



Brussels, 16.10.2015  
SWD(2015) 197 final

PART 2/2

**COMMISSION STAFF WORKING DOCUMENT**  
*Accompanying the document*

**Report from the Commission to the European Parliament and Council**

**REFIT**

**Adjusting course: EU Passenger Ship Safety Legislation Fitness Check**

{COM(2015) 508 final}

**COMMISSION STAFF WORKING DOCUMENT**  
*Accompanying the document*

**Report from the Commission to the European Parliament and Council**

**REFIT**

**Adjusting course: EU Passenger Ship Safety Legislation Fitness Check**

**Table of content**

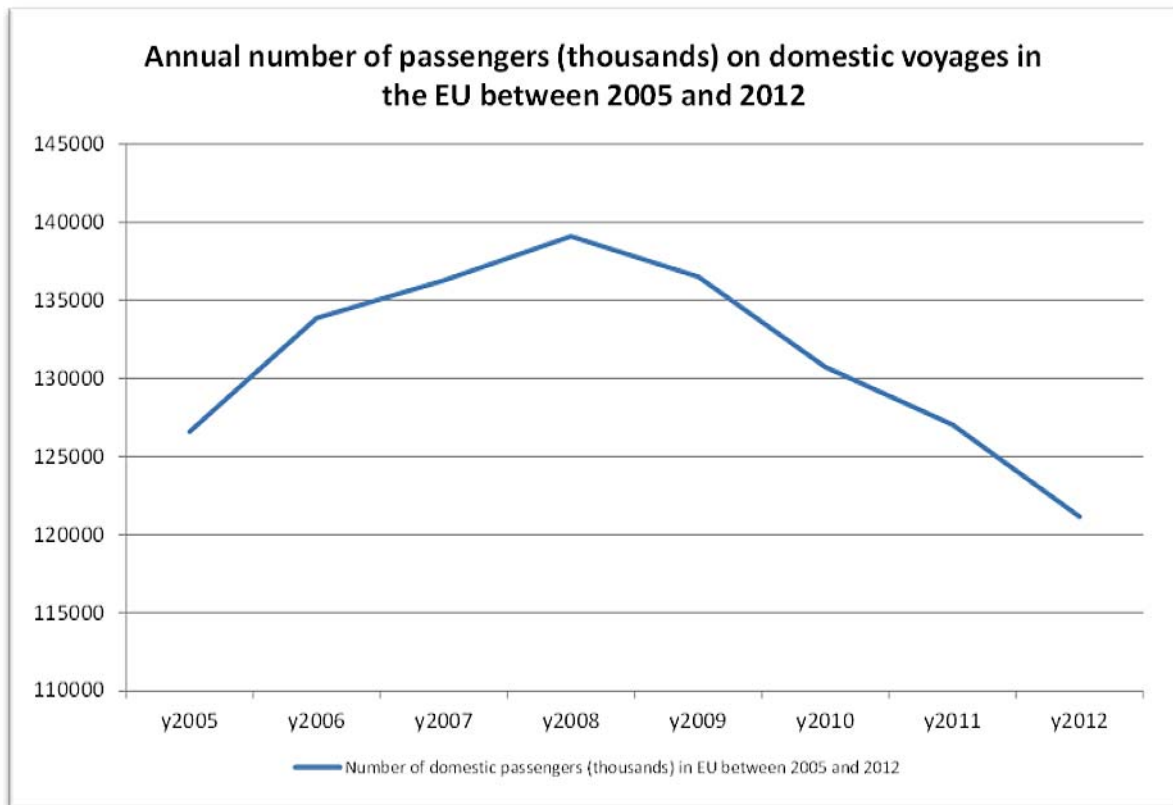
18      Annex 9: EU domestic passenger fleet ..... 163

1 SIZE OF THE MARKET

1.1. Passengers

The table below gives an idea of the development of the maritime domestic passenger traffic over the last years in terms of number of passengers. This evolution has been positive until 2008, when the economic crisis began and caused a decrease of the number of passengers until 2012 (the last year for which data is available):

**Figure 1: Annual number of passengers (thousands) in the EU on domestic voyages between 2005 and 2012**



Source: Eurostat

When analysing the data at quarter level, one can see the traffic is the highest during the summer months:

**Table 1: Sum (thousands) and percentage of passengers per quarter for the period 2005-2012**

	Sum (thousands) of passengers per quarter	% per quarter
Q1 (2005-2012)	148.785	14,15%
Q2 (2005-2012)	281.602	26,79%
Q3 (2005-2012)	448.381	42,65%
Q4 (2005-2012)	172.501	16,41%
<b>TOTAL</b>	<b>1.051.269</b>	<b>100%</b>

Source: Eurostat

The following table below gives an overview of the number of times the fleet capacity has been used in 2012 by dividing the number of passengers of each quarter of 2012 by the maximum fleet capacity of the domestic passenger ships of each Member State.

It can be seen that the fleet in Northern Europe seems to be more frequently used<sup>1</sup> (Estonia, Denmark, Sweden, Germany) with an annual ratio of 326 to 540 times per passenger of capacity, compared to the South of Europe (Greece Italy, Spain, France, ...) with an annual ratio of between 36 to 304 times. The analysis of these 2 tables gives an idea that the Northern European model is based on ships operating throughout the year without large peaks, whereas in Southern Europe there are ships which capacity is only used during the summer period (during the winter they are probably operating at very low capacity or even not operating).

**Table 2: Frequency of used fleet capacity in 2012**

	Number of passengers per quarter (2012)				Maximum fleet capacity per MS	Frequency of used fleet capacity				
	2012Q1	2012Q2	2012Q3	2012Q4		2012Q1	2012Q2	2012Q3	2012Q4	Total/year
Malta	774.000	1.079.000	1.338.000	901.000	1.334	580	809	1003	675	3067
Denmark	1.286.000	2.262.000	2.978.000	1.650.000	15.153	85	149	197	109	540
Estonia	263.000	503.000	741.000	356.000	3.533	74	142	210	101	527
Sweden	297.000	708.000	1.217.000	408.000	6.686	44	106	182	61	393
Germany	1.095.000	2.932.000	3.799.000	1.822.000	29.599	37	99	128	62	326
Greece	4.979.000	8.897.000	14.677.000	5.851.000	113.224	44	79	130	52	304
Italy	4.729.000	8.544.000	14.043.000	5.704.000	216.603	22	39	65	26	152
Poland	0	42.000	265.000	0	2.196	0	19	121	0	140
Spain	1.549.000	2.095.000	3.209.000	1.757.000	76.986	20	27	42	23	112
UK	413.000	865.000	1.111.000	539.000	29.115	14	30	38	19	101
Portugal	24.000	58.000	138.000	35.000	4.528	5	13	30	8	56
Finland	83.000	148.000	172.000	111.000	13.145	6	11	13	8	39
France	261.000	231.000	1.379.000	383.000	63.419	4	4	22	6	36

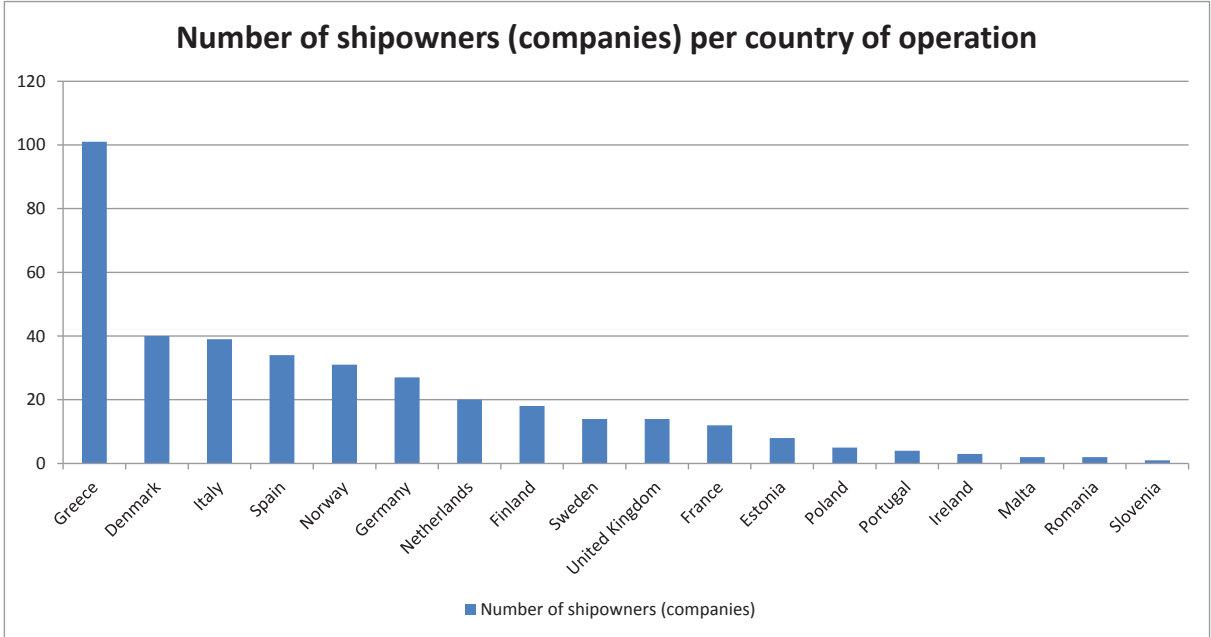
Source: Eurostat<sup>2</sup>

<sup>1</sup> The number of voyages is not known. Therefore this ratio has to be considered as an indication  
<sup>2</sup> The EUROSTAT data for the UK seems to be underestimated. UK official data shows around 25 million passengers per year (without including river ships)

**1.2. Ship owners**

Greece (with about 100 ship owners) is the country that has by far the largest number of ship owners. In all the other Member States the number of ship owners ranges between 1 and 40. Greece is also one of the Member States where a large majority of these ship owners own only one domestic passenger ship (see table below). This gives an indication of the importance of SMEs among Greek ship owners.

**Figure 2: Number of ship owners per MS (country of operation)**



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

The following table can nevertheless give an idea of the ship owners' company sizes:

**Table 3: Number of domestic passenger ships (under Directive 2009/45/EC) per ship owner in each Member State**

	Number of ships owned per shipowner in each country of operation					
	1 ship	2 to 3 ships	4 to 5 ships	5 to 10 ships	11 to 20 ships	More than 20
Denmark	31	6		1		
Estonia	4	3				
Finland	15	1		2		
France	5	6		1		
Germany	17	2	2	3		
Greece	68	9		2	1	
Ireland	1	2				
Italy	24	10	7	6	2	
Malta	1	3				
Netherlands	16	3				
Norway	19	1	2		2	2
Poland	3	1				
Portugal	1	2				
Romania	1					
Spain	24	5	2	1		
Sweden	20	4	1	1		1
United Kingdom	9	2	1	1		1
<b>Total</b>	<b>259</b>	<b>60</b>	<b>15</b>	<b>18</b>	<b>5</b>	<b>4</b>

Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

Most (259) of the ship owners with ships under Directive 2009/45/EC only manage one domestic passenger ship. This has nevertheless to be taken with caution, as some of the ship owner companies also have ships in other materials or also organise international voyages.

The turnover and number of jobs that is created thanks to this specific domestic passenger traffic market in the ship owner sector is very difficult to quantify as some of the companies (more usually those with more ships) may also be trading internationally.

One can make a rough estimation (for all domestic passenger ships falling under Directive 2009/45/EC) based on data provided by 2 ship owners with Class A and HSC ships and 1 ship owner with Class B ships. The total estimated turnover and full time equivalent (FTE) positions has therefore to be considered as a rough estimation.

Considering that a Class A ship has on average 80 FTE per ship (including shore personnel), and that a Class B ship has on average 30 FTE per ship, this Class B average number of FTE can be extrapolated to the ships of other classes.<sup>3</sup>

<sup>3</sup> First divide the average maximum capacity per type of ship (Class C, Class D or HSC) by the average maximum capacity of a Class B ship. Multiply this number by 30 FTE (average number of FTE on a Class B ship). As such, we obtain on average 20 FTE per Class C ship, 17 FTE per Class D ship and 24 per HSC ship. Then multiply these FTE averages by the number of ships in each class (69 Class A ships \* 80 FTE = 5520 FTE; 166 Class B ships \* 30 FTE = 4980 FTE; 262 Class C ships \* {(313 pax Class

Based on these hypotheses, the employment created by the ship owners with domestic passenger ships under Directive 2009/45/EC represents about 24.014 FTE's in the European Union.

The same exercise can be done in order to have a rough estimation of the turnover of the domestic passenger traffic market. Based on an annual turnover of EUR 14,6 million per Class A ship or HSC ship, the turnover per Class B, C and D ship can also be calculated by extrapolating this amount in function of the average passenger capacity of Class B, C and D ships, multiplied by the number of ships in each class.

The turnover created by the ship owners with domestic passenger ships under Directive 2009/45/EC represented EUR 5.798 million in 2013.

On the other hand, a recent study commissioned by EMSA and carried out by a consortium of ship owners, shipyards and led by a Classification Society on damage stability<sup>4</sup>, provides a figure of USD 50.000 of turnover (about EUR 45.000) per passenger of capacity per year for ships with more than 80m and 1.000GT. Taking this value and extrapolating to small ships with proportionate lower values, the turnover would be around EUR 20.000 million. Therefore, with the data available, the best approximation that can be made to the **market value of the domestic passenger ships in the EU would be between EUR 6 and EUR 20 billion of annual turnover.**

---

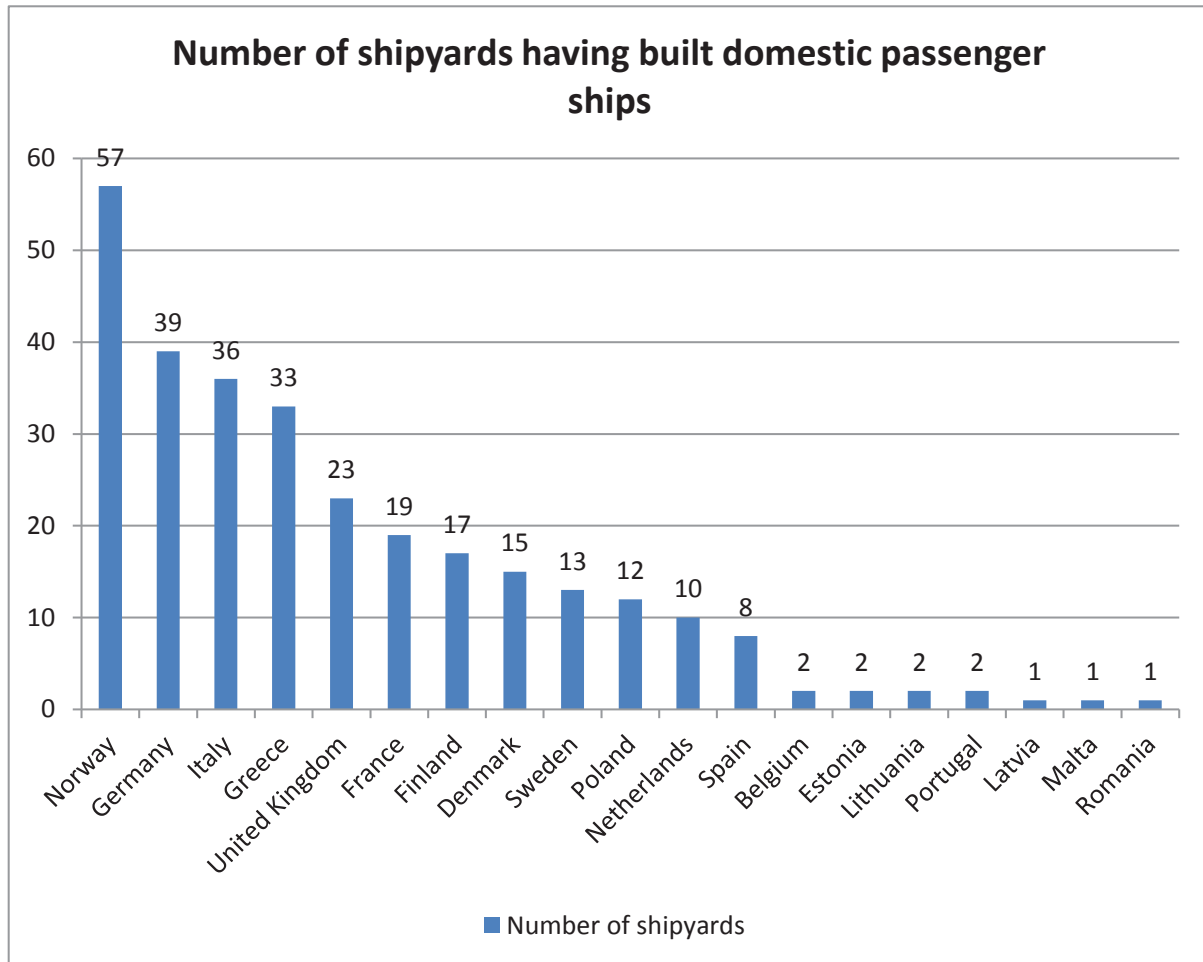
<sup>4</sup> C/481 pax Class B)\*30} FTE = 5240 FTE; 272 Class D ships \* {(272 pax Class D/481 pax Class B)\*30} FTE = 4624 FTE; 152 HSC ships \* {(386 pax HSC/481 pax Class B)\*30} FTE = 3648 FTE)  
EMSA 3 study, available at: <http://emsa.europa.eu/damage-stability-study.html>



### 1.3. Shipyards

The following figure gives an overview of the number of shipyards building domestic passenger ships under Directive 2009/45/EC in each Member State. Norway - followed by Germany, Italy and Greece - are the Member States where most shipyards are located.

**Figure 3: Number of shipyards having built domestic passenger ships**



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

It must be noted that some of the shipyards included in the previous graph may no longer be in operation. Therefore, to have a more complete picture, the table below gives an illustration of the number of domestic passenger ships that have been built during different periods of time by each Member State. One can see a slight increase of domestic passenger ships built from 1999.<sup>5</sup>

<sup>5</sup> Directive 2009/45/EC applies to the following passenger ships and craft, regardless of their flag, when engaged on domestic voyages: a) new passenger ships (built on or after 1 July 1998); b) existing (built before 1 July 1998) passenger ships of 24 metres in length and above; and c) high-speed passenger craft

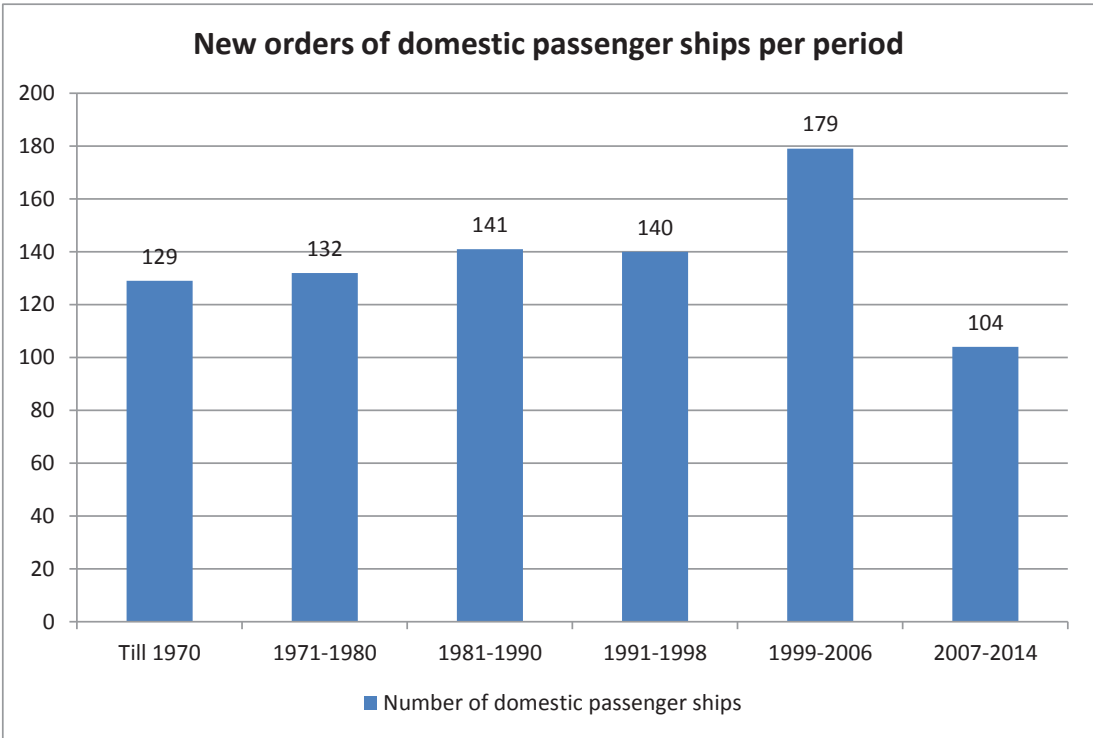
**Table 4: Number of the domestic passenger ships (under Directive 2009/45/EC) built per period in each Member State**

	Till 1970	1971-1980	1981-1990	1991-1998	1999-2014
Belgium	0	1	0	0	1
Denmark	5	6	3	14	11
Estonia	0	0	0	0	2
Finland	5	5	5	5	2
France	1	5	4	4	10
Germany	24	28	10	7	8
Greece	3	8	14	16	21
Italy	5	24	22	15	54
Latvia	0	0	0	0	5
Lithuania	0	0	0	0	6
Malta	0	0	1	0	1
Netherlands	4	1	0	8	1
Norway	18	31	19	20	47
Poland	2	1	3	0	20
Portugal	0	0	2	0	0
Romania	0	0	0	0	5
Spain	0	1	0	3	18
Sweden	5	3	6	3	4
United Kingdom	4	3	21	10	13
<b>TOTAL</b>	<b>76</b>	<b>117</b>	<b>110</b>	<b>105</b>	<b>229</b>

*Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)*

The figure below presents the evolution of new orders of domestic passenger ships (built in the Member States and outside Europe). From 1971 to 1998, there has been a slight increase in new orders. In the period 1999-2006, new orders of domestic passenger ships increased by 28%. After that period, the economic crisis had an impact on the ship building market: 75 fewer ships were built in the period between 2007 and 2014.

**Figure 4: New orders of domestic passenger ships per period**



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

The table below gives an idea of the production of domestic passenger ships expressed in GT (Gross Tonnage) and CGT (Compensated Gross Tonnage) for each Member State, which gives a measure of the shipyard activity related to domestic passenger ships falling under Directive 2009/45/EC.

Compensated Gross Tonnage (CGT)<sup>6</sup> is an indicator, developed by the OECD, of the amount of work that is necessary to build a given ship and is calculated by multiplying the tonnage of a ship by a coefficient, which is determined according to the type and size of a particular ship. In the case of a passenger ship, the CGT is calculated as:  $CGT = 49 * (gt^{0,67})$ , where 49 is the factor representing the influence of the ship type (in this case: passenger ship) and 0,67 the factor which represents the influence of the ship size (of the passenger ship).

In following table, the GT of every ship falling under Directive 2009/45 has been multiplied with this formula, and CGT of all ships have been summed up per Member State (where the ships have been built).

<sup>6</sup> Statistical information on new ships completed is available on a country or global basis in gross tons, as well as partly in deadweight tons. Figures in gross tons are available for all ship types, but not the number of man-hours, the use of materials and the amount of yard-hardware used in their production. Resources used to build one gross ton differ widely with the size and type of ship. By multiplying figures in gross tons with CGT coefficients, which reflect the work content of each type and size of ship, it is possible to convert the ever changing product mix into CGT figures, which reflect with some accuracy worldwide shipbuilding activity (Source: “Compensated Gross Ton (CGT) system, 2007, OECD, council working party on shipbuilding)

**Table 5: Total GT and CGT of all domestic passenger ships under Directive 2009/45/EC built in the EU per Member State**

Country	GT	CGT
Italy	800.974	1.625.055
Norway	216.288	765.527
Germany	288.563	651.457
Spain	311.947	603.128
Greece	64.875	284.753
United Kingdom	71.348	270.155
Netherlands	139.251	268.753
Sweden	136.722	257.312
Denmark	42.159	177.969
Poland	49.312	174.841
Finland	43.042	126.327
France	36.128	122.237
Romania	34.700	91.807
Lithuania	27.152	80.679
Belgium	7.024	22.792
Latvia	4.106	21.306
Portugal	450	3.691
Malta	366	3.213
Estonia	308	2.860
<b>TOTAL</b>	<b>2.274.715</b>	<b>5.553.863</b>

*Source: MS 2014/09 FC Questionnaire + TRACTEBEL + MARINFO (EMSA)*

The shipbuilding activity related to domestic passenger ships falling under Directive 2009/45/EC is highest in Italy, Norway and Germany. Figure 3 shows that Norway has the

highest number of shipyards building this type of ships but the CGT is much lower than Italy where there are fewer shipyards than in Norway. It can be deduced that the shipyards in Italy are building more and/or bigger domestic passenger ships than the shipyards in Norway.

## **2 SEGMENTATION OF THE MARKET**

The domestic passenger ship market can be segmented with respect to different parameters:

- Area of operation (in or out port areas);
- New or existing ships (built before or after the Directive entered into force)
- Building material (steel, aluminium, composite or wood).
- Size of ship ( $\geq$  or  $<$  24m in length); and
- Type of activity (regular services)

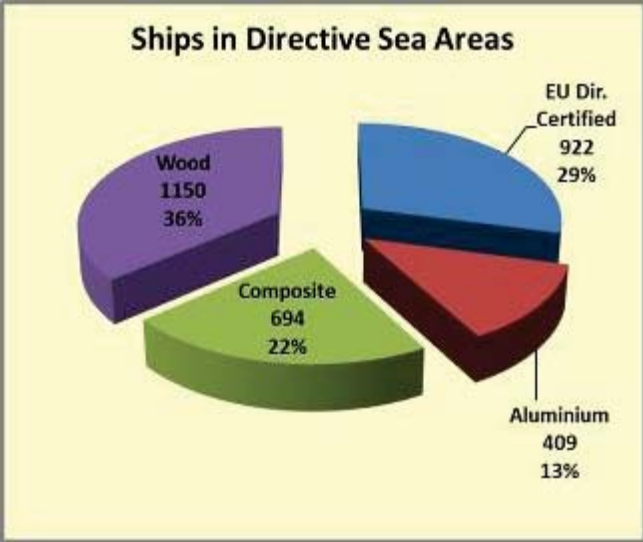
An analysis of the evolution of the figures related to these different segmentations is not possible as data about the situation in the past are not available (e.g. information about ships that are not operating anymore). Only information on segmentation about the current situation has been collected in the fitness check Member States questionnaire of September 2014.

### **2.1. Area of operation**

According to the Member States 2014/09 fitness check questionnaire, EU domestic passenger fleet include around 3175 vessels trading in sea areas A, B, C and D (including HSC) as defined by Directive 2009/45/EC and around 900 ships operating exclusively in port areas as defined by Member States. The ships operating exclusively in port areas are out of the scope of the Directive.

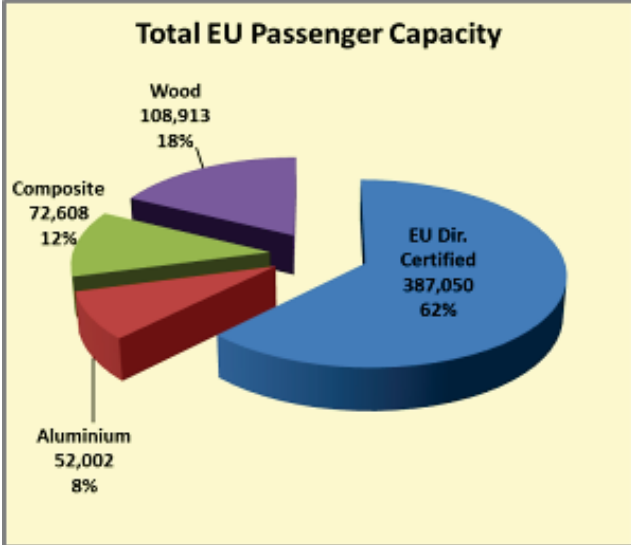
Ships operating in the Directive sea areas can also be outside the scope of the Directive due to the construction material: only ships built in steel or equivalent are within the scope. Out of the ships operating in the sea areas under the scope of the Directive, around 30% of them are certified according to the Directive representing 62% of the passenger capacity, i.e. the largest ships are certified according to the Directive. The average passenger capacity of ships under the Directive is 420 as compared to 104 for ships not certified under the Directive.

**Figure 5: Distribution of number of ships operating in Directive Sea Areas**



Source: MS 2014/09 FC Questionnaire

**Figure 6: Distribution of passenger capacity for ships operating in Directive Sea Areas**



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

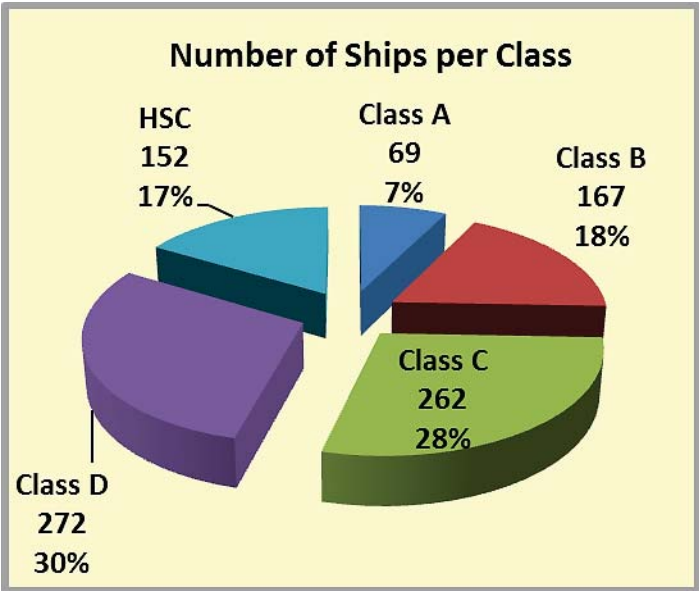
**Table 6: Distribution of number of ships and passenger capacity for ships operating in Directive Sea Areas**

	Ships	Passenger Capacity	Average Capacity
<b>EU Dir. Certified</b>	922	387,050	420
<b>Aluminium</b>	409	52,002	127
<b>Composite</b>	694	72,608	105
<b>Wood</b>	1150	108,913	95
<b>Sub-total ships out of Directive (Al, Comp &amp; Wood)</b>	2253	233,523	104
<b>TOTAL</b>	<b>3,175</b>	<b>620,573</b>	<b>195</b>

Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

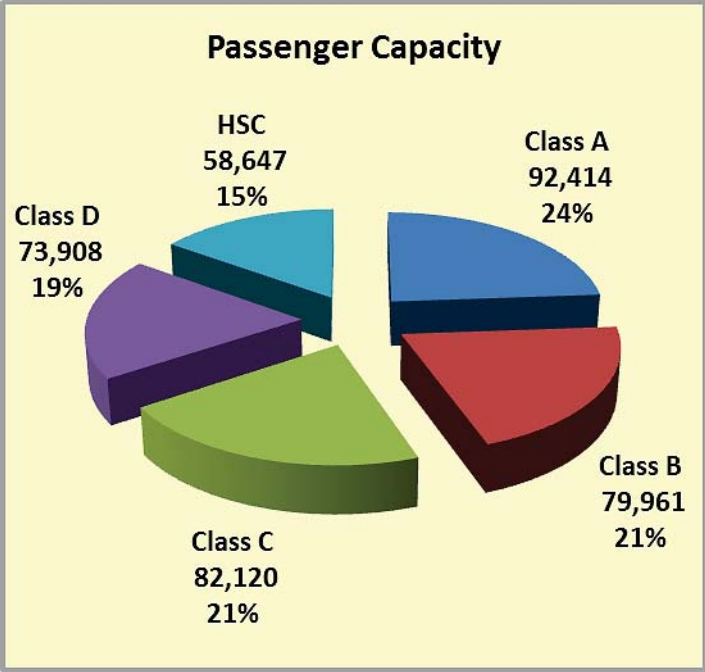
With regard to the ships certified according to the Directive, the distribution per sea area is as follows:

**Figure 7: Number of EU Directive certified ships per class**



Source: MS 2014/09 FC Questionnaire

**Figure 8: Passenger Capacity of EU Directive certified ships per class**



Source: MS 2014/09 FC Questionnaire

**Table 7: Number and passenger capacity for EU Directive certified ships**

	Ships	Passenger Capacity	Average Capacity
<b>Class A</b>	69	92,414	1,339
<b>Class B</b>	167	79,961	479
<b>Class C</b>	262	82,120	313
<b>Class D</b>	272	73,908	272
<b>HSC</b>	152	58,647	386
<b>TOTAL</b>	<b>922</b>	<b>387,050</b>	<b>420</b>

Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

As expected, Class A ships have, on average, the largest capacity. While they represent 7% of the fleet, their passenger capacity is 24% of the total.



## 2.2. New or existing ships (built before or after the Directive entered into force)

The Directive distinguishes between existing (built before the Directive entered into force) and new ships (built after the Directive entered into force). This distinction is more relevant for Classes B, C and D. The existing ships of these classes had to be adapted to the Directive requirements within a certain time frame (already elapsed) but with a certain degree of flexibility. According to the data available<sup>7</sup> (see table below), more than 75% of the ships certified under the Directive for Classes C and D are “existing”. With regard to Class B, 70% of the ships are “existing”:

**Table 8: Number of new and existing Class B, C & D ships**

		New Ships	Existing Ships
Class B	Number	50	114
	%	30%	70%
Class C	Number	46	186
	%	20%	80%
Class D	Number	50	161
	%	24%	76%

Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

## 2.3. Analysis of materials of passenger ships

As indicated above, the EU passenger ship fleet includes around 3175 vessels trading in sea areas A, B, C and D as defined by Directive 2009/45/EC. Such vessels are built in four different materials: (1) steel, (2) aluminium, (3) composite and (4) wood. In the following points an analysis by material is presented.

### Ships built in steel

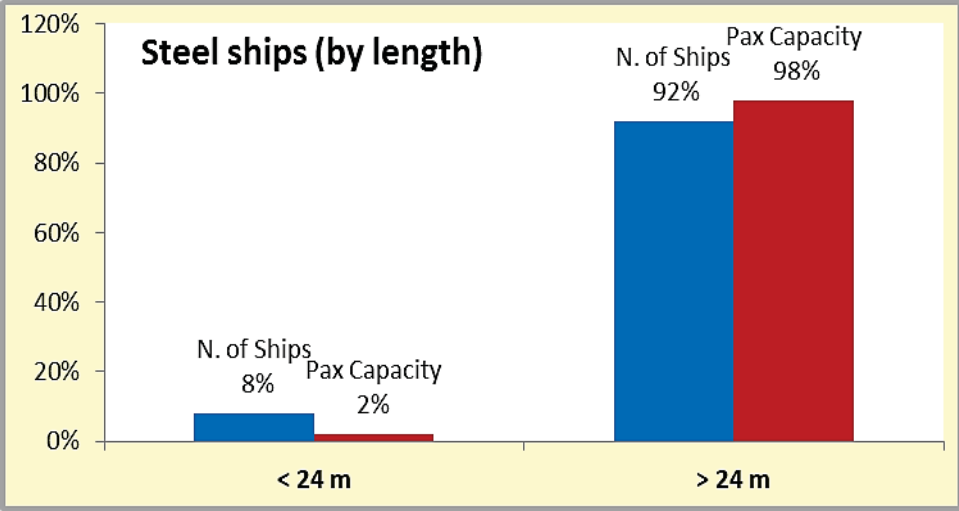
Steel ships fall under the scope of the Directive 2009/45/EC, with the sole exception of existing ships of less than 24m or those operating in port areas. Out of the 922 ships certified according to the Directive, steel ships accounts for 742 (including one built in iron). It has also to be noted that two vessels flying the French flag, are not sailing in European waters (Indian Ocean).

In the tables and graphs below a more detailed analysis of the fleet is carried out.

---

<sup>7</sup> The data displayed in the table is related to ships for which the year of construction is available in MARINFO

**Figure 9: Number of steel ships and passenger capacity**



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

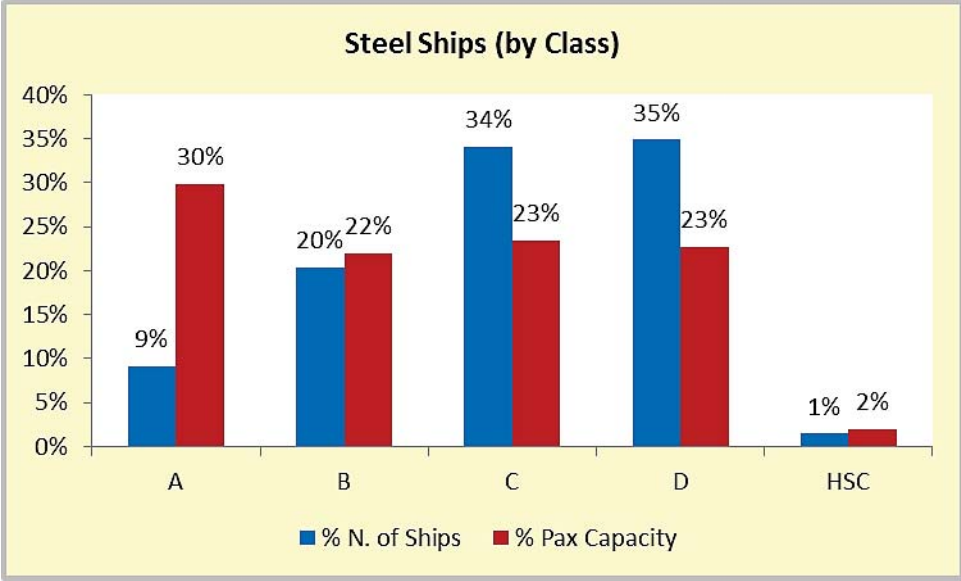
A first classification is made with respect to the ship's length, i.e. below or above 24m. In this respect, more than 92% of the ships are above 24 m in length representing 98% of the passenger capacity for steel ships. In the table below more details are provided.

**Table 9: Classification of EU certified ships built in steel per size**

	< 24 m	> 24 m	Total
<b>Ships</b>	60	682	742
<b>% of Ships</b>	8%	92%	100%
<b>Passenger Capacity</b>	6,643	320,558	327,201
<b>% Pass. Capacity</b>	2%	98%	100%

Source: Member States 2014/09 fitness check questionnaire + MARINFO (EMSA)

**Figure 10: Steel ships by Class**



Source: MS 2014/09 FC Questionnaire

The distribution of ships built in steel certified under Directive 2009/45/EC is included in the figure above. The table below provides a more detailed breakdown. It can be noted how Class A ships have the largest passenger capacity (30%) as compare to 9% in terms of number of ships. HSC built in steel are very limited in number and capacity as expected. When high speed is the main characteristic of a craft, the higher density of steel makes it less efficient compared to lighter materials like aluminium or composite.

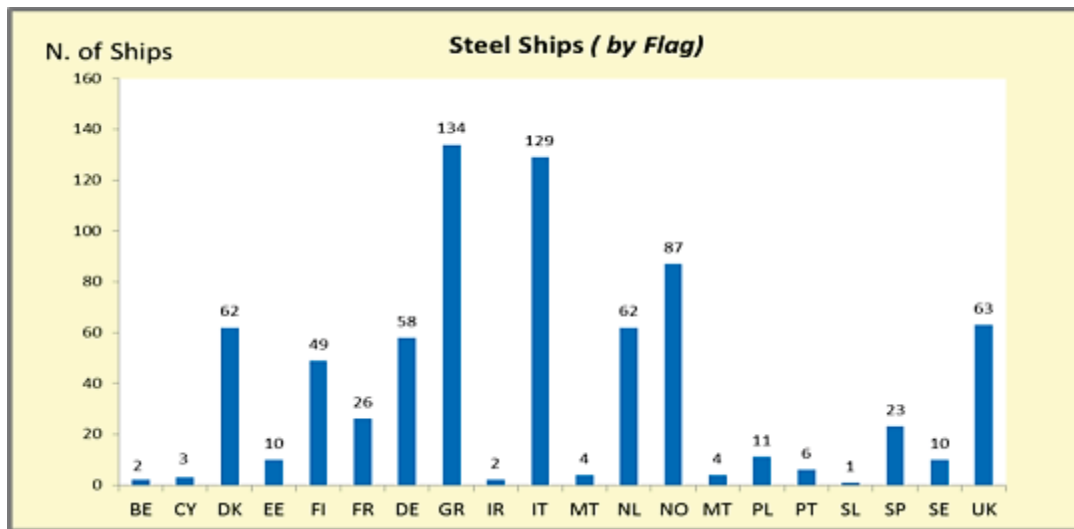
**Table 10: Classification of EU certified ships built in steel per Class**

	A	B	C	D	HSC	Total
<b>Ships</b>	68	151	253	259	11	742
<b>% of Ships</b>	9%	20%	34%	35%	1%	100%
<b>Passenger Capacity</b>	92,218	76,656	80,322	71,861	6,144	327,201
<b>% Pass. Capacity</b>	28%	23%	25%	22%	2%	100%

Source: MS 2014/09 FC Questionnaire

The figure below shows the distribution of steel built ships per Member State. Greece and Italy have the largest fleet followed by Norway.

**Figure 11: Steel ships by Member State** (Source: MS 2014/09 FC Questionnaire)



**Table 11: Average age of steel fleet** (Source: MS 2014/09 FC Questionnaire+MARINFO, EMSA)

		<5 years	>20 years	>25 years	>30 years	>40 years	Average
<b>Class A</b>	<b>Number</b>	5	25	16	13	0	<b>18</b>
	<b>%</b>	7%	36%	23%	19%	0%	
<b>Class B</b>	<b>Number</b>	9	99	84	65	41	<b>29</b>
	<b>%</b>	5%	59%	50%	39%	25%	
<b>Class C</b>	<b>Number</b>	13	168	139	112	66	<b>35</b>
	<b>%</b>	5%	64%	53%	43%	25%	
<b>Class D</b>	<b>Number</b>	23	141	118	99	59	<b>30</b>
	<b>%</b>	8%	52%	43%	36%	22%	
<b>HSC</b>	<b>Number</b>	0	1	1	0	0	<b>15</b>
	<b>%</b>	0%	1%	1%	0%	0%	
<b>TOTAL</b>	<b>Number</b>	<b>50</b>	<b>434</b>	<b>358</b>	<b>289</b>	<b>166</b>	<b>30</b>
	<b>%</b>	<b>5%</b>	<b>47%</b>	<b>39%</b>	<b>31%</b>	<b>18%</b>	
<b>Ro-Ro</b>	<b>Number</b>	39	244	188	137	54	<b>23</b>
	<b>%</b>	9%	59%	45%	33%	13%	

**Table 12: Average age of the complete fleet**

		<5 years	>20 years	>25 years	>30 years	>40 years	Average
<b>Class A</b>	<b>Number</b>	5	25	16	13	0	<b>18</b>
	<b>%</b>	7%	36%	23%	19%	0%	
<b>Class B</b>	<b>Number</b>	10	105	89	68	41	<b>29</b>
	<b>%</b>	6%	63%	53%	41%	25%	
<b>Class C</b>	<b>Number</b>	13	171	142	114	68	<b>35</b>
	<b>%</b>	5%	65%	54%	44%	26%	
<b>Class D</b>	<b>Number</b>	23	147	122	102	61	<b>31</b>
	<b>%</b>	8%	54%	45%	38%	22%	
<b>HSC</b>	<b>Number</b>	26	26	11	4	0	<b>13</b>
	<b>%</b>	17%	17%	7%	3%	0%	
<b>TOTAL</b>	<b>Number</b>	<b>77</b>	<b>474</b>	<b>380</b>	<b>301</b>	<b>170</b>	<b>27</b>
	<b>%</b>	<b>8%</b>	<b>51%</b>	<b>41%</b>	<b>33%</b>	<b>18%</b>	
<b>Ro-Ro</b>	<b>Number</b>	42	248	189	137	54	<b>23</b>
	<b>%</b>	9%	55%	42%	30%	12%	

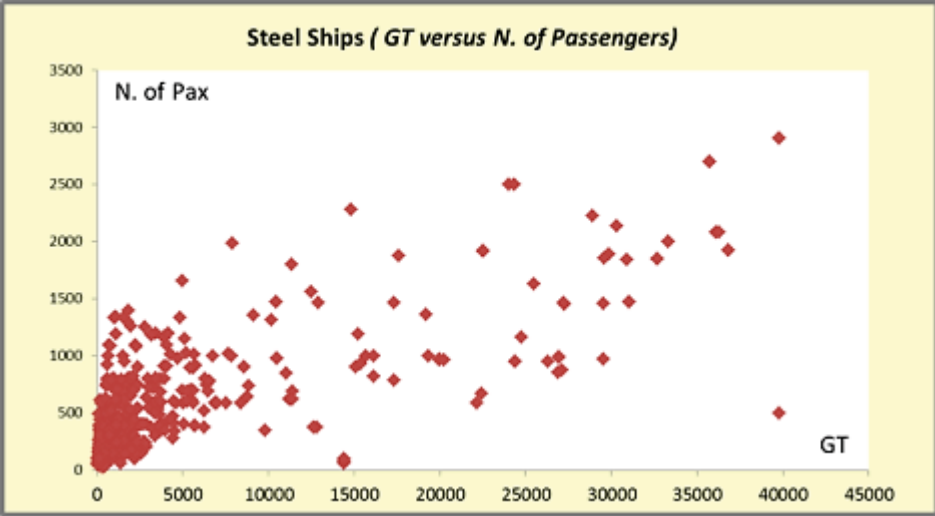
Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

As it can be noted in the tables above, large part of the steel fleet is built after 1975 (82%). About 40% of the fleet is older than 25 years. HSC comprise the youngest part of the fleet with an average age of 13 years. These ships are mainly built in material other than steel. This is clear when comparing the average age of the steel fleet (30 years) with the average age of the complete fleet (27 years), which means that the ships built in materials other than steel, mainly HSC, decrease the average age.

Within the steel fleet, Class A ships are the youngest ships with an average age of 18 years, whereas Class C ships are the oldest with an average age of 35 years.

The average age of ro-ro passenger ships is 23 years, with 30% of the fleet older than 30 years. It is likely that the inclusion of traditional sailing ships has skewed the age profile of the fleet, increasing the average age.

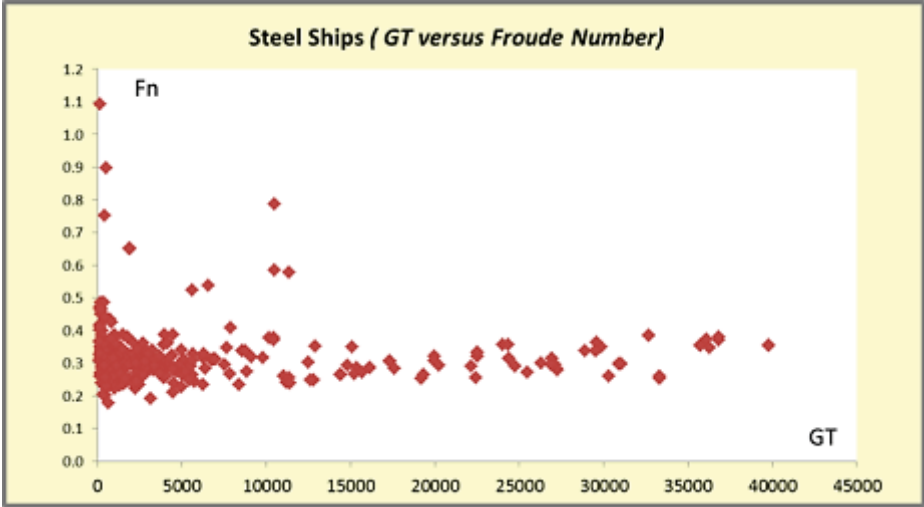
**Figure 12: Distribution of steel ships by GT and number of passengers**



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

In the figure above it can be seen the distribution of steel built ships per Gross Tonnage (GT) versus Number of ships. Large part of the fleet is made of relatively smaller ships below 5,000 GT.

**Figure 13: Distribution of steel ships by GT and Froude number**

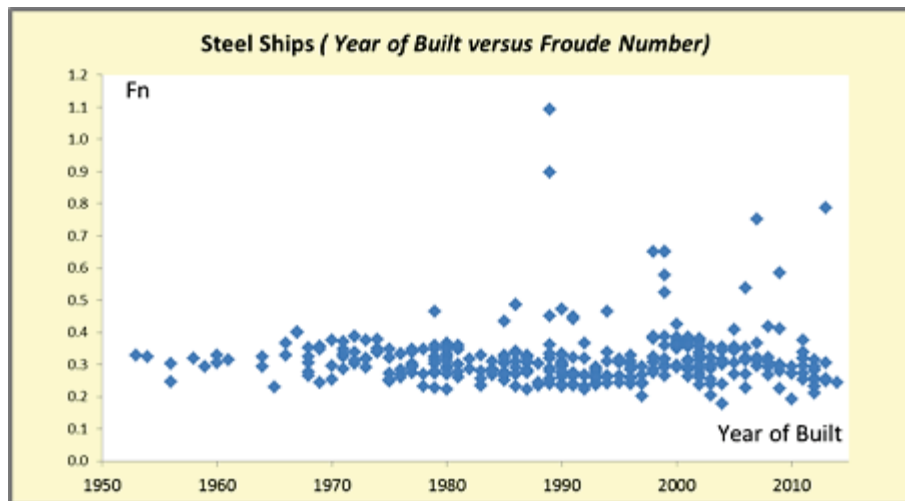


Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

In the figure above it can be seen the distribution of steel built ships by Gross Tonnage (GT) versus Froude number<sup>8</sup> ( $F_n$ ). It is worth noting that the fleet is sailing around  $F_n$  0.3. Only smaller vessels, well below 5000 GT are sailing above  $F_n$  0.5 and hold a HSC certificate.

<sup>8</sup> Froude number = speed/square root of (gravity acceleration\*length of the ship)

**Figure 14 – Distribution of steel ships by year of built and Froude number**



*Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)*

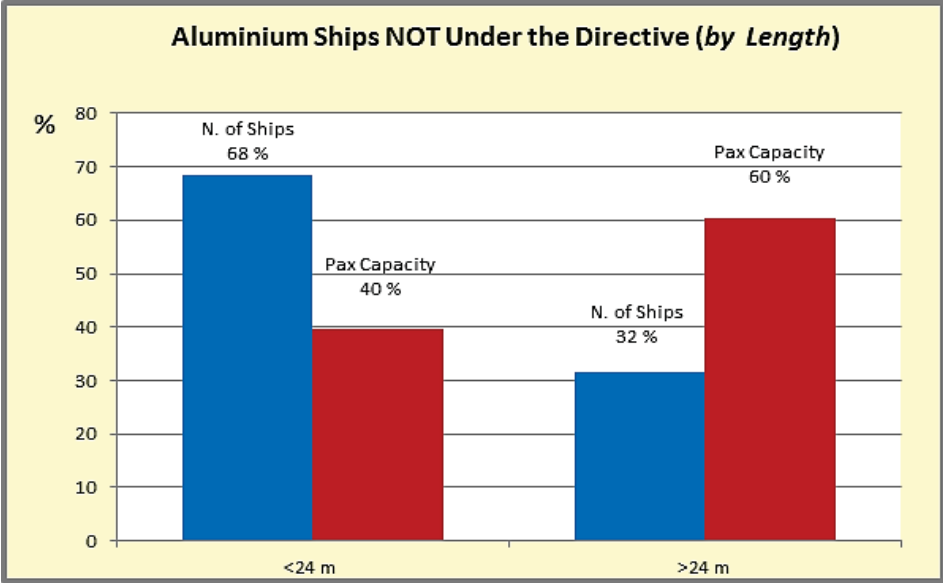
In the figure above it can be seen the evolution of the  $F_n$  against Year of Built. Interestingly the average  $F_n$  is fairly constant over the years ( $F_n = 0.3$ ) showing that over the past 60 years the service speed has not increased.

### **Ships built in aluminium**

In the tables and graphs below a detailed analysis of the fleet of aluminium built ships is carried out. The analysis is carried out in the following order:

1. aluminium built ships for which the Member States have not issued a Directive 2009/45/EC certificate;
2. aluminium built ships for which the Member States have issued a Directive 2009/45/EC certificate;
3. aluminium built ships aggregated data.

**Figure 15: Ships in aluminium**



Source: MS 2014/09 FC Questionnaire

**Table 13: Classification per size of aluminium ships out of the Directive**

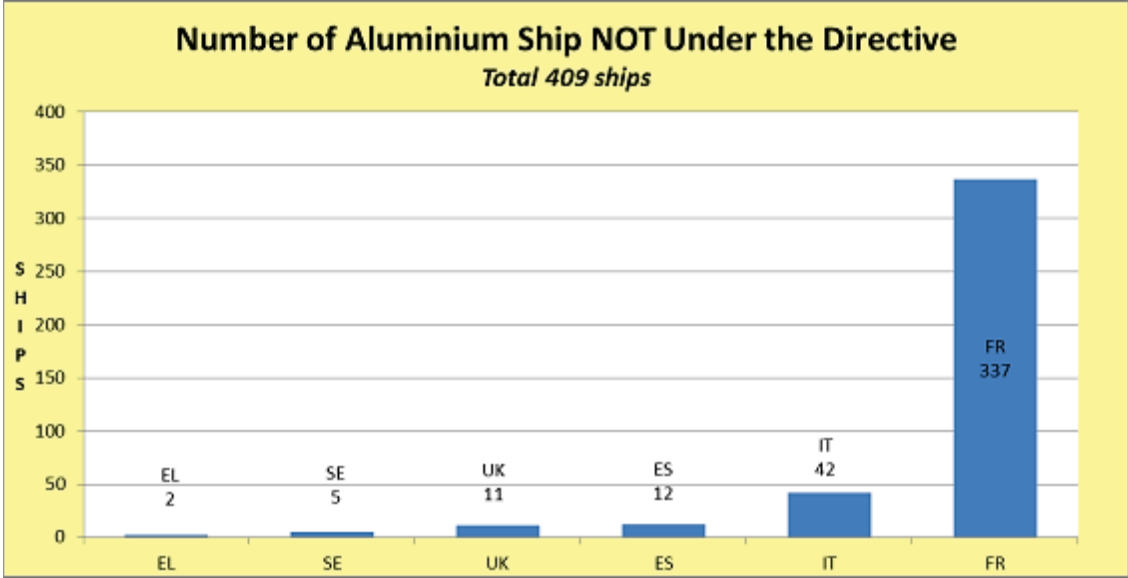
	< 24 m	>= 24 m	Totals
<b>N. of Ships</b>	<b>280</b>	<b>129</b>	<b>409</b>
<b>% N. of Ships</b>	<b>18%</b>	<b>82%</b>	<b>100%</b>
<b>Passenger Capacity</b>	<b>20,665</b>	<b>31,337</b>	<b>52,002</b>
<b>% Pass. Capacity</b>	<b>40%</b>	<b>60%</b>	<b>100%</b>

Source: MS 2014/09 FC Questionnaire

The figure and the table above show that the large majority (68%) of aluminium built ships (which do not hold a Directive 2009/45/EC certificate), are ships below 24 m in length, while the passenger capacity is more concentrated on vessels above 24 m (60%).



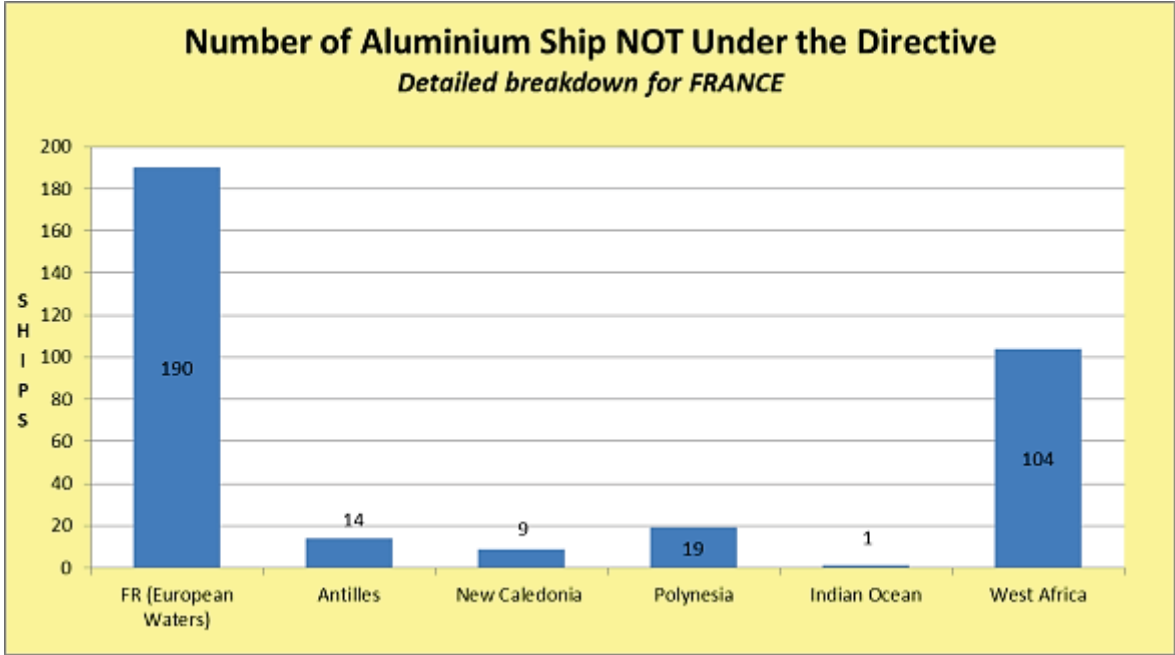
**Figure 16: Ships in Aluminium out of the Directive per Member State**



Source: MS 2014/09 FC Questionnaire

The figure above shows the aluminium built ships distribution (which do not hold a Directive 2009/45/EC certificate), by Member States. It clearly emerges that France has the largest share (82%) with 337 vessels of 409 vessels in total. These vessels are then certified under various national standards with navigation permitted in sea areas of 5 nm or 20 nm from the coast line. Only very few hold a sailing permit beyond the 20 nm. However, it is not possible to assess how many of these vessels hold a HSC Certificate.

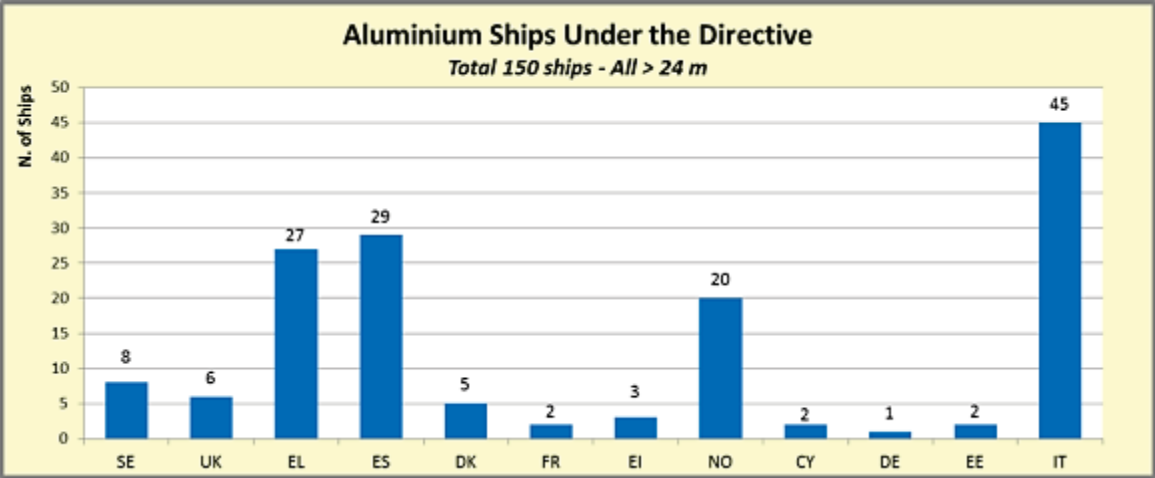
**Figure 17: Ships in Aluminium out of the Directive – France**



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

A closer look to the aluminium built ships flying the French flag shows that nearly half of such vessels is sailing in French waters outside European waters.

**Figure 18: Ships in aluminium under Directive**

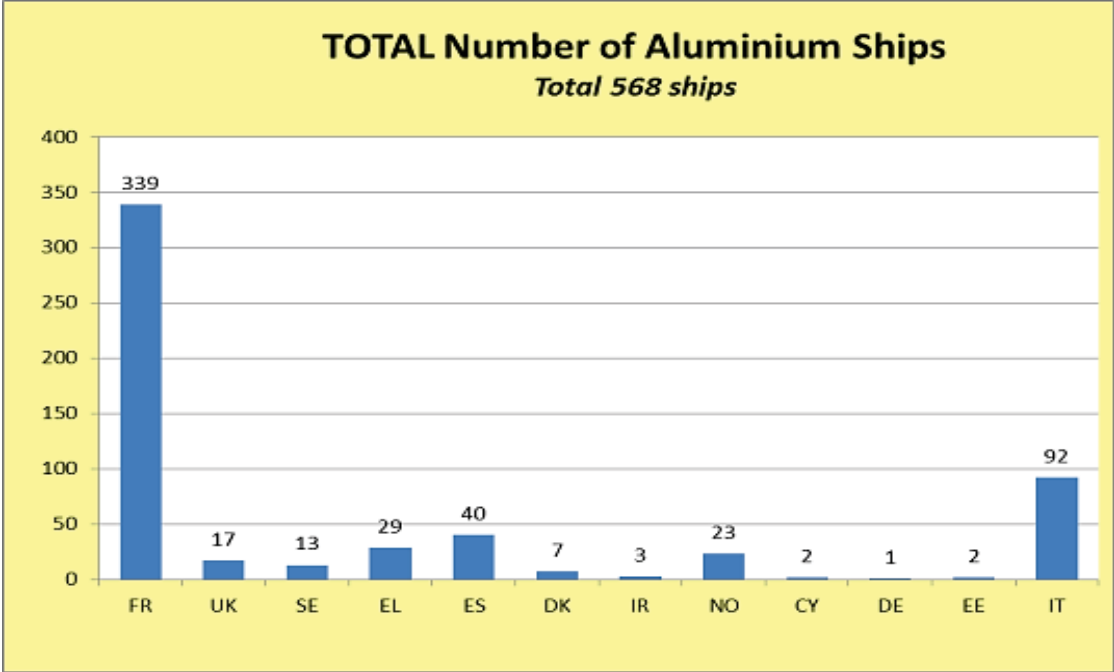


Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

The figure above shows the aluminium built ships distribution (which do hold a Directive 2009/45/EC certificate), by Member States. Italy has the largest share of these vessels, followed by Spain and Greece. It is worth noting that:

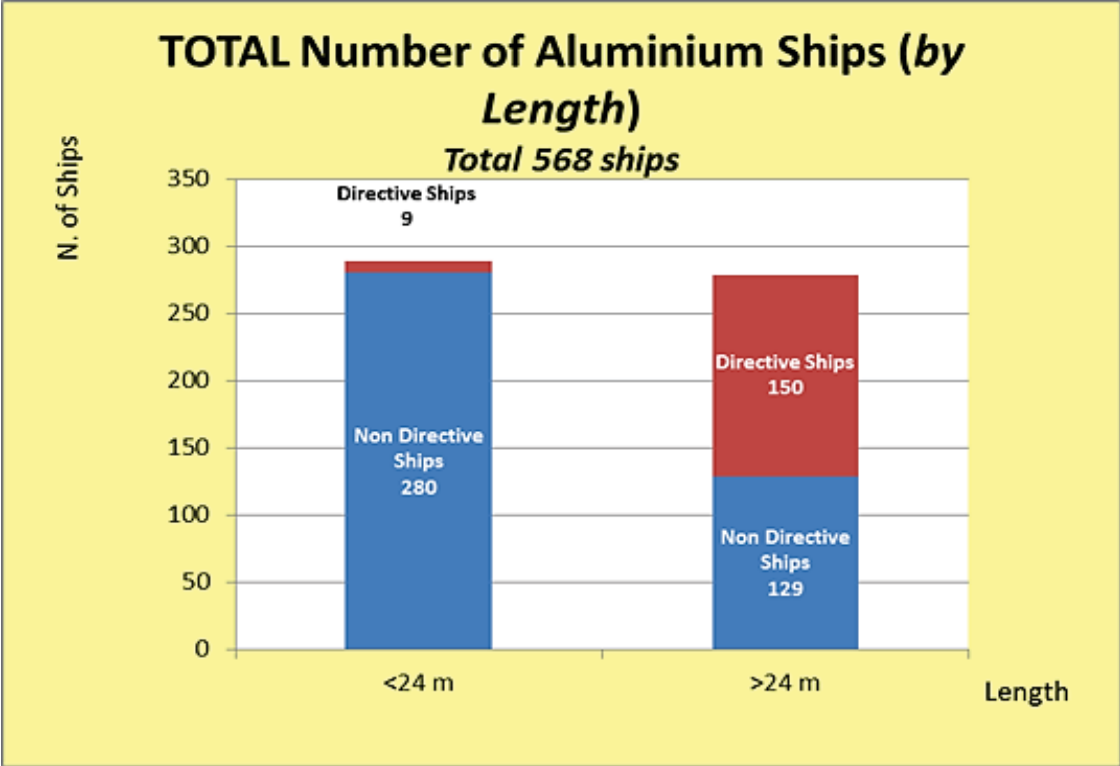
- a) All vessels are above 24 m in length;
- b) Large majority of these vessels holds HSC certificate (more than 80 % of the vessels);
- c) France has 2 vessels with HSC certificates in the Directive.

**Figure 19: Ships in aluminium in and out of the Directive per Member State**



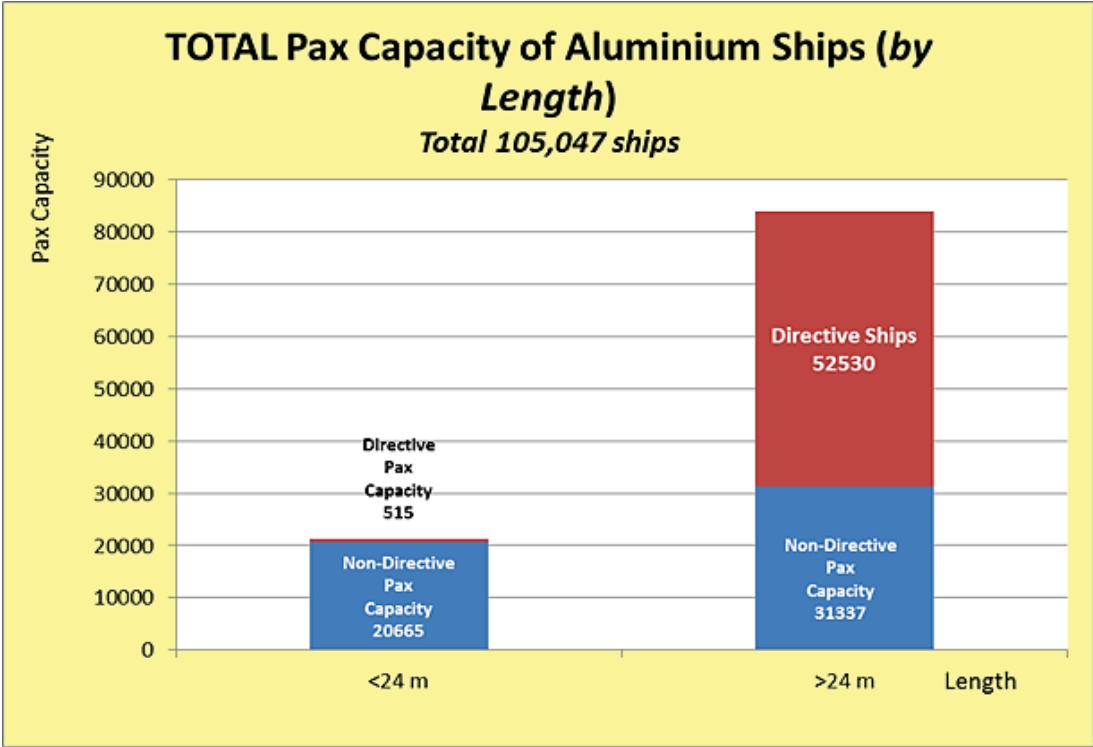
Source: MS 2014/09 FC Questionnaire

Figure 20: Ships in aluminium in and out of the Directive by size



Source: MS 2014/09 FC Questionnaire

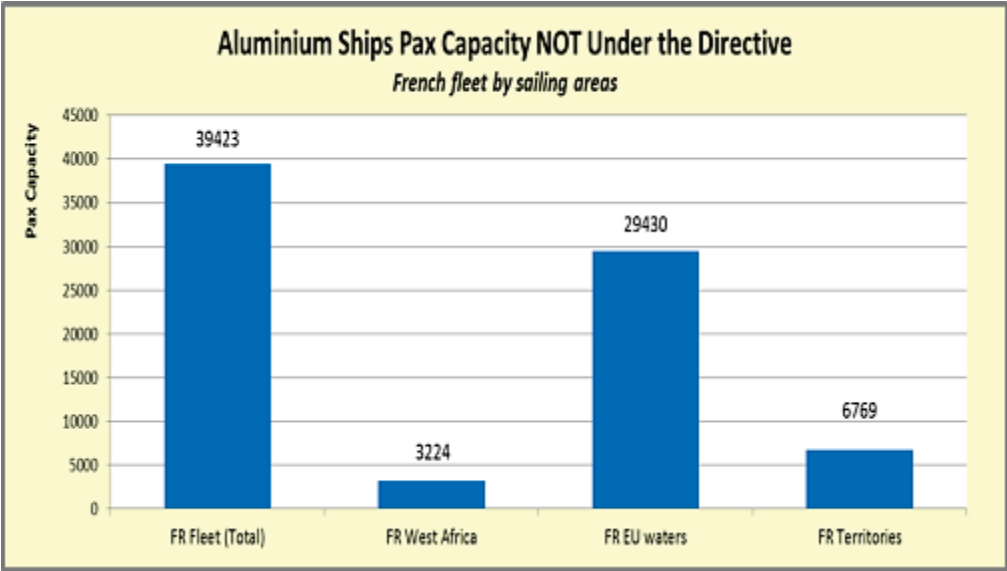
Figure 21: Passenger capacity of aluminium ships



Source: MS 2014/09 FC Questionnaire

The figures above show the total passenger capacity of aluminium built ships which carry a Directive certificate and ships not carrying such a certificate. The total passenger capacity for the aluminium built ships fleet is greater than 100.000 passengers, with about 80% of capacity concentrated in vessels above 24 m. In terms of number of ships, in total there are 568, 50% above 24m and 50% below 24 m. France has by far the largest share in terms of number of ships (60%) and about 30% of the passenger capacity, which is distributed in European continental waters and overseas as shown below:

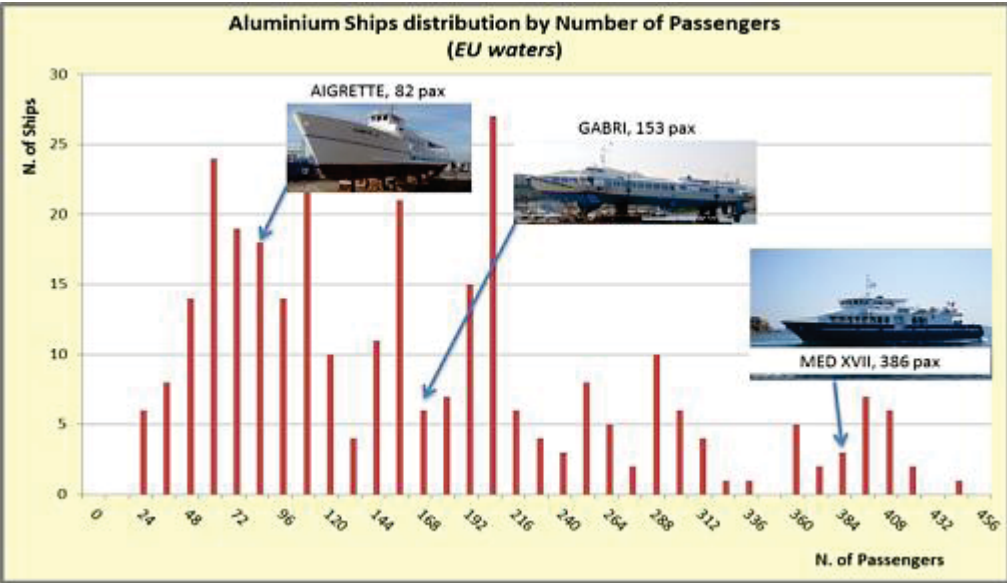
**Figure 22: Passenger capacity of aluminium ships in France**



Source: MS 2014/09 FC Questionnaire

The figure below shows the aluminium built ship fleet in terms of passenger capacity versus number of ships. It emerges that most of the vessels are carrying far less than 200 passengers.

**Figure 23: Aluminium ships by number of passengers**

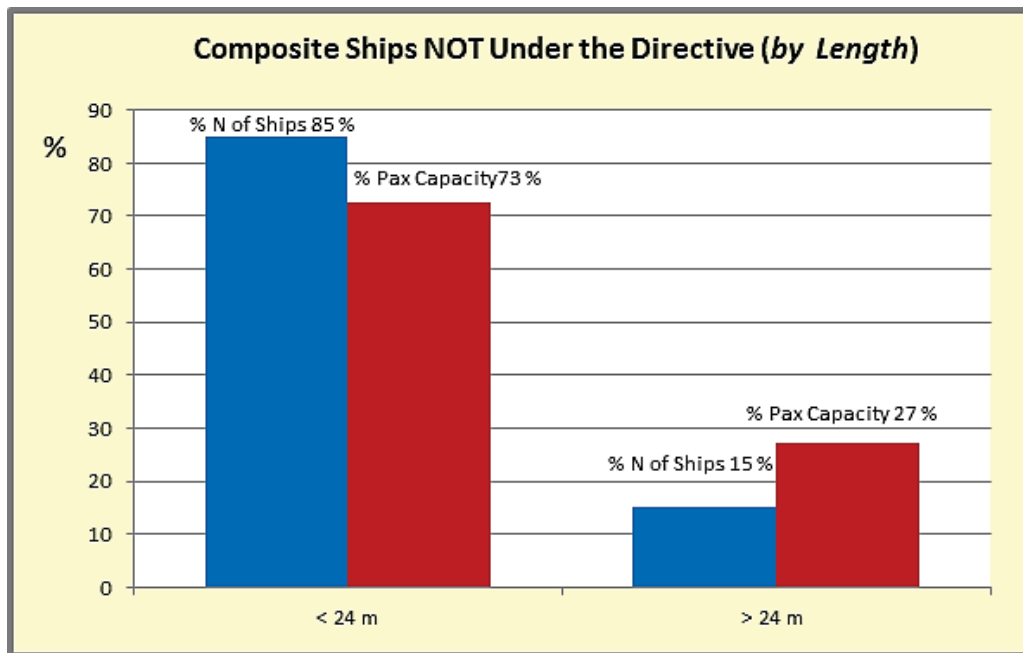


Source: MS 2014/09 FC Questionnaire

### Ships built in composite

Composite built ships are a relevant category in the fleet. These are reported by the Member States under several material denominations, such as composite, GRP, glass/epoxy or plastic which, however, all fall under the composite material classification. About 15 of these composite built vessels have been certified under the Directive 2009/45/EC as HSC (3,500 passenger capacity). Out of these 15 ships, 13 fly the Norwegian flag. Therefore the following analysis is carried out only with regard to composite built ships which do not fall under the Directive 2009/45/EC.

**Figure 24: Ships in composite out of the Directive**



Source: MS 2014/09 FC Questionnaire

**Table 14: Classification per size for composite ships out of the Directive**

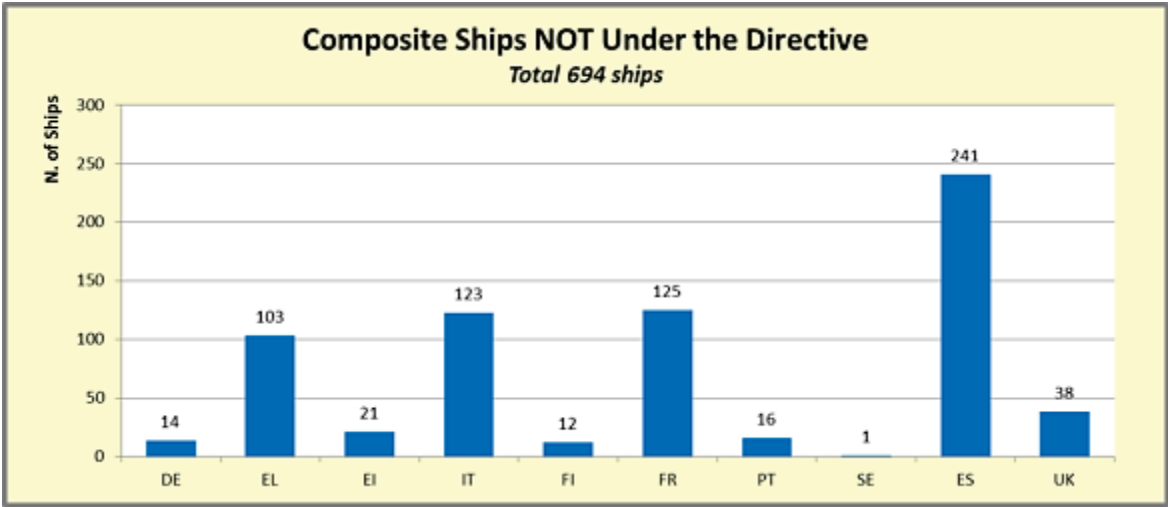
	< 24 m	>= 24 m	Total
<b>Ships</b>	589	105	694
<b>% of Ships</b>	85%	15%	100%
<b>Passenger Capacity</b>	52,837	19,831	72,668
<b>% Pass. Capacity</b>	73%	27%	100%

Source: MS 2014/09 FC Questionnaire

From the figure and table above it can be seen that the large majority of these vessels is below 24 m in length. The reason of that is most probably linked the manufacturing technology more

easily available to smaller yards and to some technological and economic challenges in scaling up this type of construction.

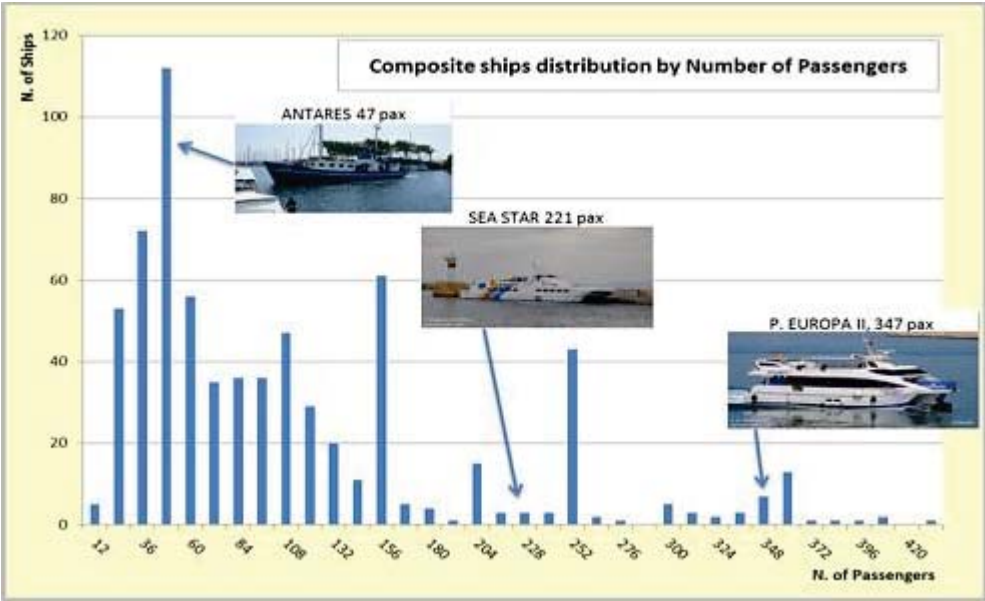
**Figure 25: Ships in composite out of the Directive per Member State**



Source: MS 2014/09 FC Questionnaire

In terms of fleet distribution in the Member States, Spain has the largest fleet, followed by France and Italy.

**Figure 26: Ships in composite out of the Directive by number of passengers**



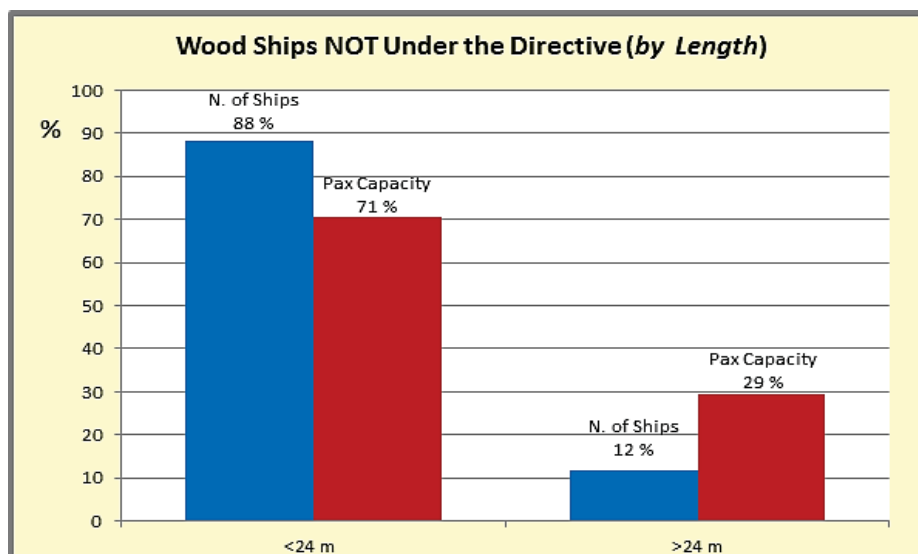
Source: MS 2014/09 FC Questionnaire

The figure above illustrates the fleet distribution in terms of passenger capacity versus the number of ships, providing some examples of vessels in different passenger capacity segments.

## Ships built in wood

Wooden built ships constitute a relevant part of the total EU passenger ship fleet, in terms of number of vessels accounting for around 36% of the total fleet. However, in terms of passenger capacity, the percentage falls to 18% of the total share. Wooden built ships do not hold a Directive 2009/45/EC certificate as none of the Member States consider wood as equivalent to steel. Initially, Denmark included some ships under the Directive, although they were later removed during the fitness check process. A breakdown of the wooden built ships is set below:

**Figure 27: Classification of wood ships out of the Directive per size**



Source: MS 2014/09 FC Questionnaire

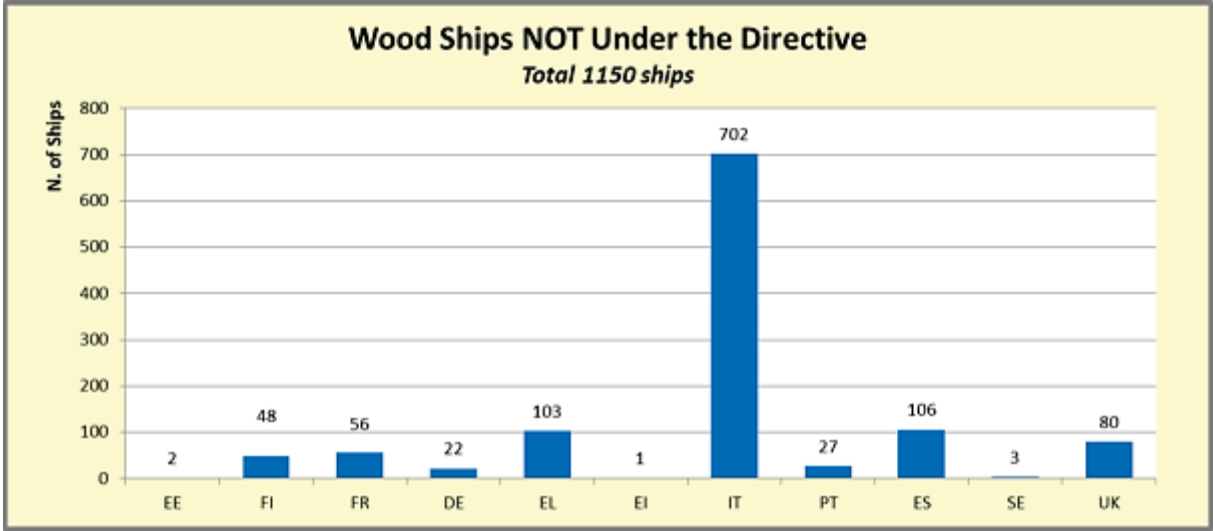
**Table 15: Classification of wood ships out of the Directive per size**

	< 24 m	>= 24 m	Total
<b>Ships</b>	1014	136	1150
<b>% of Ships</b>	88	12	100
<b>Passenger Capacity</b>	77,004	31,909	108,913
<b>% Pass. Capacity</b>	71	29	100

Source: MS 2014/09 FC Questionnaire

The table above shows that most of the wooden built ships both in terms of number of ships and passenger capacity are vessels below 24 m in length.

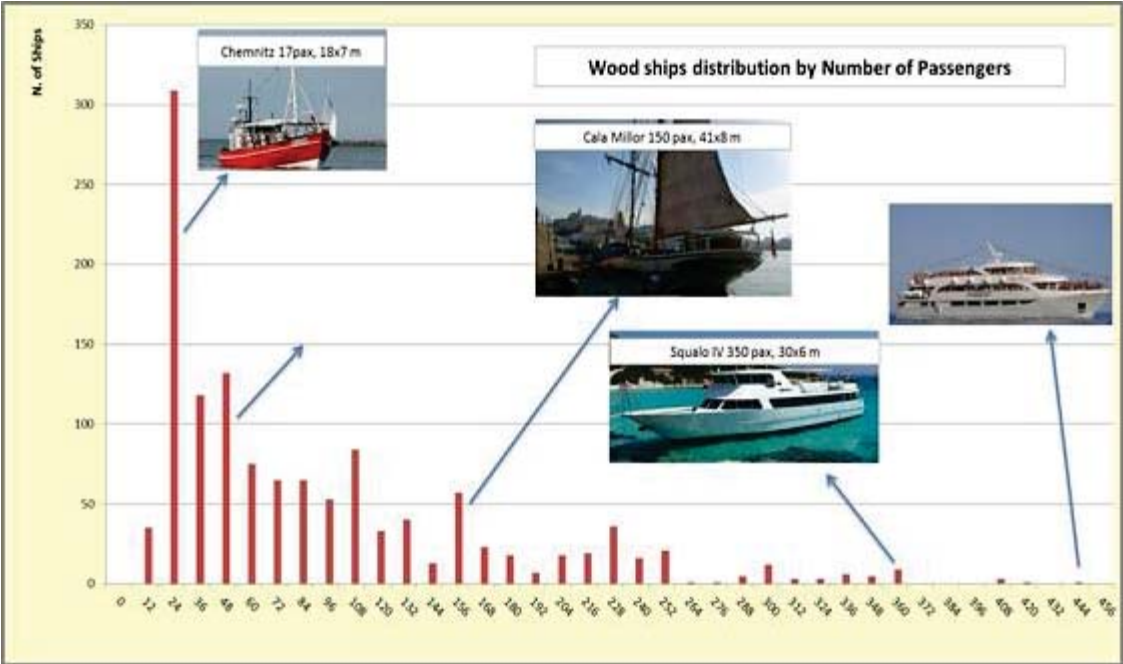
**Figure 28: Wood ships per Member State**



Source: MS 2014/09 FC Questionnaire

Italy has by far the largest share of wood built ships (61%) followed by Spain and Greece (around 10% each.)

**Figure 29: Wood ships distribution per passengers**



Source: MS 2014/09 FC Questionnaire

The figure above illustrates the distribution of wooden built ships in terms of passenger capacity versus number of ships. Distribution is skewed towards smaller ships, however there is a statistically relevant number of vessels with passenger capacity exceeding 150 and up to 450 passengers, which can be considered as a relevant figure for such type of built.

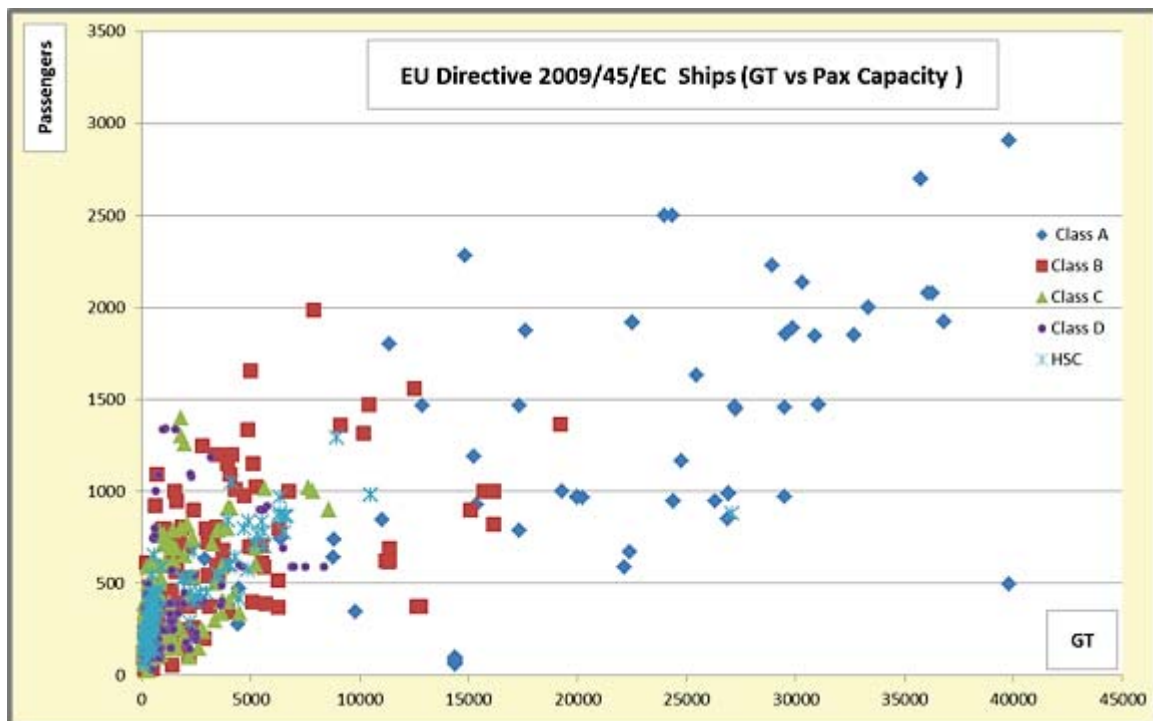


### All ships under Directive 2009/45/EC

In the following figures, some further data are presented regarding the entire vessels populations falling under the scope of the Directive 2009/45/EC including steel ships, aluminium and composite ships (i.e. when a Member State has granted them a Directive certificate) and HSC. The data presented show only those vessels for which (from the questionnaire to Member States) figures were provided and therefore the datasets showed in the figures do not represent the entire population.

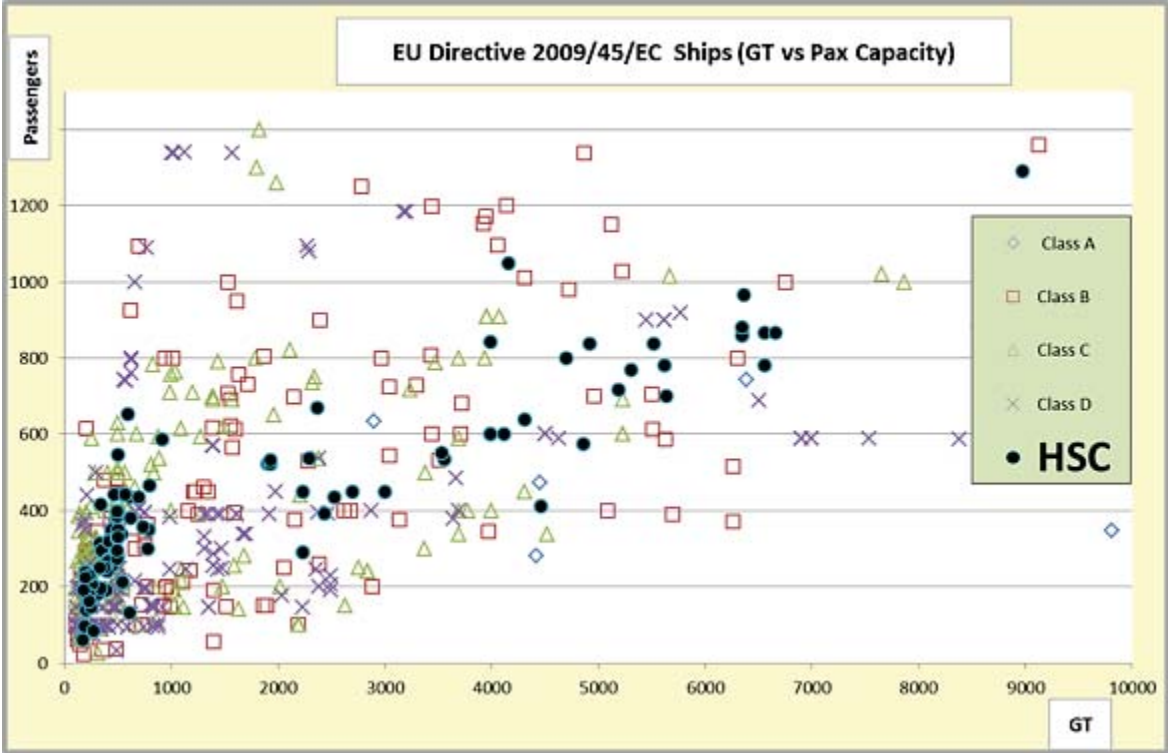
The following 3 figures (i.e. 30, 31 and 32) show the distribution of passenger capacity versus GT for all classes with a closer look at HSC and Class C and D below < 10.000 GT. As can be easily seen, the large majority of the fleet is well below 5.000 GT and carries less than 1.000 passengers.

**Figure 30: All EU Ships under Directive 2009/45/EC**



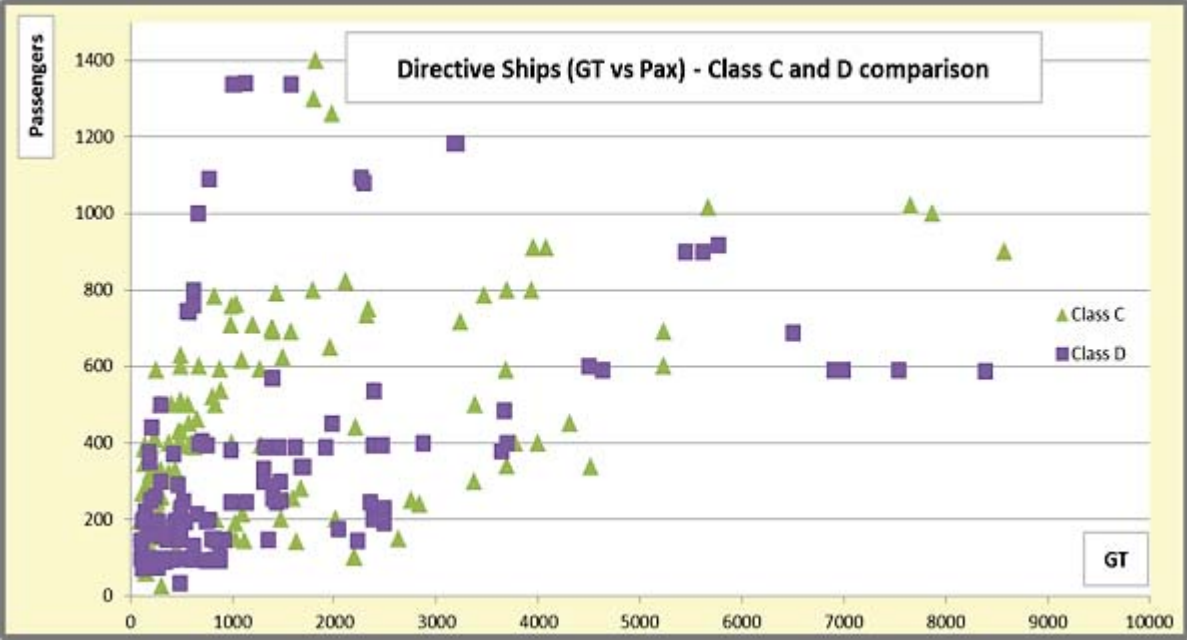
Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

Figure 31: Zoom (< 10.000 GT) Ships distribution all classes – HSC highlighted



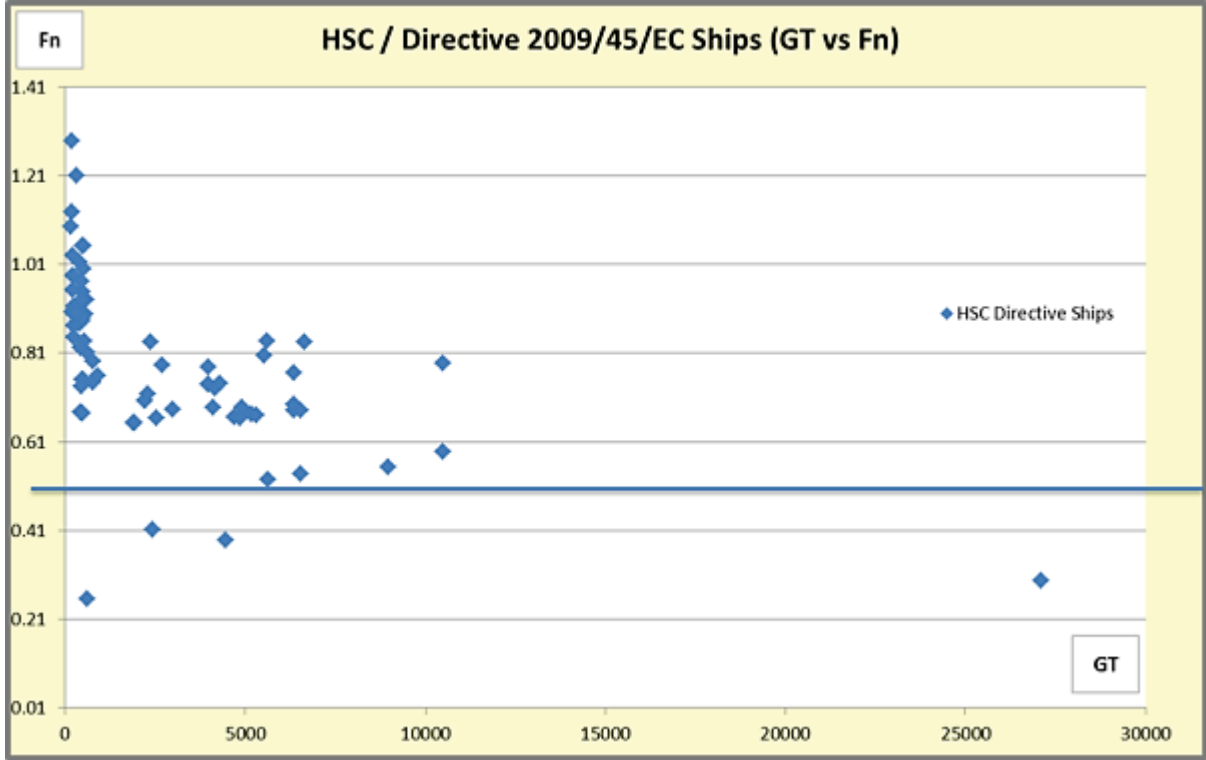
Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

Figure 32: Zoom (< 10.000 GT) Ships distribution all classes – Only class C and D



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

**Figure 33: HSC GT versus Froude Number**



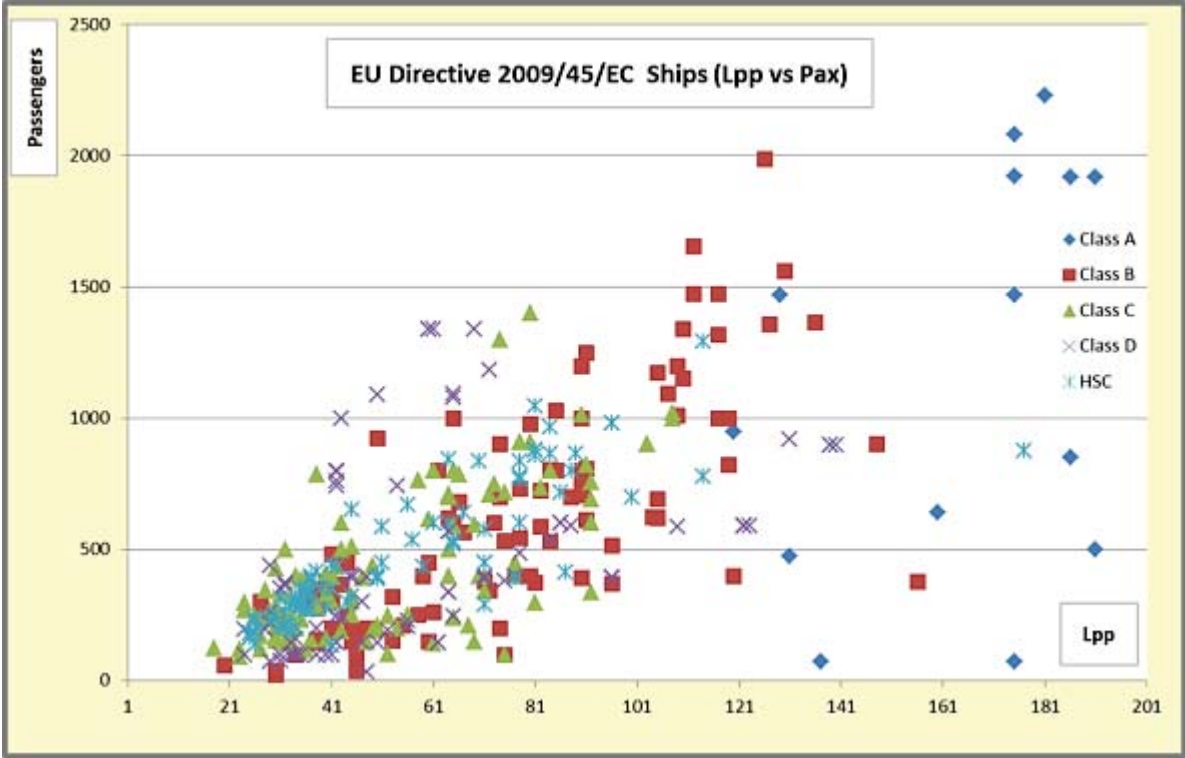
Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

Figure 33 shows the Froude Number distribution versus GT of the European HSC fleet. As can be seen, the large majority of HSC is below 1.000 GT. It can also be noted as some data as submitted by the MS maybe affected by clerical mistakes (such as Fn > 1.20 and < 0.5).

Figures 34, 35 and 36 show Directive 2009/45/EC ships of all Classes. In particular Figure 34 shows the Lpp (Length between perpendicular) versus number of passengers, from which it can be seen that the bulk of the fleet is between 20 and 100/120 m in length.

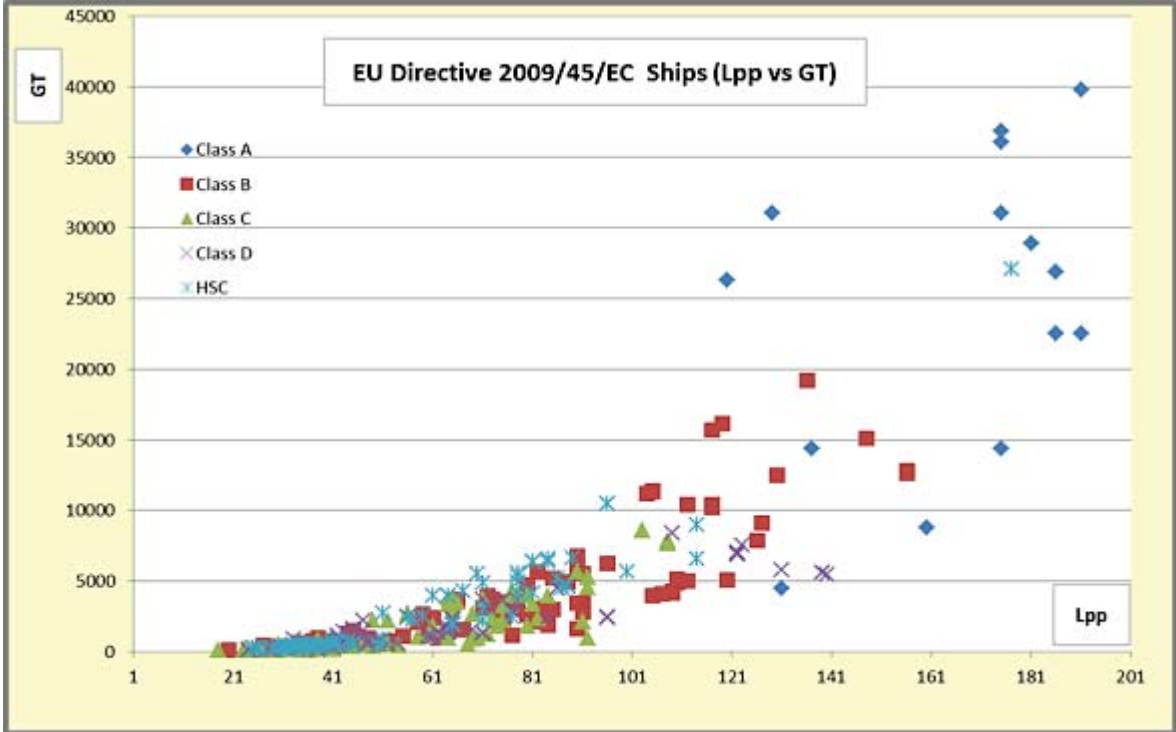
Figures 35 and 36 (close-up) are showing the fleet distribution for all Classes Lpp versus GT; bulk of the fleet between 20-100 in length and < 5.000 GT.

Figure 34: All Classes – Lpp versus number of passengers



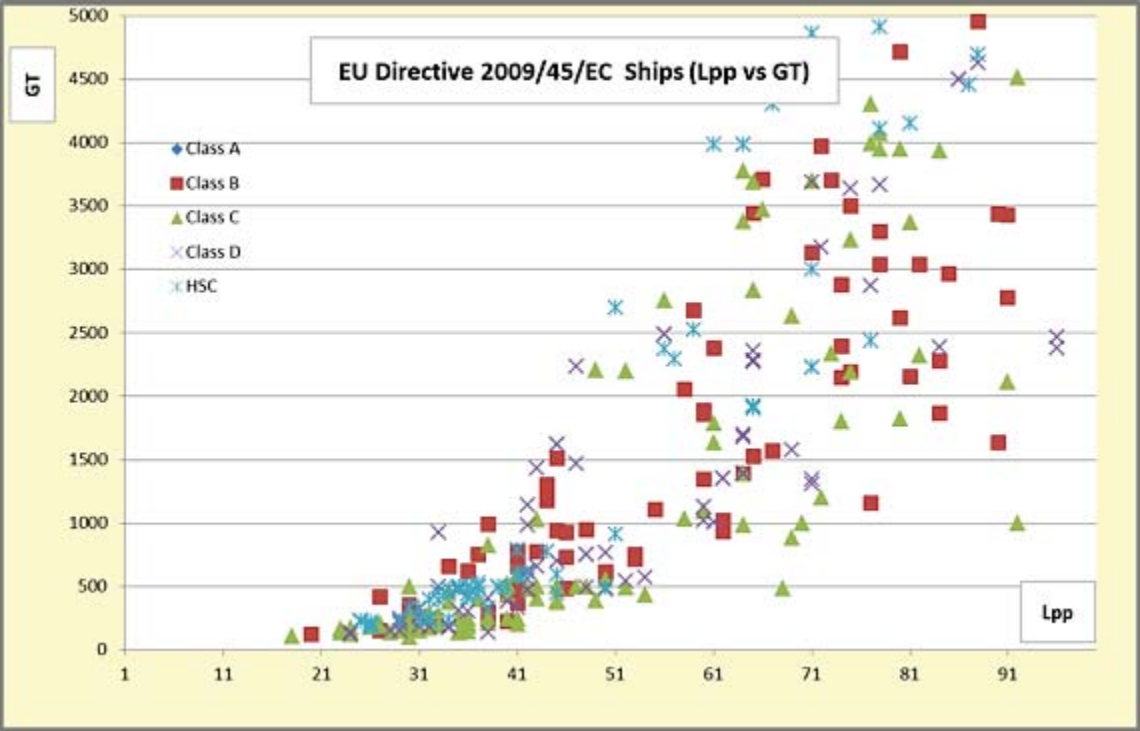
Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

Figure 35: All Classes – Lpp versus GT



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

Figure 36: All Classes – Lpp versus N. Passengers – Zoom < 100 m and GT < 5.000



Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)

## 2.4. Size of ships

With regard to the size of the ships, as already indicated in the previous point, the largest ships are certified according to the Directive: 92% of the 922 passenger ships covered at present by Directive are ships of > 24m length. On the other hand, the proportion of passenger ships outside the scope of the Directive due to their construction material of > 24m length is 16%.

**Table 16: Classification per size**

	No. Ships >24m	No. ships <24m	% Ships >24m	% Ships <24m
<b>EU Dir. Certified</b>	850	72	92%	8%
<b>Aluminium<sup>9</sup></b>	129	280	32%	68%
<b>Composite</b>	105	589	15%	85%
<b>Wood</b>	136	1014	12%	88%
<b>Sub-total of ships out of Directive (Al, Comp &amp; Wood)</b>	370	1883	16%	84%

*Source: MS 2014/09 FC Questionnaire*

It is worth mentioning that the maximum length of the ships above 24m for the ships certified out of the Directive is around 38m.

---

<sup>9</sup> Includes the ships operating in French Overseas Territories (New Caledonia etc.)

## 2.5. Type of activity of ships

The following table shows that about 50% of the domestic passenger ships under Directive 2009/45/EC are ro-ro passenger ships. These ro-ro passenger ships are, in general, providing regular services. The following table shows the classification per sea area:

**Table 17: Classification of ro-ro passenger ships under Directive 2009/45/EC**

	<b>Ships</b>	<b>Pass. Capacity</b>	<b>&gt;400 Pass.</b>	<b>&gt; 250 Pass</b>	<b>% of Class</b>	<b>% of Pass. Capacity for the Class</b>
<b>Class A</b>	66	88,738	58	60	96%	96%
<b>Class B</b>	96	62,727	61	76	57%	78%
<b>Class C</b>	107	46,004	43	62	41%	56%
<b>Class D</b>	144	48,428	32	61	53%	66%
<b>HSC</b>	39	22,830	29	34	26%	39%
<b>TOTAL</b>	<b>452</b>	<b>268,727</b>	<b>223</b>	<b>293</b>	<b>49%</b>	<b>69%</b>

*Source: MS 2014/09 FC Questionnaire + MARINFO (EMSA)*

As it can be seen in the previous table, around 50% of the ships certified under the Directive are ro-ro passenger ships representing 70% of the passenger capacity. It can also be noted that practically all Class A ships have ro-ro capacity vs 26% of the HSC.

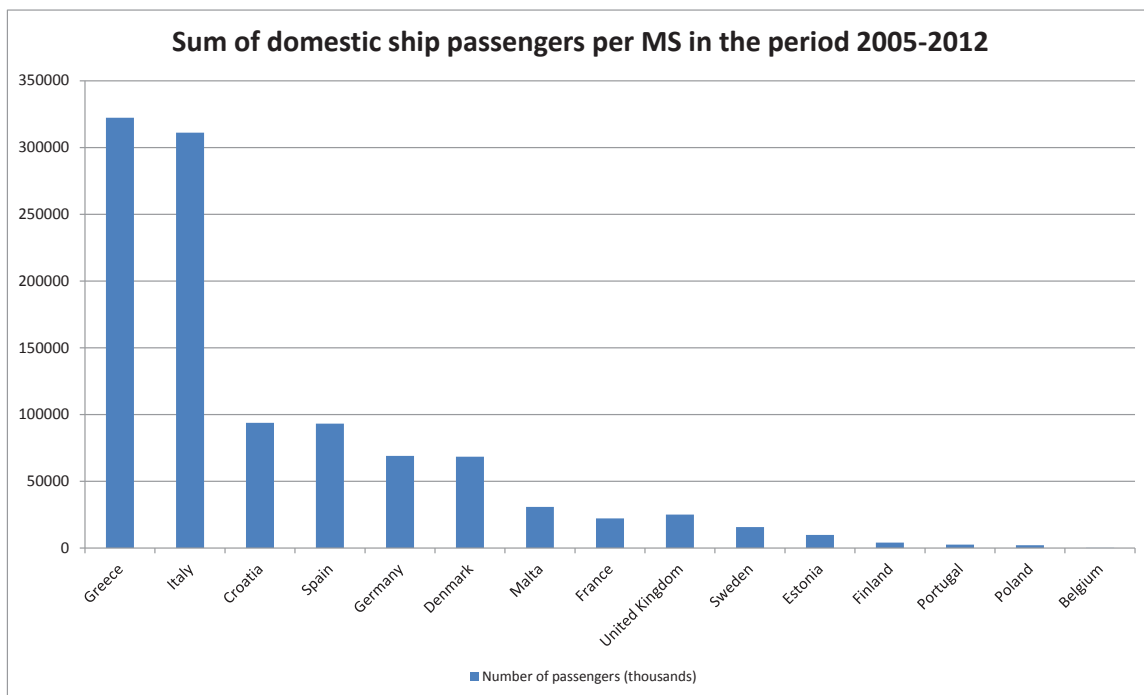
Existing data about the activities of the domestic passenger ships under Directive 2009/45/EC are only related to the fact of whether they are ro-ro passenger ships or not. No other data about activities of the domestic passenger ships is available.

Most of these ships operate in regular services. Nevertheless, based on the statistics about passengers and seasonality, it can be estimated that around 70% of the passengers are transported during the summer period (i.e. second and third quarter of the year), and 30% in the winter period. This means that the main concentration of the activity is in the period where good weather conditions are more frequent and where the proportion of daylight and good visibility conditions is higher. This could also lead to think that ro-ro passenger ships increment their activity in summer.

### 3 GEOGRAPHICAL DISTRIBUTION OF TRANSPORT ACTIVITY

Next figure gives an overview of the total sum of domestic passengers in the EU per MS during the period 2005-2012 according to Eurostat. However, the figure corresponding to the UK seems to be underestimated. UK official data shows around 25 million passengers per year (not including river ships), which would mean that the UK would be the third EU State in terms of number of domestic passengers transported. However, the two major countries are Greece and Italy.

**Figure 37: Sum of domestic ship passengers in the EU per MS in the period 2005-2012 (thousands)**



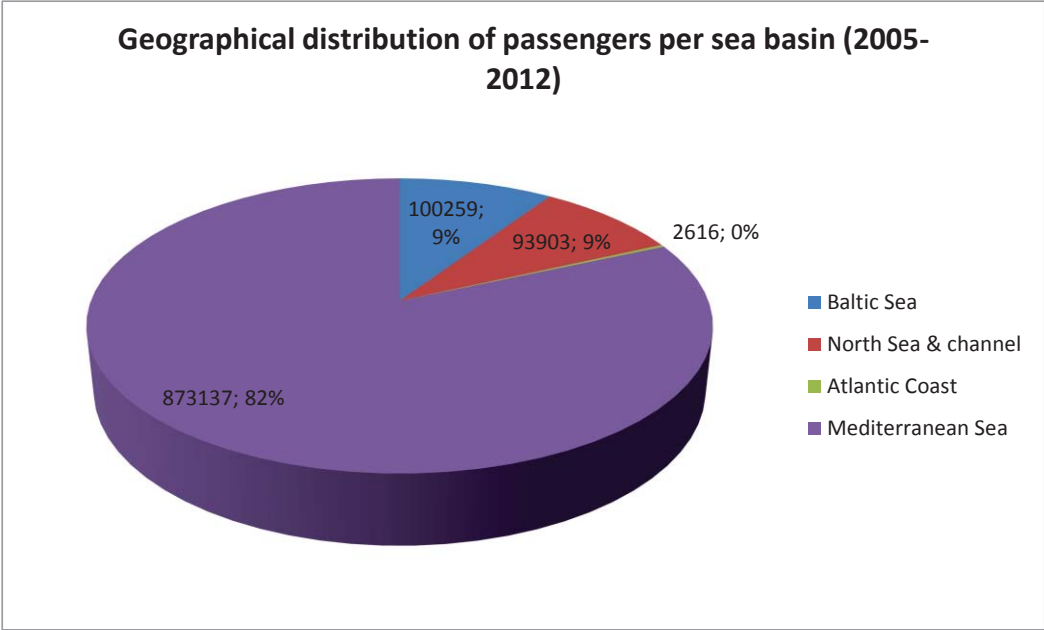
Source: Eurostat<sup>10</sup>

This corresponds with the following figure where it is shown that the biggest part of the passengers transport is done in the Mediterranean Sea:

<sup>10</sup> The data for the UK is probably underestimated in the source used



**Figure 38: Geographical distribution of passengers per sea basin<sup>11</sup>**

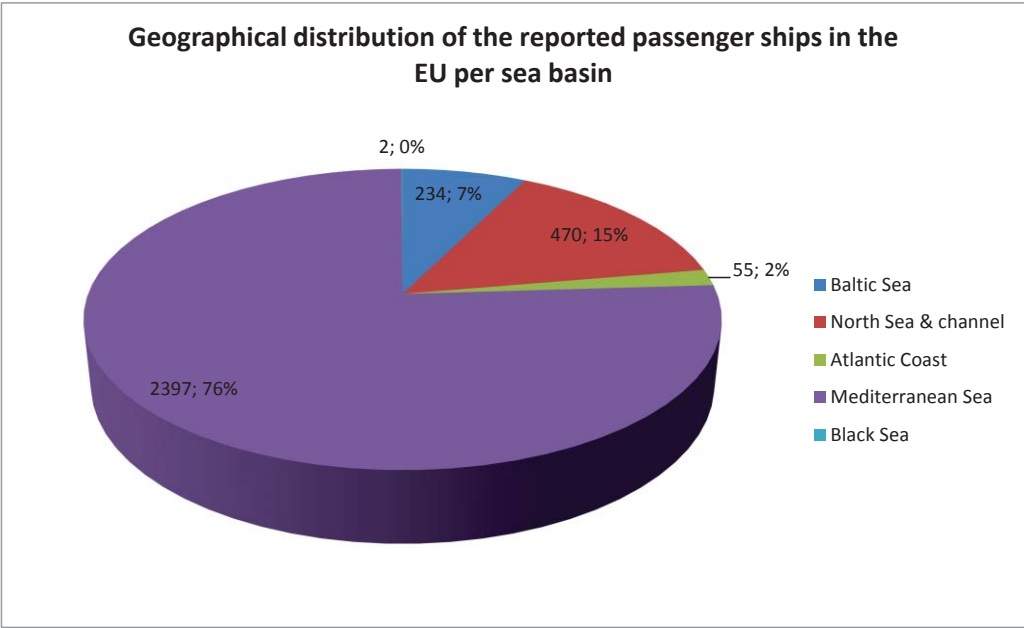


Source: Eurostat + TRACTEBEL

The next figure indicates the geographical distribution of all passenger ships per sea basin, which corresponds more or less to the geographical distribution of passengers per sea basin. Although no information is available regarding the number of voyages performed by the passenger ships, nor about the evolution of the number of ships between 2005 and 2012, a correlation can be seen between the percentages of ships and percentages of passengers in each sea basin:

<sup>11</sup> MSs of Baltic Sea: Poland, Sweden, Denmark, Estonia, Finland, Germany; MSs of North Sea and Channel: Germany, Netherlands, UK, Ireland, Belgium, Norway; MSs of Atlantic Coast: France, Portugal; MSs of Mediterranean Sea: France, Malta, Greece, Spain, Italy, Croatia, Slovenia and Black Sea: Romania

**Figure 39: Geographical distribution of the reported passenger ships in the EU per sea basin**



Source: MS2014/09 FC Questionnaire + TRACTEBEL