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| **The economic contribution of the UK Maritime Sector**  A Cebr report for Maritime UK  August 2019 | |

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| **Disclaimer**  Whilst every effort has been made to ensure the accuracy of the material in this document, neither Centre for Economics and Business Research Ltd nor the report’s authors will be liable for any loss or damages incurred through the use of the report.  Authorship and acknowledgements  This report has been produced by Cebr, an independent economics and business research consultancy established in 1992. The views expressed herein are those of the authors only and are based upon independent research by them.  The industry figures making up the broad Maritime Sector are however not always additive because some of the reports have been customised to cater for the overlap between certain industries. Simply adding together the industries would therefore produce a degree of double counting. Nonetheless, the broad Maritime report has had this double counting stripped out. Cebr believes fundamentally in the thoroughness and robustness of its approach and, as such, we stand by our own unbiased and fresh examination of the role of the Maritime Sector and its constituent industries in the UK.  The report does not necessarily reflect the views of Maritime UK.  London, August 2019 |

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# Executive Summary

### Report Purpose

* The Centre for Economics and Business Research (Cebr) has been commissioned by Maritime UK to quantify the **economic contribution of the Maritime Sector to the UK economy**. This report forms one of ten reports assessing the contribution of the Maritime Sector as a whole, at an industry-level, in Scotland, Wales, the Liverpool City Region and the Solent LEP region.

### Defining the Maritime Sector

* **The Maritime Sector is defined as consisting of the individual shipping, ports, leisure marine, marine engineering and scientific and Maritime Business Services industries, each of which comprise a diverse array of activities.** This report draws upon a combination of data sources, including company financial database FAME, industry sources and publicly-available data to quantify both the direct and aggregate economic impact of Maritime Sector activities in the UK economy in the years 2010 to 2017.

### Economic contribution of the Maritime Sector

* The Maritime Sector makes a substantive macroeconomic contribution to the UK through turnover, Gross Value Added (GVA), employment and through the compensation of employees. **It is estimated that the sector directly supported just over £47 billion in business turnover, £17 billion in GVA and 220,100 jobs for UK employees in 2017. The marine engineering and scientific (MES) and shipping industries are the largest constituent industries in terms of economic activity**, contributing £5.1 billion and £6.1 billion in GVA respectively, and directly supporting around 81,900 jobs and 59,400 jobs in 2017.
* **The substantial direct economic contribution of the Maritime Sector exceeds those of other comparable industries.** For example, the sector’s direct turnover contribution of £47 billion compares to £43 billion from the entire Manufacture of Other Transport Equipment industry in 2017; similarly, the sector’s direct GVA contribution of £17 billion compares favourably to £10 billion from the Manufacture of Other Transport Equipment industry.
* **The direct contribution of the Maritime Sector through turnover, GVA and employment has increased since 2010**, when turnover, GVA and employment are estimated to have been £37.8 billion, £13.6 billion and 195,400 jobs respectively. Average productivity in the Maritime Sector – as measured through the GVA generated by each job – exceeds that of the national average. Average productivity in each maritime industry also exceeded the national average in each year from 2010 to 2017.
* **The Maritime Sector also helped to raise billions of pounds each year to the UK Exchequer and made a sizeable contribution to UK trade through exports of goods and services.** The sector contributed an estimated total of just under £5.3 billion in tax revenues in 2017, or 0.7% of total UK tax revenues, spread across Income Tax, NICs, VAT, Corporation Tax and Business Rates. The Maritime Sector exported £12.4 billion of goods and services in 2017, or around 2.0% of the UK total.
* After quantifying the indirect economic impacts through the industry supply chains and induced effects on expenditures, **it is estimated that the Maritime Sector helped to support a total of £46.1 billion of GVA in 2017.** This implies that, for every £1 in GVA directly contributed on average by the sector, a total of £2.71 in GVA was supported across the UK economy.
* These aggregate economic impacts associated with the Maritime Sector also extend to turnover, employment and the compensation of employees. I**t is estimated that the Maritime Sector helped to support a total of £108.8 billion in turnover, 1,066,000 jobs and £21.6 billion through the compensation of employees in 2017.**
* **While the economic contribution of the industry is spread across all UK regions, London contributes the most to GVA and employment, both directly and more widely.** In 2017, it is estimated that the industry in London directly contributed £4.6 billion of GVA (27% of the industry) and 42,400 jobs (19%). After indirect and induced effects are considered, the aggregate contribution from London rises to £10.7 billion of GVA (26%) and 216,100 jobs (22%).

### Forward look

* We have modelled the Maritime economy as a function of its macroeconomic drivers and industry features to produce projections of GVA and Turnover over the next 5 years. Our model shows that **the sector is set to grow at a Compounded Annual Growth rate (CAGR) of 2.8% which translates into cumulative growth of 15% for 2019-2023.**
* Within the considered horizon, **moderate growth** is resulting from the combination of sluggish GDP growth projections, slow growing seaborne trade and high costs reflecting ambitious investments in infrastructure, technology, education and environmental sustainability. **Nonetheless, we do expect these investments to lead to major gains in efficiency and productivity over the longer term**.

# Introduction

Cebr is pleased to present this report to Maritime UK on the economic impact of the Maritime Sector on the UK economy. For the purposes of this study, the Maritime Sector is broadly defined as comprising of the individual shipping, ports, marine engineering and scientific (MES), marine leisure and Maritime Business Services (MBS) industries; each of these industries comprises numerous and diverse activities which are reflected in the study.

This report forms one of ten reports on the economic contribution of the Maritime Sector. The other reports focus on the economic contribution of each of the five constituent Maritime Sector industries at UK level, and the economic contribution of the sector in Scotland, Wales, the Solent LEP and the Liverpool City Region. It is therefore important to consider this report as part of the wider framework set out in the ten reports, which set out the impact of the Maritime Sector both at a national and regional level.

Our examination spans the period from 2010 to 2017 (inclusive), with the latter being the latest year for which full data are available, and endeavours to capture the full economic ‘footprint’ of the shipping industry. As such, our report is not confined to direct ongoing contributions to GDP and employment through the shipping industry’s operations and activities in the UK, but also provides assessments of the associated indirect and induced multiplier impacts.

## About Maritime UK

Maritime UK is the industry body for the UK’s Maritime Sector, representing companies and partner organisations in the shipping, ports, marine and maritime business services industries. It acts to promote the sector, influence government and drive growth.

## Purpose of this report

This study seeks to equip Maritime UK with statistics and figures on the value of the Maritime Sector to the UK economy, within the context of the value of the Maritime Sector. As such, Cebr has focused on the following key economic indicators: business turnover, employment, Gross Value Added (GVA), the compensation of employees, the Exchequer contribution (through tax revenues raised) and exports of goods and services.

The study also seeks to identify the contribution of the Maritime Sector at regional level (across the former Government Office Regions), after accounting for the relatively high concentration of economic activity taking place in the City of London.

## Overview of the study and methodology

### Purpose of the study

This report provides a thorough and comprehensive examination of the role of the Maritime Sector in the UK and its constituent sub-regional economies. It presents a range of analyses demonstrating different aspects of the value contributed by the overall sector, including direct contributions to GDP and employment, indirect and induced multiplier impacts and the Maritime Sector’s contribution to the UK Exchequer through tax revenues raised.

An important task has been to develop an in-depth understanding of the Maritime Sector. To produce a robust study, it is necessary to analyse the available data to ensure that it captures the full range of activities that should be included in establishing the total economic ‘footprint’ of the industry. Following the collation of the necessary data capturing these activities, the values of key economic indicators were established to demonstrate the impact of the sector. The key macroeconomic indicators include:

* GVA[[1]](#footnote-1) contributions to UK and regional GDP generated by the Maritime Sector, directly and through indirect and induced multiplier impacts.
* Jobs supported by the sector, including direct, indirect and induced jobs through multiplier impacts.
* The value of the turnover of Maritime Sector and, again, the turnover supported in the UK and regional economies through multiplier impacts.
* The value of employee compensation[[2]](#footnote-2) generated by the Maritime Sector, representing the total remuneration of employees operating in the sector.
* The contribution of the Maritime Sector through revenues raised for the Exchequer.
* The value of goods and services exported by the industries comprising the Maritime Sector.

### Mapping the UK Maritime Sector

Here we set out how the Maritime Sector has been defined for the purposes of the study. On a holistic level, the wider sector can be disaggregated into the shipping, ports, leisure marine, marine engineering and scientific and Maritime Business Services industries, which in themselves are formed of numerous individual and distinct activities.

Cebr has subsequently undertaken a mapping exercise using this list to identify how each of these four industries aligns with the national accounts. For most industry activities, a corresponding Standard Industrial Classification (SIC) code exists which enables the identification and quantification of the direct economic impacts using publicly-available data sources. A minority of activities do not map neatly against the SIC framework, necessitating the use of industry or local-level data for quantification purposes.

* **Shipping industry**
  + International passenger transport (cruise and ferry);
  + Domestic and inland waterway passenger transport;
  + International freight transport (bulk, container, gas and tanker);
  + Domestic & inland waterway freight transport;
  + Other shipping activity.
* **Ports industry**
  + Warehousing and storage;
  + Port activities and management;
  + Stevedores, cargo and passenger handling;
  + Border agency, HMRC and public sector employees operating in ports.
* **Leisure marine industry**
  + Recreational marine activities, marine finance and legal activities and general marine services;
  + Boatbuilding (marine leisure vessels);
* **Marine engineering and scientific industry**
  + Shipbuilding;
  + Marine renewable energy;
  + Marine support activities for offshore oil and gas, engineering and mining;
  + Marine science and academic activities, including government vessels and technical consulting;
* **Maritime Business Services industry**
  + Shipbroking services;
  + Maritime Insurance services;
  + Maritime Financial services;
  + Maritime Legal services;
  + Ship Surveying and Classification activities;
  + Maritime Education (including Maritime university courses and cadetships);
  + Maritime Consultancy; and
  + Maritime Accountancy.

Here we focus solely on the Maritime Sector on a holistic basis; a full description of how the direct, aggregate and regional economic impacts of each industry has been measured can be found in Cebr’s separate reports for each industry.

### Quantifying the direct economic impacts of the Maritime Sector and data sources

The first stage of the study, discussed in more detail in Cebr’s separate reports on the shipping, ports, leisure marine, marine engineering and scientific and Maritime Business Services industries, has involved mapping the activities of each industry against the National Accounts framework, in order to establish clarity on the precise definition of activities as they map against the Standard Industrial Classification (SIC) framework.[[3]](#footnote-3)

In essence therefore, this involves taking each of the sector’s and industry’s activities, and mapping these to the most relevant Standard Industrial Classification (SIC) code in order to identify the activity’s economic data. It is clear from Cebr’s analysis that the majority of activities do map neatly onto the National Accounts framework. As a result, Cebr have been able to exploit company financials data in addition to publicly-available data sources such as the Annual Business Survey to gather data for some constituent activities of the sector. Cebr has therefore drawn upon a combination of publicly-available data, desk research and industry data to quantify the economic contribution from the Maritime Sector.

In order to quantify the direct economic impacts of the Maritime Sector, a number of different approaches have been taken which reflect the degree of alignment (or otherwise) for each activity against the National Accounts framework. They are as follows:

* The major source of data used to quantify the direct economic contribution of the Maritime Sector is the Financial Accounts Made Easy (FAME) database, which provides business demography and financial accounts data for companies operating in the UK Maritime Sector. The FAME database has been used to generate estimates for the business turnover, GVA, employment, the compensation of employees and profitability of the shipping industry.
* For those industries and constituent activities which do not map neatly against the national accounts framework, a combination of industry sources (such as the British Marine Key Performance Indicators) and publicly-available data sources have been used to generate direct economic impact estimates.
* As FAME does not provide data on exports of goods and services, data have instead been sourced from both the ONS Pink Book or industry sources such as the UK Chamber of Shipping’s (UKCoS) Annual Sea Inquiry. In some instance the ONS Supply Use Tables have been used to generate estimates.
* Data for the direct economic contribution of each industry have by extension been then used to quantify the contribution that the Maritime Sector makes to the UK Exchequer, and the productivity of the sector in terms of GVA per job.

Again, a more detailed description of sources used for each industry and their constituent activities can be found in Cebr’s separate industry reports, which quantify the economic contribution of each industry.

### Quantifying the aggregate economic impacts of the Maritime Sector

After collation and interrogation, the direct economic impacts for the Maritime Sector have then been embedded within Cebr’s economic impacts models of the UK economy. For each of the activity groups, the direct impacts are then combined with the bespoke economic multipliers to generate indirect, induced and so aggregate impacts. These multipliers were calculated by Cebr using our input-output modelling approaches, as these activities are not ‘standard’ sectors reported in the ONS’ input-output tables. Cebr’s models establish the relationships between industries through supply chain linkages, as well as industries’ linkages with government, capital investors and the rest of the world (through trade).

The models produce three types of impact for four indicators – turnover, GVA, employment and the compensation of employees. The three types of impact are:

* **Direct impact**: this is the value generated and jobs supported directly by the economic activities of the UK Maritime Sector.
* **Indirect impact**: this is the value and jobs supported in industries that supply inputs to the UK Maritime Sector industry.
* **Induced impact**: this is the value and jobs supported in the wider economy when the direct and indirect employees of the sector spend their wages and salaries on final goods and services.

These three impacts are then combined to convey the aggregate impact associated with each industry and activity within the Maritime Sector in terms of turnover, GVA, employment, and the compensation of employees.

### Removal of “double-counting” effects

As this report considers the activities of the entire Maritime Sector (as defined above), when quantifying the associated aggregate economic impacts it is necessary to consider and account for the crossovers or interlinkages that will exist between each of the constituent industries. For example, the UK shipping industry will purchase a significant amount of services from either the UK ports or UK Maritime Business Services industries. So if we were to simply apply multipliers to each of the four maritime industries and combine the resulting aggregate impacts, we would in effect be double-counting some of the economic contributions, and would by extension overstate the aggregate impacts of the sector.

To avoid double-counting it has therefore been necessary to remove these surplus interlinkages from our analysis. In practice, this involves removing coefficients relating to affected industries within Cebr’s input-output models which would otherwise feature as part of the maritime industry multipliers. For example, the coefficient reflecting the additional activity generated when the shipping industry consumes ports services has been removed. As a result, the summation of the aggregate economic impacts taken from Cebr’s individual industry reports will not align with the aggregate economic impacts for the Maritime Sector as presented in this report (and the Maritime Sector aggregate impacts will necessarily be lower.)

## Structure of the report

The remainder of the report is structured as follows:

* Section 2 outlines the direct economic impacts of the Maritime Sector. We consider the direct impacts through turnover, GVA, employment, the compensation of employees, the contribution to the UK Exchequer through tax revenues contributed by the industry, and the contribution through exports.
* Section 3 considers the multiplier impacts of the Maritime Sector through the activities it stimulates in local supply chains and in the wider economy when employees directly and indirectly employed by the different industries spend their wages and salaries in the local and wider economy.
* Section 4 examines the direct and multiplier impacts of the Maritime Sector at regional level, as disaggregated by the 12 former Government Office Regions (GORS).[[4]](#footnote-4)
* Section 5 provides forecasting analysis for the Maritime Sector in the context of the current economic climate.
* Section 6 provides case studies on each of the industries that make up the Maritime Sector.
* Annex A sets out the full set of direct economic impacts by region.

# The direct economic impact of the Maritime Sector in the UK

The direct contribution of the Maritime Sector is measured in terms of the following key macroeconomic indicators: turnover, GVA, employment, the compensation of employees, the Exchequer contribution through tax revenues raised and exports.

## The direct economic impact through turnover

Figure 1 below shows the breakdown of business generated by the Maritime Sector and its constituent industries between 2010 and 2017, and expressed as a share of the total UK Non-Financial Business Economy.[[5]](#footnote-5) Overall, the Maritime Sector contributed an estimated £47 billion in turnover in 2017, or 1.23% of total UK turnover. This is an increase of £9.6 billion on the 2010 level of turnover (£39.6 billion), although 0.02% below the 2010 percentage. In nominal terms, Maritime Sector turnover increased every period.

Figure 1: The estimated turnover of the Maritime Sector, and expressed as a share of total UK turnover from the non-Financial Business Population, 2010 to 2017,

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

The largest constituent industry within the Maritime Sector in terms of turnover directly generated was the shipping industry, with £18.9 billion of business turnover in 2017, with marine engineering and scientific second, contributing £14.2 billion. Shipping also grew by the most over the period considered, both in nominal terms (£5.5 billion) and as a percentage (40% growth since 2010). This growth is largely driven by turnover for international passenger transport (cruise and ferry), which grew by £3.7 billion (almost 40% of the total growth of the sector) over the assessed period. This is consistent with very solid growth in the global cruise industry over similar timeframes, with The Cruise Lines International Association reporting growth of over 20% from 2011 to 2016.[[6]](#footnote-6)

Combined, the shipping and MES industries contributed 70% of total Maritime Sector turnover in 2017. This joint percentage contribution is relatively consistent over the period, although down slightly from the 2015 peak of 72%.

In line with increases in turnover directly generated by the Maritime Sector, average profitability (as measured using the ratio of gross profits to turnover) in the Maritime Sector is estimated to have grown since 2010. Table 1 shows trends in profitability for the sector and across each industry. The overall average profitability of the industry rose from 17% to 20%; in other words, for every £1 in turnover generated by a business in the Maritime Sector in 2017, an estimated 20 pence was generated in gross profit, compared to 17 pence in 2010. However this growth over the assessed period was actually driven by strong increases in profitability from 2010 to 2014. Since, profitability has actually fallen slightly, by 1.4 percentage points from the 2014 peak of 21.6%

Table 1: Estimated average profitability (gross profit ratio) of the Maritime Sector and constituent industries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Profitability** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** |
| **UK Maritime Sector** | 17.3% | 17.0% | 18.7% | 19.7% | 21.6% | 20.0% | 20.5% | 20.2% |
| Shipping industry | 16.4% | 17.3% | 19.6% | 19.8% | 22.9% | 24.1% | 25.6% | 24.1% |
| Ports industry | 25.4% | 23.3% | 25.1% | 25.5% | 25.2% | 25.1% | 24.2% | 25.5% |
| Leisure marine industry | 26.3% | 20.2% | 17.2% | 17.4% | 16.3% | 16.4% | 15.4% | 15.4% |
| MES industry | 32.1% | 30.7% | 32.1% | 31.1% | 29.6% | 28.9% | 23.8% | 33.7% |
| MBS industry | 12.8% | 13.4% | 16.3% | 17.7% | 21.1% | 15.9% | 18.8% | 18.2% |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

Over the majority of the period (every year bar 2016), the most profitable industry was MES. Weighting each year equally, it had an average profitability of 30%. Ports and the shipping industry were second and third respectively, with average rates of 25% and 21%. Average profitability increased in every industry over the period, except for leisure marine, where profitability fell by 10.9%. Leisure marine went from the second most profitable industry in 2010, to the least profitable in 2017. By the same metric, average profitability increased by the most in the shipping industry, with a 7.7 percentage point rise.

Maintaining the UK’s competitive advantage as a leading maritime nation is also a key theme in the UK’s Maritime 2050 strategy report.[[7]](#footnote-7) This is targeted through a series of themes, setting out the overall vision for the sector, with those of particular pertinence to firm profitability including maintaining fiscal attractiveness, the efficiencies available through the UK’s maritime cluster, government support of maritime innovation and a modern regulatory framework. All this is promising for a continued trend of strong business profitability in the Maritime Sector.

To place the Maritime Sector’s direct contribution through turnover in context, Figure 2 below compares turnover in the Agriculture, Forestry and Fishing; Creative, Arts and Entertainment; Rail Transport; Air Transport; and Road and Other Land Transport industries with that of the Maritime Sector; both in absolute levels and the growth since 2010. Turnover data for the comparable industries has been sourced from ADS Group [[8]](#footnote-8) and the Annual Business Survey (ABS).

Figure 2: The direct contribution through turnover of the Maritime Sector against comparable sectors in 2017, and growth against the 2010 level

*Source: ADS, ONS, Cebr analysis*

In 2017, Maritime Sector turnover exceeded that of all the other sectors considered, although Road and Other Land Transport was within £2 billion. Turnover generated by the Maritime Sector in 2017 is estimated to have increased by approximately 25% since 2010, with this outturn comparing favourably to the other two industries with the highest 2017 level of turnover (Road and Other Land Transport and Air Transport).

## The direct economic impact through Gross Value Added (GVA)

This subsection illustrates the contributions in terms of the GVA from the Maritime Sector to UK GVA. Figure 3 shows this direct impact, disaggregated by industry in the years 2010 to 2017, as well as the Maritime Sector’s share of total GVA in the UK. It is estimated that the Maritime Sector directly contributed a total of £17.0 billion in GVA in 2017, an increase of 25% from £13.7 billion in 2010.

Figure 3: The direct contribution of the Maritime Sector through GVA, and the sector’s share of total UK GVA, 2010 to 2017,

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

The majority of this net 25% increase occurred in three year-on-year jumps. GVA increased by £2.0 billion, £0.9 billion and £1.1 billion in 2012, 2014 and 2017 respectively, with GVA growth relatively flat in the other years, or declining (GVA fell by £0.9 billion in 2013). As a percentage of UK GVA, Maritime Sector GVA is down very slightly (0.03%) over the assessed period. This peaked at 1.04% in 2012, and as of 2017 was at 0.92%.

These three different increases occurred for differing reasons, and are worth examining separately. The GVA increase in 2014 was primarily driven by the 17% GVA growth of the shipping industry, although the GVA contribution from Maritime Business Services also grew by £0.3 billion – the most the industry grew by in a single year over the period we considered.

The largest increase, occurring in 2012, was driven by strong growth in the shipping (£0.5 billion), ports (£0.4 billion) and marine engineering and scientific (£0.8 billion) industries. Within each of these constituent industries, the most significant factors were increases again in the GVA generated from the Transport of Passengers (International) and Sea Faring (associated with similar trends as discussed in the previous subsection), and a rise of over £0.5 billion in GVA associated with marine oil and gas support activities.

This intuitively is likely to be linked to UK natural gas prices, with the demand for support services derived from the demand for oil and gas itself. Looking at trends in the UK National Balancing Point (NBP) price[[9]](#footnote-9), this does seem correlated with economic activity associated with marine oil and gas support activities, albeit with a slight lag (which makes sense, as the level of support activity required would be expected to have a degree of stickiness, as market changes take time to filter through supply chains). The level of economic activity supported by these support activities are very volatile, particularly over the second half of the assessed period. The GVA impact generated here increased from £1.3 billion in 2016 to £2.1 billion in 2017, a rise of 63%. This £0.8 billion increase alone is responsible for 73% of the total Maritime Sector GVA increase in 2017.

What is even more striking, is the cause of the very minor decline in GVA (£3.2 million) observed from 2015 to 2016. At face value this may seem like a down year, however GVA essentially remained constant, despite the GVA contribution from the marine oil and gas support activities declining by £1.2 billion, following a near two year period of declining natural gas prices. Stripping out this sector (with the aim of eliminating the effect of this extreme one-year drop, and thus giving a better proxy for the overall performance of the rest of the Maritime Sector), the Maritime Sector actually grew by £1.2 billion in 2016, but just £0.3 billion in 2017.

As for turnover, the majority (66% in 2017) of GVA was contributed by the shipping and marine engineering and scientific industries. In terms of the observed £3.4 billion GVA growth for the entire sector, £1.7 billion (49%) was due to increasing GVA in the shipping industry. MBS and the marine engineering and scientific industry contributed £0.7 billion each in GVA growth. In percentage terms, GVA in the shipping industry grew by the most from 2010 to 2017 (38%), with Maritime Business Services second (33%). All five of the constituent industries saw a GVA growth of at least 10% from 2010 to 2017.

Following Figure 2, Figure 4 below compares Maritime Sector GVA against those of comparable activities in 2017.

Figure 4: The estimated GVA of the Maritime Sector against comparable industries in 2017, and growth against the 2010 level

*Source: ADS, ONS, Cebr analysis*

The Maritime Sector is larger than the entire Rail and Air Transport Sectors, along with the Creative, Arts and Entertainment activities and Agriculture, Forestry and Fishing sectors. In 2017, only GVA from Road and Other Land Transport (£22.2 billion) exceeds that of the Maritime Sector.

## The direct economic impact through employment

In addition to its contribution through GVA, the Maritime Sector also directly supports a significant number of jobs. Figure 5 below highlights the direct contribution of the Maritime Sector to UK employment, again disaggregated by individual industry.

Figure 5: The direct contribution of the Maritime Sector through employment, and the sector’s share of total UK employment, 2010 to 2017

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

It is estimated that the Maritime Sector directly supported around 220,000 jobs for UK employees in 2017, an increase of 24,000 jobs (12%) on the 196,000 provided in 2010. The sector’s share of total UK employment remained broadly stable over this period, on average around 0.67%. As with turnover and GVA, in each year the MES and shipping industries contributed the lion’s share of employment, equating to 64% in 2017. Employment over the period increased for ever constituent industry except ports, where employment fell 7%.

Based on trends in GVA and employment presented in Figure 2 and Figure 4, employees operating in the Maritime Sector are highly productive, as measured by GVA per job. Table 2 below shows the estimated productivity of jobs in the sector and across each industry across the years 2010 to 2017, and compared against the UK economy as a whole.

Table 2: Productivity (GVA per job) in the Maritime Sector and constituent industries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **GVA per job** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** |
| UK economy | £46,215 | £47,176 | £48,355 | £49,691 | £50,877 | £51,619 | £53,013 | £54,330 |
| **UK Maritime Sector** | **£69,760** | **£68,554** | **£78,170** | **£74,721** | **£75,599** | **£75,209** | **£74,609** | **£77,358** |
| Shipping industry | £84,132 | £84,291 | £91,852 | £73,355 | £86,987 | £87,524 | £104,994 | £102,589 |
| Ports industry | £64,594 | £58,616 | £80,931 | £66,589 | £70,942 | £66,859 | £67,725 | £77,225 |
| Leisure marine industry | £30,285 | £29,986 | £32,260 | £34,524 | £34,984 | £34,706 | £33,799 | £34,127 |
| MES industry | £64,370 | £62,117 | £70,822 | £78,267 | £67,440 | £72,459 | £56,692 | £62,602 |
| MBS industry | £115,334 | £118,760 | £127,112 | £134,049 | £136,625 | £116,112 | £117,503 | £117,632 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

The average job in the Maritime Sector in 2017 raised approximately £77,400 in GVA, and so compares favourably to the UK average of £54,300. The average job in each consistent industry bar leisure marine was more productive than the UK average in each year, with those operating in the Maritime Business Services industry and shipping industry averaging over £100,000 of GVA produced per job in 2017. Every industry except MES increased in productivity over the period, although productivity in the Maritime Business Services industry is significantly (12%) lower than the 2014 peak of £136,600.

Maintaining and improving this impressive productivity record is also a focus moving forwards. Investment in technology such as autonomous vessels and autonomous freight movement through ports has the potential to be beneficial in this regard, and is targeted in the Maritime 2050 strategy report.[[10]](#footnote-10)Additionally, focus has been placed on arresting the declining productivity in the MES industry, with long-term support of the Maritime Enterprise Working Group committed to. This is a body set up following the publication of the National Shipbuilding Strategy in 2017, and the Maritime 2050 strategy highlights the importance of working with the group to raise productivity and secure a sustainable and globally successful UK shipbuilding sector – one of the constituent activities in the marine engineering and scientific industry. Further focusing in on MES, it is encouraging that despite the slight headline decrease, GVA per worker in the marine renewable energy sub-industry has increased substantially (52% from 2010 to 2017). This is particularly pertinent given the potential move in this direction, particularly in the light of the recent government commitment to cut greenhouse gas emissions to almost zero by 2050.[[11]](#footnote-11)

Figure 6 compares the direct contribution that the Maritime Sector made through UK employment in 2017 against comparable industries. Employment in the Maritime Sector compares favourably, with 2017 employment and growth since 2010 second and third respectively out of the six considered industries.

Figure 6: The estimated employment of the Maritime Sector against comparable industries in 2017, and growth against 2010 level

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

## The direct economic impact through the compensation of employees

Figure 7 below illustrates the compensation of employees which is directly supported by the Maritime Sector in 2017, disaggregated by industry. It also illustrates the proportion of all direct employee compensation in the Maritime Sector which is directly supported by the industry.

Figure 7: The direct contribution of the Maritime Sector through the compensation of employees, and the sector’s share of total UK employee compensation, 2010 to 2017

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

It is estimated that the Maritime Sector directly contributed just under £8.5 billion through the compensation of employees in 2017; equivalent to around 1.3% of the total employment costs of the total UK Non-Financial Business Economy. Overall the sector increased its direct employee compensation by £1.5 billion over the assessed period, although as a share of total UK employee compensation this was down 0.14%.

Due to both its high direct employment contribution (37% of the Marine Sector total), and high average employee compensation, the MES industry contributed the highest share (around 45% in 2017). The total growth in Marine Sector employee compensation was also driven the most by the £0.7 billion increase in MES industry, although in percentage terms shipping industry employee compensation increased the most (40% higher in 2-17 than in 2010). Together, these two industries contributed 67% of employee compensation, and 80% of the growth since 2010.

## The direct contribution of the Maritime Sector to the UK Exchequer

This subsection discusses the contribution of the Maritime Sector to the UK Exchequer through tax revenues. For each industry and constituent activity, Cebr have calculated the contributions in terms of the tax heads listed below:

* Income Tax;
* National Insurance Contributions (NICs) – from both employees and employers;
* Value-Added Tax (VAT);
* Corporation Tax;
* National Non-Domestic Rates (Business Rates).

For the personal taxes listed above, Income Tax and NICs revenues have been calculated by applying tax rates to the estimated wages and salaries paid to employees operating in each industry; rates and thresholds have been sourced from HMRC for the years 2010 to 2017. Wages and salaries for employees have been sourced from FAME and the Annual Survey for Hours and Earnings (ASHE).[[12]](#footnote-12)

For the business taxes listed above and aside from revenues raised from the Tonnage Tax regime applied to the shipping industry (discussed in Cebr’s separate report on the economic contribution of the shipping industry), Corporation Tax revenues have been estimated by combining the revenues raised through the Tonnage Tax regime, Corporation Tax revenues have been estimated by applying HMRC estimates for Average Effective Tax Rates (AETRs) to the estimated Gross Profit of each industry activity. Business Rates have been estimated using the average level of Business Rates paid as a proportion of GVA, drawing upon the ONS Annual Business Survey (ABS).

Figure 8 shows the direct contribution of the Maritime Sector to the UK Exchequer across the years 2010 to 2017, disaggregated by industry and expressed as a share of total UK tax revenues.

Figure 8: The direct contribution of the Maritime Sector to the UK Exchequer, and the share of total UK tax revenues, 2010 to 2017

*Source: UKCoS, British Marine, PwC, FAME, ONS, HMRC, Cebr analysis*

The Maritime Sector is estimated to have directly generated £5.3 billion in tax revenues for the UK Exchequer in 2017, 20% higher than the £4.4 billion in 2010. In all years, the MES industry contributed the most, with on average 44% of the total sectoral contribution. Shipping benefits from the tonnage tax regime, hence the lower tax contributions. Exchequer contributions increased over the period for every constituent industry, however as a share of total UK tax revenue, Maritime Sector Exchequer contributions fell slightly, from 0.79% of the total UK revenue (and a 2014 peak of 0.82%), to 0.70% in 2017. Figure 9 below disaggregates the Exchequer contribution of the Maritime Sector by tax head.

Figure 9: The direct contribution of the Maritime Sector to the UK Exchequer, by tax head, 2010 to 2017

*Source: UKCoS, British Marine, PwC, FAME, ONS, HMRC, Cebr analysis*

VAT formed the largest component of Exchequer contributions, with £1.9 billion in 2017 and constituting almost 35% of total revenues from the sector from 2010 to 2017; this is despite the assumed zero contribution from those businesses undertaking shipping, ports and shipbuilding activities (among others). The sector also contributed over £1 billion each in Income Tax and NICs in 2017, although in percentage terms, Corporation Tax revenue increased the most over the period (34% higher in 2017 than 2010).

## The direct contribution to the UK’s exports of products and services

In this subsection we consider the contribution that the Maritime Sector makes to goods and services exported from the UK. We compare this total value to the total value of products and services exported from the UK[[13]](#footnote-13). Figure 10 shows trends in the value of services exports from the Maritime Sector between 2010 and 2017, with exports then expressed as a share of the total value of UK exports across the same period.

Figure 10: Exports of goods and services from the Maritime Sector, and the share of total UK exports, 2010 to 2017

Source: UKCoS, British Marine, PwC, FAME, ONS, HMRC, Cebr analysis

The Maritime Sector is estimated to have exported services valued at £12.4 billion in 2017. This is 18% lower than the £15.2 billion in 2010, and 25% below the 2011 peak of £16.6 billion. However in recent years this decline has stabilised, with the value of exports in 2017 marginally above (1.3% higher) than the 2015 trough. As a consequence, the proportion of UK exports supported by the Maritime Sector has fallen from 3.4 % in 2010 to 2.0% in 2017.This decline is primarily driven by a £3.3 billion decline in the value of exports from the shipping industry. Stripping this out, the value of exports actually increased by £0.4 billion over the period.

There are targeted ways in which the Maritime Sector can arrest the declining exports. One of the impacts of Brexit already being felt, is a decline in the value of the pound, which as of August 2019 is 18% lower (against the US dollar) than June 2016. This has the potential to help UK exporters, as UK goods and services become more competitive. Additionally, an awareness of changing population trends, and the impact this may have on the demand for UK exports is key. Some of these are set out in the Maritime Sector’s 2050 strategy report, including the increased role of the African market, and the Port of Djibouti part of a new free trade zone. The potential through the increased spending power of Asia’s middle class is also noted: this demographic is expected to grow by two billion people (153%) by 2030, and spend an estimated $30 trillion more per year than in 2017.[[14]](#footnote-14)

Figure 11 compares exports from the Maritime Sector against those from other comparable sectors. We observe that the value of exports of products and services from the Maritime Sector in 2017 was substantially larger than that of the Rail, Road, Agriculture, forestry and fishing and Advertising and market research sectors, but lower than the value of exports from the Air Travel sector.

Figure 11: Exports of services from the Maritime Sector in 2017 against comparable activities, £ million

*Source: ADS, ONS, Cebr analysis*

# The aggregate economic impact of the Maritime Sector

This section sets out the aggregate economic impacts of the Maritime Sector, by taking into account the indirect (or supply chain) and induced (employee spending) impacts that arise from the activities of firms within this industry. The four macroeconomic indicators for which the aggregate economic impact have been calculated are as follows: business turnover; GVA; employment; and the compensation of employees. Multipliers have been generated from Cebr’s economic impact model for the UK.

## The aggregate economic impacts through turnover

Figure 12 below illustrates the turnover multipliers for the Maritime Sector within the UK. Combined, the shipping, ports, leisure marine, marine engineering and scientific and Maritime Business Services industries contributed £47.3 billion in direct turnover. However considering the turnover supported in the industries’ supply chains (indirect impact) and when employees (and supply chain employees) spend their earnings (induced impact), a total aggregate turnover footprint of £108.9 billion is supported. £38.9 billion of this is due to the indirect impact, and £22.6 billion due to the induced impact.

Figure 12: Turnover multiplier impacts of the UK Maritime Sector, 2017

Total Impact = ❶+❷+❸ = £108.8bn

**❶ DIRECT**

£47.4bn

**❷ INDIRECT   
(supply-chain)**£38.9bn

**❸ INDUCED  
(wider-spending)**£22.6bn

**Turnover**

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

Another way of conceptualising this is the additional value of the turnover supported, for every pound earned in the Maritime Sector. Based on these figures, **for every £1 of turnover initially generated by the Maritime Sector in 2017, a total aggregate turnover of £2.30 was supported in the UK economy.**

Table 3 shows the breakdown of this estimated aggregate turnover impact, by considering the impacts from the individual industries in the Maritime Sector.

Table 3: Turnover impact of the Maritime Sector by industry, £ million, 2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Turnover in 2017** | **Direct Impact** | **Indirect Impact** | **Induced Impact** | **Aggregate Impact** |
| **TOTAL** | **47,372** | **38,878** | **22,591** | **108,842** |
| Shipping | 18,936 | 16,546 | 9,481 | 44,963 |
| Ports | 4,768 | 4,790 | 2,780 | 12,338 |
| Leisure marine | 2,807 | 2,294 | 1,407 | 6,508 |
| Marine engineering and scientific | 14,239 | 9,861 | 6,111 | 30,212 |
| Maritime Business Services | 6,608 | 5,375 | 2,805 | 14,789 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

Within this aggregate economic contribution, the activities of the shipping industry supported the largest turnover impact, with £45.0 billion in 2017. After shipping, the MES industry supported the most in aggregate turnover, with £30.2 billion in 2017. The ports industry had the highest aggregate multiplier, with every £1 of direct turnover supporting a total aggregate turnover footprint of £2.59 in the UK economy.

Table 4 below presents in each year the direct contribution to turnover from the Maritime Sector, alongside our estimate of the composite turnover multiplier that applies to the entire sector. The aggregate turnover impact grew from £85.8 billion in 2010 to £108.9 billion in 2017.

Table 4: Direct and total turnover impact of the Maritime Sector, £ million, 2010 to 2017

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Direct Impact** | **Composite multiplier** | **Aggregate Impact** |
| 2010 | **37,785** | **2.27** | **85,761** |
| 2011 | 39,629 | 2.27 | 90,034 |
| 2012 | 40,833 | 2.26 | 92,482 |
| 2013 | 43,058 | 2.26 | 97,200 |
| 2014 | 44,604 | 2.26 | 101,006 |
| 2015 | 45,455 | 2.26 | 102,543 |
| 2016 | 46,050 | 2.30 | 105,756 |
| 2017 | 47,358 | 2.30 | 108,809 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

To place these results in context, Figure 13 below compares the total turnover impact of the Maritime Sector against the comparable sectors identified in the previous section. In addition, the turnover multipliers associated with each activity are also presented.

Figure 13: The aggregate turnover impact and turnover multiplier of the Maritime Sector against comparable industries, 2017

*Source: ADS, ONS, Cebr analysis*

## The aggregate economic impacts through GVA

Figure 14 below illustrates the GVA multipliers for the Maritime Sector within the UK. As for turnover, the direct impact is augmented by the indirect (supply-chain) and induced (wider employee spending) impacts, to estimate the aggregate economic footprint of the sector.

Figure 14: GVA multiplier impacts of the UK Maritime Sector, 2017

Total Impact = ❶+❷+❸ = £46.1m

**❶ DIRECT**

£17.0bn

**❷ INDIRECT   
(supply-chain)**£17.4bn

**❸ INDUCED  
(wider-spending)**£11.7bn

**Gross Value Added (GVA)**

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

The Maritime Sector directly contributed £17.0 billion in GVA in 2017, and once the indirect and induced economic channels are taken into consideration the sector supported £46.1 billion in GVA. **Therefore, for every £1 of GVA initially generated by the Maritime Sector in 2015, a total GVA impact of £2.71 was supported in the UK economy.**

Table 5 below shows the estimated direct and total GVA impacts from the individual industry activities when taken in isolation. Within the aggregate economic contribution of £46.1 billion, the shipping, then MES industries made the largest aggregate contributions, with £17.9 billion and £11.7 billion respectively in 2017.

Table 5: GVA impact of the Maritime Sector by industry activity, £ million, 2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **GVA in 2017** | **Direct Impact** | **Indirect Impact** | **Induced Impact** | **Aggregate Impact** |
| **TOTAL** | **17,019** | **17,411** | **11,679** | **46,110** |
| Shipping | 6,090 | 7,120 | 4,655 | 17,865 |
| Ports | 2,063 | 2,676 | 1,794 | 6,534 |
| Leisure marine | 974 | 1,050 | 733 | 2,756 |
| Marine engineering and scientific | 5,128 | 3,706 | 2,893 | 11,727 |
| Maritime Business Services | 2,764 | 2,859 | 1,604 | 7,227 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

Table 6 below presents in each year the direct contribution to GVA from the Maritime Sector, alongside our estimate of the composite GVA multiplier that applies to the entire industry. The total GVA impact has increased by 28.4% from £35.9 billion in 2010 to £46.1 billion in 2017. This has been supported by the composite multiplier increasing slightly over the period. This is slightly higher than total UK GVA growth over the same period, which increased by 27.7%, per ONS data.

Table 6: Direct and total GVA impact of the Maritime Sector, £ million, 2010 to 2017

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Direct Impact** | **Composite multiplier** | **Aggregate Impact** |
| 2010 | 13,642 | 2.63 | 35,910 |
| 2011 | 13,796 | 2.66 | 36,760 |
| 2012 | 15,782 | 2.67 | 42,066 |
| 2013 | 14,865 | 2.63 | 39,153 |
| 2014 | 15,808 | 2.68 | 42,386 |
| 2015 | 15,929 | 2.66 | 42,367 |
| 2016 | 15,930 | 2.75 | 43,852 |
| 2017 | 17,019 | 2.71 | 46,110 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

To place these results in context, Figure 15 below compares the total GVA impact of the Maritime Sector against the comparable activities identified in the previous section. In addition, the GVA multipliers associated with each activity are also presented.

Figure 15: The aggregate GVA impact and GVA multiplier of the Maritime Sector against comparable industries, 2017

*Source: ADS, ONS, Cebr analysis*

The total GVA impact of the Maritime Sector in 2017 exceeded that of all of the comparative sectors except Road and Other Land Transport. Considering just the size of the GVA multiplier, the Maritime Sector again exceeded all bar one sectors (Rail Transport). The implication of this latter point is that for every £1 of GVA supported in each of the sectors, only Rail Transport contributes a greater level of aggregate economic support to the UK economy.

## The aggregate economic impacts through employment

Figure 16 illustrates the aggregate employment impacts for the Maritime Sector, in 2017.

Figure 16: Employment multiplier impacts of the UK Maritime Sector, 2017

Total Impact = ❶+❷+❸ = 1,066,000 jobs

**❶ DIRECT**

220,000 jobs

**❷ INDIRECT   
(supply-chain)**523,000 jobs

**❸ INDUCED   
(wider-spending)**323,000 jobs

**Employment**

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

In addition to the 220,000 jobs directly provided by the Maritime Sector, a cumulative 846,000 are supported by the indirect and induced effects. Notably this means that the Maritime Sector supports over a million jobs, when considering the direct and multiplier effects. Additionally, **for every job directly provided by the Maritime Sector in 2017, a total of 4.85 jobs were supported in the UK economy.**

Table 7 below shows the estimated aggregate employment impacts from the individual industries when taken in isolation. The very high employment multiplier (11.5) associated with the shipping industry in the UK accentuates the aggregate impact employment impact across the sector. As a result, the shipping industry is responsible for around 64% of the Marine Sector’s aggregate employment impact.

Table 7: UK Employment impact of the Maritime Sector by industry activity, thousands of jobs, 2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Employment in 2017** | **Direct Impact** | **Indirect Impact** | **Induced Impact** | **Aggregate Impact** |
| **TOTAL** | **220** | **523** | **323** | **1,066** |
| Shipping | 59 | 376 | 246 | 682 |
| Ports | 27 | 30 | 15 | 72 |
| Leisure marine | 29 | 17 | 10 | 56 |
| Marine engineering and scientific | 82 | 61 | 34 | 177 |
| Maritime Business Services | 24 | 40 | 17 | 81 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

The very high multiplier associated with the shipping industry is driven by the intermediate consumption trends of water transport services. Examination of the ONS Supply Use Tables shows that this industry’s intermediate consumption is predominantly from other industries which are very labour-intensive. These include employment services, construction, warehousing and storage, and legal services. As such, the indirect and induced output supported in these industries, are associated with high levels of employment, for a given level of economic activity.

Table 8 below presents in each year the direct employment from the Maritime Sector, alongside the domestic employment multiplier that applies to the entire sector.

Table 8: Direct and aggregate UK employment impact of the Maritime Sector, thousands of jobs, 2017

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Direct Impact** | **Composite multiplier** | **Aggregate Impact** |
| 2010 | 195 | 4.83 | 943 |
| 2011 | 201 | 4.81 | 967 |
| 2012 | 202 | 4.87 | 982 |
| 2013 | 199 | 4.92 | 978 |
| 2014 | 209 | 4.76 | 995 |
| 2015 | 212 | 4.88 | 1,033 |
| 2016 | 213 | 4.85 | 1,035 |
| 2017 | 220 | 4.85 | 1,066 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

The total employment impact has grown from around 944,000 jobs in 2010 to 1.07 million jobs in 2017, an increase of 13%. The composite multiplier has fluctuated slightly over the period, however as of 2017 it is marginally higher than in 2010. This compares favourably to an increase in UK employment of 9% over the same period, per the Office of National Statistics’ Annual Population Survey.

To place these results in context, Figure 17 compares the total employment impact of the Maritime Sector in 2017 to the comparable sectors identified in the previous section. In addition, the employment multipliers associated with each activity are also presented.

Figure 17: The aggregate employment impact and employment multiplier of the Maritime Sector against other industries, 2017

*Source: ADS, ONS, Cebr analysis*

Driven by the highest employment multiplier (4.85, with no other sector above 4), the Maritime Sector also has the highest aggregate employment impact in 2017. The total 1.07 million jobs supported is slightly higher than the 1.02 million supported by the Road and Other Land Transport Sector. This again is primarily a function of the much higher calculated multiplier (4.85, compared to 1.97).

## The aggregate economic impacts through the compensation of employees

In this final subsection we consider the aggregate economic impact of the Maritime Sector through the compensation of employees. Figure 18 illustrates the direct, indirect and induced compensation of employee impacts associated with the sector.

Figure 18: Multiplier impacts for the compensation of employees for the UK Maritime Sector, 2017

Total Impact = ❶+❷+❸ = £21.6bn

**❶ DIRECT**

£8.5bn

**❷ INDIRECT   
(supply-chain)**£8.9bn

**❸ INDUCED  
(wider-spending)**£4.3bn

**Employee Compensation**

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

In addition to the £8.5 billion in direct employee compensation provided, £8.9 billion in employee compensation is supported in the supply-chains of the Maritime Sector, and £4.3 billion due to wider employee spending. Overall, the Maritime Sector supports a total of £21.6 billion in employee compensation. **For every £1 directly raised in the compensation of employees in 2017, a total of £2.56 in employee compensation was supported in the UK economy.**

Table 9 below shows the direct and aggregate impact through the compensation of employees across each industry. Of the £21.6 billion aggregate economic impact for the Maritime Sector, the largest impact (£9.2 billion) was supported by the marine engineering and scientific industry.

Table 9: Impact through the compensation of employees of the Maritime Sector by industry activity, £ million, 2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Compensation of Employees in 2017** | **Direct Impact** | **Indirect Impact** | **Induced Impact** | **Aggregate Impact** |
| **TOTAL** | **8,469** | **8,864** | **4,312** | **21,645** |
| Shipping | 1,820 | 2,021 | 975 | 4,816 |
| Ports | 1,052 | 1,113 | 550 | 2,715 |
| Leisure marine | 642 | 693 | 339 | 1,674 |
| Marine engineering and scientific | 3,820 | 3,573 | 1,787 | 9,180 |
| Maritime Business Services | 1,135 | 1,464 | 660 | 3,259 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

Finally, Table 10 below shows the trend in the direct impact and aggregate support from the Maritime Sector, from 2010 to 2017. The aggregate impact through the compensation of employees has grown from £18.1 billion in 2010 to £21.6 billion in 2017. This has been driven by an increasing direct impact, with the size of the composite multiplier relatively stable over the period.

Table 10: Direct and aggregate impact through the compensation of employees of the Maritime Sector, £ million, 2010 to 2017

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Direct Impact** | **Composite multiplier** | **Aggregate Impact** |
| 2010 | **7,003** | **2.58** | **18,095** |
| 2011 | 6,822 | 2.57 | 17,547 |
| 2012 | 7,558 | 2.56 | 19,380 |
| 2013 | 7,999 | 2.54 | 20,354 |
| 2014 | 7,743 | 2.56 | 19,787 |
| 2015 | 8,237 | 2.56 | 21,119 |
| 2016 | 7,704 | 2.57 | 19,808 |
| 2017 | 8,469 | 2.56 | 21,645 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

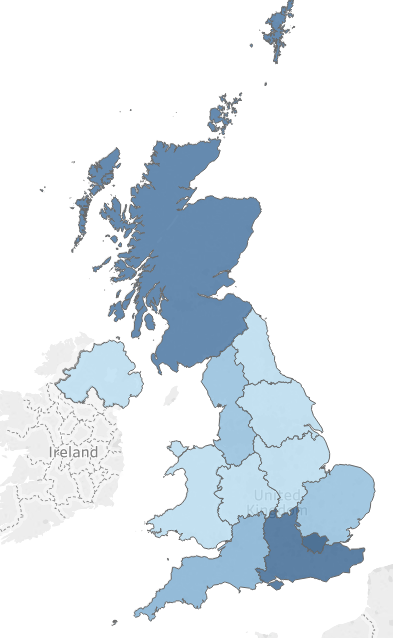
# The regional economic impact of the Maritime Sector

## The direct economic impact of the Maritime Sector by UK region

**Business turnover and GVA**

Figure 19 and Figure 20 below show the estimated regional breakdown of direct business turnover and GVA directly supported by the Maritime Sector in 2017.

Figure 19: Regional breakdown of turnover directly contributed by the Maritime Sector, £ million, 2017



**Scotland**, £9,900m (21%)

**North East**, £1,100m (2.3%)

**Yorkshire and the Humber**, £1,300m (2.8%)

**East Midlands**, £370m (0.8%)

**East of England**, £2,800m (5.8%)

**London**, £12,300m (26%)

**South East**, £10,300m (22%)

**South West**, £3,900m (8.3%)

**West Midlands**, £660m (0.8%)

**Wales**, £490m (1.0%)

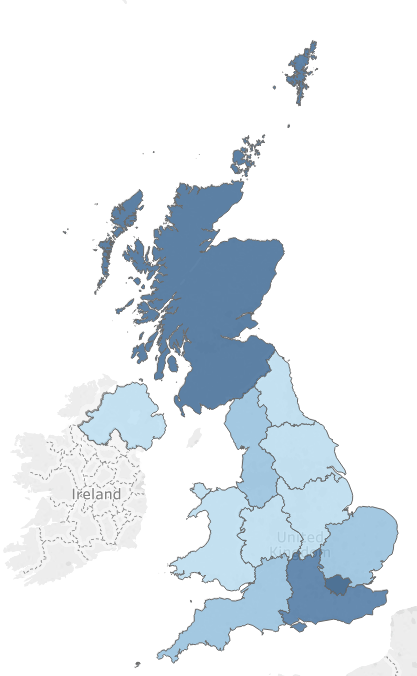
**North West**, £3,600m (7.5%)

**Northern Ireland**, £770m (1.6%)

The highest concentrations of business turnover directly generated in 2017 were in London (£12.3 billion, 26%), the South East (£10.3 billion, 22%) and Scotland (£9.9 billion, 21%).

Note: Figures subject to rounding to nearest £100 million. Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Figure 20: Regional breakdown of GVA directly contributed by the Maritime Sector, £ million, 2017



Note: Figures subject to rounding to nearest £100 million. Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

An inspection of the regional breakdown of GVA yields similar results, with London, Scotland and the South East making the largest direct contributions to GVA in 2017.

Combined, the three regions contribute 68% of total UK GVA.

**Scotland**, £3,700m (22%)

**North East**, £270m (1.6%)

**Yorkshire and the Humber**, £550m (3.2%)

**East Midlands**, £140m (0.8%)

**East of England**, £1,000m (6.1%)

**London**, £4,600m (27%)

**South East**, £3,300m (19%)

**South West**, £1,400m (8.4%)

**West Midlands**, £180m (1.1%)

**Wales**,

£260m (1.5%)

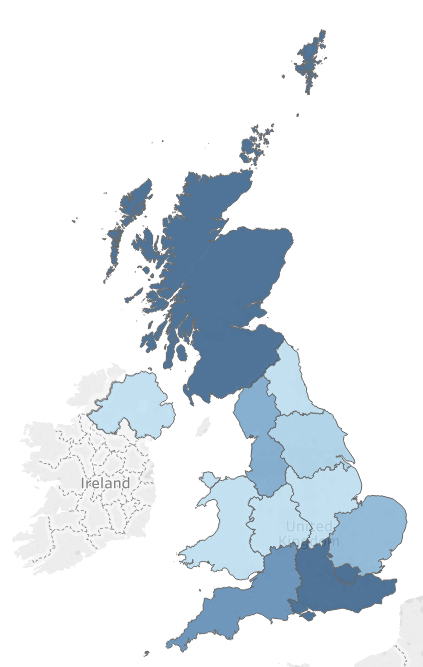
**North West**, £1,300m (7.8%)

**Northern Ireland**, £220m (1.3%)

**Employment and the Compensation of Employees**

Figure 21 and Figure 22 below show the estimated regional breakdown of employment and the compensation of employees directly supported by the Maritime Sector industry in 2017.

Figure 21: Regional breakdown through the employment directly contributed by the Maritime Sector, 2017



**Scotland**, 41,000 jobs (19%)

**North East**, 4,200 jobs (1.9%)

**Yorkshire and the Humber**, 9,900 jobs (4.5%)

**East Midlands**, 3,800 jobs (1.7%)

**East of England**, 16,000 jobs (7.1%)

**London**, 42,000 jobs (19%)

**South East**, 40,000 jobs (18%)

**South West**, 30,000 jobs (13%)

**West Midlands**, 3,700 jobs (1.7%)

**Wales**, 4,100 jobs (1.8%)

**North West**, 22,000 jobs (10%)

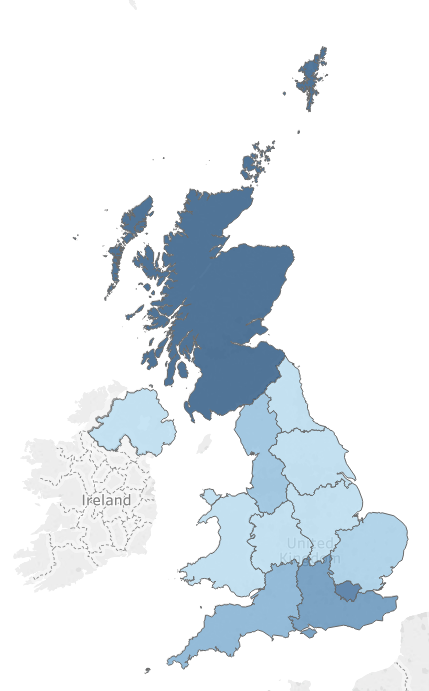
**Northern Ireland**, 3,300 jobs (1.5%)

Once again, the majority of the direct employment is concentrated in Scotland, London and the South East, although the trend is slightly different. London’s share of employment (19%) is lower than GVA (27%), with the three regions all contributing similar amounts.

The South West and North West also contribute significantly, with 13% and 10% respectively.

Note: Figures subject to rounding to nearest 1000 jobs. Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

Figure 22: Regional breakdown through the compensation of employees directly contributed by the Maritime Sector, £ million, 2017



**Scotland**, £2,300m (27%)

**North East**, £220m (2.6%)

**Yorkshire and the Humber**, £290m (3.4%)

**East Midlands**, £100m (1.2%)

**East of England**, £470m (5.6%)

**London**, £1,800m (21%)

**South East**, £1,300m (15%)

**South West**, £970m (11%)

**West Midlands**, £100m (1.2%)

**Wales**, £100m (1.2%)

**North West**, £650m (7.7%)

**Northern Ireland**, £150m (1.8%)

Driven by a high proportion of employment and higher average wages and salaries than most other UK regions, Scotland directly contributes the highest proportion of the total compensation paid to employees (£2.3 billion in 2017, or 27% of the sector total.) Part of this can be attributed to the offshore sector.

After Scotland, London had the second largest contribution (£1.8 billion, or 21%).

Note: Figures subject to rounding to nearest £100 million. Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

## The aggregate economic impact of the Maritime Sector by UK region

This final subsection examines the aggregate economic impact of the Maritime Sector across each region for the four macroeconomic indicators covered in the previous subsection.

In order to estimate the aggregate economic impact of the sector at regional level, the direct economic impacts as already estimated were combined with Cebr’s regional economic impact models, within which the activities of the Maritime Sector were separately identified and isolated. It should be noted that the economic impact multipliers as estimated for each region are necessarily lower than the equivalent multiplier for the sector as a whole, reflecting the leakage of impacts when the activity of the sector in a particular region imports inputs from elsewhere in the UK outside that region.

### The aggregate economic impacts for business turnover and GVA by region

Per Sections 2 and 3, it is estimated that from a total of £47 billion in turnover and £17 billion in GVA was directly contributed by the Maritime Sector in 2017, and £84 billion and £35 billion respectively supported in aggregate across the UK regions. Table 11 shows the breakdown of direct and aggregate economic impacts for business turnover and GVA in 2017, alongside the composite sector multiplier for each region. For GVA, the highest multipliers are associated with the South East, the South West and the East of England.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Turnover** | | | **GVA** | | |
| **Region** | **Direct Impact** | **Sector Multiplier** | **Aggregate impact** | **Direct Impact** | **Sector Multiplier** | **Aggregate impact** |
| Scotland | 9,876 | 1.98 | 19,524 | 3,714 | 2.11 | 7,849 |
| Wales | 493 | 2.06 | 1,016 | 256 | 2.50 | 638 |
| Northern Ireland | 770 | 2.08 | 1,598 | 217 | 2.47 | 534 |
| East of England | 2,760 | 2.22 | 6,126 | 1,033 | 2.70 | 2,792 |
| East Midlands | 373 | 2.00 | 744 | 143 | 2.27 | 324 |
| London | 12,263 | 1.93 | 23,691 | 4,588 | 2.32 | 10,650 |
| North East | 1,077 | 2.09 | 2,248 | 274 | 2.52 | 689 |
| North West | 3,550 | 2.11 | 7,483 | 1,330 | 2.45 | 3,262 |
| South East | 10,293 | 2.24 | 23,011 | 3,304 | 2.74 | 9,039 |
| South West | 3,940 | 2.24 | 8,842 | 1,434 | 2.67 | 3,825 |
| West Midlands | 655 | 1.88 | 1,234 | 183 | 2.15 | 394 |
| Yorkshire and the Humber | 1,324 | 2.22 | 2,934 | 550 | 2.64 | 1,454 |

Table 11: Regional breakdown of business turnover and GVA supported by the Maritime Sector, £ million, 2017

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

For both turnover and GVA, the highest level of direct support is generated in Scotland, London and the South East. Given the relatively higher variance in direct impact size compared to multiplier size, the highest levels of aggregate support are also in these same three regions. Just considering the multipliers, the highest turnover multiplier is in the South West, while the highest GVA multiplier is in the South East.

For contextual purposes, by comparing the aggregate impacts with regional GVA data from ONS, we can estimate the percentage of economic activity in a region that is supported by the Maritime Sector. This is estimated to be highest in Scotland, where 5.6% of total GVA is supported by the Maritime Sector. In second and third are the South East and South West, with 3.4% and 2.9% respectively.

### The aggregate economic impacts for employment and the compensation of employees by region

Finally, Table 12 shows the breakdown of direct and aggregate economic impacts for employment and the compensation of employees in 2017, alongside the respective multipliers for each region.

Table 12: Regional breakdown of employment and employee compensation supported by the Maritime Sector, 2017

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Employment (thousands of jobs)** | | | **Compensation of Employees (£ million)** | | |
| **Region** | **Direct Impact** | **Sector Multiplier** | **Aggregate impact** | **Direct Impact** | **Sector Multiplier** | **Aggregate impact** |
| Scotland | 41.0 | 3.79 | 155.3 | 2,299 | 2.21 | 5,073 |
| Wales | 4.1 | 4.89 | 19.9 | 105 | 2.15 | 226 |
| Northern Ireland | 3.3 | 5.53 | 18.2 | 153 | 2.02 | 309 |
| East of England | 15.6 | 4.43 | 69.2 | 472 | 2.45 | 1,158 |
| East Midlands | 3.8 | 1.90 | 7.2 | 99 | 2.02 | 200 |
| London | 42.4 | 5.06 | 214.2 | 1,806 | 2.35 | 4,236 |
| North East | 4.2 | 2.57 | 10.9 | 224 | 2.22 | 497 |
| North West | 22.4 | 4.09 | 91.7 | 653 | 2.07 | 1,354 |
| South East | 40.2 | 6.61 | 265.4 | 1,296 | 2.42 | 3,140 |
| South West | 29.6 | 3.66 | 108.5 | 965 | 2.20 | 2,126 |
| West Midlands | 3.7 | 2.90 | 10.8 | 105 | 2.06 | 216 |
| Yorkshire and the Humber | 9.9 | 2.99 | 29.5 | 291 | 2.28 | 664 |

Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis

The region with the largest aggregate impacts through employment in 2017 was the South East, with 265,400 jobs, while the largest for employee compensation was Scotland, with an aggregate impact of £5.1 billion. The highest employment multiplier was in the South East (contributing to the highest aggregate impact, despite a lower direct impact than London and Scotland) and the highest employee compensation multiplier was in the East of England.

As for GVA, we can estimate the percentage of total regional employment that is supported by the Maritime Sector. This is highest in the South West, with 5.9% of all employment supported by the Maritime Sector. In Scotland, London and the South East, the Maritime Sector also makes significant employment contributions, with 5.8%, 4.7% and 4.0% of all employment supported by this sector.

# The UK Maritime Sector: A Forward Look

In this final section of the report we present projections of the Maritime economy for the period 2019-2023. The section starts off by discussing the key trends and themes that will be shaping the future of the Maritime Sector in the UK and in the rest of the world. We then describe the conceptual approach that we have developed to produce projections of the direct economic impacts after 2017. Finally, we present our forecasts of Maritime turnover and GVA over the period 2019-2023.

## Maritime worldwide trends and key themes shaping future UK Maritime economy

This section provides a summary of the trends and events set to shape the future of the Maritime Sector in the UK and in the rest of the world. A number of policy documents, in particular the Department for Transport’s “Maritime 2050: Navigating the Future”[[15]](#footnote-15)and in the UNCTAD’s “Review of Maritime Transport 2018”[[16]](#footnote-16), underpins this section.

We highlight below the worldwide trends that will influence the evolution of the Maritime Sector:

* **Growth in trade is likely to represent the main opportunity, facilitating a favourable outlook for the Maritime Sector.** The volume of goods transported by ships and demand for maritime services has grown steadily with no sign of significant change as shown by global containerised trade, which tripled to 148 million twenty-foot equivalent units (TEUs) in the past 10 years. The growth is set to maintain current levels with containerized and dry bulk commodities expected to experience the strongest growth.
* **Strong economic and population growth in Africa and Asia** is likely to shift trading patterns opening new opportunities for the UK. On the other hand, an ageing population in many developed countries might lead to decreasing demand for some products and create challenges for the UK workforce.
* **The world’s economic centre is moving eastwards** with Asia’s middle class forecast to grow by 153% by 2030 adding 2 billion additional consumers. Implications for the Maritime Sector include the need for UK ports to stay ahead of the curve in terms of efficiency and for suppliers to the manufacturing sector to position themselves well to meet future demand.
* **Climate change and significant climatic events are likely to change the patterns of trade** while amplifying the need to protect the marine ecosystem. Aside from massive economic impacts through a variety of channels, increasing sea levels are likely to have direct disruptive consequences on port operations.

Alongside these trends, we focus on the key development areas within Maritime in the UK, drawing particular emphasis on the objectives and initiatives set out by the government and the industry as part of the Maritime 2050 Strategy document. The below section provides a summary of these themes as key drivers of the UK Maritime Sector.

* **One main objective for the sector will be retaining its competitive advantage, with the UK as a leading maritime nation.** It is the UK government’s intention to work alongside the Maritime Sector to retain the best possible fiscal regime as already demonstrated by the introduction of the Tonnage Tax in 2000. Alongside this, the UK regime will be promoted to domestic SMEs and international companies as a prime location for business. The UK aiming to be one of the top shipping 10 registers is another example of how the country is building its competitiveness. With this objective in mind, the UK Ship Register (UKSR) has already opened up the flag considerably and now accepts ship owners from Commonwealth countries and 20 other nations.
* **Technology will act as a driver of change within all Maritime industries.** Technological advancements will directly drive the output of the MES industry, but also act as an enabler or a driver for other key themes within the 2050 strategy. We have already observed this in the past with respect to the emergence of autonomous vessels and we expect technology to be a growing need in the future. We note, for instance, that the aim to reduce emissions by 50% by 2050 and the movement towards ‘Smart Ports’ can be only be successfully achieved if technology enables it.
* **The UK is a major hub for maritime education** as demonstrated by its leading maritime training programmes and apprenticeships. This is an area that the government, alongside the industry, want to maintain and boost by 2050. Skills are vitally important in the Maritime Sector and, with the emergence of international competitors such as Singapore, it is increasingly important to retain the UK’s skill advantage. This is the rationale behind the various initiatives launched by the sector, amongst which we note the £30m a year invested from 2018 in SMarT plus training.
* **A number of initiatives in the UK and worldwide have been launched to reduce the economy’s environmental impact,** with some directly targeting the Maritime Sector. The primary target for will be the reduction in carbon emissions worldwide by at least 50% by 2050, although recent UK government policy has gone further in calling for a 100% reduction by 2050. Accordingly, the IMO Strategy on reduction of Greenhouse gas (GHG) emissions from ships aims to bring emissions down least 50% by 2050 compared to 2008. Other IMO’s initiatives include the 2020 sulphur regulation, entering into force on 1 January 2020, will impose a 0.50% sulphur limit for marine fuels in use on ships operating outside sulphur emissions control area. The UK government is committed to increase public and private R&D spending to 2.4% of GDP. As noted above, the driver of this change to a cleaner industry will be technological advancement.
* **The Maritime Sector is the main facilitator of trade, borne out in the fact that 95% of UK internationally traded goods are transported via ships.** Seaborne trade provides 25% of the country’s energy supply and 48% of the food supply. We note that shipping has experienced a stronger performance over the period 2010-2015 amongst the other Maritime industries. As such, the evolution of the Maritime Sector will heavily depend on trade prospects. Although trade reliance on shipping may decline somewhat as a result of new technologies such as 3D printing and other modes of transport expanding, the Maritime Sector will still be the primary mode of transport for international trade in the foreseeable future. Furthermore, the UK’s need to establish a post-Brexit trading framework with the rest of the world is also becoming increasingly important. Linking this is the emergence of Africa and Asia, where there will likely be large opportunities to expand trade beyond the already established trading partners. Government and industry are already committed to fostering UK exports through a number of short-, medium- and long-term initiatives that have been detailed in a Trade Route Map[[17]](#footnote-17). In the short-term, the government has committed to conducting an industry competitiveness study, considering the case for free ports, creating a network of UK Export Champions, starting engagement for establishing new shipping routes in the Artic and seeking continuity for the existing EU FTAs.
* **Investment in infrastructure will be needed in conjunction with technological advancements** to begin establishing ‘Smart Ports’ throughout the UK through investment in infrastructure and opening new opportunities such as an increase in offshore wind generation.
* **The industry and government aim to maintain the security and resilience** of UK waters and overseas territories while also investing in the technology to tackle the emerging threat of cybercrime. This is increasingly important when considering the Royal Navy has responsibility for all UK and Red Ensign Group Vessels globally. [[18]](#footnote-18)

## The Maritime Sector Forecast (2019-2023)

### Modelling approach

We investigate the relationship between the maritime economy and a number economic variables through an econometric approach. Our findings show that the UK Maritime Sector is primarily linked to national GDP and energy (oil and gas) production. After having established Maritime economy’s elasticities to GDP and energy production, we project these historical relationships forward to produce a forecast of Maritime turnover and GVA. The output of this model constitutes our baseline forecast.

Forecast models rely on macroeconomic variables, for example, GDP, which are generally more suitable for long term horizon while the focus of our analysis is in the short-medium term (5 years). For this reason, we build on the baseline forecast, introducing more sector-specific assumptions which are used to flex the relation to the drivers previously identified. This approach also enables us to address deterministic expectations about the sector.

To identify the sector-specific assumptions, we drew on the trends and key themes identified in the previous sub-section. Each assumption has been assigned a specific weight reflecting its relevance to the wider Maritime Sector and a set of adjustment factors have been produced.

Applying the adjustments to the baseline forecast, we obtain our central forecast of the Maritime Sector turnover and GVA over the period 2019-2023. To note also that our historical analysis of maritime ends in 2017. This requires us to produce a “now-cast” for the first two year (2018) for which we know the actual value of the drivers but not of Maritime turnover and GVA and a forecast for the following period.

### Modelling Assumptions

#### UK GDP

Cebr’s macroeconomics department produces regular forecasts of key economic indicators for the UK national and regional economies which can directly inform our analysis. We therefore rely on our own forecast of UK national GDP. Cebr expects UK GDP to grow at a moderate Compounded Annual Growth rate (CAGR) of 1.6% over 2018-2023 in real terms. This rate is lower than the 2.1% CAGR observed during the past 5 years. A high level of uncertainty characterises the forecast as the outcome of Brexit negotiations could easily shift the projections.

#### Seaborne trade

As previously outlined, seaborne trade represents the main opportunity for the Maritime Sector over the near future. We consider both worldwide and UK-specific trade projections within our modelling framework.

Worldwide trends indicate a sustained growth in trade. UNCTAD[[19]](#footnote-19) sees positive prospects for world seaborne trade forecasting a 3.8% compound annual growth rate between 2018 and 2023 with strongest growth in volumes for containerized and dry bulk commodities. Seaborne trade projections are in line with recent trends showing an average growth rate of 3.5% between 2005 and 2017. These figures are broadly in line with forecasts published by other organisations. DNV GL (an internationally accredited registrar and classification society) projected a 39% increase in seaborne trade tonnage over 2016-2030[[20]](#footnote-20). According to the OECD, global trade is forecast to grow at a higher rate than the economy and specifically a 1% increase in GDP is expected to correspond to a 1.1% growth in seaborne trade (tonnes)[[21]](#footnote-21).

UK prospects are slightly less optimistic than the aforementioned forecasts, as demonstrated by the 2019 DfT’s projections of UK port freight traffic covering the years 2017 through to 2050. DfT reports that overall port traffic is forecast to remain relatively flat over the short term, but then grow over the long term, with tonnage 39% higher in 2050 compared to 2016.

#### Production of energy: Oil & Gas

We rely upon the Oil and Gas Authority (OGA)’s latest projections, which show a constant decline in oil and gas production for the period up to 2035. Energy production can have an ambiguous effect on the Maritime Sector. While it directly contributes to its direct economic impact through what we have defined as “Marine Engineering and Scientific”, it can negatively affect trade. An increase in domestic production leads the country to relying less on imported energy, hence implying a reduction in total UK trade. Noting that 25% of the country’s energy supply is imported by ship, a negative relationship between the Maritime economy and energy production can be explained.

#### Sea passengers

The Maritime Sector also plays a key role in tourism and leisure with nearly 2 million cruise passengers passing through UK ports and more generally in sea transportation of passengers. In 2017, 20 million international ferry passengers travelled on UK short sea routes and 44 million domestic sea passengers.

Using UK GDP as main driver, we projected forward the number of sea passengers obtaining a cumulative growth of 1% over 2018-2023. This figure is in line with historical trends of this sector.

#### High investment

The Maritime 2050 strategy document outlines a large number of recent or planned investments in infrastructure, technology and education as well as ambitious environmental targets. We expect the UK Maritime Sector to experience major improvements over the longer term thanks to greater level of efficiency and productivity, however higher short-term costs might contribute to flatter growth trends.

### The 2019-2023 forecast

Figure 23 shows the Maritime Sector experiencing steady growth over the five year horizon. Our forecast indicates that maritime turnover and GVA are set to grow at a Compounded Annual Growth rate (CAGR) of 2.8% over the considered period. This translates into a cumulative growth of 15% for 2018-2023, which is in a comparable range to the trajectory experienced over recent years.

In line with the rest of the analysis, turnover and GVA have been projected in nominal terms. When the forecast is considered alongside projected inflation, cumulative growth is about 5%.

Figure 23: Maritime Sector turnover and GVA trends and projections, £ million, 2015 to 2023

*Source: UKCoS, British Marine, PwC, FAME, ONS, Oil and Gas Authority, DfT, Cebr analysis*

# Case studies

## Maritime Business Services – Anglo Eastern

Anglo Eastern is a maritime consultancy and global ship management company. Established in 1974 in Hong Kong, the company has expanded to become one of the world’s largest ship management companies with 25 offices worldwide.[[22]](#footnote-22) Anglo Eastern’s current operations include complete third-party management of 600 vessels – 300 bulk carriers, 200 tankers and 100 container ships – and employ 27,000 seafarers and 1,700 shore staff.[[23]](#footnote-23)

Anglo Eastern is globally renowned for its training and commitment to the career goals of seafarers. It operates dedicated training centres in India, the Philippines, China and Ukraine which offer courses such as cadet training, cargo operations, engineering, nautical institute accreditations and environmental management.[[24]](#footnote-24) In addition to this, Anglo Eastern also offer over 50 courses for experienced officers to upgrade their skills beyond the mandatory requirements with the intention to maintain Anglo Eastern as one of the front runners of ship management.[[25]](#footnote-25)

Anglo Eastern’s services are significant, they provide third party management of bulk carriers, container ships, tankers, offshore vessels and semi-submersibles. In addition to this, they also deliver technical services such as conceptual design and new build supervision.[[26]](#footnote-26) However, Anglo Eastern is not solely a business operator, but also provides services within the Leisure Marine sector focusing on yacht management. This emphasises that Anglo Eastern is a broad maritime company encompassing Shipping, Leisure Marine and Marine engineering and scientific as well as Maritime Business Services.

Anglo Eastern’s UK office is based in Glasgow and is slightly differentiated from the parent company in that it is ‘Anglo Eastern Offshore’. This slight difference refers to the fact that Anglo Eastern’s UK operations take the form of the broad ship management the global company is distinguished for as well as additional consultancy in offshore markets.[[27]](#footnote-27) This additional consultancy refers to the oil and gas industry and renewable energies.

Anglo Eastern’s UK office focusing on the additional consultancy of oil and gas and renewables is well suited within Scotland. In 2017, 89% of the UKs support activities in Oil and Gas were situated within Scotland. Moreover, a 2013 governmental study on the low carbon economy found that 15% of offshore wind employees and 32% of marine renewables employees were located in Scotland,[[28]](#footnote-28) emphasising the regions importance to the renewables sector.

More recently, the Managing Director of Anglo Eastern Offshore in Glasgow has, along with a range of other maritime companies, formed the Scottish Maritime Cluster. This organisation currently has over 40 members within the Maritime Sector and its aim is to enhance Scotland’s global maritime market share.[[29]](#footnote-29) The focus of this organisation is on commercial shipping, military contracts, Maritime Business Services, legislation and training.

Scotland is currently the UKs second largest maritime cluster, providing significant resources to the UK maritime industry. The Scottish Maritime Cluster organisation is hoping to provide a way to enhance opportunities for the region and drive economic growth for the industry as a whole. A key objective for the Scottish Maritime Cluster is to expand membership to beyond traditional maritime companies so as to bring in new expertise and skills to the sector.[[30]](#footnote-30)

The Scottish Maritime Cluster’s objectives align with the government’s broader Maritime 2050 goals. The government is particularly keen on maintaining the UK’s competitive advantage within the Maritime Sector in terms of training, its fiscal regime and the business services it provides.[[31]](#footnote-31) Institutions like the Scottish Maritime Cluster and Anglo Eastern who are stimulating these areas will be key players in the UKs objective to maintain its position as one of the strongest maritime hubs globally.

## Shipping – Carnival Cruise

Carnival Cruise is a large multinational company with its UK headquarters based in Southampton. It is the largest leisure travel company in the world comprising of operations in the UK, USA, Mainland Europe, China and Australia among others. Made up of notable brands such as Carnival Cruise, P&O Cruise (UK and Australia), Princess Cruises, Cunard, Costa Cruises and Holland America Line, their portfolio contains 102 ships that visit more than 700 ports worldwide.[[32]](#footnote-32)

Carnival Cruise accounts for approximately 50% of the global market, providing service to 12.1 million guests in 2017.[[33]](#footnote-33) This amounted to a revenue of $12.9 billion where 74% came through the sale of tickets alone. The remaining 26% came through on-board purchases which include things like day excursions, souvenirs, select dining and spa treatments.[[34]](#footnote-34)

Carnival’s UK operations in the form of P&O Cruises are significant for the Solent region as they primarily operate out of Southampton: 2017 alone saw 800,000 individuals travel on UK P&O Cruises. This significant activity is supported by approximately 39,000 employees where 87% reside on-board the cruises themselves.[[35]](#footnote-35)

Southampton has a rich history with P&O Cruises, dating back to 1837 where cruises began with tours to Egypt, expanding to India in 1842.[[36]](#footnote-36) The 175th anniversary was celebrated in 2012 which was marked by all seven cruise liners docking in Southampton for the first time.[[37]](#footnote-37)

Since then, Carnival Cruise has established its 2020 Sustainability Goals stimulating significant investment in Marine Technology to the point where they are market leaders in some maritime environmental technologies.[[38]](#footnote-38) The Sustainability Goals revolve around carbon emissions, general efficiency and environmental impact. Carnival Cruise’s $400 million investment into Exhaust Gas Cleaning Systems has led to 59% of their 102 ship fleet being covered and are leading the way in this technology. They have also invested in reducing waste from ships, producing a 5% reduction relative to the 2010 baseline and increased their water efficiency by 5% through investments in technologies like reverse osmosis. They have also pledged the removal of single use plastics to be replaced by recyclable or biodegradable alternatives.[[39]](#footnote-39)

These technologies have been particularly effective at reducing the company’s carbon footprint. One of the Sustainability Goals was to reduce their CO2 footprint by 25% relative to 2005 levels by 2020. By 2018, Carnival Cruise had achieved a reduction of 24.8% implying that reductions will exceed target. This is particularly relevant as a key target of the UK Maritime 2050 report is reducing carbon emissions by 50%.[[40]](#footnote-40) Cruise Shipping accounts for just over a third of direct revenue of the broader UK shipping industry emphasising the scale of effect investments into greener technologies could produce.

Cunard, another subsidiary of the Carnival Cruise PLC, has recently announced the introduction of a fourth ship to its fleet. This ship will have a capacity of 3,000 passengers and will be the first time since 1998 that the company has four ships operating simultaneously.[[41]](#footnote-41)

Southampton is the only UK port from which Cunard and P&O Cruises operate out of. This highlights the region’s importance to the UK cruise tourism industry.

## MES industry – Autonomous Vessels

Autonomous Vessels is a fast emerging sub-industry in the Maritime Sector with projections that it will be worth $136bn globally by 2030.[[42]](#footnote-42) Its success relies on continuous investments within the Marine Engineering and Scientific Sector as well as the viability of moving into commercial shipping. Rolls-Royce have already stated that it is not a matter of ‘if the technology is available’, but rather how the technology can be utilised in the most cost-efficient manner.[[43]](#footnote-43) The technology for automation, such as fusion sensors (sensors comprised of HD cameras, thermal imaging and LIDAR) are readily available in autonomous cars and drones.[[44]](#footnote-44)

One of the crucial factors that will determine the viability and success of autonomous vessels in the case of international shipping, passenger ferries and military operations is the vessel’s safety. To have a chance of regulatory approval and commercial feasibility, the vessels need to be at least as safe as current operations.[[45]](#footnote-45) However, this may not be as large an issue as it seems – autonomous vessels will benefit from reducing the amount of human error that is made. Human error currently accounts for between 75 to 95% of all insured losses from shipping.[[46]](#footnote-46) Moreover, it is quite possible that unmanned vessels will be able to navigate areas that are too risky for manned vessels, creating opportunities and increasing efficiency beyond current operations.

The technology is advancing rapidly. In 2018, Rolls-Royce in partnership with Finferries completed the world’s first fully autonomous ferry crossing in Finland. Although a crew were on-board, the journey between Parainen and Nauvo was completed autonomously, including the docking, using latest collision avoidance technology.[[47]](#footnote-47) Similar advancements are being made in the UK from L3 ASV and AutoNaut, both leading the way for commercial use, research and military use of autonomous vessels.

L3 ASV provides autonomous vessels for commercial activities relating to Oil and Gas, Marine Science, Geophysical Surveying and Offshore Renewables. Its military operations include Marine Targets, Marine Countermeasures, Anti-Submarine Warfare and Security and Surveillance.[[48]](#footnote-48) This wide scope of operations employ 83 individuals in the UK and had a turnover in 2017 of £9.78m.[[49]](#footnote-49) Leading work has included operations for the National Oceanic Atmospheric Administration’s Office of Coast Survey and discovery of shipwrecks in the Great Lakes of the US and Canada.[[50]](#footnote-50)

In a similar vein, AutoNaut has also significantly developed autonomous vessels for commercial operations. Their speciality falls to Metocean, Water Quality Testing, Passive Acoustic Monitoring, Surveillance, Marine Surveying, Commination gateways and Marine Life Monitoring.[[51]](#footnote-51) One of the key properties of AutoNaut is its use of renewable energy. It is powered by the motion of the waves and the sensory equipment through solar energy. This means it can survive weeks on end without any carbon-based fuel.[[52]](#footnote-52)

Companies like Rolls-Royce, L3 ASV and AutoNaut have illustrated their importance to the Marine Engineering and Scientific Sector through their continual investment into this emerging area of maritime. L3 ASV was awarded, alongside nine other companies, £3 million by Innovate UK to research and develop Maritime Autonomous Systems.[[53]](#footnote-53) This emphasises the view that autonomous vessels are an important emerging sub-sector to the wider Maritime Sector and to the UK as a whole.

Autonomous vessels are likely to become increasingly utilised in the future. As it stands, 95% of UK trade volume is transported via ships[[54]](#footnote-54) and is not expected to decline significantly by 2050. Thus, if autonomous vessels can increase the efficiency of this trade, it will have a significant positive impact on the economy.

Moreover, a key target of the Maritime 2050 Strategy is to reduce carbon emissions by 50%.[[55]](#footnote-55) AutoNaut has already shown the ability to operate for weeks on end without the need for carbon-based fuels, relying on wave movement and solar energy to power its operations. This can, in theory, be scaled up such that a larger part of the ship-based Maritime Sector relies more heavily on renewable energies than the heavy sulphur based fuels.

## Leisure Marine – Cammell Laird[[56]](#footnote-56)

Cammell Laird, one of the most famous names in the history of British shipbuilding and ship repairing, was founded over 190 years ago in Birkenhead. Its fortunes have mirrored those of the wider economy in which it is located, centred on the River Mersey. Following several decades of decline both the firm itself and the Liverpool City Region have seen a recovery in recent years and are now poised to build on their new found confidence with increasingly ambitious growth plans.

Annual turnover was almost £95m in 2018 and has remained above £90m since 2012. The firm supports 1500 core and supply chain workers at peak times and 300 small business suppliers. As of mid-2019, there were around 1200 jobs maintained on site. Following a pause in growth from 2015, the firm is now raising its ambitions. It expects its on-site workforce to expand by 20% during the second half of 2019 and has growth plans that will see the scope and sophistication of its activities expand over the next five years or so.

The company is now at the heart of a modern marine cluster that plays a significant role in the economy of the Liverpool City Region. This provides it with access to a range of support services and also the deep pool of specialist skills that are critical to its success. It is active in planning for future workforce needs, investing £18m in 250 apprentices since 2008. A further success factor is the quality of Cammell Laird’s facilities. The company claims to have some of the UK’s most comprehensive facilities for heavy fabrication and specialist engineering in its sector. These include a flexible range of four dry-docks, a non-tidal wet basin, one of the largest modular construction halls in Europe and a network of covered workshops. These occupy a 120 acre site next to the River Mersey, offering direct access to the sea. The facilities have been upgraded in recent years, with £93m invested in the company and its infrastructure and equipment since 2008.

The firm’s current success is all the more impressive when considered in the context of its recent history. Having driven the Birkenhead economy during the nineteenth and early twentieth century, the firm experienced a sustained period of decline and upheaval after World War II, including nationalisation and subsequent privatisation within the ten years from 1977, and then closure in 1993. The business was revived in 1997 as a ship repair operation and the current owners[[57]](#footnote-57) acquired it in 2005. Since then it has worked to rebuild its position as a leader in its sector, taking on a wide variety of projects that include specialist offshore conversions and fabrication, commercial ship-repair and the refit and upgrade of highly complex naval and naval auxiliary vessels.

In 2008 Cammell Laird ‘Through-Life Support’ contract for the Royal Fleet Auxiliary (RFA), under which the £44m refit of one of the Ministry of Defence’s largest vessels, the RFA Fort Victoria, was recently completed. This included upgrading the ship to a double-hull tanker in a way that complied with the International Convention for the Prevention of Pollution from Ships (MARPOL). The quality and efficiency of the firm’s work on the project have been cited by the MOD’s procurement organisation, with very good collaborative working relationships with Cammell Laird and its main subcontractors, ships’ staff and other stakeholders noted as key success factors. This refit was the last major package to be carried out under the contract. Cammell Laird has, however, won two new 10-year Through-Life Support contracts to support RFA ships worth £619 million, beginning in March 2019. These will sustain 300 jobs and enable the creation of 100 apprenticeships - and they represent votes of confidence in the firm’s performance and capability.

In 2012, Cammell Laird successfully re-entered the ship building market and it now has a growing reputation as a supplier of specialist ferries, military and military support vessels and scientific research ships. A notable recent commission was the state of the art arctic exploration ship, RRS ‘Sir David Attenborough’, worth £150m, which proved the firm’s polar capability and is expected to act as a springboard for new export markets.

The business is also active in the energy sector, acting as a hub in the off shore wind industry and it also offers its facilities and highly trained workforce for work in the civil nuclear sector and the off shore oil and gas sector. An example of a recent energy related contract was the manufacture and installation of 400 tonnes of steelwork for fitting on board the A2SEA Sea Installer for its deployment works on the Burbo 2 wind farm extension[[58]](#footnote-58).

 Cammell Laird is currently bidding for two contracts worth a total of £2bn that would set it on a course of sustained expansion to 2025, by when there could be 2000 workers on-site. It is part of a consortium bidding for a further RFA contract for new Fleet Solid Support (FSS) vessels and also part of a joint bid with BAE Systems to manufacture the Royal Navy’s Type 31e Frigates, which has involved building up a network of more than 2,000 suppliers.

The Government has expressed a desire to see the British shipbuilding industry aggressively pursue export markets and the company is well placed to act on this. The recommendations made by Sir John Parker in his National Shipbuilding Strategy stand to create greater opportunities for shipyards such as Cammell Laird, particularly in the naval new build sector. The promotion of the Leander design, developed by BAE Systems for the Type 31e frigate competition, in potential export markets reflects this initiative. In addition to those referred to above, there are further prospects for domestic and overseas orders in the coming years, building on markets in which the company has a proven recent track record. These include:

* Further naval construction projects following the successful commissions for flight deck blocks for the Queen Elizabeth Class aircraft carriers and blocks for Astute Submarines;
* New build commissions in the specialist ferry market, which is expected to strengthen as the World’s existing fleet ages. Cammell Laird has recently delivered a number of new ferries including a £10m Ro-Pax freight vessel for Isle of Wight ferry operator, Red Funnel;[[59]](#footnote-59)
* Continuing routine and non-planned drydockings[[60]](#footnote-60) and repairs for the strong Irish Sea market and new business from overseas markets, taking advantage of a more favourable exchange rate;
* Green projects ranging from LNG Floating Power Stations and wave power generation to rigid foil wind propulsion technology.

Cammell Laird’s reputation, the growing scale and scope of its ambition and the strength of prospects in its sector augur well for its future. As it grows and prospers over the coming years it will support the success not only of the specialist marine cluster that has formed around it but also the wider economy. As a result it will make an increasingly prominent contribution to the innovation and growth that will ensure the Liverpool City Region’s remarkable renaissance continues.

# Annex A: Full set of direct economic impacts by region

Table A.1: Direct economic impact of the Maritime Sector through turnover, £ million, 2010 to 2017

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TURNOVER** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** |
| **England** | **28,307** | **29,432** | **30,149** | **31,543** | **32,473** | **32,785** | **34,933** | **36,234** |
| **Scotland** | **7,988** | **8,303** | **8,849** | **10,241** | **10,679** | **10,343** | **9,474** | **9,876** |
| **Wales** | **886** | **1,306** | **1,304** | **858** | **919** | **1,092** | **863** | **493** |
| **Northern Ireland** | **619** | **603** | **546** | **431** | **549** | **622** | **788** | **770** |
| East of England | 2,913 | 3,081 | 2,775 | 2,840 | 2,606 | 2,356 | 3,107 | 2,760 |
| East Midlands | 393 | 357 | 411 | 520 | 963 | 434 | 310 | 373 |
| London | 9,928 | 11,831 | 11,410 | 10,911 | 12,381 | 14,119 | 12,103 | 12,263 |
| North East | 980 | 937 | 886 | 1,232 | 1,522 | 1,149 | 1,405 | 1,077 |
| North West | 2,784 | 2,531 | 2,754 | 3,231 | 2,987 | 2,842 | 3,666 | 3,550 |
| South East | 6,281 | 5,743 | 6,984 | 7,018 | 6,789 | 6,333 | 8,919 | 10,293 |
| South West | 2,623 | 2,709 | 3,220 | 3,963 | 3,621 | 3,743 | 3,459 | 3,940 |
| West Midlands | 668 | 524 | 586 | 725 | 821 | 724 | 790 | 655 |
| Yorkshire and the Humber | 1,736 | 1,720 | 1,122 | 1,103 | 781 | 1,085 | 1,175 | 1,324 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

Table A.2: Direct economic impact of the Maritime Sector through GVA, £ million, 2010 to 2017

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **GVA** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** |
| **England** | **9,768** | **10,164** | **11,507** | **10,853** | **11,705** | **11,591** | **12,429** | **12,839** |
| **Scotland** | **3,385** | **3,000** | **3,669** | **3,475** | **3,580** | **3,778** | **2,858** | **3,714** |
| **Wales** | **333** | **417** | **378** | **348** | **331** | **375** | **416** | **256** |
| **Northern Ireland** | **161** | **220** | **233** | **195** | **200** | **192** | **230** | **217** |
| East of England | 959 | 895 | 974 | 927 | 991 | 881 | 1,165 | 1,033 |
| East Midlands | 171 | 133 | 165 | 179 | 340 | 168 | 109 | 143 |
| London | 3,787 | 4,142 | 4,334 | 4,012 | 4,592 | 4,800 | 4,572 | 4,588 |
| North East | 340 | 326 | 343 | 375 | 470 | 365 | 300 | 274 |
| North West | 800 | 921 | 1,063 | 1,131 | 1,243 | 1,319 | 1,494 | 1,330 |
| South East | 1,889 | 1,955 | 2,561 | 2,212 | 2,242 | 2,050 | 2,741 | 3,304 |
| South West | 890 | 961 | 1,299 | 1,365 | 1,203 | 1,298 | 1,289 | 1,434 |
| West Midlands | 215 | 135 | 161 | 170 | 232 | 214 | 231 | 183 |
| Yorkshire and the Humber | 716 | 697 | 606 | 482 | 392 | 496 | 528 | 550 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

Table A.3: Direct economic impact of the Maritime Sector through employment, jobs, 2010 to 2017

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Employment** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** |
| **England** | **147,728** | **151,194** | **152,769** | **150,212** | **155,499** | **161,300** | **164,178** | **171,826** |
| **Scotland** | **37,881** | **38,220** | **39,774** | **39,130** | **45,309** | **41,463** | **39,855** | **40,990** |
| **Wales** | **7,008** | **8,214** | **6,044** | **6,401** | **5,343** | **6,162** | **6,233** | **4,067** |
| **Northern Ireland** | **3,003** | **3,739** | **3,417** | **3,331** | **3,111** | **3,054** | **3,391** | **3,297** |
| East of England | 17,288 | 16,243 | 15,338 | 15,092 | 15,891 | 14,463 | 17,633 | 15,632 |
| East Midlands | 3,518 | 2,978 | 3,702 | 3,257 | 6,247 | 3,743 | 2,873 | 3,790 |
| London | 34,008 | 38,742 | 37,369 | 34,542 | 39,955 | 45,904 | 40,399 | 42,353 |
| North East | 6,634 | 6,815 | 6,329 | 7,356 | 8,044 | 6,407 | 5,638 | 4,235 |
| North West | 15,546 | 16,629 | 17,486 | 18,474 | 19,515 | 21,277 | 23,169 | 22,425 |
| South East | 31,133 | 31,181 | 34,289 | 32,029 | 30,880 | 30,385 | 35,062 | 40,172 |
| South West | 22,897 | 22,733 | 25,069 | 27,920 | 24,093 | 25,881 | 25,977 | 29,625 |
| West Midlands | 4,550 | 3,345 | 3,648 | 3,362 | 4,418 | 4,611 | 4,253 | 3,727 |
| Yorkshire and the Humber | 12,154 | 12,527 | 9,539 | 8,180 | 6,455 | 8,628 | 9,175 | 9,868 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

Table A.4: Direct economic impact of the Maritime Sector through the compensation of employees, £ million, 2010 to 2017

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Compensation of employees** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** |
| **England** | **4,548** | **4,634** | **5,035** | **5,361** | **5,412** | **5,534** | **5,638** | **5,912** |
| **Scotland** | **2,115** | **1,807** | **2,186** | **2,372** | **2,041** | **2,424** | **1,749** | **2,299** |
| **Wales** | **247** | **258** | **208** | **180** | **172** | **169** | **162** | **105** |
| **Northern Ireland** | **93** | **124** | **129** | **85** | **119** | **110** | **155** | **153** |
| East of England | 489 | 484 | 478 | 502 | 462 | 431 | 505 | 472 |
| East Midlands | 74 | 67 | 82 | 106 | 126 | 94 | 71 | 99 |
| London | 1,487 | 1,633 | 1,649 | 1,693 | 1,785 | 1,918 | 1,760 | 1,806 |
| North East | 206 | 193 | 197 | 252 | 289 | 257 | 298 | 224 |
| North West | 521 | 450 | 554 | 538 | 586 | 660 | 653 | 653 |
| South East | 890 | 843 | 1,079 | 1,035 | 1,025 | 938 | 1,159 | 1,296 |
| South West | 492 | 571 | 696 | 908 | 845 | 869 | 821 | 965 |
| West Midlands | 71 | 67 | 88 | 99 | 111 | 130 | 121 | 105 |
| Yorkshire and the Humber | 317 | 326 | 214 | 228 | 183 | 237 | 250 | 291 |

*Source: UKCoS, British Marine, PwC, FAME, ONS, Cebr analysis*

1. GVA, or gross value added, is a measure of the value from production in the national accounts and can be thought of as the value of industrial output less intermediate consumption. That is, the value of what is produced less the value of the intermediate goods and services used as inputs to produce it. GVA is also commonly known as income from production and is distributed in three directions – to employees, to shareholders and to government. GVA is linked as a measurement to GDP – both being a measure of economic output. That relationship is (GVA + Taxes on products - Subsidies on products = GDP). Because taxes and subsidies on individual product categories are only available at the whole economy level (rather than at the sectoral or regional level), GVA tends to be used for measuring things like gross regional domestic product and other measures of economic output of entities that are smaller than the whole economy. [↑](#footnote-ref-1)
2. Compensation of employees is the total remuneration, in cash or in kind, payable by an employer to an employee in return for employers' social contributions, mainly consisting of employers' actual social contributions (excluding apprentices), employers' imputed social contributions (excluding apprentices) and employers' social contributions for apprentices. [↑](#footnote-ref-2)
3. The United Kingdom Standard Industrial Classification of Economic Activities (SIC) is used to classify business establishments and other standard units by the type of economic activity in which they are engaged. [↑](#footnote-ref-3)
4. These are: Scotland, Wales, Northern Ireland, the East of England, the East Midlands, London, the North East, the North West, the South East, the South West, the West Midlands, and Yorkshire and the Humber. [↑](#footnote-ref-4)
5. This is the total level of turnover for businesses not in the Financial Services industry as taken from the Annual Business Survey; The Annual Business Survey covers only the UK Non-Financial Business Economy, which accounts for approximately two thirds of the UK economy in terms of Gross Value Added (GVA). Simply put, this is the turnover for businesses that do not trade in financial/investment-related goods and services. [↑](#footnote-ref-5)
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8. <https://www.adsgroup.org.uk/about/> [↑](#footnote-ref-8)
9. ERCE. (2019). ‘[UK Natural Gas NBP Spot Price](https://www.erce.energy/graph/uk-natural-gas-nbp-spot-price)’. [↑](#footnote-ref-9)
10. Department for Transport. (2019). ['Maritime 2050: Navigating the Future'.](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/773178/maritime-2050.pdf) [↑](#footnote-ref-10)
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12. The Annual Survey of Hours and Earnings (ASHE) provides data on the levels, distribution and make-up of earnings and hours worked for UK employees by sex and full-time or part-time status in all industries and occupations. [↑](#footnote-ref-12)
13. A full description of how the value of industry exports have been calculated can be found in each of Cebr’s reports for the Shipping, Ports, Marine and Maritime Business Services industries. [↑](#footnote-ref-13)
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17. Department for Transport. (2019). ['Maritime 2050: Trade Route Map'.](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/772905/trade-route-map.pdf) [↑](#footnote-ref-17)
18. The Red Ensign Group (REG) is a group of British shipping registers. The registers are operated by the UK, the Crown Dependencies (Isle of Man, Guernsey and Jersey) and UK Overseas Territories (Anguilla, Bermuda, British Virgin Islands; Cayman Islands, Falkland Islands, Gibraltar; Montserrat, St Helena, Turks & Caicos Islands). [↑](#footnote-ref-18)
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54. Department for Transport. (2019). ‘Maritime 2050 Navigating the Future’. [↑](#footnote-ref-54)
55. Ibid. [↑](#footnote-ref-55)
56. The data for this case study was produced from publicly available sources together with information from Cammell Laird [↑](#footnote-ref-56)
57. Northwestern Ship Repairers & Shipbuilders. This company is 50% owned by Peel Holdings, owners of the Mersey Docks and Harbour Company. Peel Holdings purchased the shipyard site and surrounding land in 2007 to facilitate the proposed Wirral Waters development. [Northwestern Ship Repairers & Shipbuilders](https://en.wikipedia.org/wiki/Northwestern_Shiprepairers_%26_Shipbuilders) continue to maintain a long-term lease on the shipyard facilities, which will form an integral part of Peel’s regeneration scheme. [↑](#footnote-ref-57)
58. This involved the manufacturing of three main structures, two to support 12 giant wind turbine blades and the other to support four turbine towers. A range of deck fittings were also manufactured to enable four nacelle hubs to be transported and installed offshore. [↑](#footnote-ref-58)
59. The project used 45 British supply chain businesses and generated 3,000-man hours of work for Cammell Laird’s apprentices. The firm further employed 200 direct workers, 200 sub-contractors and 10 apprentices on the contract. [↑](#footnote-ref-59)
60. In 2016 more than 150 drydockings and repairs were undertaken at the yard. [↑](#footnote-ref-60)