCEES sector-based survey).

For commercialised production, the SCEES uses a branch-based approach to build the Prodcom database, where French seafood production is broken down into groups of products. The largest sales volume segment is that of fish-based canned or prepared foods, with 37% of the sector's turnover, including 12% for canned tuna, mackerel and sardines. This is followed by fresh, chilled and frozen fish which make up 26% of the sector's turnover, of which 18% is for fish filets. The smoked, dried or salted fish segment, representing 18% of sector turnover, has smoked salmon production in a predominant position.

Between 2001 and 2004, only the fresh, chilled and frozen fish segment showed significant growth in marketed production (+17% in value). Growth was weak (3%) for the smoked, dried or salted fish segment, although smoked salmon was up 6% all the same. The canned seafood segment is declining. Finally, shellfish, both crustaceans and molluscs, rose in volume, but dropped in value, which show the difficulty of enhancing these products. The industry's activity nationwide can be compared with all consumer sales in France, which Ofimer has estimated through Secodip consumer panels. In 2004, chilled deli products accounted for 29% of sales in value, frozen products for 25%, canned products for 17% and smoked fish (mainly salmon) for 11%. However, among these four sectors, only chilled deli products have undergone high growth (26%) since 1999, while the three other, older activities seem to have reached maturity. Apart from chilled deli products, the increase in consumption concerned surimi, up 50% since 1999, other deli products for 25% and cooked prawns for 21%.

KEY FIGURES FOR THE SEAFOOD PROCESSING INDUSTRY

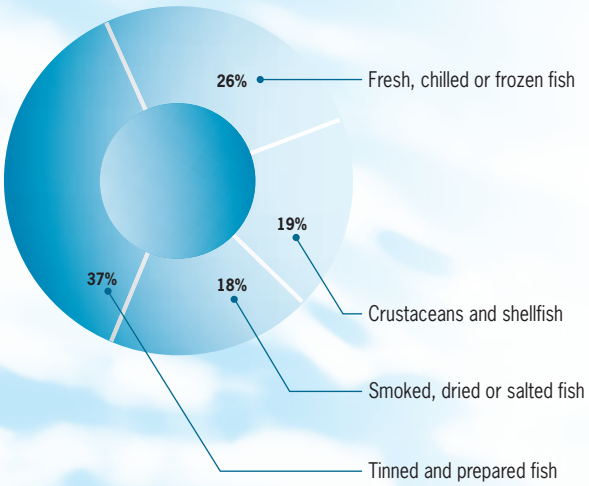
	1998	1999	2000	2001	2002	2003
Number of companies	123	127	128	141	140	152
Number of jobs	10,971	11,987	12,632	13,347	13,428	14,326
Turnover (M€)	2,361	2,492	2,502	2,871	2,858	3,077
Value added (M€)	389	439	424	510	548	650
Level of exports	15.4	11.1	9.2	9.4	9.7	9.8

Source: SCEES.

Processed seafood industry turnover (2004)*

Source: the SCEES's PRODCOM database, according to Agreste, Adepale-FIAC French confederation of canned food industries, and FICT French federation of meat processors, cooked pork meat and delicatessen industries.

* This breakdown hardly changed during the period from 2000-2004.



Breakdown of turnover by product type in 2004, and trends between 2001 and 2004 for marketed production in value and quantity

Sources: SCEES, based on Agreste, Adepale-FIAC, FICT.

%	Breakdown in 2004	Trends 2001-2004 in turnover	Trends 2001-2004 in amounts sold
Tinned and prepared fish	37	- 3	2
including tinned tuna, mackerel and sardines	*12*	*- 5*	*- 8*
Fresh, chilled or frozen fish	26	17	12
including fish filets	*18*	*19*	*20*
Smoked, dried or salted fish	18	5	3
including smoked salmon	*14*	*6*	*6*
Crustaceans and shellfish	19	-9	6
Total*	**100**	**2**	**6**

* Not including fish meal and other (fish livers, roe and soft roe, caviar).

Breakdown of consumer sales by product type and trend between 2001 and 2004

Source: Ofimer.

%	2004 breakdown of sales in value	Trend in 2001-2004 sales in value
Chilled deli products	29	26
Frozen	25	5
Tinned	17	1
Smoked, dried or salted fish	11	- 2
Other deli products	7	25
Cooked prawns or shrimp	6	21
Surimis	5	50

The industry's concentration

In 2003, only 12 of the 152 firms covered in SCEES surveys had a turnover of 50 million euros or more, while the turnover of 92 enterprises, i.e. 60% of the total, was under 10 million euros. Although the sector seemed to move slightly towards deconcentration between 1998 and 2001, the trend has been reversed since then and a high level of concentration has been reinforced: the top 10 companies make over 40% of sales and provide nearly 35% of the salaried jobs in the sector. Following the pattern which predominates in the food processing industry overall, many SMEs coexist with a few large companies of national or even international renown.

Geographic breakdown

The companies are mainly located along the coast. In 2003, the five regions of Brittany, Nord-Pas-de-Calais, Pays de la Loire, Lower Normandy and Aquitaine, hold 64% of the firms, 81% of salaried manpower and 84% of turnover. The counties containing the most SCEES-classed plants are the Finistère (26), Pas-de-Calais (19), Morbihan (11) and Vendée (7).

PUBLIC ACTION IN FAVOUR OF SEAFOOD PRODUCT INDUSTRIES

Public funding to support the seafood industry is essentially national and European. On the European level, it comes from the financial instrument for fisheries guidance (FIFG), the European agriculture guidance and guarantee fund (EAGGF) and the Pesca community initiative. Various forms of public aid are mainly intended to organise markets in the framework of the Common market organisation (CMO) for the common fisheries policy as well as for restructuring the seafood industry.

The table below showing public support for the industry indicates that aid to exploit resources and enhancing product value reaches a hundred million euros yearly. Over three quarters of public funding is channeled through social protection: this fundamental aspect is dealt with later (see the chapter on "Public intervention").

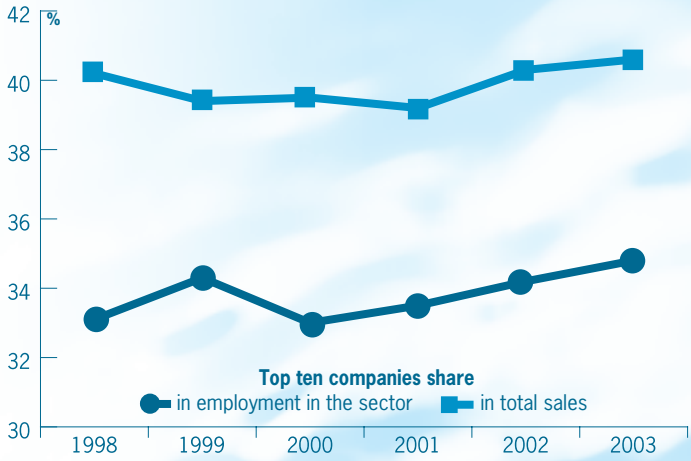
Ofimer

The national inter-professional office for seafood and aquaculture, called Ofimer is an industrial and commercial public body created in 1998. It has the status of an agricultural office as defined by the law n° 82-847 of 6 October 1982 and employs some fifty staff. In 2004, its projected budget was 27 million euros. Ofimer's missions include regulating the markets, increasing the economic effectiveness of the industry and raising product quality, improving market knowledge, organising or supporting communications and promotional operations for aquatic products. Along with that of harvesting and the initial sale, Ofimer also monitors processing, transportation and logistics, distribution and technical innovation. Its remit includes land-based aquaculture and fresh water fisheries.

With authorisation from the European Commission and French authorities, Ofimer deploys EC aid related to seafood market regulation, particularly EAGGF credits. It also acts within the framework of the specific measures programme to assist French overseas "départements" (Poseidom). To provide guidance for the seafood industry, the organisation takes part in actions developed by the State-region plan contract or which are eligible under the FIFG. This means that it can match funding from local authorities in investments designed to improve the conditions of landing catches and their initial sale, provide financial support for project to upgrade and modernise workshops for fish handling and support producer organisations in their projects to improve product quality.

Seafood processing industry concentration, trend from 1998-2003

Source: SCEES.



Breakdown of seafood processing companies by region in 2003

Source: SCEES.

	Number of companies	Average salaried staff	Net turnover (M€)	Value added (M€)
Brittany	43	5,507	1,106.6	235.2
Nord - Pas-de-Calais	24	2,431	584.8	106.1
Pays de la Loire	13	775	157.3	29.9
Lower Normandy	10	1,045	374.2	77.0
Aquitaine	8	1,640	321.8	76.6
Languedoc-Roussillon	8	272	42.2	11.9
Ile-de-France (Paris area)	7	253	55.1	12.4
Upper Normandy	7	846	96.5	41.6
Provence-Alpes-Côte d'Azur	6	216	164.4	18.8
Rhône-Alpes	6	186	25.7	7.4
Alsace	5	246	59.5	8.9
Burgundy	4	166	22.1	5.4
Auvergne	3	204	27.3	6.5
Poitou-Charentes	3	100	10.8	4.0
Centre	2	s	s	s
Franche-Comté	2	s	s	s
Picardy	1	s	s	s
Champagne-Ardenne	0	0	0	0
Corsica	0	0	0	0
Limousin	0	0	0	0
Lorraine	0	0	0	0
Midi-Pyrénées	0	0	0	0

s: not available.

Public support for the seafood industry

Source: MAP, "Les concours publics aux pêches et aux cultures marines" (public support for fisheries and mariculture), Oct. 2003.

En M€	2002	2003	National budget 2003	EC budget 2003
Exploitation of resource	**77.6**	**58.5**	**35.7**	**22.8**
Investment and upgrading	*34.3*	*27.5*	*17*	*10.5*
Orientation of production and support for markets	*11.3*	*10.8*	*6.3*	*4.5*
Limiting of production	*4.5*	*4.8*	*2.6*	*2.2*
Compensation for geographical disadvantages	*7.1*	*5.6*	*0*	*5.6*
Transitional aid and restructuring	*2.7*	*0.3*	*0.3*	*0*
*Disasters and bad weather **	*17.7*	*9.6*	*9.6*	*0*
Enhancing seafood product value	**22**	**21.7**	**13.8**	**7.9**
Initial marketing	*12.7*	*13.7*	*8.2*	*5.5*
Seafood processing industry	*4.8*	*4.9*	*2.5*	*2.4*
Development of seafood consumption	*4.5*	*3.1*	*3.1*	*0*
Research and teaching	**58.2**	**54.2**	**54.2**	**0**
Social protection and solidarity	**570.9**	**593.5**	**593.5**	**0**
General services	**19.2**	**32.3**	**29.5**	**2.7**
TOTAL	**748**	**760.3**	**726.9**	**33.4**

* Including Ofimer indemnities paid in compensation for the oil spill and storm damage in 1999.

Marine aggregate extraction

MARINE AGGREGATES MINED IN FRANCE INCLUDE SILICA SANDS AND GRAVELS, CALCAREOUS SAND AND MAERL. THE FIRST CATEGORY IS USED FOR CONSTRUCTION, ENGINEERING AND PUBLIC WORKS AND THE SECOND MAINLY IN AGRONOMY (SOIL IMPROVEMENT) AND TO FILTER DRINKING WATER. THERE ARE ALSO EXTRACTION OPERATIONS IN GUADELOUPE (MIXED VOLCANIC AND CALCAREOUS SANDS USED FOR CONSTRUCTION AND CIVIL ENGINEERING) AND AT SAINT-PIERRE-ET-MIQUELON (SILICEOUS SAND AND GRAVELS).

THE ACTIVITY'S SITUATION

Marine aggregate production in France makes up between 1% and 1.5% of national production of building materials (15% in the United Kingdom), estimated at 430 million tonnes (with 35 million cubic metre of ready-to-use concrete). This mainly consists of:

- siliceous aggregates, at just under 6 million tonnes in metropolitan France in 2003 and 2004. Along with this growing production is some 300,000 tonnes from a site mined in Guadeloupe, a very low yield from Saint-Martin and production from Saint-Pierre-et-Miquelon amounting to 20,000 tonnes;
- For calcareous materials, amounting to 420,000 tonnes in metropolitan France in 2005. This involved maerl and calcareous sand. The former is used as a processed soil improver, or as a component in animal feed or of fertiliser; the latter as raw soil improver or as an ingredient of animal feed.

Extraction of marine materials is governed by the mining laws and requires issuance of a mining title deed, a national permit and authorisation for work to begin, along with an impact study. Extracting maerl and calcareous sand is subject to quotas and authorisation from the prefect. These regulatory provisions were harmonised by the law 97-1051 of November 1997, which places calcareous materials under the mining system.

The main production centres for siliceous materials are located between the Seine-Maritime and Gironde counties, in shallow areas of less than 30 metres. The main production site is at the mouth of the Loire River. Calcareous materials are produced in Brittany (four maerl sites are exploited).

If we define this activity's scope as only the extraction, unloading, drying and calibration up to loading before being processed, the overall turnover was about 25 million euros in 2001 and 2002 (Ifremer's estimation after consulting professionals). The value added was around 10 million euros (Ifremer's estimation based on Sessi data).

EMPLOYMENT AND COMPANIES

For siliceous materials, direct employment is estimated to be approximately 200 seamen and 100 on-shore staff (administrative, sales and technical duties) according to Ifremer. There are dozen firms using 16 sand dredging vessels of varying sizes (from 80 to 1,926 grt). Some of these companies process these materials and sell them for ready-to-use concrete or civil engineering operations. Marine materials are also extracted by industrial firms mining land-based deposits, in an effort to diversify their supplies. Extracting can then be subcontracted to specialised international companies. They are also used for construction and civil engineering work.

PRODUCTION OF SILICEOUS MARINE AGGREGATES IN METROPOLITAN FRANCE

	1999	2000	2001	2002	2003	2004
Extraction*						
Channel	660	690	1,230	1,240	1,160	1,190
Brittany	70	60	35	10	30	30
Atlantic seafront	3,610	3,700	4,100	4,150	4,730	4,650
Total	**4,340**	**4,450**	**5,365**	**5,400**	**5,920**	**5,870**

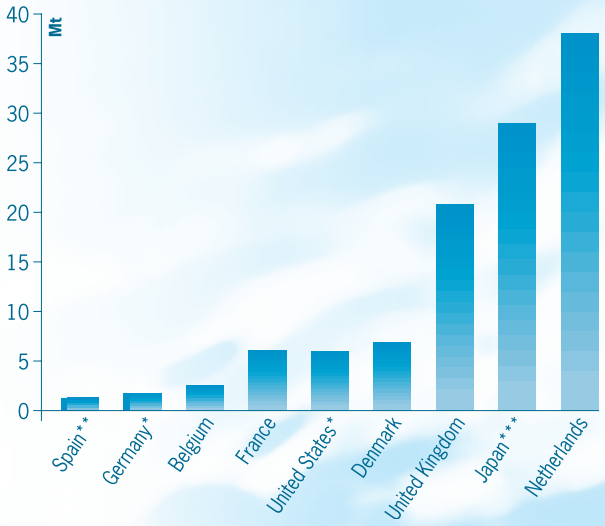
Source: National aggregate producers union.
* Mostly siliceous materials. Not including maerl extraction.

The shipowners working in calcareous material extraction do so in four companies employing a hundred seaman and ten vessels.

OUTLOOK

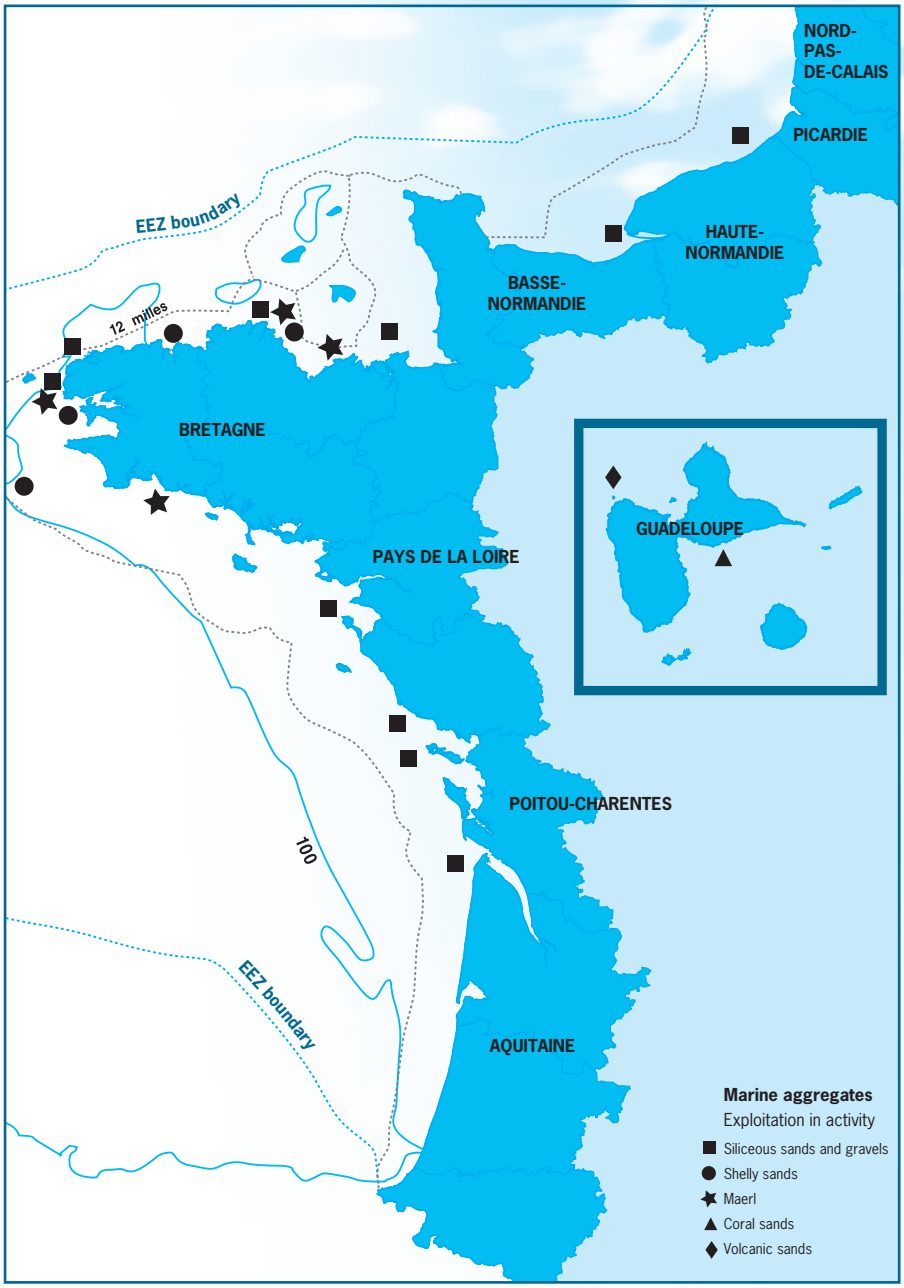
Ifremer assesses the siliceous aggregate resources in French territorial waters to be 52 billion tonnes. However, usable reserves are currently limited to 600 million cubic metres (960 million tonnes).

Marine aggregate extraction in a few countries in 2004
Source: ICES, 2004.



** Data for 2003. ** Except for the province of Gran Canaria.*
**** Source METL 23 Mt in 2002, 25.3 Mt in 2001, 35.4 Mt in 1999.*

Extraction areas
Map: from document by Claude Augris, Ifremer.



Electricity generation

THIS SECTOR COVERS BOTH COASTAL ELECTRICAL POWER PLANTS AND WIND GENERATORS SET UP ALONG THE COAST. FOR THE FORMER, THE CHOICE OF AN ELECTRICAL PRODUCTION SITE DEPENDS ON ITS POSSIBILITIES FOR COOLING OR DILUTING THE EFFLUENTS DISCHARGED BY THE PLANT. THE NATURAL, STABLE COLD RESERVOIR PROVIDED BY THE SEA MAKES COASTAL ACCESS HIGHLY ATTRACTIVE FOR BUILDING NUCLEAR OR THERMAL POWER STATIONS. BUT THE SEA CAN ALSO PROVIDE TIDAL POWER. VERY WINDY COASTAL AREAS ARE ALSO STRATEGIC PLACES TO ERECT WIND GENERATORS.

ACTIVITY

No specific assessment is made for the EDF (French electricity board) plants set up along the coast. As regards employment, the total labour force for power plants on the coast reached about 6,800 in 2005, over 5,600 of them working on nuclear power sites.

Ten high-power electrical plants are located on the coast or in estuaries in metropolitan France. Their total installed power capacity is over 26,000 Mwe, i.e. a bit less than one quarter of the total capacity available in France.

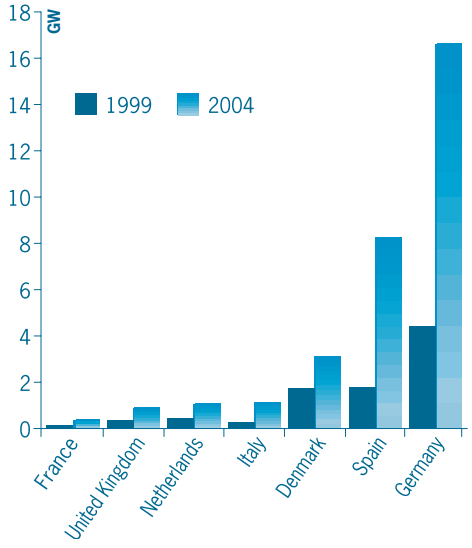
Dunkirk's DK6 combined cycle plant was commissioned in March 2005 at a cost of 450 million euros and has generated 35 additional jobs. It replaces the EDF plant in Dunkirk harbour, whose dismantlement began in 2005 after 43 years of activity.

Following the signing of the Kyoto protocol in 1997 and its coming into effect on 16 February 2005, France has committed to helping meet the European objective of reducing greenhouse gas, by ensuring that 21% of its electricity will be produced using renewable energy by 2010 (see the 1997 White paper on renewable energies, Directive 2001/77/EC). According to the Ademe (French agency for the environment and mastery of energy) this obligation means that France must plan to increase the percentage of electricity provided by wind turbines by threefold between 1997 and 2010; which would bring the installed wind power to approximately 14,000 MW in 2010.

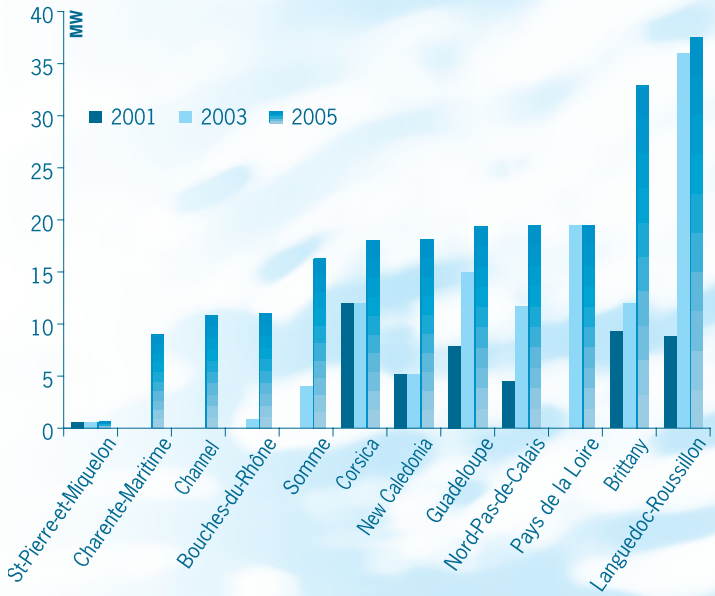
By the end of the 3rd quarter of 2005, wind generators set up along the French shores (metropolitan France and overseas Dom-Tom) provide nearly 213 MWe in all, making up 38% of total French wind power production (559 MWe in 2005, i.e. 5% of the target for 2010). In spite of significant growth since 2003, French wind farm facilities remain behind those of several European neighbours, and especially Germany, which already produces 17 GWe.

In order to limit the impact on the landscape and focus high power production in small, windy areas, the setting up of offshore wind generators is being studied. Ten offshore farms are currently operational worldwide. In Europe, 86 MW are already produced by wind turbines located offshore (Sweden, Denmark and the Netherlands). The first French offshore wind farm (105 MW) should be ready in 2007-2008, off the coast of the Seine-Maritime region.

Wind power in Europe
Source: EWEA.



Wind power production on the French coast*
Source: Ademe.



** This list only includes those sites located less than 15 km from the coastline.*

Electrical power plants set up on the coast
Source: EDF.

Site	Generating units	Net power (MWe)	Energy source	Year commissioned	Employment
Dunkirk (harbour)	1 and 2	2 x 400	combined cycle gas turbine	2004	40*
Le Havre (harbour)	1	250	coal	1968	334
	2	585	coal	1969	
	4	580	coal	1983	
Cordemais (Loire estuary)	1	490	coal	1970	500
	2 and 3	2 x 685	fuel oil	1976	
	4	580	coal	1983	
	5	580	coal	1984	
Martigues	1	250	fuel oil	1971	143
	2	250	fuel oil	1972	
	3	250	fuel oil	1973	
	4	250	fuel oil	1974	
Gravelines (outer harbour of Dunkirk)	1, 2 and 3	3 x 910	nuclear	1980	1,689
	4	910	nuclear	1981	
	5	910	nuclear	1984	
	6	910	nuclear	1985	
Penly (Eastern Channel)	1	1 330	nuclear	1990	676
	2	1 330	nuclear	1992	
Paluel (Eastern Channel)	1 and 2	2 x 1,330	nuclear	1984	1,257
	3	1 330	nuclear	1985	
	4	1 330	nuclear	1986	
Flamanville (Western Channel)	1	1 330	nuclear	1985	682
	2	1 330	nuclear	1986	
Le Blayais (Gironde estuary)	1	910	nuclear	1981	1,305
	2	910	nuclear	1982	
	3 and 4	2 x 910	nuclear	1983	
Rance estuary		240	tidal power	1966	88
TOTAL		**26,215**			**6,714**

* Provisional estimation.

Shipbuilding and repair

THE SECTOR COVERS MERCHANT AND NAVAL SHIPBUILDING AND REPAIR, NAVAL EQUIPMENT AND FITTINGS, SUBCONTRACTING AND BOATBUILDING. THERE ARE GREAT DIFFERENCES BETWEEN THESE COMPANY CATEGORIES IN TERMS OF THEIR ORGANISATION, CONCENTRATION, SIZE AND TYPE OF MARKET. BUT THEY ARE ALSO RELATED, SINCE CIVILIAN SHIPYARDS CAN BUILD AND REPAIR MILITARY VESSELS AND LARGE YACHTS; AND SHIP REPAIR HAS PROVIDED SHIPYARDS WITH AN OPPORTUNITY FOR DIVERSIFICATION.

MERCHANT SHIPBUILDING

Merchant shipbuilding mainly designs and builds merchant ships to transport passengers and cargo, fishing vessels, service vessels and offshore platforms and structures.

Trends in activity

Worldwide, since the second quarter of 2002, the sector has experienced considerable growth for most sorts of vessels, linked in great part to the unprecedented rise in global goods shipping, particularly that concerning China. World orders, which were 48.9 million cgt in 2002, reached 70.8 in 2003, then 90.4 in 2004, making a rise of 85% over two years. Although the increase in production capacity mainly took place in China, shipyards worldwide are showing very large workloads.

The types of vessels for which the greatest rise in orders was seen were oil-tankers and containerships. They went from 25.0 million dwt in 2001 to 52.5 in 2003 for oil tankers over 25,000 dwt, and 7.1 million dwt in 2001 to 26.6 in 2003 for containerships over 1,000 TEU.

Asia

Asia has continued to grow its lion's share of the shipbuilding sector. South Korea has consolidated its leadership position worldwide with orders reaching 33.3 million cgt in 2004. Without increasing its production capacities, it has considerably improved its productivity and optimised its production tool through an increasing reliance on subcontracting. The major Korean shipyards have focused on building very large vessels. These are mainly oil-tankers, containerships and methane carriers rather than bulk carriers.

Ranking second worldwide, Japan also had a record year in 2004, closing the year with an order book of 25.1 million cgt. It benefited from dynamic local shipowners who have continued to place orders. Enjoying state support, some shipyards increased their building capacity. They maintained their position for bulk-carrier construction, holding over 65% of the world market share for those vessels.

China is continuing its rise: ranking third in 2004 in world shipbuilding after Korea and Japan, with 12.6 million cgt in orders, compared to 6 million at the end of 2002.

Europe

Performances varied from one country to another, but European shipbuilding (EU, Norway, Croatia, Romania and Turkey) has maintained relatively stable production over the past few years. Its orders have fluctuated greatly (13.5 million cgt in late 2000, 9.5 late 2002, 14.6 million end of 2004, i.e., 16.1% of world orders); but deliveries remained stable at about 4 million cgt per year over the past ten years or so, due to improved productivity. Between 1985 and 2004, European shipbuilding production rose by 43%, with a drop in the workforce of 36%.

Its specialisation in technical vessels with high added value (cruise liners, ferries, chemical carriers and supply ships) has enabled Europe to stay high in world ranks with respect to turnover, with 14.4 billion euros in 2003 (about 9.5 for South Korea and Japan).

KEY FIGURES FOR CIVILIAN SHIPBUILDING

	1999	2000	2001	2002	2003
Turnover (M€)	1,576	2,127	1,586	1,856	1,163
Value added (M€)	466	440	318	263	254
Employment	6,032	5,984	6 260	6,143	5,333
Number of companies*	34	33	32	33	33

Source: Sessi (annual survey of companies).
* Doing all or part of their business in this field.

In this context of strong competition from Asia and the dollar's depreciation with respect to the Euro, the demand, combined with price hikes and available production capacity have made it possible for the main European shipbuilders, specialised in medium-sized vessels (like containerships of 1,000 to 3,000 TEU), to maintain their activities. But with the exception of a few North European shipyards, many companies have had difficulties all the same.

France

Following the large orders placed in 1999 and 2001, deliveries continued to progress until 2003, when they reached a peak of 511,000 cgt. However, French shipbuilding did not benefit from the global upturn in 2003-2004.

French shipyards have specialised in luxury liner construction over the past few years, and their orders, which were 464,000 cgt at the end of 2002, remained unchanged in late 2004 (458,000 cgt).

However, the picture is quite mixed, depending on which shipyards are considered. By mid-2005, the largest shipyards' workload counted four large cruise liners and three methane carriers with deliveries scheduled up to 2009, which left enough capacity for additional orders. Medium-sized shipyards, in specialised niches, showed variable results in 2003-2004. Some were able to develop favourably, in spite of fishing restrictions, thanks to their drive and increased diversification towards supply ships, yachts or small military vessels; others experienced a drop in activity, and still others would be sitting more comfortably with a fuller order book. The market niche for small French shipyards has shown sustained, and highly diversified, activity overall.

The activity is unevenly distributed along the coastline, with a single region, Pays de la Loire, employing 77% of the workforce in the branch.

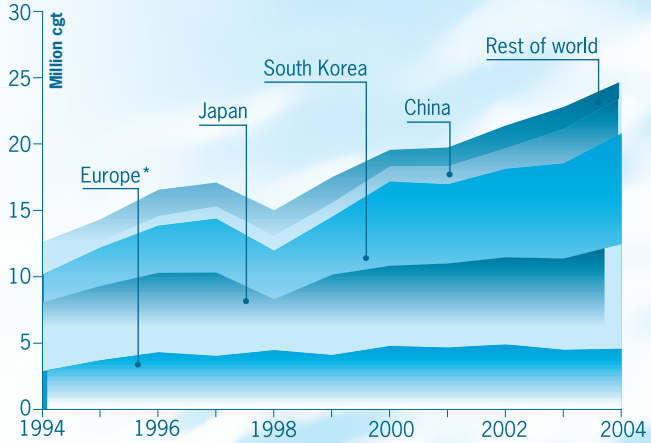
Outlook

The dynamic performance of the past two years has contradicted some forecasts: for instance, in 2003, the OECD spoke of a risk of overcapacity of up to 30% in 2004.

The activity's cyclical nature, the build time of large vessels and the current amount of world orders, however, do leave the outlook for market trends somewhat uncertain. The perspectives will, of course, be related to those of economic growth, particularly in South East Asia. The drop in average ship age should continue, leading to new orders. Objectives of reducing greenhouse gas emissions worldwide are favourable for maritime shipping, which remains a low-pollution form of transport. The rise in prices and current shipyard workloads could attract new countries, such as Turkey, Iran and India to shipbuilding, without affecting the increase in capacity planned by China.

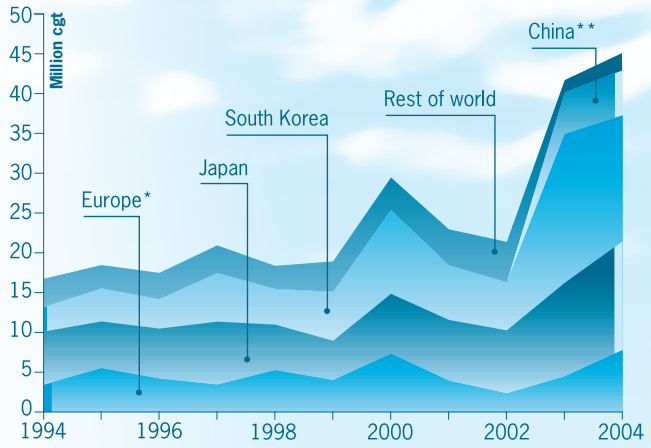
In this context, over and above the currently unfavourable euro-to-dollar parity rate, the European strategy has both advantages and risks. The trends in demand should benefit the major European yards and their subcontractors (principally in Eastern Europe) to build the most sophisticated vessels. The growing size of sea-going vessels which unload in a small number of ports goes hand in hand with the development of smaller supply ships, now a European speciality.

Market shares of main production regions
Sources: AWES, CESA.



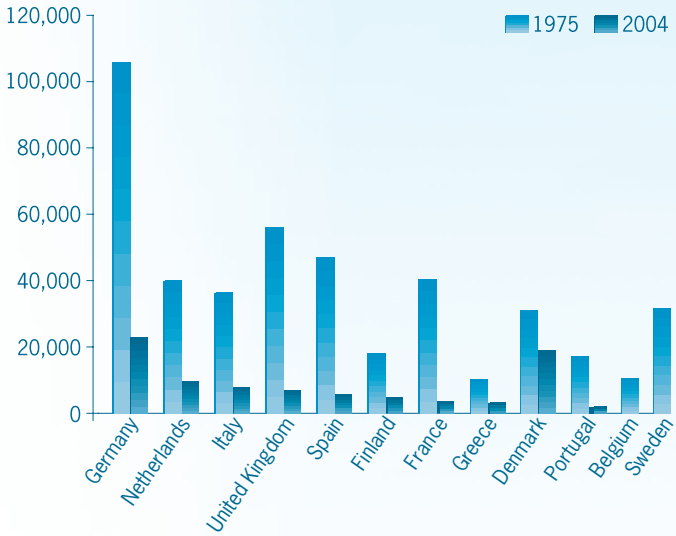
*AWES-members, followed by CESA-members.

New orders in main production regions
Sources: AWES, CESA.

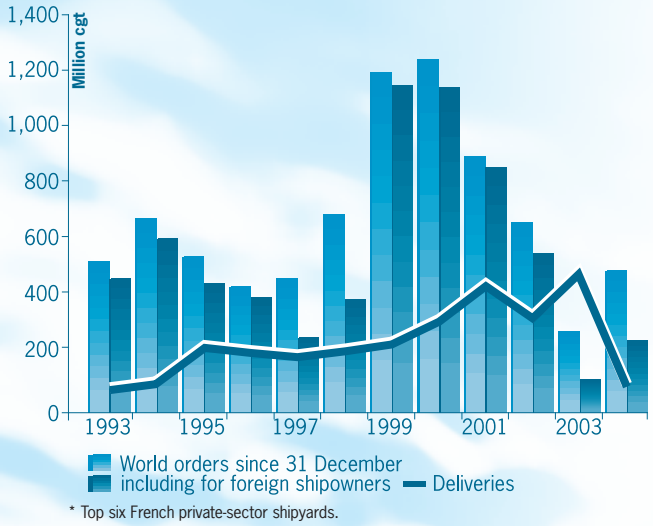


* AWES-members, followed by CESA-members.
**Individualised orders for Chinese shipyards from 2003 on.

Employment in European shipbuilding
Source: CESA.



French shipbuilding*
Source: CSCN.



* Top six French private-sector shipyards.

Regional breakdown of shipbuilding labour force*
Source: Sessi.

2004	Salaried staff
Nord-Pas-de-Calais	s
Picardy	0
Upper Normandy	s
Lower Normandy	469
Brittany	384
Pays de la Loire	3,996
Poitou-Charentes	s
Aquitaine	0
Languedoc-Roussillon	s
PACA (Provence-Alps-Côte d'Azur)	0
Corsica	0
Île-de-France (Paris area)	18
Non-coastal regions	s
Total	*4,867*
Salaried staff not in breakdown	302
making % of the sector	6
TOTAL for France	**5,169**

* Firms with more than 20 salaried employees. s: not published.

Orders and market share for Chinese shipyards
Source: Barry-Rogliano-Salles, 2005.

However, although specialisation can allow streamlining of the production, the low degree of standardisation for special types of vessels, combined with single-unit production could make the shipyards even more sensitive to uncertainties in the economic situation.

NAVAL SHIPBUILDING

It is mainly the DCN naval shipyards which build military vessels in France, along with a small number of civilian shipyards which make up less than 10% of total production. The former designs, constructs and maintains naval equipment and facilities. Its main customer is the French Navy, but it also has export customers.

Trends in activity

In the context of the law setting out the military budget for 2003-2008, showing a rise of 5.5 billion from the previous one, and with a rise in export activity, the DCN Group's turnover progressed recently to reach 2.6 billion euros in 2004. DCN is the largest company in this branch in Europe in terms of turnover. The export share (to Chile, Malaysia, Pakistan, Singapore, Saudi Arabia, Europe and Australia) has reached 30%.

CHINESE SHIPBUILDING

From a minor player in shipbuilding six years ago, China has now become the third largest shipbuilder worldwide, with 5 billion euros in turnover.

Chinese shipyards began by building standard vessels like bulk carriers (2-3% market share in late 1998 and 20% in late 2002) and small oil-tankers, at competitive prices thanks to their low manpower costs (about16% of those of Japan and 10% of those of South Korea) and significant State subsidies. From 2003 on, they were quickly capable of building all sorts of vessels, by working in association with western shipyards when required. They import a significant amount of fittings and material needed to build the ships they export, including steel.

Two State companies, created in 1999, ensured over 70% of Chinese shipbuilding in 2003, with 240,000 employees. The rest is produced by local independent shipyards or joint-ventures with foreign firms. Considerable investments are underway or planned, particularly the construction of VLCC dry docks. There should be 22 of them in 2008-2009 (as opposed to 14 in Korea and Japan).

China is also developing its ship repair industry (10 billion euros) and naval (8 billion euros) and harbour equipment and facilities. In two years time, China has become the top manufacturer of containers, with 80% of the 2.6 million TEU produced worldwide in 2004. In the same year, a single Chinese company built 54.8% of the ship-to-shore gantry cranes for containers and 49.5% (rubber-tyred and rail-mounted gantries).

Chinese shipbuilding is faced with the difficulty of power supplies, intermediate goods and equipment and the need to streamline their production. China's current share of orders to be delivered in 2007 are tending to slow down, for the first time. Several docks are available for 2008.

The average labour force at DCN went from 13,997 employees in 2003 to 12,914 in 2004 with a concurrent increase in the part of the workforce under private law contracts from 5% to 22%. The breakdown of staff is about 3,200 based in Brest (nuclear submarine and surface ship maintenance, logistics, warships and heavy tonnage ships), 2,750 in Cherbourg (submarine construction), 2,500 in Lorient (surface vessels), 1,000 at Indret (naval propulsion), 830 at Ruelle (equipment and fittings), 2,100 in Toulon (ship maintenance, combat management system) and 290 in Saint-Tropez (underwater weapons).

Several civilian shipyards take part in military shipbuilding or want to diversify their activities in this field, thus complementing DCN's offering or acting as subcontractors.

Outlook

DCN has assets for the future, such as its mastery of modern warship techniques from design to maintenance; orders of approximately 6 billion euros at the end of 2004; productivity close to that of the competition.

On the world naval shipbuilding market, marked by the clear pre-eminence of the United States, three of their firms being world leaders, industrial alliances on a national level, as well as with German, Italian and Spanish builders, are being studied.

A law passed on 31 December 2004 authorised the DCN to open its capital to shareholders. One year later, a project, which should be achieved in 2006, was announced. It planned to group within DCN the activities of Thales Naval France (except for those related to equipment and fittings) as well as the companies jointly owned by the two groups which are Armaris and its subsidiaries and MOPA2, a firm specialised on the second aircraft carrier project (see: French Navy). This grouping includes Thales' interest in Eurotorp, the European lightweight torpedo consortium.

Alongside the French State, which will continue to hold 75% of DCN's capital, Thales will become a shareholder with 25% interest. In two years, this share could be brought to 35%, particularly through the contribution of additional industrial assets.

EQUIPMENT MANUFACTURERS AND SUBCONTRACTORS

This set of businesses, supplying shipbuilding and ship repair yards, shipowners and offshore oil-related industries, includes the following activities:

- manufacturing technical equipment, propulsion machinery, electrical and electronic equipment, shipboard handling, navigation and bridge equipment, pumps, ventilation and air conditioning;
- manufacturing "modules" of assembled and tested equipment, either as prefab or installed, and complete systems or functions like installing ventilation and air conditioning or fitting out of public areas and cabin areas in passenger ships, and
- subcontracting of studies and production.

Trends in activity

The equipments and fittings branch plays a prime role in shipbuilding. Depending on the type of ship, the average contribution of equipment makers to total value is estimated to be from 60 to 80%. Turnover of the ship equipment industry worldwide was approximately 65 billion euros in 2003, stimulated by strong global growth in shipbuilding. China's market share has grown appreciably, but it imported, as did South Korea and Vietnam, 19% of its needs in 2003 and that percentage is on the rise.

In 2004, the European sector (mainly represented by Germany, the United Kingdom and Norway) was assessed at 1,250 firms and 262,000 jobs, for a turnover of 26 billion euros. Exports made up 46% of this. The Germans, top exporters worldwide, export 63% of their production, and for the first time in 2003, the share sent to Asia (37%) was greater than that for Europe (34%) (source: EMEC).

Equipment supply activities, for numerous fields of application, are ensured by many highly specialised enterprises which are geographically scattered. The last census taken in France for naval sector activities was in 2001. The turnover was 2,700 million euros and the value added was 800 million euros.

MERCHANT SHIP REPAIR

The activity includes:

- repair of civilian vessels (warship repair is included in naval shipbuilding), see above;
- ship conversions (lengthening, converting to different use);
- scrapping.

Shipbuilding and repair are closely related activities: a number of ship repair yards have moved into shipbuilding through conversion jobs, or vice versa.

Trends in activity

Internationally speaking, the need to get maximum use of ship time has led shipowners to call on shipyards located near major shipping routes. The main locations for repairs in Southeast Asia for container ships are also getting increasing competition for some lines from Middle Eastern shipyards (Dubai, Bahrain and to a lesser extent, the United Arab Emirates) for oil tankers and from those in Boston or Vancouver for cruise ships. The market share for countries with low labour costs, particular China and Malaysia, is growing. The quality of steel provided (structure condition and strength) is also a criterion in choosing shipyards. However, the flexibility and skill needed for repair work, which is highly varied in essence, leave room for shipyards with high technical skills, particularly for conversion operations.

KEY FIGURES FOR NAVAL SHIPBUILDING

	1999	2000	2001	2002	2003 [1]	2004
Turnover (M€)	60	59	106	67	1,754	2,220
Value added (M€)	21	30	56	36	271 [2]	440 [2]
Employment	626	714	695	631	13,004	12,000 [2]
Number of companies [3]	6	7	9	8	8	8
Level of exports (%)	67.4	45.7	84.3	66.5	24.3	30.3

Sources: Sessi and firms in the sector.
(1) Introduction of DCN following its change of legal status in 2002. Company considered to be 100 % in the branch.
(2) Ifremer's estimation based on companies' data.
(3) Parts of companies doing all or part of their business in this field. Four firms representing 99.4% of sales.

MARINE PROPULSION

The world market for marine power systems was 18 GW (over 20 MW slow speed turbines for large vessels) in 2004. Estimates reach 19.3 GW for 2005 (4.8 billion euros in turnover), and 19.9 GW (5 billion euros) for 2006. Available data indicates the significance of Asian shipyards for this type of equipment, but European manufacturers also have a strong position:

- *In 2004, 164 engines with over 50 MW power were all delivered to shipyards in the Far East. The two world leaders, a German group and a Polish group, together represent about 80% of the market. Their production subsidiaries are set up near the shipyards.*
- *From 2001 to 2004, slow speed (less than 300 rpm) diesel engines of over 30 MW were almost all supplied to shipyards in the Far East, with the exception of a few European yards (source: Diesel & Gas Turbine Worldwide).*

In Europe, ship repair is exposed to competition from low-labour-cost countries: Southern European shipyards (Italy, Spain) are vying with Turkey and Balkan nations; to the north, the Germans and British must cope with the attractive prices of their Polish, Baltic and Russian counterparts.

In France this is a small scale activity. Following a favourable situation in 1997-1999, turnover dropped in 2000-2001, then stabilised until 2004. For the past five years it has been lower than 5% of European turnover. Situations vary greatly from one firm to another. The largest shipyards are having a hard time maintaining their activity, except for one which is specialised in very sophisticated techniques to repair methane carriers. Repair sites for medium-sized ships are growing in number. New markets are opening up with tenders for the maintenance of small military vessels (about 50 m).

Brittany is the top ranking region for this activity, with 36% of the workforce, followed by PACA (Provence-Alps-Côte d'Azur), Nord-Pas-de-Calais and Upper Normandy. 46% of salaried employees in the sector work in these three regions.

Regional distribution of ship repair labour force
Source: Sessi.

2004	Salaried staff
Nord-Pas-de-Calais	280
Picardy	0
Upper Normandy	265
Lower Normandy	68
Brittany	784
Pays de la Loire	140
Poitou-Charentes	s
Aquitaine	s
Languedoc-Roussillon	0
PACA (Provence-Alps-Côte d'Azur)	445
Corsica	0
Île-de-France (Paris area)	s
Non-coastal regions	s
Total	*1,982*
Salaried staff not in breakdown	182
making % of the sector	8
Total for France	**2,164**

* Firms with more than 20 salaried employees. s: not published.

BOAT BUILDING

Boat building comprises the manufacturing of sail boats, rigid or inflatable power boats and windsurf boards, as well as their fitting out, maintenance and repair.

Trends in activity

The United States dominates the world boatbuilding market. Its fleet represents about 80% of the world fleet. Power boats are much more numerous (22.1% of them are inboard motor boats) than sail boats (9.8%). This means that the world fleet of motor boats is twice as large as that of sail boats, whereas in Europe the two fleets are about the same size.

The French boatbuilding industry remains the leader in Europe and ranks second worldwide. Its strong points remain the building of sail boats and inflatable boats, ranking first worldwide on these

KEY FIGURES FOR SHIP REPAIR*

	1999	2000	2001	2002	2003
Turnover (M€)	243	197	186	245	251
Value added (M€)	92	82	67	95	88
Employment	2,511	2,150	1,822	2,599	2,356
Number of companies**	55	51	45	52	49

Source: Sessi (annual survey of companies).
* Repair and conversion of civilian vessels and scrapping. ** Doing all or part of their business in this field.

KEY FIGURES FOR BOATBUILDING*

	1999	2000	2001	2002	2003
Turnover (M€)	640	793	978	1,060	1,086
Value added (M€)	210	237	314	337	342
Employment	5,072	6,174	7,151	7,598	7,705
Number of fractions of companies	52	52	65	69	73

Source: Sessi (EAE).
* Data for the field, related to companies of 20 or more employees.

market niches. The proportion of power boats produced is growing steadily. It is mainly set up between the Loire and Gironde rivers, employing 69.4% of the workforce in the branch.

According to data from the nautical industry federation (FIN), the activity showed a rise of 3 to 4% during the period from 2001 to 2003, compared to 21% recorded annually between 1997 and 2002. This slowdown in activity went along with a slowing of exports, especially in 2003 (-0.9%).

Some 828,000 boats made up the French pleasure fleet in 2004. For the past ten years it has increased by about 2.3% per year. In addition, whereas the active fleet grew by approximately 4 to 5% per year from 93-99, since that time its average annual growth has been 8%. This has been accompanied by a younger fleet age, since the number of new boats registered since 1999 has risen by 22%; the number of sail boats registered during the same period increased by 16%. The two regions of Brittany (24.0%) and Provence-Alps-Côte d'Azur (23.5%) alone represent nearly half of the registrations of new boats, in front of the Languedoc-Roussillon (11.4%) and Pays de la Loire (9.2%) regions.

Outlook

French boatbuilding is very innovative on this segment of capital goods for individual consumers, but it is influenced by trends in household income and is laid open to intense international competition. According to the International Council of Marine Industry Associations Icomia, the world boatbuilding activity, focused around a handful of powerful players and long considered as cyclical, should stabilise with an annual growth rate which will be lower, but steadier than in the past. New markets in Asia are opening up for water sports.

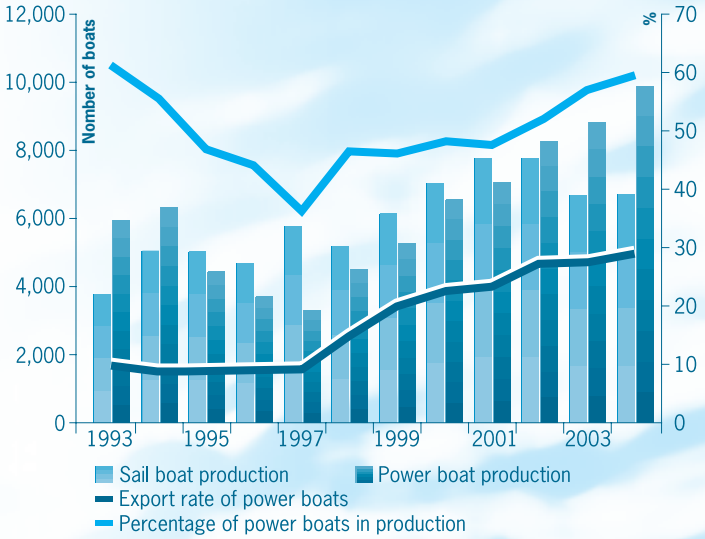
After specialising in sail boats for many years, French firms now find themselves at a turning point in their development. The increasing production of power boats is progressively changing the offer and should make it possible to reach a wider range of clients on international markets.

Regional distribution of boatbuilding labour force*
Source: Sessi.

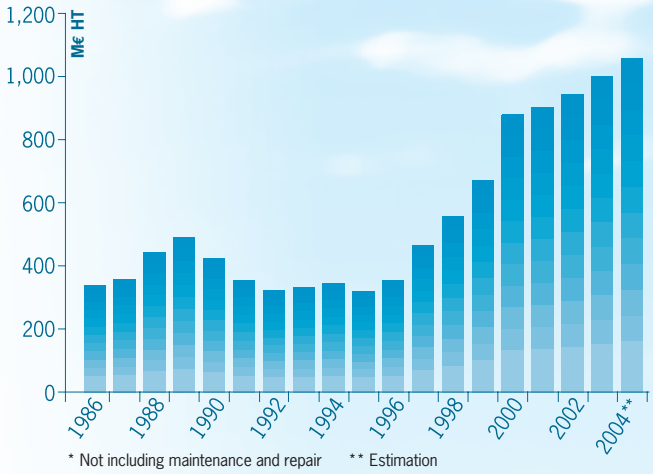
2004	Salaried staff
Nord-Pas-de-Calais	s
Picardy	0
Upper Normandy	0
Lower Normandy	192
Brittany	562
Pays de la Loire	4,147
Poitou-Charentes	1,596
Aquitaine	632
Languedoc-Roussillon	252
PACA (Provence-Alps-Côte d'Azur)	405
Corsica	0
Île-de-France (Paris area)	s
Non-coastal regions	s
Total	*7,786*
Salaried staff not in breakdown	485
making up % of the sector	6
TOTAL for France	**8,271**

* Firms with more than 20 salaried employees. s: not published.

French production of sail boats and motor boats
Source: FIN.

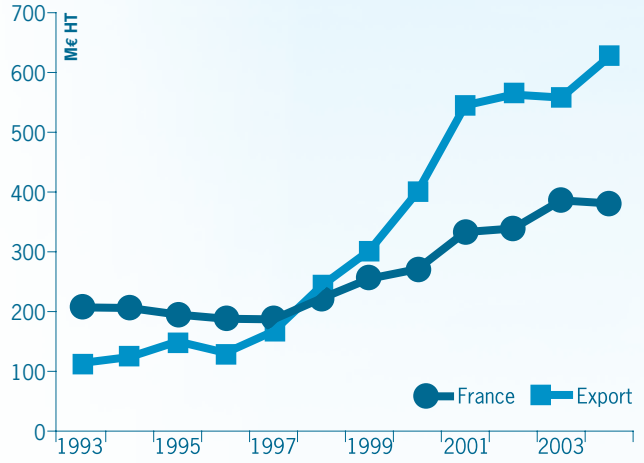


Annual production turnover for pleasure boats*
Source: FIN (branch survey).



* Not including maintenance and repair ** Estimation

French production sales in France and exports
Source: FIN (branch survey).



Maritime civil engineering

THE MARITIME AND INLAND WATER ENGINEERING ACTIVITY COVERS CONSTRUCTION AND ENGINEERING CARRIED OUT AT SEA OR ON INLAND WATERS. THIS INVOLVES BUILDING RIPRAP PROTECTION (NATURAL OR ARTIFICIAL) AND CONSTRUCTING OR REGULATING WATERWAYS (NAVIGABLE OR NOT).

IN THE AVAILABLE DATA, THE "MARITIME" SUBSET OF THIS ACTIVITY IS NOT DISTINGUISHED FROM THE "INLAND WATER" SUBSET. IFREMER HAS ESTIMATED THAT THE FORMER MAKES UP ABOUT 50% OF THE TOTAL ANNUAL TURNOVER OF MARINE AND RIVER ENGINEERING.

Maritime civil engineering (CE) meets a range of objectives:
- for harbours: constructing harbour facilities, breakwaters, quays, piers, jetties, locks, dry docks, bridges, slipways, channel linings;
- for coastal protection: rip-rap, retaining walls, ramparts;
- for the French Army and Navy: coastal defence works;
- at sea: offshore platforms, lighthouses and beacons.

These engineering projects require special techniques and materials. They can also require highly-skilled staff. Along with new constructions in maritime sites (50.6% of the activity in 2003), maritime civil engineering also involves their maintenance and renovation.

It should be noted that maritime CE makes up only a small proportion of public works overall: in metropolitan France in 2003, engineering firms on maritime and river sites produced 1.4% of the annual turnover in civil engineering, according to the statistics used here.

CIVIL ENGINEERING TRENDS IN METROPOLITAN FRANCE

After stable turnover in metropolitan France 2001 and 2002, a record 231 million euro turnover was recorded in 2003, making a rise of 33%. This upswing in activity is partly due to work carried out for the new container harbour at Le Havre (Port 2000), whose first phase amounted to 517 million euros. Indeed, since 2002, Upper Normandy is where the largest amount of maritime civil engineering work was done in metropolitan France (16% of maritime works in metropolitan France in 2002 and 2003, compared to 7% in 2001), outstripping even the PACA in southern France in 2002.

Employment rose slightly (+8% in 2002 and +3% in 2003) after a long period of stagnation between 1998 and 2001. While 66.3% of employees in the entire CE sector in 2001 were workers, maritime CE employed slightly more highly skilled workers on average: workers made up 59.1% of its total workforce in 2003.

In metropolitan France, French marine and inland CE companies' main customers are the public sector (local authorities, State) for 50.1% of production, private sector firms (21.6%) and private individuals (5.2%).

TRENDS IN ACTIVITY

In 2001 and then 2002, turnover outside of metropolitan France and DOM-TOM overseas "départements" and territories accounted for respectively 83.3% and 63.3% of the total. In 2003, some French enterprises changed status, leading to a revised area being taken into account in the professional survey and a nominal drop (nearly 18%) in the branch's contribution to exports for all French civil engineering firms. The branch remains a big exporter all the same.

OUTLOOK

As concerns the activity in metropolitan France, the first phase of work for Port 2000 (four berths out the twelve planned) ended in early 2006. The second phase should enable two berths to be put into service for 2008-2009.

The activity should continue at a good pace, with the launching of the Fos2XL project in late 2005. The cost of building its infrastructures is estimated at 153 million euros: two new container terminals in the autonomous harbour of Marseilles will be commissioned in 2009.

KEY FIGURES FOR MARINE ENGINEERING IN METROPOLITAN FRANCE [1]

	2000	2001	2002	2003	2004
Turnover (M€)	932	998	494	277	265
in metropolitan France	184	219	217	232	235
outside of metropolitan France [2]	748	779	276	46	30
Value added [3] (M€)	419	449	222	125	119
Employment [4]	1,040	1,061	1,150	1,205	1,374

Source: National federation of public works (FNTP).
(1) On the basis of maritime CE making up 50% of all marine and inland engineering (Ifremer estimation).
(2) The figures are based on statistics which distinguish work carried out in metropolitan France and that done overseas. The latter includes engineering work in the French overseas dominions and territories and abroad.
(3) Value added rate estimated to be 45%.
(4) In metropolitan France.

Submarine cables

DEEP SEA SUBMERGED TELECOMMUNICATION CABLES TRANSMIT DATA AND TELEPHONE COMMUNICATIONS. THIS ACTIVITY COVERS MANUFACTURING, LAYING AND MAINTENANCE OF THESE CABLES. SALES AND MARKING SERVICES ARE ALSO INVOLVED IN SETTING UP PROJECTS AND PROMOTING THEM.

HOW THE ACTIVITY IS ORGANISED

There are two types of cables:
- very long-haul cables which can cover thousands of kilometres with powerful transmission capacities. They use submerged repeaters, equipped with optical amplifiers to compensate for loss along the cable;
- so-called unrepeatered systems, with no submerged active electronic components. These are much cheaper than those mentioned above, can cover up to 400 km and be linked to repeatered long-haul networks.

Industrially speaking, the submarine cable stream includes:
- the feasibility study: a seafloor survey (essential for the cable's useful life) performed by a specialised vessel, underwater route surveys;
- engineering: protection method, network architecture design (capacity, connections);
- manufacturing of cables;
- laying and maintenance, which require the use of cable-laying vessels. This can entail jetting (protecting the cables by burying them) performed by remotely operated vehicles.

MARKET TRENDS

Until the late 1990s, with the development of telecommunications and the Internet, the submarine fibre-optic cable market grew significantly. From 150 to 200,000 km of cables were produced each year. Each of these specific markets (long haul repeatered and medium haul unrepeatered systems) features a small number of enterprises involved.

The submarine cable industry has had several peaks in its activity, which corresponded to the arrival of new technologies. Overcapacity for telecommunication equipment brought about a drop of nearly 80% in the submarine telecom market worldwide between 2000 and 2002. Thus, a large part of this market is now devoted to maintenance.

In 2005, a new generation of these DWDM systems (see glossary) made it possible to upgrade the Sea-Me-We 3 (linking northern Europe to southeast Asia and Australia, via the Middle East), to create the Sea-Me-We 4 networking linking 14 countries, from Singapore to France, and to start deploying the new submarine FibraLink optical network in the Caribbean Sea.

KEY FIGURES (MANUFACTURING, LAYING AND MAINTENANCE OF UNDERWATER CABLES)

	1999	2000	2001	2002	2003	2004
Value added (M€)	232	270	223	44	-	-
Employment	1,597	2,168	1,916	1,507	1,190	916

Source: data from companies and Ifremer estimations.
-: very low.

Offshore oil and gas-related industry

FRENCH INDUSTRIAL FIRMS OR FOREIGN FIRMS WORKING IN FRANCE PLAY AN ACTIVE ROLE IN SUPPLYING OIL AND GAS EQUIPMENT, FACILITIES AND SERVICES IN EXPLORATION – PRODUCTION, REFINING AND PETROCHEMICAL FIELDS. THIS BRANCH DOES NOT INCLUDE ACTIVITIES RELATED TO DISTRIBUTION AND USE OF HYDROCARBONS, OR THEIR INTERNATIONAL TRANSPORT. WORK OR FACILITIES CONCERNING TRANSPORT SUCH AS LAYING PIPELINES OR BUILDING METHANE CARRIERS ARE TAKEN INTO ACCOUNT.

TRENDS IN ACTIVITY

The French oil-related sector ranks second to that of America for exports. Turnover achieved aboard grew for 2004, with an export value of 16.2 billion euros, making 95% of the total. For the offshore sector, we estimate that 100% of production is exported (source: IFP).

The activity of companies is closely linked to the price of crude oil and gas, as well as to oil investments for exploration and production. Current tensions on the world oil market (global demand for crude has grown over the past three years at a rate of 2.4% per year on average) explain how this branch has developed.

Since 2002, motivated by the rise in oil and gas prices, operators have increased their investment budget for exploration and production (+5% in 2003, +11% in 2004) reaching a record 125 billion dollars in late 2004. With the price per barrel hitting record highs ($53 on average over the first 8 months of 2005), oil investments should continue to grow in 2005, according to the IFP's predictions, with an estimated 148 billion dollars, and remain strong in 2006 (185 billion dollars). These figures are given without taking Russia and China, which represented 1/6 of world investments in 2004 all the same, into account. (25.3 billion euros).

The growth rate, converted into euros, of the French oil and gas-related sector slowed down slightly in 2002 (+1.6%). Following a drop of the dollar, down nearly 10% with respect to the euro, this trend continued in 2003 with a 2% progression in turnover (15.7 billion euros). The year 2004 was marked by faster growth, leading to a record turnover of 17 billion euros (+8%). A significant rise, which could reach 12%, is foreseen for 2005.

After a sudden burst of growth in 2001 and then in 2002 (5.8 billion euros), offshore turnover showed a slight drop in 2003. But it then rose again by 4% in 2004, to 5.7 billion euros. The offshore sector, which accounted for 34% of French oil and gas-related business in 2004, resumed faster growth by about 7.5% in 2005 with a turnover of 6.1 billion euros.

The gas-related industry is another strategic segment where French companies are present. In the context of growing worldwide demand for energy, there has also been a sharp rise in the demand for natural gas. 2004 was marked by significant increases in gas production and consumption (+3.3%), combined with a rise in the price of natural gas. The Henry Hub average monthly gas price in the United States reached 5.85 dollars/million Btu.

Naturally, this upturn in activity affected the methane carrier market, 2004 being a very favourable year, with orders for 113 vessels with a larger average size. The countries which are currently competitive on the LNG carrier market are Finland, Japan, and above all South Korea, whose shipyards enjoy a market share of 75% of new orders. In this context, French shipyards have sound advantages in terms of "membrane" technology (used on 80% of the LNG carriers on order in South Korea) and diesel-gas-electric propulsion systems.

KEY FIGURES FOR THE OFFSHORE OIL-RELATED SECTOR

	1999	2000	2001	2002	2003	2004	2005 (1)
Turnover (M€)	3,600	3,700	5,200	5,800	5,500	5,700	6,100
Value added (M€) (2)	1,235	1,198	1,691	1,776	1,804	1,869	2,001
Employment (thousands)	17.5	17	24	25.2	25.5	25.5	25.8

Source: French petroleum institute (IFP).
(1) Forecast.
(2) IFP estimation for the oil-related sector in 1999. Ifremer estimation from 2000 on.

COMPANIES AND EMPLOYMENT

Following a recent mergers, groups in France are increasingly present in the segments of engineering, fittings and services.

70% of the overall turnover in 2004 can be attributed to upstream operations (exploration and production) and 30% to downstream ones (refining and petrochemicals). The upstream service and fittings segments (each amounting to 31% of the overall turnover) are the largest. Next come downstream equipment and services which each account for 12 to 13% of turnover.

After stagnating at around 50,000 jobs in 2000, the French oil-related industry labour force began to rise again with an average growth of 6% per year in the period from 2000 to 2004, reaching 65,000. In the offshore sector, the workforce progressed by 50% between 2000 and 2003 before stabilising at 25,000 employees in 2004.

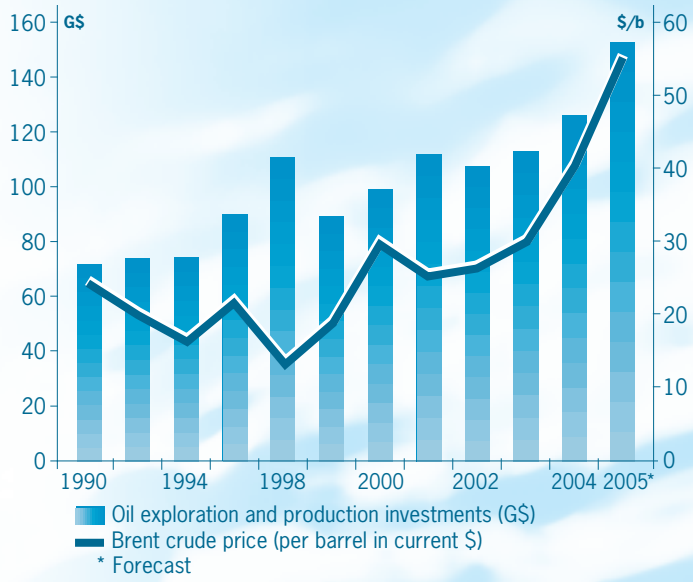
OUTLOOK

For 2005, firms in the oil-related industry present in France foresee an increase of 12% in their turnover, with a continuing upward trend in their activity in 2006. Thus, the IFP estimates that investments in exploration and production (including Russia and China) should continue to grow by 13% in 2005 to reach 170 billion dollars. Growth should continue in 2006, with a record-breaking price per barrel predicted.

As regards the gas-related industry, natural gas consumption has constantly risen (+3.3% in 2004), accounting today for nearly a quarter of world energy consumption, almost equal to coal. World production also recorded an increase of 2.8% in 2004 to 2,691 billion cubic metres. Therefore, the LNG trade is booming, especially with greater distances between consumer and producer regions. The same trend is seen in France, with a new LNG carrier terminal to be commissioned in 2007 (Fos Cavaou at Fos-sur-Mer) and the progressive replacement of the fleet of steam turbine vessels by ships with gas turbines.

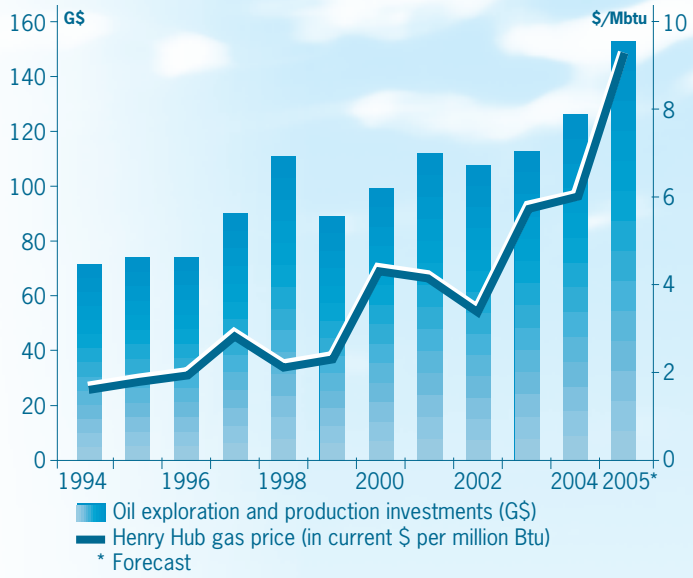
E&P investments and Brent crude price

Sources: IFP, Ufip, Direm.



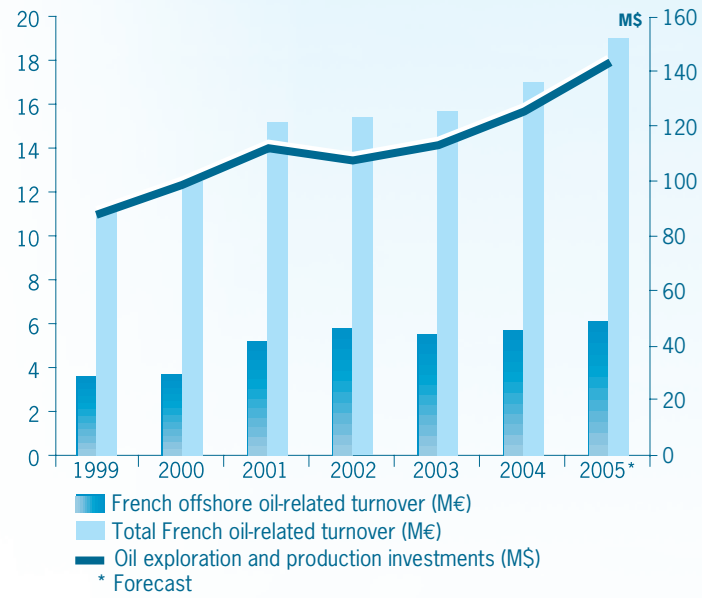
E&P investments and Henry Hub gas price

Sources: IFP, Ufip, Direm.



Turnover (total sales) of French oil-related industry

Source: IFP.



Coastal tourism

COASTAL TOURISM COVERS A WIDE RANGE OF GOODS AND SERVICES FOR VERY DIFFERENT TYPES OF CONSUMERS, BROUGHT TOGETHER BY CONSUMER'S COMMON GOAL OF TOURIST ACTIVITY. IN FRANCE THE OVERALL TURNOVER FOR TOURISM IS EVALUATED ON THE BASIS OF SPENDING BY DOMESTIC (RESIDENT) AND INBOUND (NON-RESIDENT) TOURISTS DURING THEIR STAY IN FRANCE.

GENERAL DATA

Coastal tourism is by far the largest sector of the marine and coastal economy in terms of turnover and employment. It is one of the major sectors of the French tourist economy. Average stays on the coast are longer than those in cities, mountains and the countryside. It remains the top tourist destination in terms of number of overnights and ranks second for the number of stays. It accounts for slightly more than one quarter of annual tourist spending.

TOURIST SPENDING TRENDS

Tourist consumption includes expenditures for accommodation, catering, recreation, miscellaneous purchases, other services, transportation and package offers (all-in spending for tourist stays in France).

In 2004, the tourist environment in France has improved with respect to the previous two years:

- in 2004, the French gross domestic product rose by 2.1% in volume after low growth (+0.8%) in 2003; private or household consumption followed this mass movement and was up 2.1% overall in 2004 from 2003;
- according to the initial estimates from the World tourism organisation, international tourism showed exceptional growth of 10% in 2004, following average annual growth of 4.3% between 1990 and 2000 and three difficult years from 2001 2003 (-1.7% in 2003).

For France, after the 2003 tourist year in a relatively unfavourable general climate, dynamic growth returned in 2004: +5.7% in total number of non-business stays and +1.9% in the number of overnights (these were respectively +0.8% and +0.1% in 2003).

The trend of the past two years to travel more often and stay a shorter time continued in 2004, with a rise in the number of stays combined with a drop in their average duration. This means that the French are making significantly more short stays (+8.7%), especially when they travel abroad (+13.2%). Trips abroad make up only a small part of travel by the French overall (10.8% of stays and 15.9% in nights).

Since 2001, the share of non-commercial accommodation, especially family related, has risen steadily.

THE IMPORTANCE OF THE COAST FOR TOURISM IN FRANCE

Coastal tourism remains a seasonal activity lasting from two to four months a year, depending on whether the coasts in question are in northern or southern France. From 2003 to 2004, the number of overnight stays by domestic and inbound visitors on the French coast remained stable on average (+0.2%).

The coast is the top ranking tourist destination, attracting 35% of total nights, but it only accounts for slightly over one quarter (26%) in non-business tourist consumption. With 39% of tourist spending done by a foreign clientele, the coast makes a vital contribution to the economy in coastal areas.

KEY FIGURES FOR COASTAL TOURISM

	1999	2000	2001	2002	2003	2004***
Tourist spending	18,286	19,309	19,525	20,658	21,145	20,919
Value added (M€)*	7,680	8,110	8,201	8,676	8,881	8,786
Employment**	190,402	196,334	205,757	221,145	236,975	na

Sources: Insee, Tourism directorate/Tourism accounts, Unedic.

* Ifremer estimation based on tourist operating accounts and Unedic data. Value added rate estimated at 42%.

** Jobs in activities which are characteristic of tourism, including salaried and non-salaried employees.

*** Provisional data.

na: not available.

Breakdown of tourist spending and the number of overnights by area in 2004

Sources: Tourist directorate/Key figures for tourism, 2005.

%	Spending	Overnights
City	39.2	29.2
Coast	26.3	35
Countryside	19.1	28.2
Mountains	15.4	7.5

For tourism by French residents, along with the mountains and lakeside holidays, French people stay longest at the seaside. 62% of stays exceed three nights, as opposed to 45% when all geographical areas are taken together. In fact, the seaside is the area where the average length of stay is longest (eight nights). Over a five year period, however, a slight drop in the average length of stay for most tourist areas has been seen.

In terms of spatial distribution, the seaside ranks third for overnight stays for short visits (30.4 million overnights), after the countryside and cities which are respectively number one and two domestic destinations in France for non-business trips. The seaside is the leading area for overnights on long stays (240.7 million nights).

EMPLOYMENT

In the key figures given above, coastal tourism employment is estimated using a pro rata of total tourist spending.

77% of jobs in tourism are in accommodation and catering. The other employment is mainly found in cafés, travel agencies, tourist information offices, facilitation and thalassotherapy. Other jobs are linked to tourist activity, but are not taken into account here in the "characteristic tourist activities". These are indirect and induced employment in shops, transportation, health care and waste treatment activities in particular.

SEASIDE TOURIST CAPACITY AS SEEN THROUGH ACCOMMODATION

Non-commercial accommodation is a very important form, which proves the key role played by holiday homes. Not only does it contribute significantly to urban and rural tourism, this type of accommodation is also behind the majority of overnight stays on the coast. In this area, the types of paying accommodation most used are camping and rentals. Generally speaking, holiday homes are mainly located on the coast and in the mountains.

In 2004, nearly 20% of hotel facilities were concentrated in the coastal area, whether in hotels (19.3%) or guest rooms (18.5%); coming second to cities, where 55.3% of rooms are supplied. Two-star and three-star hotel rooms respectively account for 43% and 30% of the seaside offer. Half of these hotels are located along the Mediterranean.

For open air accommodation in France, nearly half (48%) of short stay campsites are located at the seaside. The coast attracts many campers, with 53.2 million overnights (56% of total nights outdoors) including 70% of domestic visitors.

Average length of non-business stays by domestic visitors by geographic area

Sources: Tourism directorate, TNS Sofres, SDT monitoring of domestic tourist travel.

number of overnights	1999	2000	2001	2002	2003	2004
Seaside	8.2	8.2	8.1	8.0	7.9	7.9
Mountains	7.5	7.4	7.4	7.4	7.1	7.0
Countryside	5.3	5.2	5.0	5.0	5.0	4.8
City	4.7	4.6	4.6	4.6	4.4	4.5
Lakeside	7.3	7.8	7.5	7.9	7.3	7.3
Other	5.8	5.9	5.4	5.7	5.4	6.0

Breakdown of accommodation by tourist area in 2004

Sources: Tourism directorate, Insee, regional partners.

%	City	Coast	Rural	Mountains	Total
Rated rooms	55	18	16	11	100
Campground sites	5	48	33	14	100

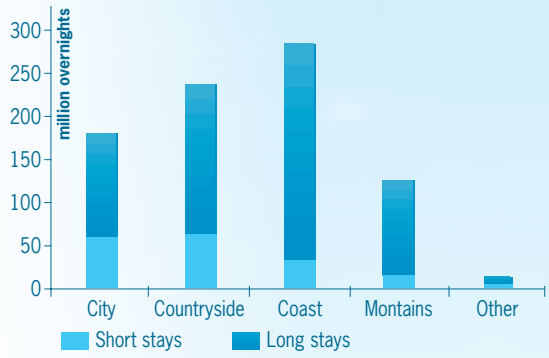
Breakdown of rated rooms and hotels by seafronts, in late 2004

Sources: Tourism directorate, Insee, regional partners.

%	Tourist hotels	Rooms
North (Normandy, Picardy, Nord-Pas-de Calais)	16	16
Atlantic (Brittany, Pays de la Loire, Poitou-Charente, Aquitaine)	39	33
Mediterranean (Languedoc-Roussillon, PACA, Corsica)	45	51

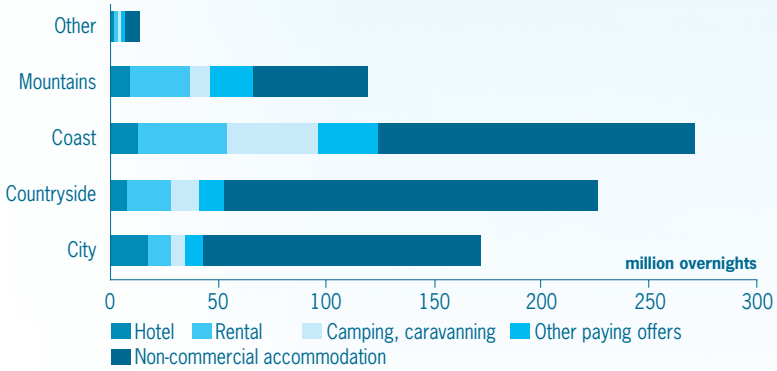
Overnight non-business stays of domestic visitors by geographic area

Sources: Tourism directorate, TNS Sofres, SDT monitoring of domestic tourist travel.



Number of overnight domestic stays by type of accommodation in 2004

Sources: Tourism directorate, TNS Sofres, SDT monitoring of domestic tourist travel.



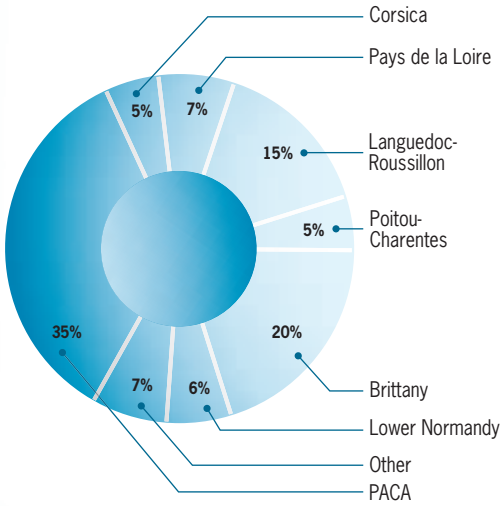
Number of visitors and jobs in tourism in the DOM-TOM in 2000 and 2003

Sources: secretary of state for Tourism, Iedom, Insee.

	2000		2003
	Number of tourists	Tourist-related employment	Number of tourists
Guadeloupe	602,815	20,000	650,000
Martinique	526,290	10,093	453,000
French Guyana*	63,300	1,900	
Reunion island	430,000	6,797	432,000
New Caledonia	109,587	3,364	101,983
French Polynesia	252,000	7,325	211,900**
Mayotte	23,000	300	23,000
Saint-Pierre-et-Miquelon	14,842	150	31,144***

* Year 1998 for number of tourists ** Data for 2004 *** Data for 2002.

Breakdown of mooring capacity in marinas in 2001



Number of visitors in DOM-TOM by tourist categories

Sources: Iedom, Guadeloupe islands committee, Martinique tourist committee, Reunion island tourist committee, French Polynesia statistics institute, ISEE New Caledonia.

	2000	2001	2002	2003	2004
Tourists on stays					
Guadeloupe	414,682	411,685	520,172	506,698	na
Martinique	526,290	460,383	446,689	453,160	470,890
Reunion island	411,271	407,037	370,622	417,600	414,914
Mayotte	22,928	24,000	35,000	22,500	na
New Caledonia	61,008	49,844	49,008	37 710	22,400
French Polynesia		177,180	169,944	-	210,000
Saint-Pierre-et-Miquelon	23,585	24,171	26,024	-	-
Tourists on cruise (not including yachtsmen)					
Guadeloupe	392,318	361,715	204,828	195 102	149,800
Martinique	289,557	202,461	200,847	268 542	159,416
New Caledonia	48,579	50,671	54,925	64 273	77,115
French Polynesia	-	50,478	19,086	-	1,900
Saint-Pierre-et-Miquelon	3,242	2,474	5,120	na	na

na : not available.

TOURISM IN THE FRENCH OVERSEAS "DÉPARTEMENTS" AND TERRITORIES

DOM-TOM hotel capacity is more than 20,000 rooms, approximately 60% of which are located in the Caribbean. French overseas locations welcomed a total of 2 million tourists in 2000. Currently, tourism is a vital activity for the DOM overseas "départements" but is still in the development phase in the TOM overseas territories (more developed in New Caledonia and Polynesia). Cruise tourism has increased above all in the Caribbean. These are the cruise areas attracting the most visitors worldwide, but currently they have to cope with Central and Latin America's market breakthrough, developing high-calibre harbour facilities which suit the North American clientele.

KEY FIGURES FOR THE PLEASURE BOATING SECTOR IN FRANCE IN 2003

Sources: FIN, AFIT, FFPP, DTMRF.

Yachting fleet*	803 711
including sailboats	178 711
including power boats	625 000
Number of marinas**	370
Turnover of marinas (M€)**	162
Number of spaces	226 000
in harbours	165 000
on moorings	61 000
Overall occupation rate (including Dom-Tom)***	94 %
Number of boat building and repair firms	184
Turnover of boat building and repair (M€)	944
Labour force in boat building and repair	9 626
Total employment in water sport industry	46 000
Total water sport industry turnover (incl. building and sail of boats and fittings and equipment) (M€)**	2 800

* As of 31 August 2004, besides 29,559 vessels: other means of propulsion, or not indicated.
** Data for 2004 *** Data for 2001

ASSESSMENT OF THE PLEASURE BOATING FIELD

With nearly 4.5 million yachtsmen in France, pleasure boating has shown sustained growth in the number of boats registered, reaching about 803,000 in 2003 (nearly a quarter of which are sail boats). French marinas have an activity of about one million calls in port, corresponding to 5 million overnights, making approximately 200 million euros spent during calls (source: Tourism directorate).

This increase in the fleet, estimated at 7,000 boats per year, is running up against the saturation level of harbour capacity, according to a study made in 2003 on behalf of AFIT, FIN, FFPP and the DTMRF (ministry in charge of Amenities and Tourism). The shortage of berths and moorings was estimated by port authorities in 2000 at 54,000. One third of them is found in the PACA region, 25 % on the Atlantic coast and 16 % in Brittany.

Shipping

SHIPPING INCLUDES MERCHANT FLEET AND SEA PORT ACTIVITIES. BY FLEET, WE MEAN THE ACTIVITIES INVOLVING TRANSPORT OF GOODS AND OF PASSENGERS. INLAND SHIPPING IS NOT INCLUDED. THE SEAPORT SECTOR COVERS GENERAL HARBOUR ORGANISATION AND OTHER AUXILIARY SERVICES. MILITARY HARBOURS ARE NOT INCLUDED HERE.

THE SIGNIFICANCE OF MARITIME SHIPPING FOR TRADE OF GOODS

Without bringing the role of shipping down to France's foreign trade alone, we must however assess its scope.

France's foreign trade outside of the European Union (EU) is predominantly seaborne. Shipping plays an important part in exchanges with the EU as well, being the second mode of transport for imports from countries outside of the EU-15.

However, the maritime share of trade flows has decreased on average over the medium term, albeit unequally with respect to the trade regions and the direction of flow. Goods transported by sea have relatively low unit values (large amounts of raw materials and heavy goods). However this shows a relative rise in trade with EU-15 and for imports from non-EU countries, most likely reflecting the increasing scale of containerisation and maritime trade of general cargo worldwide (see below).

MERCHANT SEA PORTS IN FRANCE

Ports and how they are organised

French decentralisation laws, in particular that of 22 July 1983, distinguish between three types of ports: seven autonomous ports (PA), 23 ports of national interest (PIN) and 532 decentralised ports. The latter include 304 merchant and fishing harbours and 228 marinas.

Modal distribution of goods imports and exports

Source: ministry in charge of Transport/SESP/National transport accounts in 2004.

	Tonnages		Values	
	1993	2004	1993	2004
Eu 15 imports (*) (**)				
road	55.9	56.0	74.8	71.6
sea	30.4	21.4	16.6	16.1
rail	6.3	5.7	4.4	4.5
fluvial	3.2	2.5	0.5	0.5
air	0.0	0.0	2.8	3.2
other	4.2	14.3	0.9	4.1
Eu 15 exports (*)				
road	48.9	50.8	65.5	66.6
sea	25.5	25.5	17.1	17.5
rail	12.7	8.6	5.9	5.1
fluvial	10.6	7.5	1.1	0.8
air	0.0	0.0	3.0	3.3
other	2.3	7.5	7.4	6.7
Non-Eu 15 imports				
sea	84.2	75.9	41.0	39.0
road	3.6	6.6	20.7	28.9
rail	0.4	0.5	0.9	0.5
fluvial	0.5	1.7	0.2	0.2
air	0.1	0.2	23.7	21.2
other	11.1	15.1	13.4	10.2
Non-Eu 15 exports				
sea	76.5	70.8	45.5	38.1
road	11.1	20.0	13.9	18.9
rail	3.2	2.6	1.4	1.4
fluvial	1.7	1.7	0.1	0.0
air	0.4	0.7	26.2	29.1
other	7.0	4.2	13.0	12.4

* Road links with Britain are classified as seaborne.
** Exceptional water imports through fixed pipes in 2004.
Tonnage and value of the "other" line of EU-15 imports have thus sizeably increased.

KEY FIGURES FOR PORT ORGANISATIONS*

	1999	2000	2001	2002	2003	2004
Turnover of autonomous ports (M€)	493	506	496	512	570	585
Turnover of ports of national interest (M€)	210	202	202	206	252	256
Total value added (M€)	523	529	518	524	657	659
Employment**	5,504	5,482	5,426	5,428	7,202	7,198

Source: ministry in charge of Transport/DTMRF.
* PA and PIN in metropolitan France up to 2002, including overseas "départements" (DOM) from 2003 on.
** Only PA up to 2002; PA and PIN from 2003 on. Provisional figures for 2003 and 2004.

Direct harbour employment (metropolitan France and overseas)
Sources: DTMRF, survey of autonomous ports, maritime services and Customs services.

Unit: Labour force	2003			2004		
	PA	PIN	Total State harbours	PA	PIN	Total State harbours
State services including Customs staff	1,404 532	2,276 394	3,680 926	1,396 529	2,252 392	3,648 921
Port organisations*	5,464	1,802	7,266	5,389	1,872	7,261
Harbour professions**	22,443	5,944	28,387	21,025	6,120	27,145
Including: active dockers	*3,423*	*1,105*	*4,528*	*3,348*	*1,071*	*4,419*
*pilotage****	*530*	*190*	*720*	*517*	*206*	*723*
*boatage****	*347*	*412*	*759*	*376*	*403*	*779*
*towage****	*708*	*254*	*962*	*698*	*259*	*957*
Total	**29,311**	**10,022**	**39,333**	**27,810**	**10,244**	**38,054**

* Area taken into account is slightly different than that for key figures.
** Pilotage, towage, boatage, handling (not including stevedores), shipping companies, shipping agencies, brokerage, transit.
*** Source is different from that for key figures.

KEY FIGURES FOR SERVICES TO VESSELS

Turnover (M€)

	2002	2003	2004
Boatage	60	50	49
Pilotage	95	95	98
Towing	95	100	99

Labour force

	2002	2003	2004
Boatage	770	780	780 including 490 seamen
Pilotage	710	730	720 including 610 seamen including 330 pilots
Towing	960	960	955 including 850 seamen

Source: DTMRF.

The law 2004-809 of 13 August 2004 concerning local liberties and responsibilities set out the various jurisdictions for creating, developing and operating merchant harbours: to the State for autonomous ports (PA), to regions for other merchant ports, to départements (≅ counties) for fishing harbours and to towns for harbours whose main activity concerns pleasure craft. Thus, this law has transferred the management of ports of national interest (PIN) run by the State until now, to local and regional authorities. This transfer of jurisdiction will be complete on or before 1 January 2007. The law provides for a few exceptions, particularly for a few overseas PIN (Fort-de-France, Dégrad-des-Cannes, Le Port-Réunion) which will remain non-autonomous ports under the authority of the State.

The PA seaports are: Bordeaux, Dunkirk, Guadeloupe, Le Havre, Marseilles, Nantes-Saint-Nazaire and Rouen. The area taken into account will change, following the governmental decision in 2004 to give the port of La Rochelle the status of PA. For the period in question, this chapter is based on the classification which existed before the decision in 2004.

PA harbours handled 77.5% of goods shipped by sea in 2004. PIN harbours ensure approximately 20% of goods tonnage, 46% of general cargo and about 85% of passenger traffic.

Public operators

The State services ensure harbour policing and security, maintain and operate the basic port facilities, carry out necessary upgrading and extension work. The harbour master's office is under the public authority. It is in charge of coordinating movements and berthing of vessels inside the harbour; the navigational assistance service, whose mission is to ensure safety of shipping at sea and when approaching the coast, and to help rescue people and property; the harbour police and Customs services.

The port authority federates the actions of the harbour community and promotes the harbour in terms of marketing. It is also responsible for financing public facilities, landside storage areas and warehouses, as well as operating them, or renting them to stevedoring services and harbour operators.

Other harbour stakeholderss

Ship-related auxiliary professions

The following auxiliary professions are accounted for here:
- pilotage, public services organised by the State. The principle of pilotage regulations is that it is compulsory for all vessels. Only those ships whose overall length is under a certain limit, or those assigned to harbour improvement, maintenance or supervision, or rescue and beacon ships, are exempted;

KEY FIGURES FOR PORT HANDLING OPERATIONS

	1999	2000	2001	2002	2003
Net turnover (M€)	780	852	824	778	816
Net value added (M€)	337	351	352	358	353
Employment*	5,261	5,200	4,791	4,734	5,119
Number of companies	124	125	117	128	131

Source: ministry in charge of Transport/SESP (EAE).
* Salaried and non-salaried staff (revised data).

- towage and boatage are optional commercial services under private contract, carried out in the public domain by companies which are usually governed by private law, but whose provisions have a certain character of public service, taking a direct part in safety and port operations. Contrary to pilotage dues, boatage dues are freely set, since a ruling in 1986.

Other professions related to vessels comprise the chartered shipbroker, the ship's consignee, the shipping agent, the interpreting broker and the ship conductor.

Direct employment linked to harbours, involves a labour force of slightly over 38,000 people. There is an extremely wide range of port facilities and services. These include not only the port authority functions but also the auxiliary professions related to vessels and to goods.

Auxiliary professions related to goods

Auxiliary professions working with cargo include the forwarding agent, the Customs broker, the goods broker and the cargo consignee.

Port handling contractors conduct loading and unloading operations. They use tools (cranes and gantry cranes) which either belong to them or are rented to them by the port authority, with or without the staff to operate them. There can also be options combining private and public operators. In accordance with 1992 regulations, the majority of stevedores receive monthly salaries from handling firms.

Dredging in harbours under State jurisdiction

Dredging is a significant part of major harbour construction and development operations and determines the size or draught of ships using the port.

There are two types of dredging operations: maintenance and new construction.
- the maritime port laws stipulate that dredging for maintenance in the main merchant harbours (metropolitan PA, and PIN harbours) fairways is financed by the State. Routine dredging operations are performed by port authority staff. The dredges belong to the economic interest group called Dragages-Ports, set up in 1979 between the State and metropolitan maritime PA harbours. Some ports occasionally subcontract out to other ports or, as Dragages-Ports itself, to private enterprises;
- creating new channels and fairways is an occasional activity, done by private firms (often foreign) mainly contracted by the port authorities.

Volumes dredged annually in State ports
Source: EIG Dragages-Ports.

Unit: million m³	Sand	Silt	Total
Estuary harbours	6.50	18.60	25.10
Coastal harbours	1.20	5.00	6.20
Total	**7.70**	**23.60**	**31.30**

Dredging activity indicators in France
Source: EIG Dragage-Ports.

	1999	2000	2001	2002	2003	2004
Operating cost of public fleet (1)	57,442	58,279	56,578	52,993	59,372	64,821
Work done by companies (2)	3,942	6,173	4,210	7,465	6,956	7,548
Seamen employed by ports (dredging, hydrography, safety) (3)	662	627	587	596	536	508

(1) Rental of machines belonging to Dragage-Ports + seamen's salaries (port staff) + stores and misc. expenses for machines covered by ports. A very large part of these costs involve maintenance work.
(2) Private companies.
(3) Including 440 dredging staff in 2000.

FRENCH SHIPPING AND THE INTERNATIONAL CONTEXT

French merchant fleet and companies

Although it is true that French companies have shown growth (one shipowner has ranked third worldwide since 2005 in terms of shipping capacity), the merchant fleet flying the French flag ranks 27th worldwide in terms of capacity. From 798 vessels in 1962, this went to 514 in 1975 and has hovered around 210 ships since 1995. Over a short period the number has risen slightly, with 212 vessels on 1 January 2005 for a total capacity of 6.9 million deadweight tons (dwt), compared to 206 vessels with 6.2 million dwt one year earlier. Over a longer term, capacity has risen (4.2 million dwt on 1January 1998).

As in many developed industrial countries, French firms commission a large number of vessels under third-country flags. Taken together as of 1 January 2002, there were 54 vessels over 100 gross tonnage (grt) with a total capacity of 1.2 million dwt; mostly limited to a few types of ships: ro-ro vessels, container ships, bulk carriers, tankers and ferry boats. However, the total number of French-owned ships thus corrected remains small within the world fleet (see below: International context).

KEY FIGURES FOR SEA AND COASTAL TRANSPORT*

	1999	2000	2001	2002	2003
Turnover (M€)	3,916	4,954	5,039	5,255	5,515
Value added (M€)	569	593	649	749	855
Employment**	11,562	12,272	12,595	12,046	13,447
Number of companies	384	458	418	475	484

Source: ministry in charge of Transport/SESP (EAE).
* Figures have been revised since previous edition.
** Salaried and non-salaried staff (full time equivalents).

Merchant fleet flying the French flag as of 1 January 2005*
Source: DTMRF.

Type	Number	dwt **
Liners	5	11,279
Ferries (passenger ro-ro)	36	122,189
Passenger launches	22	1,457
Chemical tankers	9	76,754
Other tankers	2	18,879
Bulk carriers	2	171,904
Other multi-purpose dry bulk carriers	5	136,880
Full container ships	19	981,963
Specialised carriers	5	7,881
Ro-Ro vessels	24	68,917
Cargo ships	25	24,943
Other types of vessel (research)	1	4,871
Oil tankers	47	4,954,612
Liquified gas tankers	10	346,785
Total	**212**	**6,929,314**

* Vessels over 100 grt, only fully owned.
** dwt: deadweight; grt: gross (registered) tonnage (see glossary).

Specialised French fleet as of 1 January 2004
Sources: ministry in charge of Transport and the Sea/CAAM.

Type	Number	Capacity (grt)
Ferry boats	36	9,388
Passenger vessels: islands and estuaries	189	33,925
Passenger launches (craft for outings)	885	28,701
Blue ocean vessels (research)	60	49,243
Sea-going barges	11	253,745
Platform supply vessels	30	19,227
High sea tugs	46	15,992
Coastal/harbour tugs	156	17,732
Pilot boats	77	1,956
Inshore pilotage boats	158	1,424
Pontoons	168	33,773
Suction dredgers	53	46,033
Motor launches/craft for various services	2,057	17,794
Other	2,852	4,339,412
Total	**6,778**	**4,868,345**
Including: TAAF	249	3,735,378
DOM-TOM (French overseas administrative "départements" and territories)	498	59,070

French seagoing labour force (1) for shipping (2)
Situation as of 31 December 2003
Sources: ministry in charge of Transport and the Sea/DAM.

	1980	1990	1995	2000	2002	2003
Officers	7,370	3,242	3,030	2,833	2,981	2,983
Ratings	15,520	7,502	6,552	6,595	6,816	6,757
Total	**22,890**	**10 744**	**9,582**	**9,428**	**9,797**	**9,740**

(1) French and EC seafarers employed by the main French shipowning companies.
(2) Maritime (except for micro-short-sea shipping and professional yachting) and port activities (towing, boatage, dredging) not including pilotage.

Breakdown of labour force* by type of activity as of 31 December 2003
Source: DAM/annual employment survey of main French shipowners.

Passenger traffic	45%
Harbour activities	22%
Chartered transport	9%
Regular lines	9%
Oil	8%
Public services	5%
Short-sea shipping	2%

* Out of a total of 9,740 people.
Not in survey: 639 jobs in pilotage, including 350 pilots.

Apart from the main categories of cargo vessels making up the merchant fleet, the French fleet also holds a number of highly varied specialised craft and ships: support vessels (for service and assistance to other ships), professional vessels, boats carrying passengers over very short distances, etc. When they are included, the fleet is much larger than that of trading vessels. In this respect, the specialised French fleet remains a major player internationally in some niches: ocean and seismic research, underwater engineering, drilling and provision of supplies to offshore platforms. A large proportion of the specialised vessels (in share of total capacity) are TAAF-registered. The French fleet's versatility is shown by them.

The auxiliary and professional fleet is much older (average age of 20 years on 1 January 2004) than the quite recent merchant fleet. On 1 January 2005, the average age was 8.6 years for the French fleet in its entirety and 8.9 years for oil tankers. 12.3% of French vessels are over 25 compared to 30.4% for the world fleet - 39% of French fleet vessels are less than five year old, compared to 12.9% of the world fleet.

Labour force

The drop in employment in the merchant navy is an international phenomenon. In EU-15, employment aboard Member-State registered vessels fell from 230,000 in 155,000 in 1999 (source: EC). The number of seafarers in France went form over 43,000 in the early sixties to just under 10,000 in late 2003, according to the ministry's annual survey. Out of the total labour force, passenger transport and harbour activities provide nearly two-thirds of jobs. Cutbacks of staff on board have also been noticeable. From 1965 to 1970, a ship's crew ranged from 35 to 40 seamen; in 1980, it was from 28 to 35 men, today, crew size is around 22 to 24 men for large and from 12 to 14 for small vessels. This decrease means that additional staff is needed during calls in port.

Foreign seafarers sailing on merchant vessels are not on the main register, with a few exceptions. In late 2004, they occupied 43% of jobs on the TAAF register, with a higher proportion of ratings (62%) than officers (17%). The proportion is high on foreign registers, ie: 74%, with all staff categories taken into account. Amongst the main nationalities are Filipinos, making up nearly one fourth of foreign seamen, Romanians with 14% and almost as many Poles.

TAX PROVISIONS AND THE FRENCH INTERNATIONAL REGISTER

Aiming to develop the French fleet and employment, the authorities have taken some regulatory provisions. The main ones have been inspired by precedents which exist abroad.

• The tonnage tax, introduced by the corrected budget act for 2002, enables shipping companies to determine the basis of their corporate tax on a lump sum tax rate schedule applied to the tonnage of the vessels they operate. Once the arrangement was approved by the European Commission, France became the 10th EU member State to adopt lump sum taxation. The EC has implemented the harmonisation of national rate schedules since the start of 2006.

• The "fiscal EIG" (law 98-546 of 2 July 1998), adjusted by the 2006 budget act, concerns cargo vessels and passenger ships. It provides tax savings thanks to the depreciation on assets purchased by investors who have formed an economic interest group (EIG). There are comparable arrangements in many European countries, the United States and Japan, amongst others, but the French system is currently undergoing a Commission inquiry with respect to its compliance with EC regulations on State aid.

• The international French register (RIF) created by the law 2005-412 of 3 May 2005, aims to "develop maritime employment and strengthen maritime safety and security by promoting the French flag" (art. 1). This Registry is subject to European regulations and France's international commitments, and will be open to international short-sea shipping and ocean-going merchant vessels, as well as professional yachting vessels of over 24 metres LOA. For the categories of vessels it is designed for, it will replace the TAAF register in two years' time.

For RIF-registered vessels, the master and his substitute will be French and 25% of the crew members will be nationals of an EU member state or of a European Economic Area (EEA) member state; rising to 35% for vessels which received tax assistance or benefits for their purchase. There are social and tax provisions to make the system attractive for companies.

International context

The world fleet is continuing to grow. This growth seems even faster since 2003, linked to the development of shipyards' activity. In early 2005, there were 39,775 ships over 300 dwt with a carrying capacity of 888 million grt in the fleet.

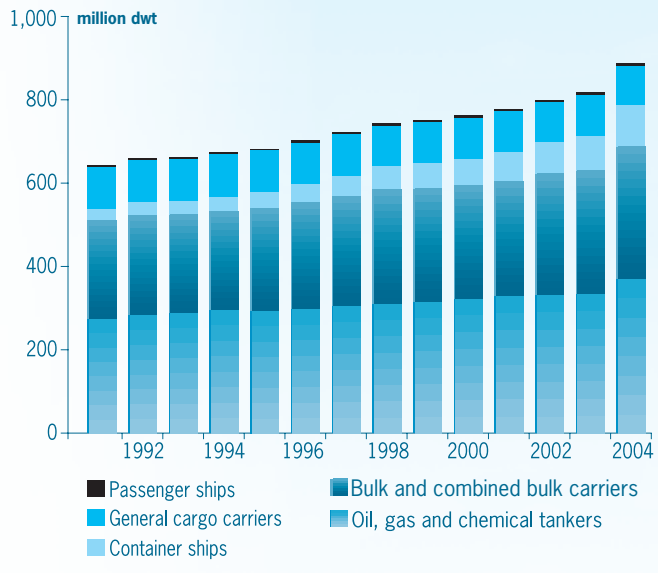
The world container-ship fleet has grown steadily for more than a decade now. Total available capacity rose by 9.1% in 2004 to reach 8.2 million twenty-foot equivalent units (teu) on 1 January 2005. Concurrently, container-ship size continued to increase. Over the past three or four years, orders for vessels of over 5,000 teu have risen sharply. Vessels of 10,000 teu (post-panamax) have been ordered (source: Lloyd's Register Fairplay). 12,000 and 15,000 ships are foreseen in a few years time, which will require that harbour facilities be reorganised.

So called flags of convenience shelter a large proportion of the world merchant fleet. For vessels over 1,000 grt, the two main flags of Panama and Liberia represented 30% of world tonnage at the start of 2005; the six main flags covering 43% (source: Cnuced). Over the past two years, the increase in tonnage under flags of convenience was low; amongst other probable reasons is the appearance of some registries with more attractive tax conditions in developed countries.

Conversely, the criterion of vessel ownership makes it possible to assess the shipowners' merchant fleet involvement in other countries. From this viewpoint, for ships with the largest capacity, Greece is the biggest shipowner, followed by Japan. Norwegian, German, Chinese and American shipowners have also created large merchant fleets.

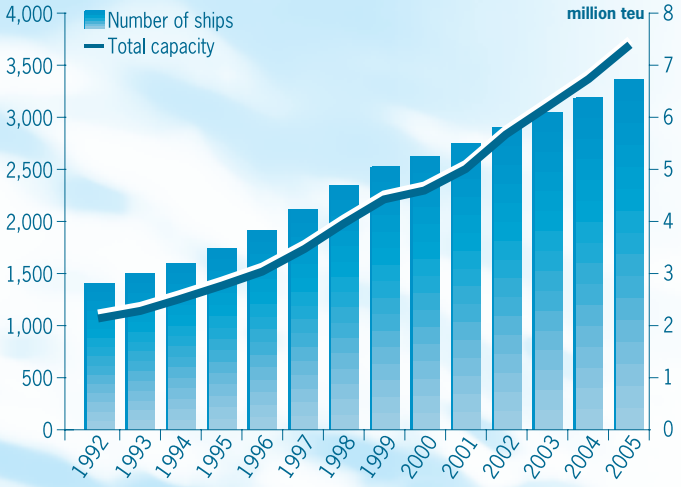
Overall, Europe has a significant position. Shipping companies belonging to EU nationals control one third of the world merchant fleet and approximately 40% of EU trade is carried on vessels controlled by interests from the European Union. France is in a special situation with respect to other important players of international trade and shipping, playing a small role worldwide in control of the fleet.

Trends in world fleet carrying capacity by type of vessels* (vessels over 300 grt as of 1 January 2004)
Source: ISL Bremen.



Trends in world fleet of container ships*

Source: Barry-Rogliano-Salles, annual report 2005.



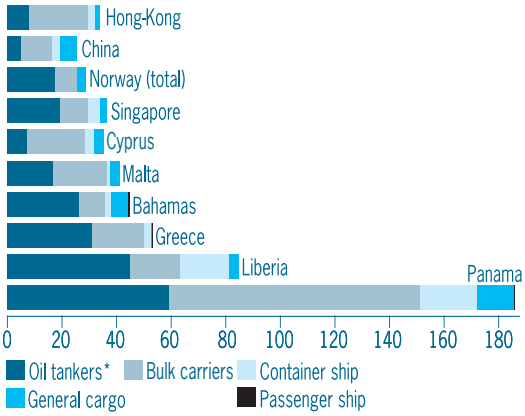
* Cellular fleet only.

Breakdown of the world fleet by type of vessel and by flag as of 1st January 2004

(vessels over 300 grt)

Source: ISL Bremen.

Unit: million dwt

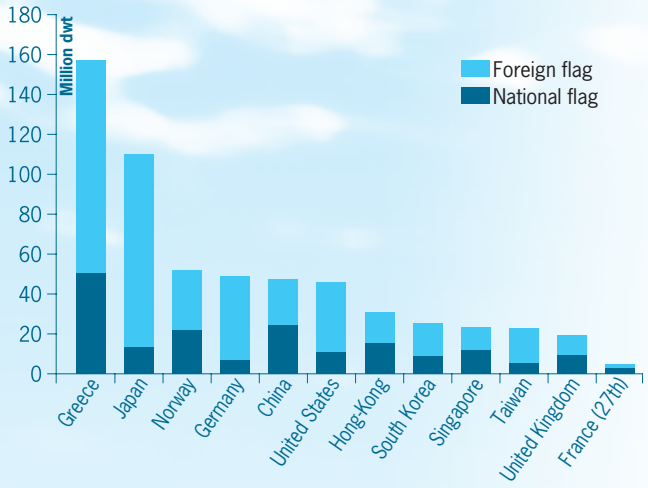


* Oil tankers, chemical and liquified gas carriers.

Main shipowning countries for shipping

Sources: Cnuced, Lloyd's Register-Fairplay. Data for January 2004.

Vessels of over 1,000 grt, except USA reserve fleet and USA and Canadian fleets of the Great Lakes.The country is where the companies controlling vessels are domiciled.



Main trading nations and shipping investment

Sources: Cnuced, Review of Maritime Transport, 2005.

%	Value share of world trade	Value share of the merchant fleet
United States	12.6	5.5
Germany	8.8	6.9
China	6.2	6.8
Japan	5.5	14.0
France	4.9	0.8
United Kingdom	4.3	3.1

SEA TRAFFIC

Maritime traffic includes liquid bulk (oil products, gas, chemicals, liquid agrifood products), dry bulk (coal, ore, fertiliser, grains, animal feeds), general cargo (ro-ro traffic, lumber and wood products, agrifood, metallurgical products), transported on regular lines, a growing percentage of which is containerised (approximately two thirds), as well as passenger traffic which includes ferries, cruise liners and launches.

International trends

International trade by sea increased by 7% in value in 2004, compared to 4-5% in the previous years. According to estimates, one third of the increase in world trade is due to China.

Since 2003, container traffic has grown sharply with rates higher by 50 to 60% in 2004 with respect to those seen in 2000. Several countries have actively exported containerised goods. This was the case of India, Vietnam, and Chile and once again, China, which recorded a 30% hike in its exports in 2004.

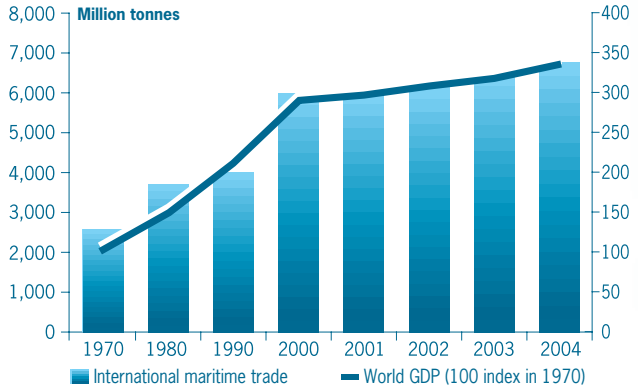
After about fifteen years of moderate growth in dry bulk traffic, 2003 showed an upturn in trade (+3% in volume). Then in 2004, the sector showed particularly dynamic performance, with a growth rate of 7% (+9.6% for iron ore, +5.7% for coal). Lastly, world traffic for liquid bulk (except gas) is also increasing: up 4% from 2002 to 2003.

Port traffic

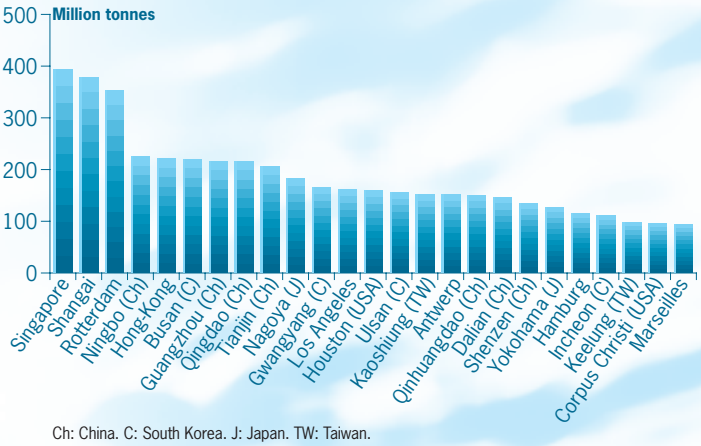
Port traffic, like sea traffic, is naturally influenced by the strong economic growth of the Far East, where the world's largest ports are now located. According to their statistics, Chinese ports stand out for dynamic development. Several of them indicate traffic volumes which rank them amongst the world leaders. It is true that great investments have been made in new facilities there.

Containerised traffic has been the determining factor in port traffic development in recent years. Once again, Asian ports have been particularly aggressive here. In Europe, although growth is clearly not as strong as in Asia, the dynamic drive of the harbours

Trends in international maritime trade and GDP
Sources: Cnuced, FMI.

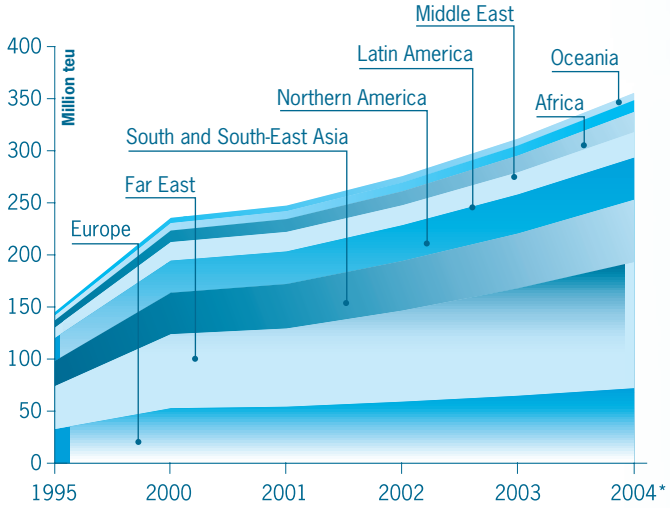


The largest world ports in 2004, all types of traffic
Source: Journal de la marine marchande, 2005.



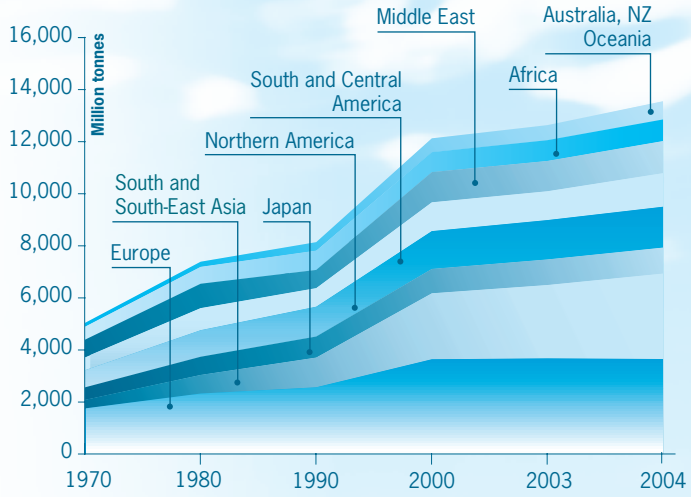
Ch: China. C: South Korea. J: Japan. TW: Taiwan.

Trends in container traffic by world regions
Source: Drewry Shipping Consultants Ltd



* Estimations.

Trends in sea traffic by world regions
Source: Cnuced.



of Antwerp, Hamburg and Le Havre can be noted in the north; and that of Mediterranean ports like Valencia, Algesiras and Gioia-Tauro in the south. Large investments have been announced for several harbours in the Mediterranean.

Situation in France

French port traffic is characterised by the structural prevalence of liquid bulk cargoes and especially oil, making French port traffic quite sensitive to the oil market climate.

Because it is strongly influenced by world maritime transport dynamics, French port activity enjoyed a favourable situation with the rise of good traffic, especially of containerised general cargo. The situation for transport of passengers is gloomier.

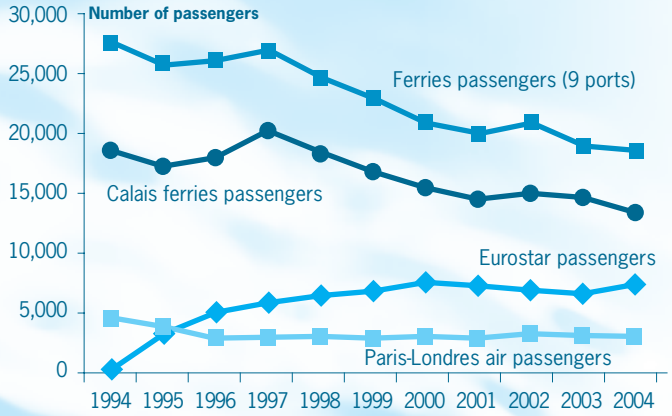
Liquid bulk cargoes: liquid bulk traffic was 170.5 million tonnes in 2004 (94% of which was hydrocarbons), up 1% from 2003. Refined product exports rose with respect to the previous year. Amongst autonomous ports (PA) Le Havre, Nantes-Saint-Nazaire and Bordeaux progressed on this segment, with respectively 48 million tonnes (+7.3%), 22.3 Mt (+9.5%) and 4.6 Mt (+1.7%). Marseilles showed a drop of 4% to 63.2 Mt, Dunkirk of 8% to 12.1 Mt and Rouen of 1.8% to 9.4 Mt.

Dry bulk cargoes: in 2004, dry bulk traffic was down 4% with respect to 2003 at 82.2 Mt, notably showing a sharp decrease in outbound cargoes (-16.5%) due to the fall in grain exports. Dunkirk remained in the lead for this type of traffic with 27.1 Mt (+5,2%), followed by Marseille-Fos (14.9Mt, +0.9%), Rouen (7.6 Mt, -18.4%), Nantes-Saint-Nazaire (7.6 Mt, -3.2%), Le Havre (4.3 Mt, -10.4%) and Bordeaux (2.7 Mt, -10.9%).

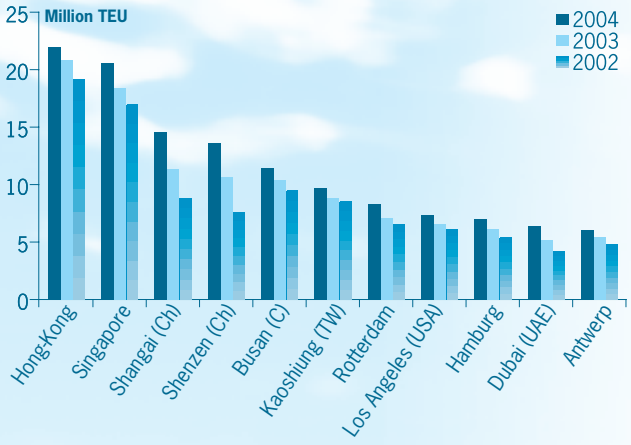
General cargo: general cargo traffic pursued its growth with a record 6.6% rise, bringing it to 110.2 Mt. Containerised traffic, accounting for one third of the tonnage, rose by 11.7%. Ports of national interest handle nearly 47% of this traffic. Calais, leading French port for containerised traffic, recorded the largest annual increase in metropolitan France with 37 Mt (+11,5%). In Le Havre, one year before Port 2000 was put into service, announced 24 Mt, a figures up nearly 10%.

Overseas: a clear progression in traffic in Reunion island from 2003 to 2004 (13%), not compensating for an overall drop in traffic for French overseas ports. Thus, tonnage handled in Guadeloupe was down by 7%.

Cross-Channel passenger traffic via France
Source: ministry of Transport/SESP/National transport accounts in 2004.

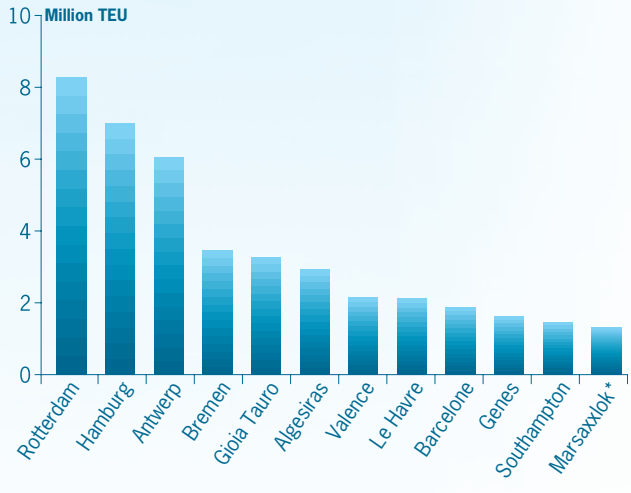


Main world container ports
Source: Containerization International, March 2005



Ch: China. C: South Korea. TW: Taiwan. UAE: United Arab Emirates.

Main European container ports in 2004
Source : Journal de la marine marchande, 2005.



* 2003

Passenger traffic: in 2004, maritime harbours accommodated 27.3 million passengers, down 1.9% from the previous year, continuing on from the decrease in 2002 and extending from the northern seafront to the entire metropolitan coast.
- Cross-Channel traffic has been declining for several years, and continued its drop by 2.3% in 2004. 70% of these passengers go through Calais, which has recorded a decrease of 3.9%. However, activity has been picking up in some ports of the cross-Channel area. This is the case for Caen, up 12% and Boulogne, with a link to Dover starting up again. In 2004, after a long, somewhat lacklustre period, Eurostar grew its market share, to the detriment of other modes of transportation: the opening of a section of high speed rail in Britain in 2003 brought positive effects.
- In the Mediterranean, passenger traffic was down 1% in 2004, with 8 million passengers. A drop in the number of visitors to Corsica, the activity's mainstay, was the principal factor involved. Marseille, Nice and Bastia were affected by this downturn in traffic, while Toulon, up 20%, benefited from new round trip links to Corsica.

Sea cruises: the world cruise market showed growth of nearly 8% in 2004 (see above: first chapter of this report). In France, the figures for 2004 are mixed. For instance, on the Mediterranean seafront, the three leading ports of Marseille, Nice-Villefranche and Ajaccio, respectively presented stagnation, a rise of nearly 10% and a leap of almost 27%. On the northern and western seafronts, with very low numbers of passengers, a few ports like Le Havre, Rouen, Cherbourg and Bayonne showed good results.

Short-sea shipping

Coasting, more properly called "short sea shipping", is a vital form of freight traffic in the EU (63% of cargo shipping - source: Eurostat), whose geography lends itself particularly well to this. Its development varies between the various Member States. It is particularly significant in France and the United Kingdom (two thirds of maritime cargo tonnage in 2003) and even more so in Italy, Sweden and Norway. The Mediterranean and the North Sea are the EU area where short sea shipping tonnage is highest (30% of cargo in each of these seas in 2003).

Short sea shipping's handicaps have been identified and are due to intermodality being held up by technical limits of infrastructures, distortion of competition, complexity of administrative procedures and harbour services' lack of flexibility.

On the European level, the main measures taken to promote short sea shipping are:
- in the Marco Polo I (2003-2006) programme, with a 100 million euro budget for EU-25;
- the Marco Polo II (2007-2013) project proposed by the EC with a 740 million euro budget;
- and promoting "motorways of the sea", an initiative where eligible projects can receive matched funding (up to 20%). These motorways of the sea should become one part of the trans-European transport network (TEN-T) - just like motorways on land and railways - making it possible to reduce traffic jams and even improve access to outlying regions and states and islands. TEN-T and Marco Polo funding could be complementary and drawn concurrently with State aid, in order to set up these sea routes.

France is affected by European initiatives. In the TEN-T framework, aiming to set up new intermodal transport chains by 2010, four maritime corridor projects have been selected and given priority by the European authorities:
- from Portugal to the Bay of Biscay, and to the Irish Sea, the Channel and the North Sea;
- From the Baltic Sea to the North Sea;

- Western-Mediterranean: from the Alboran Sea to the Gulf of Lion and of Genoa and to Sicily;
- Eastern-Mediterranean: from the Adriatic Sea to the Aegean Sea and Cyprus.

A call for projects was jointly launched by Spain and France in 2006 for the Atlantic-Channel-North Sea seafront; an inter-government commission will be set up by the two countries to ensure the operational steering. For the eastern Mediterranean, preliminary studies will be jointly begun by Spain, Italy and France in 2007, following their outcome, another call for projects will be launched.

OUTLOOK

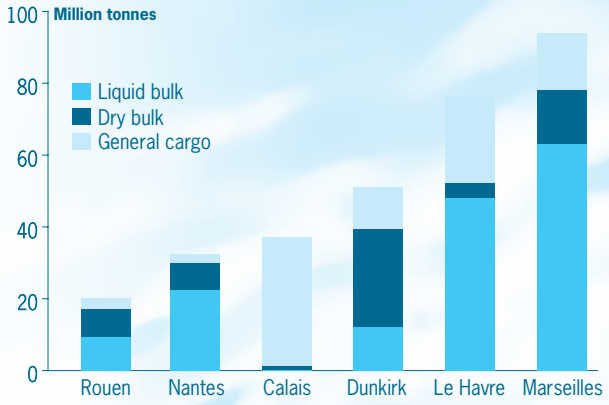
Amongst the factors influencing French shipping's short and medium term development, the considerable economic growth of Asia must be mentioned. If it continues, it will keep on driving international shipping in general and Asian ports in particular, with consequences which are already obvious in terms of the increasing share of containerised trade. The latter, along with the arrival of giant container-ships, is a major trends which many sea ports are reacting to through adaptation strategies. In this respect, the Port 2000 and Fos 2XL should have noticeably perceptible effects in the coming years.

Nationwide, the RIF international register became operational in early 2006, following publication of the decree of application for the law of 2005. The new register will bring changes in the fleet flying the French flag, although a few uncertainties remain with regard to the new regulations.

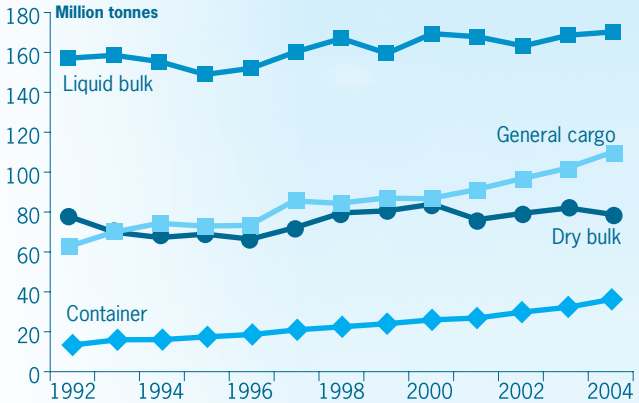
On the European scale, developing intermodality and the motorways of the sea projects, which will lead to longer term development, are essential issues in managing the congestion of major roadways as well as in fighting global warming and greenhouse gas emissions. But these actions are just beginning and will require lasting, sustainable political and financial commitments.

Security of ships and harbours is also an issue with both European and national stakes. Just touched on in the EC white paper of 2001 on the European transport policy approaching 2010, the topic became more broadly considered after 9-11 and IMO's adoption of the international ship and port facility security (ISPS) code in 2002. The directive 2005/65/EC of 26 October 2005 aims to provide a security system within harbours (mooring areas, waiting berths and surrounding areas). It follows on from regulation (EC) 725/2004 of 31 March 2004 whose realm of application only concerned security measures aboard vessels and in immediate interface between port and ship. The directive requires Member States to designate "port security authorities" and draw up assessments of port security for those ports subject to the directive's application. Security plans defining levels with respect to risk incurred will then be drawn up. Lastly, the directive provides for a port security agent to be designated in each port.

Goods traffic in main ports in metropolitan France in 2004
Source: DTMRF.



Trends in goods traffic in the main French ports*
Sources: ministry of Transport/DTMRF.



* The six metropolitan autonomous ports and the 13 PIN until 2002, 14 since 2003.

Maritime financial services

MARITIME FINANCIAL SERVICES INCLUDE INSURANCE AND BANKING. MARITIME INSURANCE IS MONITORED BY THE PROFESSION ITSELF. SINCE MORE GENERAL DATA IS LACKING, BANKING ACTIVITY TAKEN INTO ACCOUNT HERE, COVERS ONLY PART OF THAT RELATED TO THE MARITIME FIELD.

MARITIME INSURANCE

Definition

This sector comprises "hull insurance" underwriting for vessels, including those being built, and "cargo insurance" for goods transported by ship. International standardisation of statistics has led to hull and cargo insurance of all categories being pooled here.

International situation

The branch's volume of business, if not its profitability, has been influenced by shipping's growth worldwide, since it is generally an activity with a high number of claims for loss or damage.

Rates and premiums deteriorated until 2000, then a turnaround began in 2001, becoming a confirmed trend up to 2004 (world turnover reached nearly 16 billion dollars in 2004). Since late 2003, there has been a slowdown in the rise, which makes some experts think that the bull cycle will come to an end. Indeed, the new capacity coming from Russia, Korea and Poland, and new investors (in London and Scandinavia) have promoted more competition and the stabilisation of premium rates. For cargo insurance, tariff quotations have remained fairly stable. Contrary to 2003, when there were few major events, 2004 showed a rise in claims, both in terms of the frequency of events and of cost.

However, pressure to raise premiums is felt in the branch, particularly for the "P & I Clubs" which have shown deficits over the past few years.

French companies: situation and outlook

French companies are very active on the international insurance market overall and on the marine and transport insurance markets in particular.

In a global context of shipping on the rise, in 2003 French maritime activity continued its growth of the previous year. The creation of the RIF French international register has also raised favourable expectations.

Sources in the profession indicate that after several years of technical losses, the French ship insurance market started making profits again in 2003 and accounted for 10% of the world market in 2004. Although claims dropped in 2003, the situation is still considered to be fragile. The current level of premiums would make it possible to cope with the usual level of loss or damage, but does not take a possible major event into account. The French sector for cargo insurance, with 9% of the market, is also considered to be highly dynamic.

KEY FIGURES FOR MARINE AND TRANSPORT INSURANCE IN FRANCE*

	1997	1998	1999	2000	2001	2002	2003	2004
Hull insurance turnover (M€)*	493	407	473	505	537	595	483	451
Cargo insurance turnover (M€)	505	488	543	496	567	697	654	593
Total maritime turnover (M€) (1)	998	895	1,016	1,001	1,104	1,292	1,137	1,043
Value added (M€) (2)	112.5	103.6	123.2	114.5	111.5	151	153	146
Jobs (2) (3)	1,318	1,326	1,380	1,202	1,383	1,588	1,300	na

Sources: FFSA-DMAT, Insee (branch accounts).
*Figures have been revised since previous edition.
(1) Total gross premium income. Ordinary risks and war risks, direct writing and assumed reinsurance, including river and pleasure boats, not including land transport liability
(2) Revised Ifremer estimations
(3) Full time equivalents.
na: not available.

BANKING SECTOR

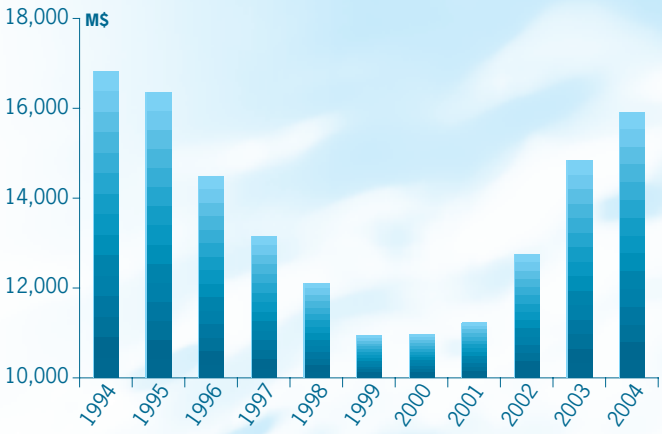
Banking services for marine activities (harbour activities, merchant navy, etc.) are generally fragmented and competitive markets, with several French banks playing an active role. Three French banks are even amongst the world leaders in financing of ship-building. The main banking activity covered here is marine fisheries financing, as the only one for which sufficiently comprehensive data is available.

In the realm of banking assistance for the marine fisheries sector, the Crédit maritime mutuel holds the SCCMM mutual maritime loan company and ten regional mutual marine loan banks operating on the coast of metropolitan France, in the West Indies and the Indian Ocean. Following an agreement signed on 10 January 2003, these establishments are now affiliated with the Federal bank of popular banks which replaces the Crédit coopératif's central savings bank.

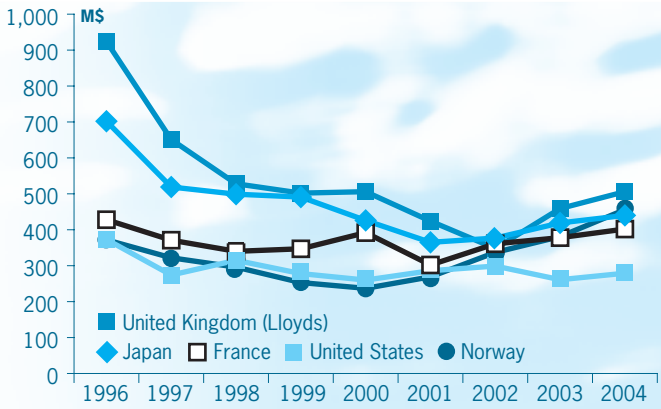
In the field of banking and finance, the SCCMM represents all national and EC institutions. The institution has 140 agencies and over 900 staff.

It helps finance the entire fisheries and mariculture stream, including seafood processing and marketing. It is the number one financial intermediary in the field of marine fisheries and exclusively manages a number of bonified loans for the sector. Thus the fisheries sector views banking terms as another instrument of the State's sector-based policy. The Crédit maritime covers at least 90% of banking services in the fisheries sector. It is also present in the merchant harbour and marina sectors.

World turnover for marine and transport insurance
Source: Central Union of Maritime Underwriters, Oslo.

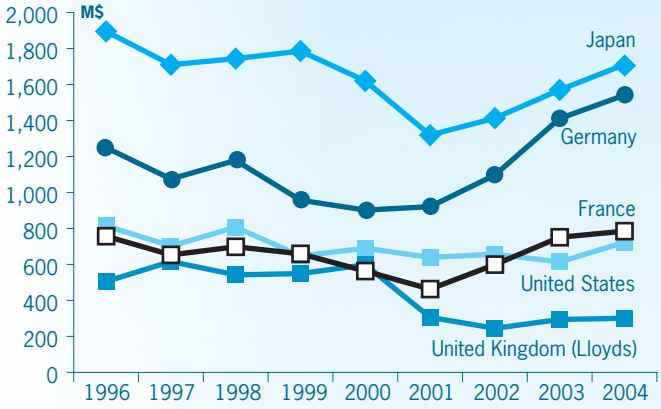


The five major world markets: hulls*
Source: IUMI.



Market scoping which has not been harmonised between countries.
* Not including offshore energy and hull liability.

The five major world markets: cargo
Source: IUMI.



Market scoping which has not been harmonised between countries.

KEY FIGURES FOR THE CRÉDIT MARITIME MUTUEL LOAN BANK

	1999 (1)	2000 (2)	2001	2002	2003
Net bank proceeds	81.3	88	92	92	100
Value added* (M€)	54.6	58.7	62.6	62.6	68.9
Employment**	891	908	900	900	900

Source: Crédit maritime mutuel.
(1) All regional banks, SCCMM, Guarantee funds, Union of regional banks, Crédit maritime Informatique.
(2) = (1) + CM Vie (life insurance company).
* Ifremer estimation based on operating accounts.
** Full time equivalents.

PUBLIC SECTOR

The Navy

THE FRENCH NAVY IS TAKING PART IN THE MAJOR CHANGES IN ARMED FORCES DEPLOYMENT SINCE THE END OF THE COLD WAR, I.E., THE MOVE TO PROFESSIONALISATION AND REFOCUSING OF PRIORITIES ON MISSIONS OF DETERRENCE, PREVENTION, PROJECTION-ACTION AND PROTECTION. IT HAS THREE MAIN FIELDS OF ACTION: TAKING PART IN NUCLEAR DETERRENCE, OPERATIONAL ACTION AND MARITIME PROTECTION.

FIELDS OF ACTION

- Nuclear deterrence guarantees that France's vital interests will be defended in the face of any global or regional power armed with weapons of mass destruction and harbouring hostile intentions;
- Operational action comprises missions to prevent the development of conflict or crisis situations as well as missions of power and force projection.
- Maritime protection includes all missions designed to deal with emerging threats which can come from the sea (terrorism, smuggling, piracy), defend sovereign rights at sea (fisheries police, for instance) and master the risks related to maritime activity (pollution prevention and response).

BUDGETARY MEANS AND WORKFORCE

French Navy budget

The Navy's budget structure features a clear pre-eminence of heading V (equipment/investments: 66%) over heading III (operating cost: 34%). In fact, it is the Navy which accounts for the Ministry of Defence's largest investment budget. This distribution is explained by the high level of technology implemented in a particularly harsh environment, a factor determining the scope and scale of the Navy and its personnel.

The 2005 budget was the third annual instalment of the military spending programming law (LPM) for 2003-2008. It marked the continued effort for recovery engaged in 2003 and 2004, to bring the availability of equipment and materials up to scale, renew and modernise facilities and prepare the future through sustained efforts for research.

The Navy's priority is to augment the availability of its ships. For the six years covered by the LPM draft budget, the largest expenditures involve scheduled maintenance on ships, submarines and aircraft: this makes up about 25% of heading V and is up 5% from the LPM budget for 1997-2002.

The operating aspect (heading III) must provide seamen's wages ("Payroll and social contributions" - RCS) as well as ensuring the running costs for their action through their directorates and support services.

In 2005, commitment appropriations (CA) opened by the initial Finance act thus reached 5,954M€.

Navy workforce

The professionalisation of the Navy has led to a clear change in its format. This means that between 1996 and 2002 naval personnel, both military and civilian, went from 70,000 to 55,000. Their number has now stabilised there.

For 2005, set employment levels provided for up to 5,150 officers (including officer cadets), 29,000 petty officers, 8,400 ratings and seamen and 1,500 volunteers. The large proportion of petty officers shows the highly technical nature of jobs in the Navy, since the ratings, seamen and volunteers act as operators.

A large number of civilian personnel work within Naval support services (supply department, fleet support service, naval air bases), currently making up about 20% of Navy personnel. The 10,000 agents fall into two major regulatory categories of equal size: personnel with worker status and staff who are civil servants.

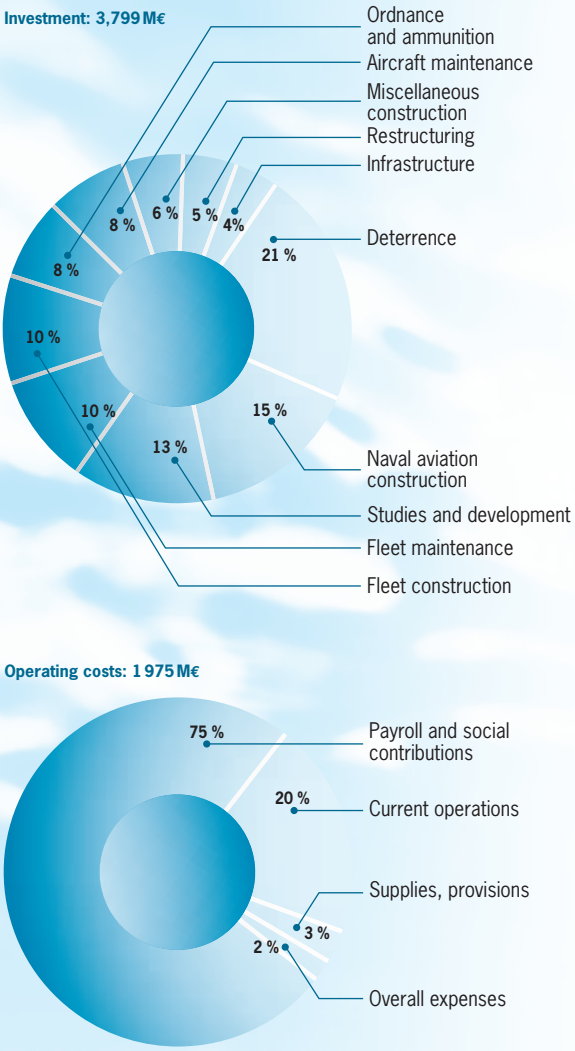
PAYROLL OF NAVY MILITARY AND CIVILIAN PERSONNEL

	2000	2001	2002**	2003	2004	2005	2006*
Civilian personnel	9,502	9,205	10,157	10,296	10,291	10,064	10,064
Military personnel	49,491	45,387	44,276	44,267	44,131	43,195	43,960
including conscripts and volunteers	5,018	1,667	1,613	1,601	1,596	1,515	1,509
Total	**58,993**	**54,592**	**54,433**	**54,563**	**54,422**	**53,259**	**54,024**

Source: Naval staff.
* Draft budget.
** Due to professionalisation of the Armed Forces, since 2002 there are no longer any conscripts.

Navy budget for 2005

Source: Naval staff.



Naval and naval aviation facilities

Source: Naval staff.

Main equipment	2005	2008 (end of LPM)	Armed Forces model 2015
Aircraft carrier	1	1	2
Carrier-based aircraft	60	61	60
Maritime patrol aircraft	28	28	22
Combat helicopters	46	52	51
SSBN	4	4	4
SSN	6	6	6
Anti-aircraft frigates	3	3	4
Multi-mission frigates*	22	22	22
Surveillance frigates	6	6	6
Mine warfare countermeasure ships	14	14	16
Support ships**	5	5	6
Light transport and patrol ships	15	15	16

LPM: military programming law.
* These include the multi-mission land attack version frigates (Fremm AVT), ASW frigates, "La Fayette" type frigates and A69 aviso patrol boats.
** Supply tankers and repair and maintenance ships.

Lastly, the operational reserve (5,500 positions in 2005, 7,700 in 2012), supplies the Navy with the supplementary staff needed to carry out its missions. There are 24,000 seamen in the civilian reserve.

OUTLOOK

Fleet renewal

The military programming law's objective is to renew the high seas fleet (submarine and surface ships) and back up the naval air fleet renewal: eight multi-missions frigates and two "Barracuda" nuclear-powered attack submarines (SSN) have been ordered and seventeen "Rafale" aircraft and the first seven "NH-90" helicopters delivered.

When the military programming budget is complete, the Navy will therefore enjoy an improved anti-air protection capacity, with the delivery of two "Horizon" type frigates. Moreover, the Navy is restoring the permanence of the carrier battle group and improving its projection and command capability, thanks to the delivery of two BPC vessels.

The Navy has launched programmes in compliance with the new naval strategy orientations, whether they fall under the projection/action function (naval cruise missile) or that of protection (Spationav):

- 250 naval cruise missiles (MDCN) are to be delivered from 2011 onwards. Aboard multi-mission frigates and submarines, they will provide deep strike capability;
- the means for surveillance and protection of maritime approaches have been strengthened to help fight terrorism and smuggling, along with the traditional actions of the State at sea: the Spationav programme, modernising the string of semaphores and the programme to renew launches belonging to the maritime gendarmerie.

The second aircraft carrier

The choice of conventional propulsion was made official by the president of France on 13 February 2004. This does not call the undeniable qualities of the "*Charles-de-Gaulle*" into question, but should enable a 10% savings on the cost of ownership and open the path to cooperation with the United Kingdom, with a future British aircraft carrier adapted to specific national requirements (deployment of conventional aircraft with catapults and arresting gear). Although British and French air groups and the way they use their aircraft carriers are different, the needs and schedules of these two navies do converge.

The second aircraft carrier will have a larger displacement than her elder sister, with significant possibilities to adapt so that future generation aircraft can be used. After moving into the programme phase in 2005, construction of the vessel should begin in mid-2007, to be commissioned in 2015 when the "*Charles-de-Gaulle*" will be due to change her two nuclear cores.

THE FRENCH NAVY AND EUROPE

The Navy's action is and will increasingly be part of a series of operational commitments with our European partners. At the Helsinki European Council in 1999, the fifteen Member States set the objective of a force projection capability which would comprise naval elements if needed.

In the naval field, France made a significant contribution with the aim of providing sufficient operational help to:

- control information in the maritime environment, using in particular, maritime patrol aircraft, anti-aircraft frigates and Hawkeyes;
- take part in the sequence of operations with the command structures, the air-and-sea group organised around the aircraft carrier, its air group, its escort of frigates, a nuclear attack submarine, and amphibious equipment.

It also participates in *Euromarfor*, alongside Spain, Italy, and Portugal, and in the French-German force (FNFA). Euromarfor was engaged in the Indian Ocean and the Red Sea from February 2002 to December 2004 within the "Enduring Freedom" operation. The French-German naval force also took part (in summer 2003 and since early 2005). These European commitments will continue to grow and thought is being given to fitting them into a broader framework with the Eumarc (EU Maritime Reaction Capability) concept.

In the realm of armaments, the French Navy is making a major contribution to the emergence of a "Europe of armament", through bilateral or multilateral cooperation (Fremm, Horizon, NH 90) and by jointly organising armament cooperation (Occar, which gathers the United Kingdom, Germany, Italy and France), for the PAAMS (Principal Anti Air Missile System) air defence systems based on Aster missiles (future surface to air family).

Public intervention

STATE ADMINISTRATIONS TAKE ACTION IN SEVERAL FIELDS OF MARITIME ACTIVITY, INCLUDING ECONOMIC AND SOCIAL REALMS (SEAFARER LABOUR SCHEMES, SOCIAL PROTECTION), REGULATIONS (ESPECIALLY IN THE MARITIME PUBLIC DOMAIN) AND EDUCATION (SEAFARER TRAINING). THE STATE ALSO ENSURES TECHNICAL MISSIONS (BEACONS AND SIGNALLING, SURVEILLANCE, SECURITY AND SAFETY) THOUGH DECENTRALISED SERVICES.

MARITIME PUBLIC SPENDING

Maritime public spending in 2005 can mainly been appraised through the budget set up for "Civil engineering and amenities, Transports, Spatial development, Tourism and the Sea" - under the "Marine" section, which lists the main resources devoted to the missions carried out by the MTEM (ministry of transport, amenities, tourism and the sea) in the maritime field: security and safety at sea, harbour traffic and security, port facilities, regulating maritime activities, training and support for seafarers, fisheries inspections, coastal management and protection. Between 2003 and 2005, public intervention in the maritime domain, under the "Marine" budget item, rose by 10.6% overall. The state subsidy for the ENIM (national establishment for disabled naval personnel) alone makes up over 72% of this.

ADMINISTRATION OF MARITIME AFFAIRS

Decentralised services

The services of the administration dealing with the sea include:
- decentralised services of the Maritime affairs directorate: "general" services (regional and county level directorates) and operational services specialised in maritime safety (for example, Cross operational search and rescue centres and the vessel safety centres);
- maritime services within the DDE county-level directorates, who are responsible for maritime signalling (lighthouse and beacons service) and for pollution response on the coast and at sea for accidental oil pollution (Polmar-terre).

Staff

There are two categories of personnel working in the maritime field:

• Maritime affairs staff, under the "Marine" section of the budget. As of 1st January 2005, they represented 2,547 agents working in decentralised services (not including the Directorate, MSI and ENIM). They carry out:
- administrative missions in the field of management for seafarers (labour scheme, social protection, disciplinary and penal aspects and occupational training for seamen);
- technical assignments for vessel safety (safety centres), maritime navigation (Cross centres), economics (regulating maritime fisheries and mariculture, managing the public maritime domain used for mariculture, health and technical inspections of seafood, fisheries statistics and quotas);
- policing and judicial duties in courts dealing with maritime and trade disputes.

• The personnel with the remit for lighthouses and beacons and oil pollution response, who fall under Section 23 "Joint services and urban planning", representing some 950 persons.

For maritime signalling, they study, draw up proposals and implement nautically (navigational aids) and physically (small towers and buoys) adapted solutions. Their electronics and civil engineering skills are required to repair these navigational aids. They help keep sailors informed about work underway, defects and repairs. Coastal services also work in the framework of Polmar-Terre pollution response plans to manage storage centres for equipment used to combat accidental oil pollution at sea, as well as organising exercises which are directed by the prefects.

ENIM

The ENIM provident fund for naval personnel is one of the MTEM's directorates:
- as a central state service, it draws up legislation and regulations for the seafarer's social benefit scheme;
- as an administrative public body, it manages social benefits for seafarers and their families, and collects social security contributions from shipowner companies and their seafaring employees. It works to prevent occupational risks and hazards.

The ENIM's central services are located in Paris. It has three centres dealing with health insurance benefits (Saint-Malo, Lorient and Bordeaux), a centre for pensions at Paimpol and the national centre national the settlement of manning scales located at Saint-Malo, recovers the social debts owed by the scheme's registrants. There was an average of 506 agents employed in each unit in 2004.

The drop in the working population of seafarers (-8.6% from 2000 to 2004) and the rise in the number of pensioners explain the relatively large State balancing subsidy. This means that the ratio of working/non-working registrants went from 1:2.6 in 1995 to 1:3.2 in 2004.

SIGNALS, SURVEILLANCE, SAFETY AT SEA, SAR

Signals: French lighthouse and beacon service

An essential factor of safety at sea, the signal system of the French and overseas DOM coasts has some 6,500 maritime signal set ups, including 3,700 lights and lighthouses, 2,350 buoys (1,230 of which are light buoys) and 2 radio-navigation systems.

Maritime signals are part of the MTEM's remit, entrusted to the DAM maritime affaires directorate. About 950 staff members (central administration, coastal divisions, technical network and training) work in maritime signalling. The system is implemented by the network of specialised maritime services and DDE (23 services in metropolitan France, 9 services overseas).

The Lighthouse and beacon network's missions, the oldest of which being signals at sea, are taken from the Solas convention's application. The main ones are:
- supplying an adapted and compliant system of navigational aids for sailors so that they can avoid hazards;
- helping inform sailors about the status of this system.

Thirty four centres on the metropolitan coast and the DOM-TOM maintain the signalling facilities. The lighthouse and beacons fleet counts fifty vessels of all sizes working from the various centres.

The Cetmef maritime and river studies centre is a research and survey entity serving the central administration and outside services. It ensures a technology watch and develops new products (safety devices and aids of interest for sailing and shipping). It provides opinions to help draw up policies and monitor the existing navigational aid systems.

Safety, surveillance, rescue

The Cross regional operational surveillance, search and rescue centres are specialised services under the DAM maritime affaires directorate's authority. They coordinate the use of the administration's naval and air resources taking part in the State's action at sea, i.e., the French Navy, Air Force, national Gendarmerie, Customs, civil security and maritime affairs. They also rely on the SNSM's lifeboats and launches, as well as privately-owned vessels in the zone (merchant, fishing or pleasure vessels) which are obliged to take part in search and rescue operations when in the vicinity of a situation of distress. The Cross centres have a coastal radio-communications chain created and maintained by the Cetmef. It is part of the international network of "maritime coordination and rescue centres" set up by Hamburg convention in 1979.

Funds allocated to the "Marine" budget (LFI)

Source: MTEM/DAM.

Unit: million €	2003	2004	2005
Central administration	94.7	96,7	98,8
including staff costs [1]	*82.5*	*84,6*	*86,7*
including running costs, training and data processing costs	*11.1*	*11.3*	*11.3*
including investment costs	*0.8*	*0.8*	*0.8*
Seafarers [2]	11.3	10.3	10.2
State subsidy to the ENIM	721.4	777.7	822.0
Maritime police and safety	26.0	27.2	30.6
Seaports and coast	115.6	120.0	119.3
Merchant fleet	63.1	62.1	60.8
Total	**1,032.1**	**1,094.0**	**1,141.7**

(1) Performance on "joint services" section and part of funding for maritime high schools transferred to the "agriculture and fisheries" section of the ministry of Agriculture.
(2) Decrease for this item due to the reduction in the number of seamen concerned by fisheries and merchant fleet exit plans for which the State pays a benefit in the form of a loss of earning compensation allowance or a payment for early termination of activity. These arrangements are one-stop schemes.

ENIM budget

Source: ENIM.

	2000	2001	2002	2003	2004
ENIM budget (M€)	1,455	1,433	1,478	1,523	1,507
State subsidy (M€)	704	708	688	745	778

Trends in number of ENIM beneficiaries

Source: ENIM.

	1995	2000	2004
Number of working population	45,541	43,503	39,748
Number of pensioners	121,524	125,651	129,389
Number of beneficiaries	269,083	240,837	217,525

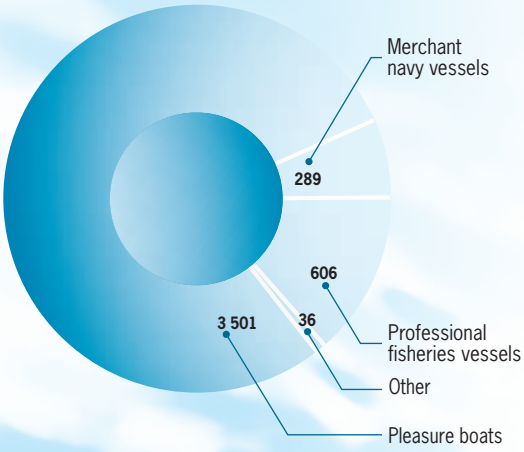
Funding allocated to maritime policing and signals at sea

Source: MTEM/DAM.
Budgets performed up to 2004, LFI 2005.

Unit: million €	2000	2001	2002	2003	2004	2005
Running costs	7.7	8.0	8.0	8.1	9.4	12.4*
Capital expenditure	13.9	13.4	16.0	18.0	17.8	18.3
Total	**21.6**	**21.4**	**24.0**	**26.1**	**27.2**	**30.7**

* In 2005, area taken into account was changed due to the LOLF experiment in the Channel-North Sea. A large amount of spending, including structural spending, has been broken down.

Breakdown of operations in 2005 by type of craft involved (zones of French responsibility)
Source: Cross statistics.



There are five Cross in Metropolitan France (Gris-Nez, Jobourg, Corsen, Etel and La Garde) and two overseas Cross at Fort de France and Reunion Island. Two MRCC "Maritime Rescue Coordination Centres" at Papeete and Noumea coordinate rescue operations in the zones under French authority in the Pacific. Their remit covers:

- search and rescue of people in distress at sea;
- surveillance of maritime traffic;
- surveillance of maritime fisheries;
- surveillance of pollution;
- disseminating information for safety at sea.

Three of them (Gris-Nez, Jobourg, Corsen) are in charge of the surveillance of shipping in the Pas-de-Calais, les Casquets and Ushant traffic separation schemes. The Cross Etel is more clearly involved in fisheries surveillance while the Cross La Garde is more turned towards rescue operations for yachting and water sports and surveillance of pollution events.

With the MTEM as their line authority and the maritime prefect as their delegating operational authority, they keep constant watch, receive alerts and direct search and rescue operations.

In 2005, the Cross and overseas centres dealt with 7,693 operations, up 3.4 % from 2004 (7,439 operations). Pleasure boating and water sports made up 79% of rescue operations coordinated by the Cross, with peak activity in the summer season.

The French SNSM sea rescue society, a State-approved private body, carries out a large part of rescue operations on a volunteer basis under Cross (RCC) control. As a non-profit organisation, the SNSM is financed for nearly half by private donations and the rest by subsidies from State, regional and local authorities.

The SNSM in figures

3,500 permanent volunteers manning lifeboats
1,200 volunteer rescuers during the summer season
26 training centres
1,200 permanent volunteers for administrative tasks
40 salaried employees at headquarters and in workshops to repair the equipment
SNSM fleet
146 high sea craft (all weather lifeboats and launches)
465 inshore inflatable dinghies
In 2003
370,000 hours of volunteer work
5,800 hours of rescue missions at sea
10,102 people rescued
Over 40% of the total time devoted to action at sea of maritime rescue resources

SNSM* budget (M€)

	2000	2001	2002	2003*	2004**
Operating budget	6.1	7.9	8.2	9.5	9.8
Capital expenditures budget	3.3	3	3.9	5.1	5.6
Total	**9.4**	**10.9**	**12.1**	**14.6**	**15.4**

Source: SNSM.
* Performed up to 2002, voted in 2003.
** "Social mission" item of the use of resources account for 2004.

TRAINING AND EDUCATION

Maritime training

The following section covers the training and education streams which draw on the "Marine" budget.
There are several levels of training available for seaman, from the vocational aptitude certificate for fisheries to officer's degrees from French merchant navy schools.

- High schools for maritime and aquaculture training called LEMA provide initial and further training for qualified seamen, aquaculture professionals and some fisheries officers. Teachers in maritime high schools now have public sector status.
- The four French ENMM merchant navy schools in Le Havre, Saint-Malo, Nantes and Marseilles train officers who will mainly serve aboard merchant vessels.
- There are other schools which are private or run by associations.

To assimilate the new STCW international training standards and cope with the difficulties of recruiting seafarers (in fisheries and merchant fleets) and their shorter careers, an education reform has been implemented since 2003. It aims to open up maritime professions to new publics, develop seafarer loyalty and to adapt training to changing needs of shipowners and changing expectations of seamen.

Funding allocated to seafarer training (budgets performed up to 2005, PLF 2006)
Source: MTEM/DAM.

Unit: million €	2001	2002	2003	2004	2005	2006
ENMM subsidy	1.9	2.7	2.4	2.7	2.2	2.3
including operations	*1.5*	*1.4*	*1.7*	*1.6*	*1.6*	*1.7*
including equipment	*0.4*	*1.3*	*0.7*	*1.1*	*0.6*	*0.6*
Agema* subsidy	15.2	4.4	0	0	0	0
Subsidies for maritime vocational high schools	0.1	0.1	0.3	1	1.7	1.9
including operations	*0*	*0*	*0.3*	*1*	*1.5*	*1.7*
including equipment	*0.1*	*0.1*	*0*	*0*	*0.2*	*0.2*
Private schools	0.7	0.9	0.9	0.7	1.	0.7
Seafarers sub-total	17.9	8.1	3.6	4.4	4.9	4.9
Grants and further vocational training	2.9	3.3	3.5	2.8	2.8	3
Total maritime training	**20.8**	**11.4**	**6.2**	**7.2**	**7.7**	**7.9**

* From 2002 on, the Agema subsidy has been calculated to take account of Agema personnel who now have public sector status. The association was dissolved on 15 September 2003.

LEMA maritime and aquaculture initial training
Source: MTEM/DAM.

Number of students	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Fisheries	808	783	768	391	797	707
Shellfisheries	354	334	328	316	276	318
Merchant seaman	148	140	176	175	175	194
Fisheries and merchant navy	428	388	403	391	421	414
Total	**1,738**	**1,654**	**1,675**	**1,688**	**1,669**	**1,633**

Breakdown of enrolment by school
Sources: Bureau of education and maritime training, DAM.

School year	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
LEMA maritime and aquaculture initial training	1,738	1,654	1 675	1 688	1 669	1 633
LEMA further training	1,988	1,805	1,789	1,798	1,802	1,793
ENMM	1,051	1,040	1,036	1,042	998	1,010
Total	**4,777**	**4,499**	**4,500**	**4,528**	**4,469**	**4,436**

ENMM annual budget (M€)

	2000	2001	2002	2003	2004	2005
Le Havre	1.3	1.3	1.2	1.2	1.4	1.4
Saint-Malo	0.6	0.9	0.7	0.8	1	1.5
Nantes	1.0	1.1	0.9	1	1.3	1
Marseilles	1.2	1.5	1.7	1.8	2.3	2
Total	**4.1**	**4.8**	**4.5**	**4.8**	**6**	**5.9**

Source: MTEM/DAM.

Main schools and training courses for maritime activities and marine science in 2004

Sources: Association to promote trades of the sea, Institut Océanographique.

	High school and higher education short courses (up to A-levels + 2 years)		Higher education in long courses (from A-levels + 3 years)		
	Type of diploma	**Schools**	**A-levels + 3 years, A-levels + 4 years**	**A-levels + 5 years**	**Schools**
Boatbuilding and shipbuilding industries					
Naval architecture				DEA, DESS	Ensta, Ensieta, Centrale Nantes architecture and engineering schools
Shipbuilding and repair	CAP, BEP, Bac Pro, DUT, BTS	Many vocational high schools			ESIM, Ensieta, Centrale Nantes, Ensta, Ensieta
Maritime fisheries and mariculture					
Marketing and sale of fisheries products (fish wholesalers and fishmongers)	CAP	Maritime high schools, CFA, seafood training centre, Céfimer			Innomer
Fishermen	CAPM, BEPM, CIN	Maritimes high schools of Boulogne-Le Portel, Cherbourg, Etel, Fécamp, Ciboure, Lorient, Nantes, Paimpol, La Rochelle			ENMM
Employees in shellfish farming and oyster farmers	CAPM, BEPM	Maritime vocational high schools, CFPPA			Universities of Nancy, Rennes, Montpellier, Intechmer, Ensar
Head of mariculture farm	Bac Pro, BEPM, CAPM	LMA Etel, Cherbourg, Sète, Saint-Malo, La Rochelle			
Fish farmer	CAPM, BEPM	Maritime vocational high schools, CFPPA, Cempama, LEGTA			Universities of Nancy, Rennes, Montpellier, Intechmer, Ensar, Creufop, agriculture and veterinary schools
Marine research					
Biologist	DU, DTSM, DEUST		Vocational bachelor's degree, DU	DESS, Master	Ensar, Universities of Marseilles, Boulogne-sur-Mer, Caen, UBO
Environmental research technician	DEUST				Intechmer, universities, engineering schools
Climatologist				DEA	Universities of Lyon, Grenoble, Jussieu, Toulouse
Geologist (marine geoscience)	BTS, DEUST, Bachelor in oceanography	ENSG (Nancy)	Master I degree	DEA, Master	ISTG, ENSMN, ENSPM, ENSG, ENSMP, ENSPS, Universities Grenoble, Paris VI, Orsay
Fisheries scientist			Vocational bachelor's degree	DESS	Universities of Caen and Boulogne-sur-Mer, Ensar
Marine chemistry	DEUST, DTSM			Masters	ENSC, Ceram
Physical oceanography	DTSM, Bachelor in oceanography			Masters	ISITV, Ceram, Ensieta
Engineer in electronics, telecommunications	DEUST, DUT			DEA , DESS	Ensta, Universities of Le Mans, St-Étienne, Toulon
Marine research engineer				DEA, DESS	ENSG-IGN, Universities of Paris VI, Marne-la-Vallée, Toulon, Versailles
Aquaculture engineer and technician	DUT, DTSM			DEA	ENSAT, INAPG, Enitab, Creufop, Intechmer
Technician/mechanic	DTSM, DEUST				Ensta, Centrale Nantes, ESIM, ISITV, Intechmer, University (Calais)
Laboratory technicians	Technological A-levels, Bac Pro, BT, BTS, DUT	Numerous schools			
Oceanography					
French Navy	Further training after BEP, EILD, École de Maistrance (petty officer training school)	CIN Saint-Mandrier, Brest		Career officers	Naval academy, Navy Commissariat school

Bachelor's degree in oceanography	Intechmer diploma in "Marine environmental prospecting" (3 years)
BEP	Vocational studies certificate (2 years)
BEPM	Maritime vocational studies certificate (2 years)
BJEPS	Vocational studies certificate for youth, popular education and sports
BTS	Higher certificate of vocational training
CAPM	Maritime professional training certificate (3 years)
Cefimer	Inter-enterprise training centre for trades of the sea
CFA	Apprentice training centre
CFPPA	Agricultural vocational training and promotion centre
CIN	Naval instruction centre
DEA	Research-oriented postgraduate diploma (A-levels + 5 years)
DESS	Business-oriented postgraduate diploma (A-levels + 5 years)
DEUST	Preliminary degree course in science and technology (A-levels + 2 years)
DTSM	Marine technician higher qualification diploma (A-levels + 2, Intechmer)
DU	University degree (A-levels + 2 to 6 years)
EILD	Initial long-term enlistment
ENMM	French merchant navy school
ENSA	Graduate school specialising in agronomy
Ensia	Graduate school for agricultural and food industries
ENSHMG	Graduate school specialising in hydraulics and mechanics in Grenoble
Ensieta	Graduate school for the design and engineering of complex systems
Ensta	Graduate school for advanced techniques
ENV	Graduate school specialising in veterinary science
ESA	Graduate school specialising in agriculture
ESIM	Graduate engineering school in Marseilles
Innomer	Institute for innovation and enhancement of seafood
INPP	National professional diving institute
INSA	National institute of applied science
Intechmer	National institute of marine sciences and techniques (Cherbourg)
LMA	High school specialised in maritime training and aquaculture
LPA	Agriculture vocational high school
UBO	University of western Brittany (UBO)

Coastal and marine environmental protection

COASTAL ENVIRONMENTS ARE SUBJECT TO NUMEROUS DISTURBANCES DUE TO NATURAL CAUSES OR RELATED TO HUMAN ACTIVITIES. TO ADDRESS THE CONSEQUENCES OF THESE DISTURBANCES, COASTAL AND MARINE ENVIRONMENTAL PROTECTION POLICIES HAVE BEEN SET UP BOTH NATIONWIDE AND IN THE FRAMEWORK OF INTERNATIONAL INSTITUTIONS WHERE FRANCE TAKES PART. THEY FOCUS ON PREVENTING, REDUCING AND ELIMINATING POLLUTION; REPAIRING DAMAGE; COLLECTING, PROCESSING AND DISSEMINATING ENVIRONMENTAL DATA. PROTECTING THE ENVIRONMENT INVOLVES, BY NATURE, A WIDE RANGE OF NOT ONLY CATEGORIES OF OPERATORS (ADMINISTRATION, PUBLIC AGENCIES, LOCAL AUTHORITIES, RESEARCH INSTITUTES AND CONSULTANCIES) BUT ALSO REGULATIONS TO BE ENFORCED, TYPES OF ISSUES AND WAYS OF DEALING WITH THEM.

THIS CHAPTER REFLECTS THE DIVERSE NATURE OF THE TOPIC. IT FOCUSES ON COASTAL WATER QUALITY MONITORING AND PROTECTION; ACCIDENTAL POLLUTION RESPONSE AND WASTE MANAGEMENT; AND PROTECTING OUR ECOLOGICAL AND LANDSCAPE HERITAGE.

PROTECTING COASTAL WATER QUALITY

Many human activities are directly or indirectly affected by phenomena of coastal water pollution through the contamination of aquatic ecosystems. This vulnerability has led to various nationwide measures to protect water quality being implemented. The core measures include monitoring networks, action taken by water boards and programmes for waste water management.

Coastal water and resource monitoring networks

Monitoring and prevention: information provided by monitoring networks is vital for detection and follow-up of health and environmental hazards. Data from the networks provide the basis for programmes informing coastal users about environmental quality in order to prevent health hazards.

Long-term monitoring: monitoring supplies part of the scientific bases required to draw up or modify environmental standards, making it possible to assess the effectiveness of coastal management and health and environmental hazard prevention policies. Long-term series generated by monitoring also provide a data heritage which will enable long-term trends of biodiversity to be traced.

Monitoring covers:
- general water quality variables (salinity, temperature, turbidity, and in the case of eutrophication, nutrients, chlorophyll a and dissolved oxygen);
- chemical contaminants (metals, pesticides, polycyclic aromatic hydrocarbons);
- health-related microbiology;
- phytoplankton and phycotoxins;
- benthic flora and fauna.

The water framework directive (WFD)

Aiming to harmonise the EU's water policy since 1975, the new directive will entail repealing several previous ones. However, those concerning drinking water, bathing water, urban wastewater and agricultural nitrates will be maintained. The WFD was transposed into French law on 21 April 2004 (law n°2004-338). The directive of the European Parliament and Council 2000/60/EC of 23 October 2000, establishing a framework for community action in the field of water policy, whose general objective is to achieve "good status" of groundwater, surface water and coastal water (transitional waters in estuaries, coastal waters and territorial waters), in fifteen years' time (2015). This general objective will involve the following action:
- sustainable management of water resources;
- preventing any deterioration of aquatic ecosystems;
- ensuring sufficient, good quality drinking water supply;
- reducing groundwater pollution;
- reducing discharges of hazardous substances and eliminating discharges of priority hazardous substances;
- helping mitigate the effects of droughts and floods.

The directive leaves it up to each Member State to assess the "good ecological and chemical status" of its various surface water masses on the basis of scientific studies, while remaining within the framework of norms set. The directive specifies:
- quality criteria to classify the ecological status, specifying the compulsory parameters for coastal waters;
- the normative definitions of the ecological status classifications (in five classes: high, good, moderate, poor and bad) for rivers, lakes transitional waters and coastal waters, as well as the definitions of maximum, good and moderate ecological potential and the setting of chemical quality standards.

The recreational water quality inspection network

Recreational waters inspections are carried out under the authority of the minister in charge of Public health, by the DDASS county-level directorates for health and social matters. The inspections help determine the quality of recreational areas which have not been permanently closed and identify those presenting a health hazard, mainly related to poor bacteriological quality.

648 coastal towns in metropolitan France and overseas are monitored during the holiday season. The number of inspection points at sea went from 591 in 1975 to 1,869 in 2002. On average, more than 13 samples are taken on each site during the bathing season (making a total of 24,890 seawater samples in 2002). The ministry in charge of the Environment and the ministry of Health have assessed the annual cost of the network at over € 4.5 m, not including labour costs.

Monitoring networks operated by Ifremer

In France, Ifremer is one of the main stakeholders in coastal environmental monitoring, managing several networks for the observation and monitoring of coastal water quality. In 1998, all Ifremer's coastal environment monitoring activities (coordinating national networks and working with regional networks, environmental data management tools) was estimated to cost over 10.7 million in all, in 2002 value.

• **The national seawater monitoring network (RNO)** was set up in 1974 by the ministry of the Environment and coordinated by Ifremer, produces monitoring data which France disseminates to international organisations like the ICES International council for exploration of the sea, Ospar and Barcelona conventions. Water quality parameters are monitored in 12 sites, two of which are in the West Indies. Contaminants (heavy metals, PCB, PAH, pesticides) are measured in marine organisms (approximately 80 sampling points) and sediments.
This watch has led measures to protect public health, and RNA data is also used to classify shellfish farming areas in terms of chemical contaminant levels (mercury, lead and cadmium).

• **The phytoplankton and phycotoxin monitoring network (Rephy)** The network was created in 1984, with the objectives of: (i) taking inventory pf all phytoplankton species in coastal waters, as well as exceptional occurrences (coloured water, harmful species); (ii) protecting consumers, by detecting the phytoplankton species which produce toxins and monitoring these toxins in shellfish. The Rephy network has about 200 sampling points. Toxicity test results can lead the competent authority (the Prefect) to prohibit the sale and harvesting of shellfish.

• Implementation of the WFD will lead to benthic monitoring being organised on a coastal scale, with Ifremer as delegated contracting authority. **The nationwide Rebent network** will be based on the methods of the Rebent-Bretagne network coordinated by Ifremer in Brittany to monitor benthic communities and subtidal and intertidal flora and fauna. This national network also aims for compliance with the "Habitats" and "Natura 2000" directives and laws on accidental pollution.

• **REMI, the microbiological monitoring network for shellfish farming zones** was set up by Ifremer in 1989, for microbiological monitoring and health watch in shellfish farming areas in accordance with the European directives 79/923/EC and 91/492/EC. The areas are classified by order of the prefect, following expert assessment by Ifremer.

PROCEDURE IMPLEMENTED BY THE WATER FRAMEWORK DIRECTIVE

The WFD has taken the principle of management by "river basin district" set up in France since the law on water in 1962, meaning decentralised management of waters by "catchments or river basins" thanks to six river basin committees and six water board agencies. An authority with jurisdiction is designated in each district (in France, this is the catchment coordinator prefect). The law introduces new concepts with respect to the French legislation, for instance for water masses, environmental characterisation, informing and consulting the public and economic analyses.

The steps of the procedures are to be applied within each Member State:
- *2003. Identification of river basin districts and designation of competent authorities.*
- *2004. District inventory and economic analysis. Register of protected areas and information of the public.*
- *2006. Environmental status monitoring programme. Consulting the public about timetables and programme to draw up the management plan, followed by the "summary of important issues" (2007) and the "draft management plan" (2008).*
- *2009. Establishing a programme of measures. Publication of a management plan for each district.*
- *2012. All programmes of measures will be operational.*
- *2013. Review of inventories for each district.*
- *2015. a) Achievement of good status objectives (unless exemptions). b) Review of measure programmes and management plans, preceded by consultation of the public. c)The review will take place in three steps (2012, 2013 and 2014); to be repeated every six years.*

A common implementation strategy for the WFD was defined in May 2001 by European Water directors, through theme-based working groups steered by the European Commission or Member States. The groups produced methodology guidance documents to enable a harmonised and coherent application of the directive. France was represented in each of the groups, and led the Wateco group on economic analysis.

This group worked on several levels for application of the WFD provisions:
- *economic analysis of water uses is to be made in each district (art. 5). It will particularly focus on supply, demand and economic determining factors of use;*
- *States must ensure that the price policy encourages efficient water use. District management plans based on long term forecasts for supply (including investments) and demand take account of the principle of recovery of costs of services related to water use, as well as the polluter-pays principle (art. 9). The economic computation should provide useful information for the implementation of these objectives;*
- *the States must ensure that a programme of measures is drawn up for each district with respect to its characteristics (art. 5) and the environmental management objectives (art. 4). The most cost-effective combination of measures. A cost-benefit analysis is required to decide on the programmes.*

The Wateco group disseminated the documents to harmonise the contents of the economic studies described above, specifying some points in the methodology.

There are four quality classes. Shellfish can only be harvested for direct human consumption in Class A zones. Marketing of shellfish from Class D zones is prohibited. Those from B and C zones must undergo cleansing or be relayed in an A class zone. REMI monitors Class A, B and C zones (328 sampling points as of 1st January 2005). The sampling schedule depends on the estimated quality or risk of deterioration.
An alert system is triggered when monitoring results exceed quality standards, there is a risk of contamination or in epidemics either reportedly or assumed to be due to shellfish

• **The farmed mollusc yield network (Remora),** created in 1993, makes it possible to assess performance of different oyster rearing areas, considering the farm's biological yield and the quality of oysters produced. The network has two purposes: helping shellfish farming ecosystem management and providing historical series to be used for scientific studies. It is based on annual monitoring of a given batch of oysters in the main French oyster-farming areas.

• **The mollusc pathology network (Repamo),** created in 1986, to meet the requirements of European directives 91/67/EC and 95/70/EC for health and hygiene inspections of shellfish. It carries out monitoring of diseases which must be declared, monitoring of farmed and wild bivalve mollusc populations, studies of causes of abnormal mortality and inspections of molluscs traded with European or other countries.

Other monitoring networks

Local measurement networks have been set up on the scales of estuaries or county coastlines. They supply data required in connection with local issues, like the nutrient monitoring programme in the Nord - Pas-de-Calais region, the "automated measurement network for the coastal environment in the bay of Seine estuary" (marel) or the "the Normandy coast hydrological network", or to coordinate monitoring activities on a regional scale, like the Mediterranean coastal network, which includes that of Rinbio, keeping a chemical contamination watch which was selected to ensure WFD chemical monitoring on the Mediterranean seafront.

In the field of sanitary microbiology, supplementing the REMI and recreational waters network data, the DDASS is in charge of monitoring the healthiness of recreational shellfish harvesting areas along the French coasts. The CQEL coastal water quality units are in charge of monitoring harbour water quality and hydrological variables in major estuaries under Ifremer's coordination. Coordination of unit strategies is nationwide in scope. The ministry of the Environment, as the contracting authority of the Repom national seaport monitoring network, has entrusted the units to implement this. It covers 186 metropolitan harbours and three overseas ports.

The INSU national institute for sciences of the universe, in the framework of its national network of marine stations has set up a "coastal environment observation service" called Somlit, to manage the permanent observation activities run on six French coastal sites.

Water management

Water board authorities and waste water management

Hydrographical networks are a major vector for polluting phenomena impacting the coastal environment and waters. Therefore, action taken by water authorities upstream from the coast is vital in this field.

The six authorities (Adour-Garonne, Artois-Picardie, Loire-Brittany, Rhine-Meuse, Rhone-Mediterranean and Corsica, Seine-Normandy) collect contributions from corporations or individuals for water abstraction (potable water, industrial uses, irrigation) and for industrial (wastewater spills in natural habitats or public sewage treatment networks) and domestic pollution (paid by towns).

The proceeds from these contributions are redistributed as aids to finance operations of pollution response, environmental protection or improving access to water resources. The authorities distribute the funds on the basis of a five year intervention programme.

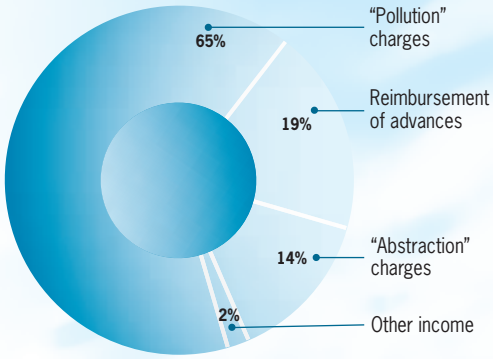
Waste water management expenses

Since 1990, nationwide spending for wastewater management has grown steadily at an average annual rate of 5%, reaching 11.2 billion euros in 2003, or 53% of total expenditure for environmental protection in France that year (sources: IFEN, PLF 2006). This is financed by firms, households, public administrations and companies specialised in collecting and treating wastewater.

The local council or inter-council services which manage wastewater, whatever their management mode (directly under local authority, partially or totally delegated), in 2003 made up nearly 80% (8.8 billion Euros) of nationwide spending in this sector. They receive financial assistance from water authorities as well as from county or regional councils. In some areas, special funding is available from the ministry of Agriculture or the European Commission.

Breakdown of water authority income in 2004
Source: PLF 2006.

Total: 2,052 M€

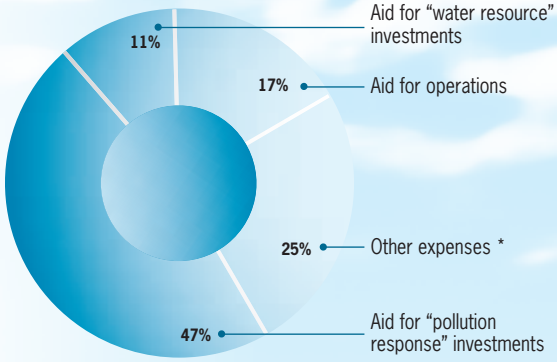


Including, per user category:

%	Local authorities	Industry	Farming
"Abstraction" charges	79	17	4
Pollution charges	89	10.4	0.6

Breakdown of water authority expenditure in 2004
Source: PLF 2006.

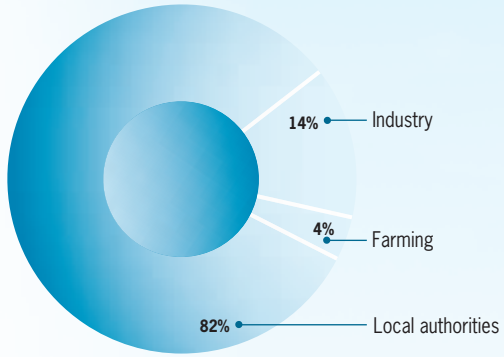
Total: 2,467 M€



* including: non-recurring credits, studies and inspection measures, extraordinary operational expenditure, running, and amortisation expenses.

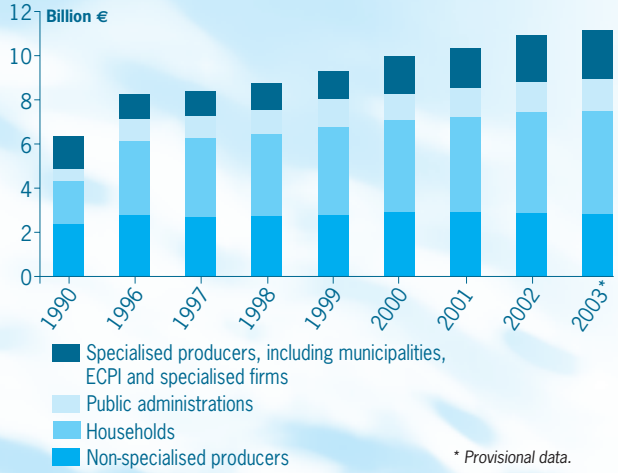
Breakdown of investment aids for pollution response by user category
Source: PLF 2006.

Total: 1,169 M€



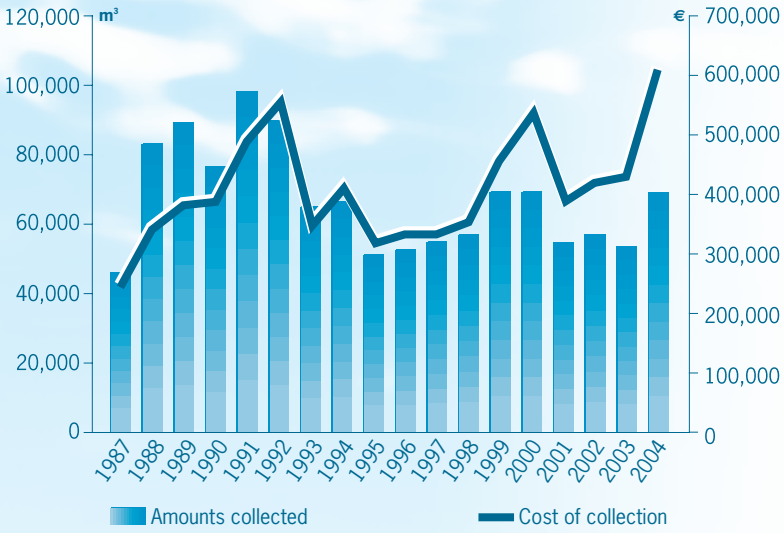
Breakdown of spending for wastewater management in France

Source: IFEN.



Trends in collection of green algae on Breton coasts

Source: CEVA.



Green tide pollution response

So called "green tides" are coastal blooms of macrophytic green algae (notably ulva and enteromorphs) which grow in the water. Blooms mainly occur in late spring and early summer, on many coastal sites in Europe. In France they have affected lagoons in the Languedoc, the Arcachon basin and above all the shores of Brittany.

These algae's development is fostered by the combined action of human and natural factors: physical and climate-related coastal features, with excessive nutrient inputs carried by streams to the sea. Along with the complex ecological consequences on the foreshore and in the benthic ecosystem, green tides have far-reaching economic and social consequences for regional tourism, because they release foul-smelling volatile sulphur compounds into the air and physically hinder recreational activities on the coast. They also affect shellfishing activities by making harvesting difficult and through ecological disturbances created by high densities of macroalgae.

The Regional council of Brittany, the Loire-Brittany water authority and the Breton counties have implemented the "Pro-littoral" programme (2002-2006) to fight green tides. Its "preventive" strand aims to reduce inputs of nitrogen from farming; its "cure" strand involves collecting and recycling seaweed; and a "cross-cutting" strand aims to provide technical support and environmental monitoring. Out of a planned 16.7 million euros, 10, 3.8 and 2.9 million euros are respectively budgeted for the three strands. Total expenses engaged from 2002 to 2004 were on average 1.8 million euros.

The seaweed collected is generally spread fresh on fields, composted or put into land-fill, in that order of importance.

ACCIDENTAL POLLUTION RESPONSE AND WASTE MANAGEMENT

Administrative action in terms of accidental marine pollution response

The organisation of accidental marine pollution response still in effect today is based on the 12 October 1978 Polmar instruction. Its objectives were mainly to set up an operational pollution prevention and response system and improve it through research studies and coordination between the administrations.

The following main organisations work within the Polmar system:
- In terms of central administration: the DAM/MTEM maritime affairs authority purchases the equipment needed for pollution prevention and response. In 2004, the funds specifically earmarked for the Polmar plan amounted to 2.4 million euros, with operating credits exceeding 680,000 euros. On average, the DAM spends from 125,000 to 150,000 euros per year on studies and research. The Cetmef/MTEM centre for sea and river technical studies provides the DAM with technical support, makes pooled purchases of equipment and manages the mobilisation of stockpiled material and equipment when needed. The French Navy's Ceppol anti-pollution practical studies commission is in charge of evaluating the needs for response at sea, and purchasing and managing Polmar-sea plan equipment, material and product stocks. The Cedre is in charge of documentation, research and on-going experimentation on pollution response techniques, equipment, material and products, as well as providing operational advice in emergency situations.

- On county and local levels: Polmar plan county-level managers ensure communication between the various stakeholders involved. The DDAM county directorate for maritime affaires acts as a local relay for the ministry of Public works and amenities and the ministry of Agriculture and Fisheries. They also play an important part in Polmar sea and land links. Furthermore, France has thirteen stockpile centres, eight of them in metropolitan France. The DDE county directorate for public works and amenities plays an important role in operations using pollution prevention and response equipment.

Since the sinking of the *Erika* and the *Ievoli Sun*, changes have been made in the Polmar system's regulations. Decree 2002-84 of 16 January 2002 concerning the powers of prefects in the zone, along with several instructions, including those published in the official journal on 4 April 2002 (concerning Polmar documents and the contingency funds for accidental pollution) aim to make existing organisations and resources more comprehensive to better combat pollution. Closer collaboration is planned:

• between various prefectures (maritime, county level and for defence areas) in drawing up contingency plans and putting POLMAR management into action;

• to implement action at different levels:

- nationally: coordination between ministries,
- on a county level: implementing and organising rescue plans,
- at the defence zone level: conducting rescue operations on land and sea.

Along with monitoring and action plans to prevent and fight pollution, expert studies on damage and health, food and environmental risks following the pollution event are provided for.

The Polmar system's development is based on:

- organising pollution response, with defence zone prefects taking part in the contingency plans at sea and on land, which may involve international cooperation;
- linking the system's land and sea components;
- close coordination between ministries and at the defence zone level;
- expert assessments;
- stockpiling and processing polluted materials and recovered pollutants;
- informing the public about health, food and environmental hazards, as well as about the steps to take to apply for compensation;
- extending the conditions for eligibility and shouldering of expenses by the State of prevention measures when the Polmar plan has not yet been triggered.

Polmar now falls under the Orsec maritime plan instituted by the law n° 2004/811 of 13 August 2004 concerning the upgrading of emergency response services and decree n° 2005-1157 of 13 September 2005.

To strengthen national systems for accidental marine pollution response, the European Agency for maritime safety has contracted with private and public sector firms to make vessels available for oil recovery operations in the case of oil spills. The contracts are signed for a period of three years, with an annual budget of 17.8 million euros. The operational zones are Baltic Sea, Atlantic-Channel and Mediterranean Sea.

To cover the Atlantic-Channel seaboard, a contract has been signed with the French shipowner Louis Dreyfus, to put the cable-layer "Ile de Bréhat" with a storage capacity of 4,000 m^3 on constant watch.

COMMUNITY MEASURES ADOPTED AFTER THE SINKING OF THE ERIKA

ERIKA I	
Strengthening of Port State control: directive 2001/106/EC modifying directive 95/21/EC. Creation of a black list of vessels.	*Entered into force on 2 January 2002*
Stricter monitoring of classification societies' activity (2001/105/EC modifying directive 94/57/EC)	*Entered into force on 2 January 2002*
Rule (EC) 417/2002 of 18 February 2002 on the accelerated phasing-in of double hull requirements (by 2015)	*Entered into force on 8 March 2002*
ERIKA II	
Directive 2002/59/EC on setting up a surveillance and information system to improve vessel monitoring in European waters	*Entered into force on 5 August 2002*
Rule (EC) 1406/2002 of 27 June 2002, establishing a European Agency for Maritime safety.	*Entered into force 25 August 2002*
Draft regulation to create a compensation fund for damage due to oil pollution in European waters.	*Project abandoned. IOPC fund supplement set up, bringing total to some 900 M€*

ERIKA III *(EC proposals on 23 November 2005)*

- *stricter conformity requirements of European flag states,*
- *stricter control of classification societies,*
- *stricter Port State Control (cracking down on substandard ships),*
- *improve traffic monitoring: designation of places of refuge, data communication networks for traffic data exchange, special equipment on fishing vessels to reduce the risk of collision,*
- *creating a harmonised European framework to conduct accident investigations,*
- *improve the system of liability and compensation in the event of maritime accidents: introducing provisions from the Athens convention of 2002, generalising the protection regime,*
- *making shipowners liable: raising the level of compensation to be paid by owners, negotiating the removal of the civil liability ceiling at international level, requiring that shipowners be obliged to take out compulsory insurance for damage to third parties.*

Macro-waste

Macrowaste is found floating or submerged in seawater. The types and sources vary greatly, the most widespread being plastic waste carried from catchments. Sometimes this waste takes a very long time to degrade and can contribute to the mortality of large marine animals who can ingest or be wounded by it.

Analyses have shown that this type of pollution has become usual along all seafronts. Measurements taken on 11 study sites indicate that the amounts of debris on beaches can range from 400 kg to 4 tonnes per kilometre of shoreline. The highest density of macrowaste seems to be in the Mediterranean. Collecting and processing the waste is the only way of dealing with this form of pollution.

A decree from 14 May 1974 states that cleaning the coast, and particularly beaches, falls under the authority of coastal municipalities. In some cases, clean-up can be cofinanced by funds from the county, region, state and sometimes Europe.

Examples of clean-up operations and their cost

In the **Gironde county**, towns do the cleaning themselves. The general (county) council takes on 50% of the cost of mechanically cleaning beaches, with a ceiling of 4,000 euros per kilometre of shoreline. This rate rises to 80% if manual cleaning is done, objective being to encourage this approach which is less harmful for the environment.

Since the early 90s, coastal clean-up in the **Landes county** is done on about a hundred kilometres year round, and more intensively during the summer season. On the so-called "wild" coast, cleaning is done once a month to avoid the processes of accumulation which would lead to more costly remedial operations in the long term. The general council, as contracting authority, advances the necessary monies to all of the towns. Nearly 47.5% of the spending comes from coastal towns and 52.5% from the general council. To this should be added a lump-sum contribution from the ministry of Defence for the bi-annual clean-up of its testing centre located in the county of Landes.

The **Pyrénées-Atlantiques county** conducts clean-up operations on land and sea. Every two days during the months of July and August, collection by a trawler is combined with air surveillance. The cost is estimated at 100,000 euros per year, for a volume of nearly 7 tonnes collected each season (financed by the county, the region and the Basque coast intercommunity joint consortium of coastal towns). Furthermore, the annual cost of cleaning beaches shouldered by coastal municipalities is estimated at nearly 1.5 million euros (source: cabinet Wertheimer, 2001).

SHORELINE CLEAN-UP COST IN LANDES COUNTY
Source: Landes general (county) council.

	2001	2002	2003*
Expenses (€)	1,218,500	1,164,029	837,949
Volume (m^3)	13,485	12,885	11,445

* Assessment over seven months. The Polmar plan took over for five months.

PROTECTING THE ENVIRONMENTAL AND SCENIC HERITAGE OF THE COAST

Public action taken in this field especially evolves fighting coastal erosion, combating proliferating species and protecting natural heritage.

Action against coastal erosion

The phenomenon of coastal erosion is the cause of growing concern. According to results from the "Corine coastal erosion" programme which is part of the European "Corine" programme, 46% of the French shores are stable, 22% are receding and 11 are undergoing accretion. In Europe, these ratios are respectively 55%, 20% and 11%. In France, 48% of beaches are receding. In the framework of the State-Region plan contracts, total funding of 40 million euros was provided to protect inhabited coastal areas for the period 2000/2006, 5 million which have been committed (Source: ministry of Public works and amenities, 2001).

Combating proliferating species

Some species have been accidentally introduced to coastal ecosystems. When their development brings about significant changes in the characteristics of these ecosystems and creates nuisances for coastal users, measures to stop their spread are required. Both public and private sector spending contributes to protecting the coastal environment.

This type of problem arises for certain species of macroalgae. Besides ulva (see above), other known cases involve some brown algae and a tropical green algae called *Caulerpa taxifolia*.

The case of the gastropod mollusc called the crepidula, or slipper limpet, is also well known. It now occupies a significant place in shallow, sheltered areas like bays and estuaries. The gulf between Normandy and Brittany is without a doubt the most colonised sector, particularly the Saint-Brieuc and Mont-Saint-Michel bays.

Until recent years, the response to crepidula was limited to occasional clean-up operations by dredging oyster beds, then discarding the limpets in abandoned areas of water or in dumps on land. A programme to restore the sea bottom was implemented in northern Brittany by the Areval association for gathering and utilisation of crepidula, formed by the regional maritime fisheries committee of Brittany and the northern Brittany regional shellfish farming section. This means extracting and recycling slipper limpets industrially for use in animal feed or as calcareous soil enrichment for farm land.

Nearly 34,000 tonnes of crepidula were removed in 2004. Forecasts for 2005 are between 25,000 and 30,000 tonnes (source: Côtes-d'Armor general council). Based on current yields, the unit cost of production has been estimated at an average of 12 euros (excl. taxes) per tonne collected. Cofinancing of this collection by professional fishermen and shellfish farmers reached 10% of the total cost. The other partners were the European Commission (50%), Brittany's regional council and the counties of Côtes-d'Armor and Ille-et-Vilaine.

Protecting natural heritage

The creation of a Fund for natural habitat management in 1999 from the Environment ministry's budget illustrates how new resources are being deployed in natural environment protection projects, especially within the framework of European directives

application. With a committed budget of 37 million euros in 2004, the fund helps finance French participation in the European Natura 2000 network of land and marine sites under the remit of the "Bird" (1979) and "Habitat" (1992) directives.

In 2003 and 2004, the ministry was granted an annual budget of over 71 million euros to create a coherent network of protected natural areas, placed under State responsibility. The beneficiaries are national parks for 48% (particularly missions to set up the Iroise Sea and Calanques marine parks), nature reserves (15%), the Coastal and lakeshore conservatory, to broaden its programme to purchase natural spaces (29%) and the National museum of natural history for its policy to promote knowledge and take stock of biodiversity.

Amongst the actions taken to protect coastal ecosystems, financed in part by public funding, are schemes for inventories, regulatory protection, contractual and land protection.

National biodiversity inventories

Biodiversity knowledge programmes make it possible to define action to be taken for its protection. They also apply to the coast and marine environments: inventories of "natural areas of ecological and wildlife interest" (14,755 of these so-called Znieff have been designated nationwide, covering 24.5% of French territory) and "important EC bird areas" (285 ZICO designated, covering 7.3% of national territory).

Nature reserves and national parks

The nature reserve system, established by law in 1930, amended in 1957 and then by the nature protection law in July 1976, is by far the most prevalent on the coast, in terms of surface area and number of sites concerned. Coastal nature reserves cover a total surface area of nearly 250,000 hectares (see table below). Some of them, like the Bouches de Bonifacio reserve (79,460 ha, which is the French portion of the international Bouches de Bonifacio marine park, the Italian part being the national park of la Maddalena), Scandola (1,669 ha) in Corsica or the Cerbère-Banyuls (650 ha) reserve in the Pyrénées-Orientales are especially marine areas.

In addition, although there is only one marine park (Port Cros) in the existing network of seven national parks created in the wake of the law of 1960, the network is now being extended to marine areas: a project is under study in the Calanques region for the Mediterranean sea; and in Brittany (Iroise sea) for the Atlantic.

Coastal and marine nature reserves in metropolitan France and the DOM

Source: ministère de l'Écologie et du Développement durable.
Unit: hectare

Marine or "mixed" reserves (land + sea or state-owned maritime area)	
Channel and North Sea	9,834.00
Atlantic	12,777.00
Mediterranean	81,779.00
DOM	16,899.00
Total	**121,289.00**
Areas of land located seaside (dunes or dykes) or connected to the sea	
Channel and North Sea	143.00
Atlantic	1,346.50
Mediterranean	15,068.00
DOM	110,023.00
Total	**126,580.50**
All "coastal" nature reserves	
Channel and North Sea	9,977.00
Atlantic	14,123.50
Mediterranean	96,847.00
DOM	126,922.00
Total	**247,869.50**

Contracts for protection (Natura 2000, PNR, Ifrecor)

The Natura 2000 network as of 1st July 2005, comprised 1,226 sites (4,279,610 hectares of which 500,610 ha are marine sites) proposed for the application of the European "Habitats" directive and 193 special protection areas (1,654,500 ha) designated for the application of the "Birds" directive. The Natura 2000 network aims to preserve the most threatened habitats and species in Europe through a concerted, contract-based approach on these sites.

Ten regional natural parks include shore areas: the Opale cape and marsh, Cotentin and Bessin marshes, Armorique, Brière, Landes de Gascogne, Narbonnais, Camargue, Corsica, Martinique and Guyana parks.

L'Ifrecor. Aiming to protect the coral reefs in the seven French overseas communities (Guadeloupe, Martinique, Mayotte, Reunion Island, New Caledonia, French Polynesia and Wallis & Futuna), the government launched the Ifrecor "French initiative for coral reefs" in 1998. The initiative took form with the creation of the Ifrecor committee made up of national and local level stakeholders. Significant financial means have been mobilised since 2000 (nearly 216,000 euros in 2002) to support the action taken by each of the authorities.

Conservatoire purchases

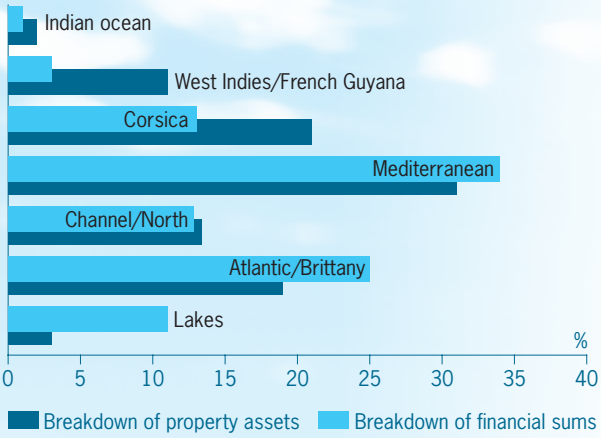
Source: Conservatoire du littoral.

	2004	Accumulated 1976-2004
Surface area belonging to the Conservatory (ha)	3,640	82,210
including: surface area purchased (ha)	*3,205*	*72,981*
surface assigned (ha)	*435*	*9,229*
Property investments (M€)*	17.1	336.94
Number of transactions	225	6,145

* Current euros.

Geographical breakdown of the Conservatoire's assets (in percentage of surface area purchased) and investments (in percentage of financial sums) for the period 1976-2004

Source: Conservatoire du littoral.



Public land purchases to protect nature

The coastal and lakeshore conservatory (a public administration) implements a land-buying policy to protect wildlife and coastal landscapes. It purchases threatened land, which is then restored to be made accessible to the public. The land acquired in this way becomes inalienable and cannot be resold. The Conservatoire's scope for intervention concerns 2,380 towns, 1,046 of which have a seafront.

Funding for these expenditures mainly come from State budget allocations (commitment appropriations) and special ministry programmes, contributions from European funds and outside partners (towns, counties, donors and sponsors). Local authorities manage Conservatoire lands, employing wardens to keep watch and maintain the sites.

From its creation in 1975 until 1st June 2005, the Conservatoire bought up more than 73,610 ha of property in 300 natural coastal sites, making 880 km of coastline (metropolitan France, overseas, lakes and coastal lagoons).

Priority is given to local authorities who accept to manage the sites purchased by the Conservatory. Other stakeholders join, or sometimes replace, local authorities to ensure this management (joint consortia, public institutions, approved foundations and associations and farmers). Although activities developed on these sites sometimes generate revenue (rental, farm tenancies, leases and agreements, proceeds from entertainment and demonstrations), profits like these remain the exception.

Two other public operators also control land used to protect nature on the coast:
- the national forestry office manages State-owned land, similar to that of the Conservatory;
- the départements (≅ counties) buy up land using the county levy for fragile natural areas. This optional tax, levied since 1985, aims to take advantage of urban development to finance the acquisition and management of areas to be protected.

Marine research

THIS CHAPTER FOCUSES ON THE ACTIVITIES OF FRENCH PUBLIC BODIES IN THE FIELD OF MARINE RESEARCH AND OPERATIONAL OCEANOGRAPHY. THE FRENCH RESEARCH EFFORT IS HIGHLY DIVERSIFIED AND SUPPORTED BY SEVERAL ORGANISATIONS IN VERY DIFFERENT FIELDS OF SPECIALISATION. IT IS CONTRIBUTED TO EUROPEAN OR EVEN GLOBAL PROGRAMMES INCREASINGLY OFTEN, IN KEEPING WITH THE SCOPE OF FUNDAMENTAL ISSUES AFFECTING THE STATE OF THE OCEAN AND THE ENVIRONMENT.

RESEARCH BODIES

Ifremer, university and CNRS-INSU oceanography laboratories, the SHOM French navy hydrographic and oceanographic service, the IRD research institute for development and the IPEV Institut Paul-Emile-Victor for polar research are the main scientific organisations at the pivot of public ocean and marine research. Earth-observation satellites provide an additional spatial component for oceanographic research. They are financed by the CNES, generally in the framework of bilateral or multilateral cooperation.

At Ifremer, marine research deals with the coastal environment, exploiting living resources, ocean and climate and exploring the deep sea.

As a resource agency, Ifremer is also responsible for creating and managing major scientific facilities of general interest on behalf of the scientific community: a fleet of research vessels, underwater vehicles, ship-borne equipment, computing and testing facilities and experimental set-ups for mariculture. It commissions coastal and deep sea vessels.

For all of France, the blue water ocean research fleet includes five Ifremer vessels, two of which are shared with the SHOM, the "*Pourquoi pas?*", 55% funded by Ifremer and now being commissioned, as well as the *Beautemps-Beaupré*, 95% financed by the Ministry of Defence and made available to Ifremer ten days a year; an IPEV vessel and two vessels for the IRD. The coastal fleet includes three inshore vessels managed by tbe CNRS/INSU, three for Ifremer and one for the IPEV. The SHOM has research vessels which are capable of taking part in nationwide surveys, such as the "*Beautemps-Beaupré*", commissioned in 2004.

Through its national scientific committee, Ifremer implements and programmes its deep sea vessels, joint resources like seismic equipment and underwater vehicles ("*Nautile*", "*Victor 6000*" and "*SAR*") to the benefit of the French scientific community:
- to study ocean circulation and the mechanisms behind its variability;
- study of carbon, nitrogen and phosphorus cycles and budgets;
- marine geosciences to discover and explore the sea floors,
- study of deep benthic ecosystems in the hydrothermal domain and on continental margins;
- fisheries (fished stock assessments, relations between these stocks and their environment);
- and the coastal environment, complementing inshore vessels (investigating contaminants and their fate, matter and nutrient fluxes and budgets, impact from human activities).

Coastal vessel activity is programmed in cooperation with the INSU in the framework of two inter-regional committees.

Ifremer operates several monitoring networks for the coastal marine environment (see above: chemincal contamination, toxic phytoplankton, farmed and harvested shellfish) and participates in the international fisheries stock assessment effort. It conducts research programmes on the environment, resources and their use.

Ifremer's annual budget provides funding for research and research-support activities (research administration, fleet operation) in metropolitan France and the DOM-TOM. Genavir is an economic interest group which operates the ocean research fleet on its own and other partners' behalf.

The oceanographic component of CNRS research requires large-scale resources for data collection (satellites, ocean research vessels, and atmospheric research aircraft), data processing and interpretation. CNRS oceanographic research mainly devolves to the Department of sciences of the universe and the INSU national institute for sciences of the universe. This research focuses on the ocean, climate and global environment, and study of the marine biosphere, solid earth dynamics and the coastal environment. Many of these investigations are carried out jointly with Ifremer. Over forty of the CNRS's own labs and university laboratories associated with CNRS are involved in this research.

The national network of marine stations, was reorganised in 1994. It is made up of ocean research laboratories set up along the coast, thirteen of them in all. The main research themes addressed there are marine species biology, marine ecosystems, ocean circulation and flows, marine environmental chemistry and marine geology. Six of these stations are OSU science of the universe observatories.

The main universities involved in ocean research are Bordeaux I, Brest, Lille I, Marseille II, Paris VI, conjointly supervising the six OSU with the INSU, and Caen, La Rochelle, Littoral-Côte d'Opale and Perpignan.

• Oceanographic research's spatial dimension is provided by the Earth observation satellites launched by the CNES national space research centre and the ESA European space agency. Following the combined ERS2 and Topex/Poseidon missions, the scientific community and operational services now have data supply by *Jason-1* and *Envisat* which were respectively launched in December 2001 and March 2002. Seeing the expected lifespans of these altimetric satellites, in December 2005 the CNES announced they were launching a new programme called AltiKA, an altimeter which could be taken aboard the Indian OceanSat3 satellite. This mission will be launched in 2008, in combination with the Jason-2 mission, which is the successor to Jason-1.

• The SHOM, with 708 staff in 2004, including 132 sea-going personnel, mainly conducts research on oceanography for military purposes (marine environment and its physical phenomena, bathymetry and sedimentology). The military oceanography centre CMO is also specialised in naval oceanography, supplying French Navy forces with ocean and meteorological data and the means to use them. The SHOM-Météo research and design consultancy called BRESM is within the CMO.

The SHOM's main establishment (Epshom) is in charge of centralising, processing, formatting and disseminating data on operational hydro-oceanography. It carries out R&D work in collaboration with several organisations (Météo-France, CNRS, Ifremer, universities). The other fields of Epshom's studies deal with physical oceanography, sedimentology, geophysics and marine chemistry.

• IRD conducts research on intertropical environments. The main multidisciplinary research themes related to the sea are:
- tropical climate variations and ocean-atmosphere interactions;
- uses of coastal areas with respect to the environment, resources and societal aspects;
- tropical aquaculture;
- and marine ecosystems, living resources and their exploitation, impact of human activities.

• The IPEV is a public interest group created in 1992. As a resource agency for French polar and subpolar research, it selects and promotes scientific programmes in polar and subpolar regions, as well as financing and implementing these programmes in sub-Antarctic islands, in the Arctic and the Antarctic. Its research principally addresses: internal and external geophysics, physics of the upper and lower layers of the atmosphere, glaciology, marine and continental biology, oceanography and medicine.

• The other principal research bodies involved in ocean studies are:
- Météo France (French Meteorological office): doing research on ocean-atmosphere interactions and climate fluctuations, carried out in cooperation with university and CNRS laboratories and with several other bodies which are active in the ocean-atmosphere-biosphere environment (CNES, IRD, Ifremer),
- INRA: marine hydrobiology and ecosystems, migrating fish species ecology, research related to marine and freshwater finfish farming (especially pathology) and to upgrading of products either fished or farmed in fresh or brackish waters;
- Cirad, whose main marine research themes are fisheries and coastal biodiversity;
- BRGM: amongst other subjects, working on geological mapping of the continental shelf, and study of phenomena at the ocean-continent interfaces, such as inputs from catchment areas.

Apart from oceanographic research, mariculture research is mainly done at Ifremer (showing the highest budgeting and use of human resources), at INRA and at IRD. The Afssa French agency for food safety also works on aquaculture-related pathology.

OPERATIONAL METEOROLOGY AND OCEANOGRAPHY DATA

Operational oceanography aims to supply a description in almost real time of the 3D hydrological structure of the ocean and marine currents. To do so, it uses observational data and processes their assimilation in numerical models which can forecast ocean trends. The outputs of these models are "secondary" data, often applied at a local level. The final products are distributed to private industrial users and to public bodies. The raw data comes from *in situ* measurements made on buoys or vessels, as well as spatial observations such as meteorological data from the Metop programe and from oceanograpic satellites, especially *Jason* and *Envisat*.

The activity is growing in several fields: measurements and forecasts, especially concerning speed and direction of sea winds, wave height and direction, surface currents, tides, sea ice and sea surface water temperature. Several public organisations are involved in setting up operational oceanography.

Civilian marine research effort by main organisations
Sources: the various organisations.

	Total expenses (M€)		including staff costs (M€)		Labour force	
	2003	**2004**	**2003**	**2004**	**2003**	**2004**
Ifremer [1]	201.5	171.1	81.5	81.8	1,705 [2]	1,705
CNRS-INSU-universities [3]	85	85	56	56	786	786
IPEV	8.4	8.4	0.2	0.2	10	10
IRD	33.7	31.4	26.5	26.0	98 [4]	98
INRA	4.1	3.7	2.8	2.5	53	50
Total	**332.7**	**299.6**	**167.0**	**166.5**	**2,652**	**2,649**

(1) All Ifremer activities.
(2) including 1,385 Ifremer salaried employees and 320 Genavir salaried staff. Scientific and administrative personnel.
(3) Ifremer estimation after consulting the INSU.
(4) Scientific staff (80) and seamen (18) specifically assigned to marine research.

MARINE RESEARCH VESSEL FLEETS

The OFWG Ocean research fleets working group was set up under the mandate of the ESF European Science Foundation's Marine Board to analyse the situation and management of the European fleet of research vessels over 35 metres LOA, in order to propose a joint strategy for its use. The work is underway and the initial results will provide an assessment of the size of the fleet in question.

The OFWG classifies research vessels according to the UNOLS University-National Oceanographic Laboratory System, ie, by their main area of navigation. The "local" and "régional" categories correspond to coastal zones, with the first gathering vessels under thirty metres. The "ocean" and "global" classes are for the open sea; including vessels which can work on the scale of an ocean for the first category and those that can work over the entire globe, including polar zones, for the second. The OFWG has selected vessels with an academic research calling, operating on bids for tenders and running multi-purpose missions. It does not include professional vessels used occasionally for assessment cruises (like for fisheries stocks).

It appears that the European ocean research fleet is comparable, overall, to that of the United States. It now holds 45 vessels (not including the local category), ten of which fall into the global class, belonging to Germany, France and the United Kingdom. The rest of the fleet, mainly in the ocean and regional classes belongs to various countries in Europe.

Breakdown of American and European research fleets* in 2005
Sources: Unols, OFWG.

Class	Europe	United States
Large or Global	10	10
Intermediate/Ocean	14	7
Regional	21	9

* Apart from local class vessels.

Research vessels over 30 metres in Europe
Source: OFWG.

	30-60 m	Over 60 m
Germany	2	6
Belgium	1	0
Denmark	0	1
Spain	2	2
Finland	0	1
France	4	1
Greece	0	1
Iceland	1	1
Ireland	1	1
Italy	1	2
Norway	3	3
Netherlands	0	1
Poland	1	0
Portugal	5	2
Romania	0	1
United Kingdom	0	4
Sweden	0	1

Météo-France's role

There is a strong connection between ocean meteorology and operational oceanography in terms of modelling. Moreover, climate and meteorological forecasts in general can also benefit from ocean predictions. Météo-France, as a public adminstration under the supervision of the ministry in charge of planning and amenities, has made operational oceanography one of its priorities for 2000-2010. Météo-France is particularly interested in the ocean layer affected by ocean-atmosphere interactions.

Météo-France expenditures for marine meteorology and operational oceanography in 2002 accounted for a budget of about 15.5m euros. The international nature of these activities requires its major participation in international networks for cooperation and exchange of data, particularly in the framework of the joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). Météo-France fulfills France's operational commitments in terms of safety at sea, marine pollution, tropical storm forecasts and management of data from drifting buoys. It also takes part in the GMDSS global maritime distress and safety system, covering the western Mediterranean, part of the Atlantic and part of the Indian Ocean, where its centre on Reunion Island is in charge of predicting cyclones and marine forecasts for the Amsterdam-Crozet-Kerguelen zone. In the Mediterranean and the Atlantic, Météo-France contributes to pollution response in the framework of the marine pollution emergency response system.

Within the framework of the Eumetsat European Organisation for the Exploitation

of Meteorological Satellites, Météo-France has been designated to steer, run and coordinate the SAF-Ocean satellite applications centre devoted to the ocean and sea ice, in cooperation with other European meteorological institutes. The Eumetnet weather service network put Météo-France in charge of a similar mission for surface observations (ships, drifting and moored floats) in the North Atlantic (Eucos-Marine).

Météo-France supplies marine forecasts for safety offshore and the protection of French metropolitan and overseas coasts. Constant monitoring of the ocean is performed and warnings issued whenever necessary (like "special weather forecasts" for the safety of shipping, high swell and surge warnings for coastal areas). They also provide meteo-oceanographic predictions: marine weather forecasts, modelling and prediction of sea states, sea surges, drifting objects or pollution slicks. Météo-France also plays a role in the Polmar plans, in charge of predicting drifts along with the Cedre.

For oceanography and marine meteorology, Météo-France is involved in:
- *in situ* data acquisition (vessels and buoys), in an international framework. Nationwide, it works through the Coriolis programme (see below), in cooperation with Ifremer and five other organisations;
- satellite data acquisition and processing;

- routine production of sea surface temperature analyses, using *in situ* data and satellite images;
- operational implementation of models to forecast dangerous ocean phenomena (waves, low levels, surges) or technological hazards (drifting oil slicks, wrecks, etc.);
- global and regional ocean modelling within the "Mercator-Ocean" public interest grouping's activities, as well as in European programmes such as the MFS Mediterranean Forecasting System,
- data archiving, modelling and satellite imaging.

Programmes

Ifremer's operational activity falls into three main fields: managing coastal water quality monitoring networks (see above: "Coastal and marine environment protection"), ocean circulation, cruises to study physical oceanography and fisheries.

Ocean circulation is being studied in a deep sea operational oceanography programme for climate purposes, with the participation of several French research bodies, with three strands:

- **routine *in situ* ocean measurements** "Coriolis" is a project coordinated by Ifremer in cooperation with the CNES, CNRS, IPEV, IRD, Météo France and SHOM, whose objective is to collect, validate and provide real time availablity of ocean temperature, salinity and current profiles. The main user is the Mercator model (see below), which assimilates the data supplied each week by Coriolis. The project coordinates the French contribution to the world ocean observation programme "Argo" (3,000 floats planned worldwide for 2007). Coriolis also provides real-time recovery of repeated measurements made by French research vessels. Along with its "measurements at sea" component, Coriolis has an "instrumentation" element which has made drifting profiler design progress, and a "data centre" which mainly involves linking up to international networks in order to collect, check and disseminate most of the data;
- **satellite altimetry.** Since Jason's launch, sea level measurements accurate to a centimetre are taken routinely. This Franco-American programme is led by the CNES;
- **Modelling the world ocean observational** data are used by several secondary data producing systems (analysis and ocean forecasts). One of them is "Mercator Océan", a public interest grouping created in 2002 (CNES, CNRS, Ifremer, IRD, Météo-France, SHOM). It describes and predicts ocean phenomena (currents, temperature and salinity) in real teim, with high resolution, at the surface and in deep water. A 15-day forecast has been published weekly since 2001. Predictions have become increasingly accurate as the model is improved.

The SHOM is also involved in operational oceanography, and is an active partner in *Coriolis* and *Mercator*. It is responsible nationwide for collecting, validating and disseminating nautical information to civilian navigators, military and professional seafarers and boaters. It distributes more specific data on the marine environment to the naval forces and staff.

Outlook

Operational oceanography programmes aim to both refine and integrate services proposed on a world scale.

Coriolis, Jason satellite altimetric data and the overall modelling supplied by Mercator are three components which are already contributing to the international Godae ("Global Ocean Data Assimilation Experiment") and ARGO programmes, respectively for modelling and *in situ* measurements.

The four year integrated *Mersea* (Marine Environment and Security for the European Area) project (2004-2008), brings together 50 laboratories from sixteen European countries, working under Ifremer's coordination. Its objective is to set up a European system to monitor and forecast the world ocean and European regional seas, and their physical and bio-geochemical properties. It will supply the data and information on the state of the ocean needed to monitor the global environmental state and climate change, seasonal forecasting, safety at sea, developing applications for offshore industry and fisheries, responding to accidents or pollution and defence requirements, as well as drawing up and following international conventions.

Mersea federates European participation in Godae. But more broadly speaking, it produces the services required for GMES marine applications. This will be a key part of the system in coming years.

The GMES (Global Monitoring for Environment and Security) programme, to be set up by the European Space Agency and the EC in 2008, will effectively have a marine component. Its general objective is to create a decision-making aid and support network for the public and political decision makers to acquire and interpret the geospatial information which is useful for the environment and security in general. This will particularly focus on the ocean environment and its natural resources. Thus, it has been designed as the European contribution to the Global earth observation system of systems (GEOSS), set up at the world Earth observation summit (EOS III) in February 2005 in Brussels.

In doing so, operational oceanography in France and Europe falls under a dual approach:

- on the one hand, it contributes to globalisation of services, ie, to a general monitoring policy for the global environment in real time for general security purposes. Choices are made internationally and European initiatives are one dimension of their implementation;
- on the other hand, GMES and *Mercator* plan to supply scientists, experts and public authorities with a range of value added services which require more sophisticated data processing than the standard secondary products. Although Mercator's objective is to provide only general added-value services (high resolution, seafront forecasts, seasonal and educational information), GMES aims at services adapted special requirements of end users, such as managers and political decision makers (maritime safety, coastal surveillance, routing, offshore operations, pollution and degassing, toxic algae): "downstream ocean services" will come from processing of standard products.

In the long term, as services are refined and diversified, along with diversification and specialisation of the clientele, supported by GMES, the issue of what form the oceanographic data market should take will be raised. Extending the offer could involve public operators supplying data and third-party operators to produce a range of a la carte services. In fact, the clientele itself could be made up of public managers and enterprises working in coastal areas and on the open sea.

Summary

THE FRENCH MARINE ECONOMY IN 2003

Nearly 19 billion euros of added value and a work force of 500,000 full time equivalents characterised the French marine economy's importance in 2003.

For both production and employment, coastal tourism remains predominant, as noted in the previous versions of this report. It makes up almost half of the marine economy.

The rest of the economy is shared by five sectors which are basically equivalent in terms of production: the seafood sector, maritime shipping, ship and boat building and repair, offshore oil-related industry, and the public sector (most of the workforce is due to the French Navy). Thanks to high working productivity, offshore oil has much fewer jobs than the four other sectors, with about 5% of the total labour force. Conversely, manpower in shipping, a branch which has shown sustained growth, ranks second for maritime jobs with approximately 13.5% of the total. Each of the other sectors employs around 10% of the labour force.

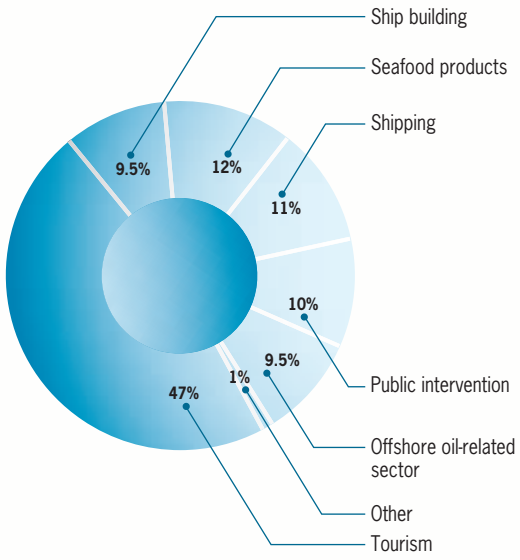
GROWTH OF THE MARINE ECONOMY FROM 2001-2003

The key figures for the marine economy must be interpreted carefully, and particularly when comparing them to the results compiled in the previous version of this report. They have indeed been revised for several of the branches. The reasons for this vary from one activity to another, but are mainly due to a change in the estimation method (shipbuilding, public sector), in scoping (port activities) or in the statistical source used (seafood processing). This has resulted in several downward adjustments.

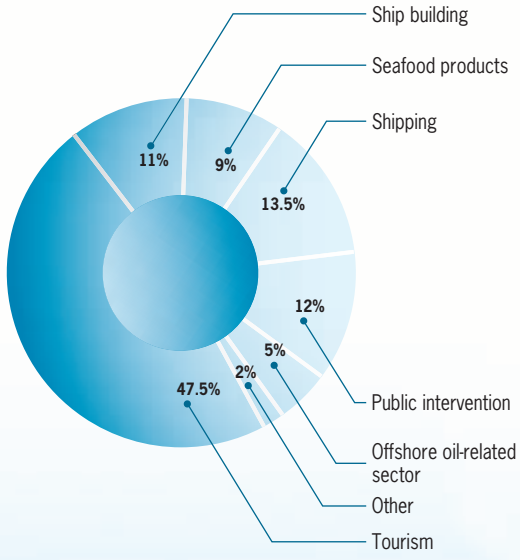
Apart from these revisions, the maritime economy's growth from 2001 to 2003 is estimated to be about 5.3%, whereas the French GDP in current prices grew by 6.4%. So, the marine economy seems to have developed at a slightly slower pace than the national economy over the recent period.

Irrespective of the internal factors of companies and branches which could explain these results, in view of this economy's sensitivity to export markets, reasons related to the international context should be mentioned.

2003 marine value added: 18.9 billion euros



Marine employment 2003: 500,000 jobs



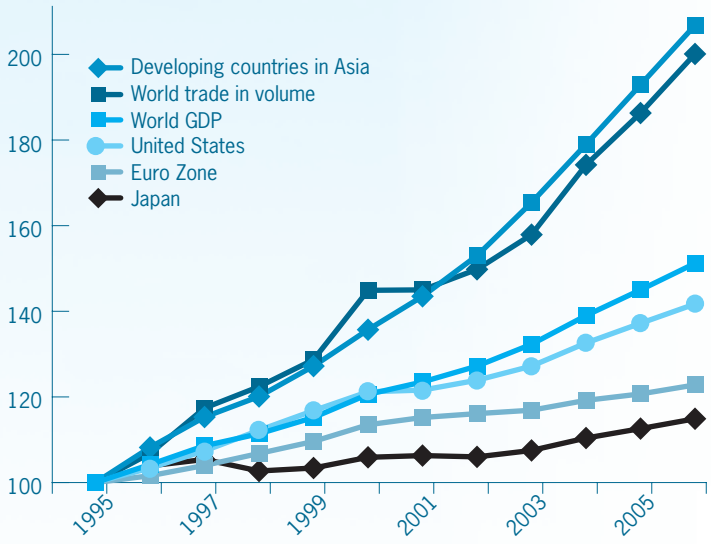
Marine activities in 2003

	Turnover (M€)	Value added (M€)	Employment
Industrial sector		**17,042**	**439,199**
Coastal tourism	**21,145**	**8,881**	**236,975**
Seafood products		**2,277**	**46,090**
Marine fisheries	1,144	721	13,532
Mariculture	552	386	11,187
Seaweed stream	296	185	1,195
Fish auctions	61	52	850
Fish trade	2,100	283	5,000
Seafood processing	3,077	650	14,326
Ship building		**1,755**	**53,398**
Merchant shipyards	1,163	254	5,333
Military vessels	1,754	271	13,004
Naval equipment and fittings	2,700	800	25,000
Ship repair	251	88	2,356
Boat building	1,086	342	7,705
Shipping		**2,056**	**66,401**
Merchant fleet	5,515	855	13,447
Maritime insurance	1,137	153	1,300
Harbour companies (1)	822	657	7,202
Stevedoring	816	353	5,119
Other harbour professions (2)	245	38	39,333
Marine aggregate extraction (3)	**25**	**10**	**300**
Electricity generation	**na**	**na**	**6,800**
Marine engineering	**277**	**125**	**1 205**
Oceanographic instruments (4)	**na**	**30**	**nd**
Submarine cables	**na**	**-**	**1 190**
Maritime press (4)	**na**	**35**	**440**
Offshore oil-related sector	**5,500**	**1,804**	**25,500**
Banking	**100**	**69**	**900**
Non-commercial public sector		**1,867**	**60,815**
French Navy		**1,597**	**54,563**
Public intervention (5)		**103**	**3,600**
Civilian marine research		**167**	**2,652**
General total		**18,909**	**500,014**

(1) PA and PIN, harbour firms and Customs.
(2) Value added concerning pilotage, towing and inshore pilotage
(3) Scoping limited to aggregate extraction.
(4) Ifremer estimations
(5) Ifremer's estimation based on METL data.
na: not available.

World growth rate*

Source: International monetary fund.



* 100 index in 1995. Estimations for 2006.

The general economic climate from 2000 to 2003 showed a slowing of growth in western countries, with an upturn at the end of that period. There was a clear fall in trade growth. This slowdown was noticeable in the United States in 2001 and 2002, but did not affect growth in developing countries in Asia (India, China and Asean countries) which continued at a steady pace. On the contrary, economic trends in the Euro zone and Japan were particularly sluggish.

From 2000 to 2003, primary commodity prices, and singularly that of oil, were fairly low with respect to current prices. The average price of the IMF's non-fuel commodity basket even hit a slack period in the cycle. A slight rise in oil prices was perceptible at the end of the period, subsequently leading up to the recent sharp increase.

As concerns the dollar/euro exchange rate, although 2000-2003 can be seen retrospectively as a turnaround period after hitting a peak in 2001, the rate remained nevertheless high over the entire period, with a drop in late 2003 and a further, unexpected decrease. Thus, the situation was relatively favourable for making exports in dollars (like offshore oil) more competitive.

The 2000-2003 period was therefore marked by flagging growth in western countries and a slowing down of world trade, while growth in Asia, with the exception of Japan, was constant. This economic context affected both company investments and consumer spending. Notably, such different items as oil exploration, production expenditure and leisure spending were not spared. In spite of its international slowdown, trade with Asia stayed dynamic, as shipping-related demand remained strong.

The world economic situation partly explains the low performance of the French marine economy. In this respect, one feature must be stressed: with a very large tourist sector, an export boatbuilding industry and shipbuilding whose key market is cruise vessels, this economy is highly dependent on leisure spending. In addition, these sectors rely on European demand, making up the majority of their export outlets.

- This means that tourism, which relies on household income and a mostly French and European clientele, showed small growth from 2000 to 2003. There have been signs of recovery since 2004.

- Boatbuilding is also dependent on leisure spending, and suffered from the slowdown of western demand from 2001-2003. Although it exports over 60% of its production, targeting European customers for 85 to 90% of its non-domestic outlets, it continued to grow (growth rate higher than the GDP in 2003) but at a more moderate pace. After exports soared from 1997 to 2001, with annual growth of 20 to 30%, the progression slowed, and export sales even decreased in 2003. Sales seemed to speed up perceptibly from 2004 on. Now the challenge will depend on increased efforts by enterprises in the motor boat sector.

- The cyclical nature of French shipbuilding can be explained by the determining influence of cruise ship orders, and thus of the cruise market. The sluggishness of the market in 2001-2003 had repercussions on cruise ship investments. Conversely, the markets for standard vessels (containerships, bulk carriers, oil tankers) and LNG carriers, in which French shipyards have a small share, were dynamic and driven by increased trade, particularly with Asia. The pronounced drop in French production only ended after cruise operators resumed their investments, from 2004-2005 on.

The offshore oil-related industry and shipping are also highly internationalised, and include services to companies, except for passenger carriage. Therefore, they fall under different approaches:

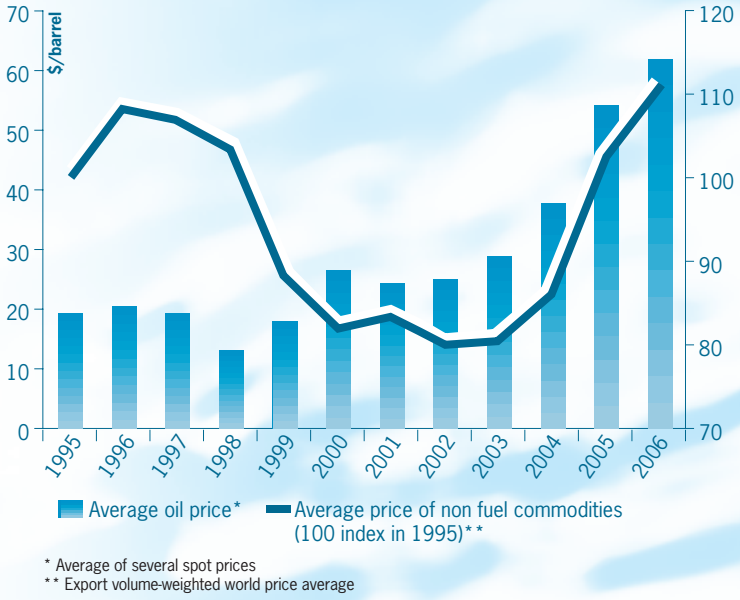
- The offshore oil industry is obviously sensitive to the energy situation, with its world markets. Oil exploration and production investments, which control the sector, did not progress at the same pace in 2001-2003, but the downswing was highly variable from one year and one region to another, in a context of low oil prices. Overall, this led to a moderate trend for the French stream for that period. Its impact is measured in the European currency and was cushioned from 2002 on by the drop in the dollar/euro exchange rate.

- French shipping has a wide range of businesses, with varying degrees of involvement in international trade. The most internationalised part has adapted to the growing share of containerisation and the rise of international trade in Asia. Globally, the period from 2000-2003 was marked by strong growth at the end of the cycle in 2000, a slowing of demand in shipping in 2001 (drop in cargo rates), stabilisation in 2002 and finally an upswing in 2003. In this fluctuating situation, French shipowners managed to achieve positive results on a regular basis. Maritime harbours owe much of their development to the constant progression of containerisation in recent years.

As concerns the other branches of the marine economy, the following recent trends should be noted:
- a weak rise in tonnages and the pricing effect for maritime fisheries, but strong growth in the seafood processing sector;
- limited activity in the submarine cable sector, which is mostly a maintenance market worldwide, in spite of a few new investments for upgrading.

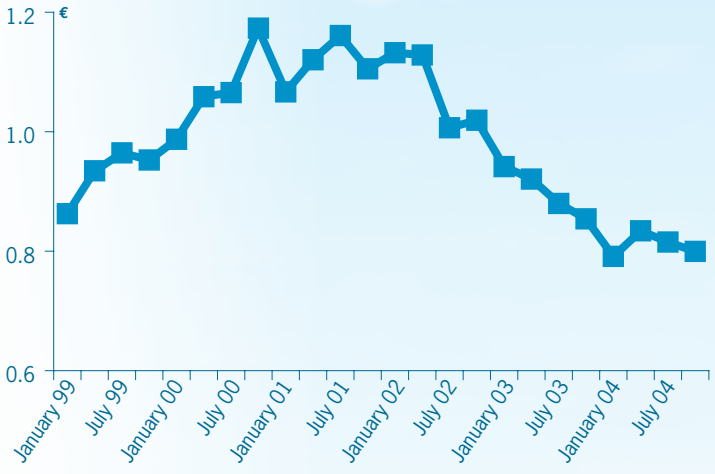
The international factors mentioned here, which explain the moderate development of the French marine economy from 2001 to 2003 have evolved. World growth has steadied, with international trade developing at a sustained pace, whereas oil and primary commodity prices have risen considerably in the past two years. The effect on European countries has been partially mitigated by the dollar's drop with respect to the euro.

Commodity prices
Estimation for 2006
Source: IMF

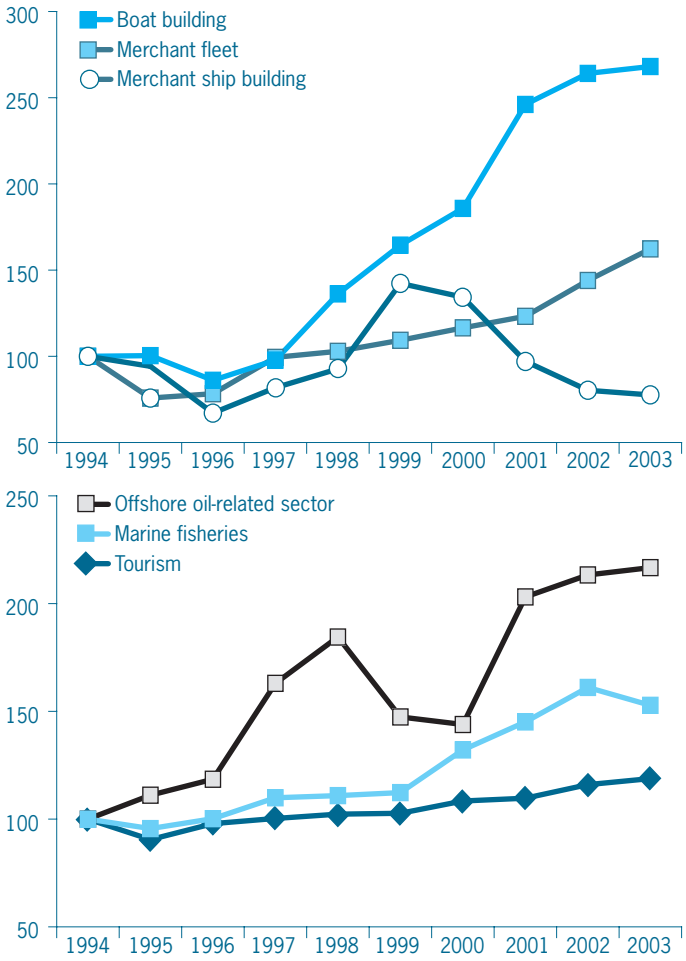


* Average of several spot prices
** Export volume-weighted world price average

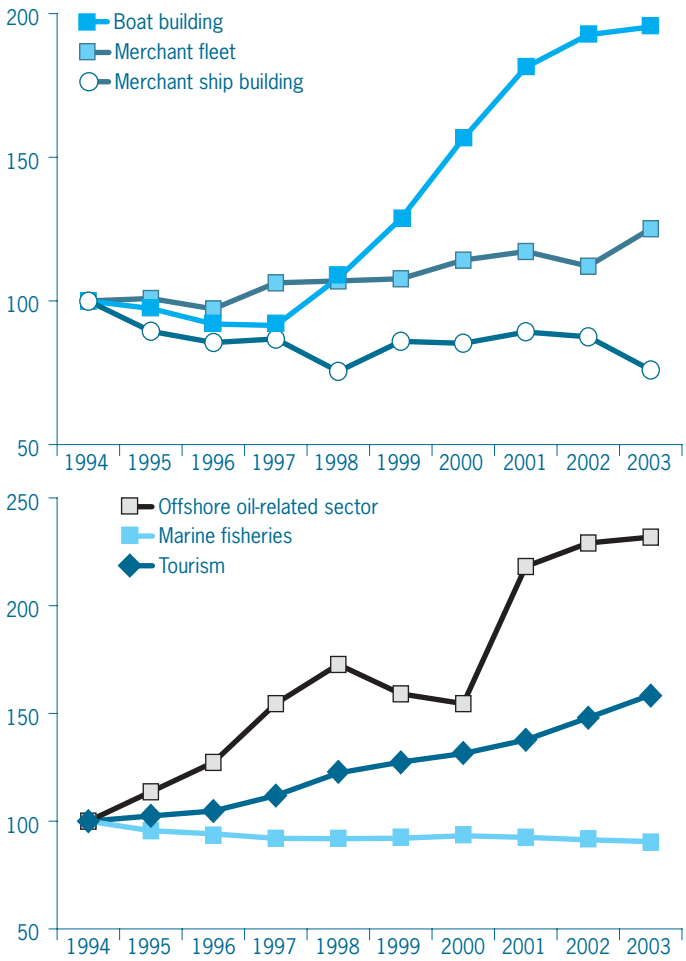
Dollar/euro exchange rate
Source: Hamburgisches Welt-Wirtschafts-Archiv, 2005.



Growth of marine economy branches
(100 index in 1994)



Employment in marine economy branches
(100 index in 1994)



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Acronyms and abbreviations

Ademe	Agency for the environment and energy management
AFIT	French agency for tourist engineering
Afssa	French agency for food sanitary safety
Agema	Fisheries and aquaculture training centre management agency
BFG	Blast furnace gas
BRESM	SHOM-Météo France research and study bureau
BRGM	Geological and mining survey office
Cedre	Centre of documentation, research and experimentation on accidental water pollution
Ceppol	Commission for practical studies in anti-pollution response (French Navy)
CESA	Community of European Shipyards' Associations
Cetmef	Marine and river technical studies centre
CEVA	Seaweed technology research centre
CFP	Common fisheries policy
cgt	Compensated gross tonnage: product of the gross tonnage multiplied by a compensation coefficient, which takes account of the fact that amount of work at the yard, measured in hours for the same gross tonnage value, is not equivalent for different types and sizes of ship (see gt).
Cirad	Centre for international cooperation in agricultural research for development
CMO	Navy oceanography centre
CNC	National shellfish-farming committee
CNEM	National commission for maritime employment
CNES	National space research centre
Cneva	National centre for veterinary and food studies
CNRS	National centre for scientific research
Cofrena	French marine equipment manufacturers association
Corine	Coordination of Information on the Environment (European programme)
Cosma	Coastal rescue centre in the West Indies
Cosru	Coastal rescue centre of Reunion island
CQEL	Coastal water quality unit
Cross	Regional search and rescue centre
CSCN	Shipbuilders trade association
DAEI	Economic and international affairs directorate (MTEM)
DAM	Maritime affairs directorate (MTEM)
DCN	Naval shipbuilding division
DDAM	County-level division of maritime affairs
DDASS	County-level division of the ministry of health and social affairs
DDE	County-level directorate public works and amenities
DEMF	French marine economic data
Direm	Energy and mineral resources directorate
DOM	French overseas "département" (= county)
DPMA	Maritime fisheries and aquaculture directorate
DTMRF	Shipping, haulage and river transport directorate (MTEM)
DWDM	Dense Wavelength Division Multiplexing
Dwt	Deadweight tonne
EAE	Annual company survey
EAGGF	European agriculture guidance and guarantee fund
EC	European Commission
EDF	French electricity board
EEA	European Economic Area
EEC	European Economic Community
EEZ	Exclusive economic zone
EIG	Economic interest group
EMA	Vocational training school for seafarers and aquaculture
EMEC	European Marine Equipment Council
ENIM	National foundation for disabled seafarers
ENMM	French merchant navy school
ENS	Graduate school for teacher and research training
EPA	State-funded administrative establishment
EPIC	State-funded industrial and commercial establishment
EPLE	Local state education establishments
EPSHOM	Main French navy hydrographic and oceanographic department
ESA	European Space Agency
EU	European Union
EWEA	European Wind Energy Association
FAO	Food and Agriculture Organization of the United Nations
FEAP	Federation of European Aquaculture Producers

FEEE	Foundation for environmental education in Europe
FFPP	French federation of yachting harbours
FFSA	French federation of insurance companies
FIAC	French federation of canned food industries
FICT	French federation of meat processors, cooked pork meat and delicatessen industries
FIFG	Financial instrument for fisheries guidance
FIN	Federation of nautical industries
FNFA	Franco-German naval force
FNTP	National federation of public works
FRDP	Framework research and development programme (European commission)
Genavir	Economic interest group for management of research vessels
GMDSS	Global maritime distress and safety system
GMES	Global monitoring for environment and security
Godae	Global Ocean Data Assimilation Experiment
gt	Gross tonnage: gross tonnage is the sum of the cubic content of the hull and that of the superstructures. Net tonnage is obtained by deducting the volume of machine rooms, bridge and crew and officers' living quarters from the gross tonnage
GT	Gross tonnage
HT	Exclusive of taxes
IAA	Agrifood processing industry
IACMST	Inter-Agency Committee on Marine Science and Technology (United Kingdom)
ICES	International Council for the Exploration of the Sea
Icomia	International Council of Marine Industry Associations
Iedom	French overseas départements note-issuing bank
IEO	Instituto Español de Oceanografía
IFEN	French institute for the environment
IFP	French petroleum institute
Ifrecor	French initiative for coral reefs
Ifremer	French research institute for exploitation of the sea
IMO	International maritime organization
INRA	National agronomic research institute
Insee	National institute for statistics and economic studies
INSU	National institute for sciences of the universe
IPEV	Institut Paul-Emile-Victor (formerly the polar research and technology institute)
IRD	French research institute for cooperative development
Isemar	Higher institute of maritime economics
ISL	Institut für Seeverkehrswirtschaft und Logistik (Bremen, Germany)
IUMI	International Union of Marine Insurance
JCOMM	Joint WMP/IOC Technical Commission for Oceanography and marine meteorology
JORF	Official journal of the French republic
LFI	Initial finance act
LNG	Liquid natural gas
LPG	Liquid petroleum gas
LPM	Military programming law
MAGP	Multi Annual Guidance Programmes (of CFP)
MAP	Ministry of Agriculture and Fisheries
Marel	Automated measurement for the coastal environment
MEDD	Ministry of ecology and sustainable development
Mersea	Marine Environment and Security for the European Area
METI	Ministry of Economy, Trade and Industry (Japon)
MFS	Mediterranean Forecasting System
MRCC	Maritime Rescue Co-ordination Centre
MTEM	Ministry of transport, public works and amenities, tourism and the sea
NAF	French activities nomenclature
OECD	Organisation for economic cooperation and development
Ofimer	Inter-professional office for seafood and aquaculture products
OFWG	Ocean Research Fleets Working Group
OJEU	Official Journal of the European Union
ONF	National forestry office
ONT	National tourism observatory
OSU	Observatory for sciences of the universe
PA	Autonomous harbour
PACA	Provence-Alps-Côte d'Azur
PAH	Polycyclic aromatic hydrocarbons
PDM	Seafood products
PIN	Port of national interest
PLF	Draft budget
R&D	Research and development
RAC	Regional Advisory Council
Rebent	Benthic biocenosis monitoring network

REMI Microbiological inspection network

Remora Network for aquaculture mollusc resources

Repamo Mollusc pathology network

Rephy Phytoplankton and phycotoxin monitoring network

Repom National surveillance network for maritime harbours

RIF French international register

Rinbio Biological integrators network

RNDE National water data network

RNO National marine environmental quality monitoring network

Roro traffic Transport of lorries or on special trailers

RSP Posidonia monitoring network

Sandre National administration for water data and references

SCCMM Mutual maritime loan company

SCEES Central service for surveys and statistical studies (MAP)

SCOP Workers cooperative production society

SDT Monitoring of tourist movement

SESP Economics, statistics and forward studies service (MTEM)

SESSI Industrial statistics service (Ministry of Industry)

SFAM French mariculture society

SHOM French navy hydrographic and oceanographic service

Short-sea shipping Maritime shipping over short distances

SIM Maritime information system (MTEM)

SIUPM Emergency marine pollution response system

SNSM National sea rescue society

Somlit Coastal environment observation service

SSBN Nuclear-powered ballistic missile submarine

SSN Nuclear-powered attack submarine

STCW Standards of Training, Certification and Watchkeeping (international convention for seafarer training standards)

TAAF French southern and Antarctic lands

TO Turnover

TOM French overseas territory

Tonnage Measurement of vessel volume expressed in tonnes Since July 1994, vessel tonnage is given in standard measurement units.

TTC All taxes included

TUE Twenty-foot-unit equivalent (standardised unit for usual container size)

UFIP French union of oil industries

Unedic National union for employment in industry and trade

UNICEM National union of quarry and building material industries

UNOLS University National Oceanographic Laboratory System

UNPG National aggregate producers union

VA Value added

VLCC Very Large Crude Carrier

WFD Water framework directive

WTO World Trade Organization

ZICO Important bird areas EC

Znieff Natural areas of special ecological interest for flora and fauna

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Keywords : Economy, marine, value added, employment, outlook.

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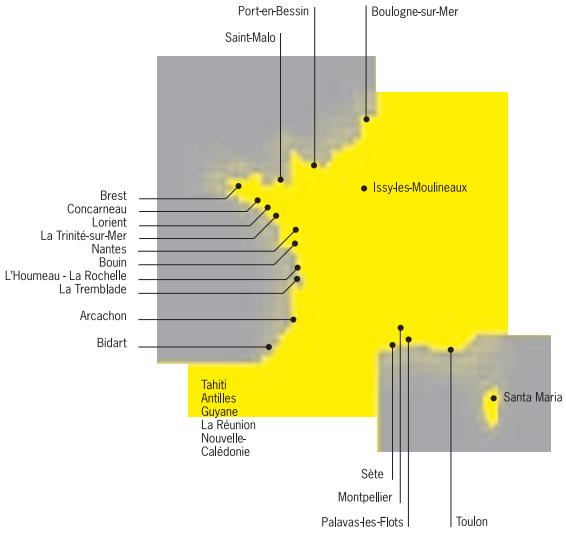
Mots-clés : Économie, maritime, valeur ajoutée, emploi, perspectives.



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