The economic contribution of the UK Marine Engineering and Scientific industry

A Cebr report for Maritime UK

May 2022

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Authorship and acknowledgements

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NB The industry figures making up the broad Maritime Sector are 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.

The report does not necessarily reflect the views of Maritime UK.

London, May 2022

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Headline findings

- The Centre for Economics and Business Research (Cebr) has been commissioned by Maritime UK to quantify the economic contribution of the Marine Engineering and Scientific (MES) industry to the UK economy. This report forms one of ten reports which also assess 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.
- The MES industry consists of a variety of activities, such as, Shipbuilding; Marine Renewable Energy; Marine Oil and Gas Support; and Marine Scientific & Technical activities. This report draws upon a combination of sources, including the ONS, British Marine, the Society of Maritime Industries (SMI) and the FAME database in order to quantify both the direct and aggregate economic contribution of these activities, both at UK and regional level. This has been done for the years 2010 to 2019 inclusive.
- The MES industry makes a substantive macroeconomic contribution to the UK through business turnover, Gross Value Added (GVA), employment and through the compensation of employees (COE). **It is estimated that the industry directly supported around £14.5 billion in business turnover, £5.7 billion in GVA and 80,400 jobs in 2019.** This respectively equates to 26% of turnover, 30% of GVA and 35% of the employment estimated to be directly supported by the wider UK Maritime Sector in 2019. **The output of the MES industry, as measured by GVA, grew by 31% over the period examined, in nominal terms.**
- In 2019, it is estimated that the Marine Engineering and Scientific industry directly contributed to the UK economy:

- **A job in the MES industry generated an average of just over £70,926 in GVA in 2019;** this lies below the average productivity of the UK Maritime sector of £82,329 but above the UK-wide level of £56,670. However, this overall industry productivity level masks the performance of some constituent activities, which are found to be very productive. For example, GVA per job in Marine Oil and Gas Support activities and Marine Renewable Energy was around £140,900 and £73,400 respectively in 2019. **Profitability in the MES industry fell from 18% in 2010 to 12% in 2019.** Our findings support the assertion that shipbuilding is a high-risk, low-margin business.
- Due to its significant direct contributions to GVA and employment, the MES industry also helps to raise millions of pounds each year for the UK Exchequer. **The industry contributed an estimated £1.9 billion in tax revenues in 2019, spread across VAT, Corporation Tax, Income Tax, National Insurance Contributions (NICs) and**

Business Rates. Marine Scientific & Technical was the largest contributor, with £536 million in 2019.

- After quantifying the aggregate economic impacts through the industry supply chains and induced effects on expenditures, **it is estimated that the MES industry helped to support a total of £16.4 billion of GVA in 2019.** This implies that, for every £1 in GVA directly contributed by the industry in 2019, a total of £2.88 in GVA was supported across the wider UK economy.
- These aggregate economic impacts associated with the MES industry also extend to business turnover, employment and the compensation of employees. **It is estimated that the MES industry helped to support a total of £34.7 billion in turnover, 217,200 jobs and £7.4 billion through the compensation of employees in 2019.**

- **The economic activity directly contributed and more widely supported by the MES industry is spread across all regions of the UK.** In 2019, the UK regions with the largest direct contribution in terms of GVA were Scotland (£2.6 billion), the North West (£0.8 billion) and the South West (£0.6 billion). Scotland's relatively high economic contribution can be attributed to the high share of employment in Marine Oil and Gas Support and Shipbuilding activities in all years considered.
- We expect the MES industry to experience little to no growth over the five-year horizon after 2020 in real terms largely due to the lasting impact of the Covid pandemic and Brexit. Our forecast indicates that turnover and GVA are **set to grow at a Compounded Annual Growth rate (CAGR) of 3.0% over the considered period. This translates into a cumulative nominal growth of 12.3% for 2021-2025, in nominal terms**, which is more than the growth experienced over the five years directly preceding the pandemic.

1. Introduction

Cebr is pleased to present this report to Maritime UK and the Society of Maritime Industries on the economic impact of the Marine Engineering and Scientific (MES) industry 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 other four industries at UK level, the contribution of the sector in Scotland, Northern Ireland, Liverpool City Region and the Solent LEP, and the contribution of the Maritime Sector at UK-level. 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.

In this context, the MES industry is defined as encompassing a wide range of constituent activities, categorised under Shipbuilding, Marine Renewable Energy, Marine Oil and Gas Support and Marine Scientific & Technical activities. Each activity represents a diverse range of sub-activities; for example, Shipbuilding and Marine Scientific & Technical activities are dominated by large manufacturers such as BAE Systems and QinetiQ.

Our examination spans the period from 2010 to 2019 (inclusive), with the latter being the latest year for which full data are available, and endeavours to capture the full economic 'footprint' of the MES industry. As such, our report is not confined to direct ongoing contributions to GDP and employment through the MES industry's operations and activities in the UK, but also provides assessments of the associated indirect and induced multiplier impacts.

1.1 About Maritime UK

Maritime UK is the umbrella body for the maritime sector, bringing together the shipping, ports, services, engineering and leisure marine industries. Their purpose is to champion and enable a thriving maritime sector. Maritime UK has responsibility for the coordination and delivery of industry recommendations within Maritime 2050.

1.2 Purpose of this report

This research provides up-to-date insights on the size and performance of the UK Marine Engineering and Scientific industry, presenting a range of statistics and figures which demonstrate different aspects of the economic value brought by the industry to the UK economy. The intention of this is to empower Maritime UK and the Society of Maritime Industries with a thorough and comprehensive knowledge and evidence base, such that they can support and advocate for the industry across the UK.

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 MES industry at a regional level (across the International Territorial Level (ITL) regions).

It should be noted that given the data lags associated with many of the official national statistics used within this study, it is not possible for our analysis to capture the full extent to which the industry was directly affected by the COVID-19 pandemic in 2020/21. As such, because of the timeframe examined in this report, this research offers a picture of the value of the MES industry right before the pandemic occurred. Further to this, our research does consider the impacts of Covid in our Forward Look section, where we provide forecasts for the MES industry as well as the other four Maritime industries, the four regions included within our analysis, and for the Maritime Sector in the UK as a whole.

1.3 Overview of the study and methodology

Objectives of the study

This report provides a thorough and comprehensive examination of the role of MES industry 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 industry, including direct contributions to GDP and employment, indirect and induced multiplier impacts and the MES industry's contribution to the UK Exchequer through tax revenues raised.

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 which capture these activities, the values of key economic indicators were established to demonstrate the impact of the industry. The key macroeconomic indicators include:

- GVA[1] contributions to UK and regional GDP generated by the MES industry, directly and through indirect and induced multiplier impacts.
- Jobs supported by the industry, including direct, indirect and induced jobs through multiplier impacts.
- The value of the turnover of the MES industry and, again, the turnover supported in the UK and regional economies through multiplier impacts.
- The value of employee compensation[2] generated by the MES industry, representing the total remuneration of employees operating in the industry.

1 GVA, or gross value added, is a measure of the value of production in the national accounts. Conceptually it can be considered the value of what is produced, less the value of intermediate goods and services used to produce it. GVA is distributed in three directions – to employees, to shareholders and to government. It is often used as the proxy for the contribution of a sector or industry to GDP: strictly this relationship is GVA + Taxes on products - Subsidies on products = GDP.

2 Compensation of employees (COE) or employee compensation, is the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter. This consists of wages paid to employees; employers' actual social contributions (excluding apprentices); employers' imputed social contributions (excluding apprentices); and employers' social contributions for apprentices.

- The contribution of the MES industry through revenues raised for the Exchequer.
- The value of goods and services exported by the activities comprising the MES industry.

In addition to the core modelling and analysis, we also undertake a range of comparisons to contextualise the findings, including:

- How the economic indicators vary over the period 2010-2019.
- How the economic indicators vary across the different sub-industries within Marine Engineering and Scientific.
- How the economic indicators for the MES industry vary across the different UK nations and regions.
- How the indicators for the MES industry compare with other important industries of the UK economy.

Mapping the UK Marine Engineering and Scientific industry

Here we set out how the Maritime Sector and, by extension, how the MES industry have been defined for the purposes of the study. On a holistic level, the wider Maritime 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.

Building up on the experience gained through previous studies for Maritime UK, Cebr has subsequently undertaken a mapping exercise using this list to identify how each of these five 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.

The mapping of the Maritime Sector has remained the same as in the 2019 Cebr study, and the MES industry specifically is broken down as follows:

- **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;

Here we focus solely on the MES industry. A full breakdown and description of how the overall Maritime Sector has been defined can be found in Section 2 of this report.

Quantifying the direct economic impacts of the MES industry

The first stage of the study involved mapping the activities of the MES 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]

In essence therefore, this involves taking each of the sector 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. In the case of the MES industry, two of the four sub-industries map neatly onto the National Accounts framework. As a result, Cebr has been able to exploit company financials data in addition to publicly available data sources such as the Low Carbon and Renewable Energy Economy (LCREE) to gather data for some constituent activities of the industry.

In order to quantify the direct economic impacts of the MES industry, 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:

- Where MES industry activities can be assigned to a particular SIC code, Cebr has drawn upon business demography data taken from Bureau van Dijk's Fame database.[4] Examples of activities where this approach was viable include Shipbuilding and Marine Offshore Oil and Gas Support activities.
- For those activities which cannot be separately identified through the use of SIC codes, Cebr has drawn upon existing analysis from the Society of Maritime Industries (SMI), an industry body which represents maritime engineering companies. These existing SMI analyses were used specifically for the Marine Scientific & Technical sub-industry. However, for the estimation of some macroeconomic indicators (such as GVA for Marine Scientific & Technical activities), these sources have been combined with FAME data in order to generate estimates.
- For Marine Renewable Energy activities, Cebr have drawn upon the Low Carbon and Renewable Energy Economy (LCREE) reports from the ONS, as well as the 2015 Department for Business, Innovation and Skills (the former BIS; now the Department for Business, Energy and Industrial Strategy) report, "The Size and Performance of the Low

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.

4 Fame is a company financials database which provides detailed information on UK and Irish companies as taken from annual reports and other sources up to the latest available year. FAME has been used to establish the aggregated contribution of businesses in the Marine industry to the UK economy in terms of turnover, employee numbers and GVA.

Carbon Economy",[5] which contain data on the economic contribution of marine renewable energy activities over the years 2010 to 2019.

- As FAME does not provide data on exports of goods and services, data have instead been gathered from different sources, including the ONS Pink Book or industry sources such as the SMI reports. In some instance the ONS Supply Use Tables have been used to generate estimates.
- Data for the direct economic contribution of each sub-industry have by extension been used to quantify the contribution that the MES industry makes to the UK Exchequer, and the productivity of the industry in terms of GVA per job.

A more detailed description of the sources used for each MES industry activity can be found in the next section of this report.

Quantifying the aggregate economic impacts of the MES industry

After collation and interrogation, the direct economic impacts for the MES industry 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 MES industry.
- **Indirect impact:** this is the value and jobs supported in industries that supply inputs to the MES industry.
- **Induced impact:** this is the value and jobs supported in the wider economy when the workers directly and indirectly employed by the industry (i.e. through its supply chain) spend their wages and salaries on final goods and services.

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

5 BIS, 2015. "The Size and Performance of the Low Carbon Economy, Report for 2010 to 2013."

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 five 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).

Changes from 2019 Cebr study

The main change in our methodology affecting our analysis for the MES industry is reflected within our aggregate impact analysis. Since our 2019 study, Cebr has made several changes to our input-output models, which underpin the calculation of the aggregate impacts. Firstly, we have updated the underlying supply-use data within the models, to reflect updated ONS data released over the intermediary period. This means the models now represent a more contemporaneous structure of the economy. Secondly, we have further refined our input-output modelling framework. The conceptual framing of our methodology remains the same, but for industries which span multiple SIC codes (such as the Maritime Sector and many of the constituent industries) the models themselves have been adjusted to remove potential double-counting and simplify the required data inputs.

There have been other changes made elsewhere in the analysis which affect some of the other constituent industries of the Maritime Sector, and these can be found in the Maritime Sector and respective industry reports.

1.4 Structure of the report

The remainder of the report is structured as follows:

- **Section 2** provides a more detailed overview of how the Maritime Sector has been defined, and how the MES industry fits within this description. Further information is also provided on how the key macroeconomic indicators have been captured or estimated;
- **Section 3** outlines the direct economic impacts of the MES industry. We consider the direct impacts through GVA, employment, the compensation of employees, and contribution to the UK Exchequer through tax revenues contributed by the industry.

- **Section 4** considers the multiplier impacts of the MES industry through the activities it stimulates in the local supply chain and in the wider economy when employees directly and indirectly employed by the industry spend their wages and salaries in the local and wider economy.
- **Section 5** examines the direct and multiplier impacts of the MES industry at a regional level, as disaggregated by the 12 International Territorial Level regions (ITL).[6]
- **Section 6** provides forecasting analysis for the MES industry in the context of the current economic climate, with a focus on the impact of Covid-19 on the sector.
- **Annex: Full set of direct economic impacts by region** contains the full set of direct economic impacts of the Shipping industry by region.

6 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.

2. The Maritime Sector and the Marine Engineering and Scientific industry

Here we set out how the wider 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, Marine Engineering and Scientific (MES), Leisure Marine and maritime business services industries, which in themselves are formed of numerous individual and distinct activities, of which the MES industry is the focus of this report.

2.1 The definition of the Maritime Sector and its constituent industries

Building up on the experience gained through previous studies for Maritime UK, Cebr has subsequently undertaken a mapping exercise based on the previous study to identify how each of these five industries align 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 and repair;
  - → 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.

In this report we focus solely on the MES industry. The remainder of this section focuses on how the direct economic impacts of the constituent activities have been measured, in light of difficulties in establishing how aspects of the industry map against the National Accounts framework.

2.2 Quantifying the direct economic impacts of the Marine Engineering and Scientific industry at a national level

Quantifying the direct economic impacts for the MES industry

Table 1 below shows how activities for the MES industry have been identified, and the data sources used to capture and quantify the associated economic activity.

Table 1: Mapping the activities of the MES industry

INDUSTRY	ACTIVITY	MAPPING	SOURCE(S)
Marine Engineering and Scientific Industry	Shipbuilding and Marine Engineering	Identified in the National Accounts framework through SIC code 3011 ("Building of ships and floating structures") and 3315 (“Repair and maintenance of ships and boats”)	ABS, BRES, FAME, Cebr Analysis
	Marine Renewable Energy	Marine renewable energy activities do not map neatly across the SIC framework. Cebr has therefore drawn upon the ONS LCREE reports as well as the 2013 BIS report, “The size and performance of the UK low carbon economy”, to derive employment, turnover and GVA estimates.	ONS, BIS, Cebr Analysis
	Marine Support activities for Offshore Oil and Gas, Engineering and Mining	Identified in the National Accounts framework through SIC code 09.1, "Support activities for petroleum and natural gas extraction".	FAME, Cebr Analysis
	Marine Scientific & Technical	Marine Scientific & Technical activities do not map neatly across the SIC framework, as they are typically bundled together with other activities within the Manufacturing and "Other Scientific and Professional" sectors. Cebr has therefore drawn upon the Society of Maritime Industries (SMI) "Annual Review of UK Marine Scientific Industries" reports to gather data.	SMI, FAME, Cebr Analysis

Source: Maritime UK, Cebr analysis

2.3 Quantifying the direct economic impacts of the industry at regional level

In this final subsection we set out the approach taken to disaggregate the direct and aggregate economic impacts at a regional level. For some activities, the approach taken to disaggregate the direct economic impacts of the MES industry has involved combining the direct economic impacts at UK level with publicly available statistics which can be disaggregated at a regional level. However, for some activities this approach is precluded as they cannot be separately identified within the National Accounts framework.

Shipbuilding and repair

As Shipbuilding and repair activities (referred to as the 'Shipbuilding' subindustry within our report) are explicitly identified within the National Accounts framework (under SIC codes 3011 and 3315, as described in Table 1 above), macroeconomic data for Shipbuilding activities as sourced from the FAME database have then been combined with publicly available data sources capturing Shipbuilding activity at a regional level.

Alongside FAME, the major source of employment was the Business Register and Employment Survey (BRES),[7] as accessed through NOMIS. BRES employment data associated with the 3011 SIC code were gathered and an implied regional breakdown estimated after interpolating for some missing information. Shipbuilding employment in Northern Ireland has been estimated using a combination of BRES and the ABS, the latter providing the proportion of employment in Northern Ireland across the broader industrial sector categories. Table 2 below shows the implied regional breakdown of employment in Shipbuilding activities from 2010 to 2019 using the approach described above.

7 The Business Register and Employment Survey (BRES), produced by the ONS on an annual basis, is the official source of employee and employment estimates by detailed geography and industry within Great Britain.

Table 2: The regional breakdown of UK employment in shipbuilding activities, 2010 to 2019

Share of Employment	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	71.2%	71.6%	75.8%	71.4%	69.4%	72.5%	73.2%	71.8%	72.5%	75.2%
Scotland	23.7%	23.4%	20.8%	24.2%	26.3%	22.0%	21.2%	22.9%	22.1%	19.6%
Wales	2.6%	2.2%	1.3%	1.6%	1.5%	2.3%	2.1%	1.7%	1.8%	1.6%
Northern Ireland	2.5%	2.7%	2.2%	2.8%	2.8%	3.3%	3.6%	3.5%	3.7%	3.6%
East of England	4.2%	2.4%	3.3%	4.1%	2.0%	2.6%	3.5%	3.1%	1.6%	2.3%
East Midlands	0.5%	0.6%	0.7%	0.8%	0.9%	0.5%	0.5%	0.7%	0.6%	0.4%
London	0.3%	0.1%	0.6%	0.2%	0.4%	0.2%	0.9%	0.2%	0.1%	1.0%
North East	4.7%	3.4%	2.1%	1.9%	1.7%	1.8%	1.7%	2.4%	1.5%	0.9%
North West	22.0%	20.8%	18.0%	21.8%	23.5%	29.5%	25.7%	26.7%	26.8%	30.1%
South East	11.2%	17.0%	30.5%	15.1%	12.8%	11.9%	14.1%	12.3%	15.2%	15.3%
South West	25.3%	23.8%	19.3%	25.7%	25.4%	24.2%	25.3%	25.4%	25.5%	23.4%
West Midlands	0.8%	0.5%	0.4%	0.3%	0.3%	0.3%	0.4%	0.2%	0.4%	0.4%
Yorkshire and the Humber	2.3%	3.1%	0.8%	1.5%	2.5%	1.5%	1.2%	0.9%	0.9%	1.2%

Source: BRES, Cebr analysis

Marine Renewable Energy

Marine Renewable Energy activities do not map neatly across the National Accounts framework, thereby preventing the use of publicly available data sources such as BRES or ABS to generate regional-level estimates. Cebr has therefore drawn upon regional breakdown estimates taken from the LCREE reports published by the ONS as well as the 2013 BEIS report, "The size and performance of the UK-low carbon economy". Table 3 below shows the regional breakdown of employment in offshore wind in 2019. Unfortunately, the data for the LCREE is broken only by UK nation and does not contain data on the English regions, so for the full regional breakdown we had to rely on the 2013 BEIS report (shown in

Table 4). Although we would expect to see a noticeable shift in the breakdown of where these activities are taking place across the UK, for the purposes of our analysis we assume that this breakdown has remained consistent across the period examined. It is worthwhile to note that the employment breakdown by UK nation for 2013 and 2019 is very similar across the two publications.

Table 3: Regional breakdown of UK employment in offshore wind in 2019 as implied by BEIS analysis

Share of Employment	Offshore wind
England	77%
Scotland	19%
Wales	3%
Northern Ireland	1%

Note: Figures subject to rounding. Source: ONS, Cebr analysis

Table 4: Regional breakdown of UK employment in offshore wind in 2013 as implied by BEIS analysis

Share of Employment	Offshore wind
England	79.0%
Scotland	15.2%
Wales	2.9%
Northern Ireland	2.9%
East of England	16.5%
East Midlands	1.4%
London	16.5%
North East	12.2%
North West	7.2%
South East	5.7%
South West	8.6%
West Midlands	7.2%
Yorkshire and the Humber	3.6%

Note: Figures subject to rounding. Source: BIS, Cebr analysis

Marine Oil and Gas Support activities

Marine Oil and Gas Support activities can be separately identified within the National Accounts framework through SIC code 09.1, "Support activities for petroleum and natural gas extraction". Regional estimates for GVA, employment and the other key macroeconomic indicators have therefore been generated using a combination of the UK-level sources described in Table 1 and publicly available data sources BRES and ABS. Table 5 below shows the implied regional breakdown of employment in Marine Oil and Gas Support activities using this approach; perhaps unsurprisingly, the vast majority of activity took place in Scotland in all years considered.

Table 5: The regional breakdown of UK employment in Marine Oil and Gas Support activities, 2010 to 2019

Share of Employment	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	8.1%	12.0%	16.2%	13.7%	11.1%	7.4%	10.1%	6.2%	8.7%	9.8%
Scotland	91.4%	87.5%	83.4%	85.8%	88.5%	91.9%	89.1%	93.5%	90.8%	89.3%
Wales	0.5%	0.5%	0.4%	0.5%	0.4%	0.7%	0.8%	0.3%	0.6%	0.9%
Northern Ireland	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
East of England	1.9%	2.2%	2.6%	2.1%	1.6%	2.0%	1.8%	1.2%	1.0%	1.3%
East Midlands	1.4%	1.5%	1.8%	1.2%	1.0%	1.5%	0.8%	0.8%	0.9%	1.0%
London	1.0%	1.5%	2.6%	1.4%	0.7%	1.0%	1.8%	1.7%	2.3%	2.1%
North East	1.4%	1.7%	0.7%	0.2%	0.2%	0.1%	0.1%	0.1%	0.3%	0.3%
North West	0.5%	0.2%	0.1%	0.0%	0.3%	0.2%	0.2%	0.3%	1.7%	2.1%
South East	0.4%	2.4%	5.5%	6.0%	3.6%	0.5%	0.5%	0.7%	0.6%	1.5%
South West	0.5%	1.0%	1.8%	0.8%	0.8%	0.7%	0.5%	0.6%	0.6%	0.6%
West Midlands	0.1%	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%
Yorkshire and the Humber	1.0%	1.5%	1.1%	1.9%	2.8%	1.3%	4.2%	0.8%	1.4%	0.7%

Source: BRES, Cebr analysis

Marine Scientific & Technical activities

Although the SMI Annual Review of UK Marine Scientific Industries reports are extremely useful at a national level, they do not provide a regional disaggregation of economic activity. And drawing upon company annual reports published at UK level using the FAME database would not be an appropriate way to disaggregate activity at a regional level. Therefore, Cebr has estimated the regional breakdown of turnover, GVA, employment and the compensation of employees based on regional employment data for the "Other professional, scientific and technical activities" industry grouping (SIC 74909). We should note that while this approach was deemed most robust given the data constraints, we do not expect the regional breakdown for Marine Scientific & Technical activities to perfectly align with that of SIC 74909.

BRES and ABS data were the two main sources of data for the regional analysis. Employment data associated with the 74909 SIC code were gathered and an implied regional breakdown estimated after interpolating for some missing information. Once again, employment in Northern Ireland has been estimated using a combination of BRES and ABS data, the latter providing the proportion of employment in Northern Ireland across the broader industrial sector categories.

Table 6: The regional breakdown of UK employment in Marine Scientific & Technical activities, 2010 to 2019

Share of Employment	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	90%	91%	91%	90%	89%	89%	91%	91%	91%	91%
Scotland	8%	5%	7%	6%	8%	7%	6%	6%	6%	6%
Wales	2%	3%	1%	3%	2%	3%	3%	2%	2%	2%
Northern Ireland	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
East of England	15%	8%	9%	7%	8%	9%	12%	7%	7%	7%
East Midlands	6%	4%	7%	5%	8%	9%	6%	8%	8%	8%
London	23%	30%	22%	28%	26%	22%	28%	25%	25%	25%
North East	2%	4%	3%	2%	3%	1%	3%	2%	2%	2%
North West	8%	8%	13%	13%	12%	9%	9%	11%	11%	11%
South East	13%	12%	15%	12%	14%	15%	12%	14%	14%	14%
South West	13%	12%	10%	10%	8%	9%	7%	11%	11%	11%
West Midlands	3%	4%	6%	5%	5%	10%	6%	5%	5%	5%
Yorkshire and the Humber	7%	8%	4%	7%	4%	6%	7%	8%	8%	8%

Other adjustments for regional economic activity

Other adjustments have been made to the regional disaggregation of the key macroeconomic indicators which represent the direct economic impacts of the MES industry, in order to reflect differences in economic performance across the regions. These are as follows:

- To account for regional differences in productivity (GVA per employee), the breakdown of GVA has been adjusted using the ONS GVA per employee by region statistics.[8]
- To account for regional differences in wages and salaries, estimated wages and salaries paid to employees in the MES industry have been adjusted using differentials taken from ASHE.[9]
- To account for regional variation in the ratio of compensation of employees to GVA in different sectors, the compensation of employees for the industry has been adjusted using regional differentials implied by the closest industry, as sourced from the Annual Business Survey.

The results of this analysis are shown in the final section of this report. The following sections set out the direct and aggregate economic impacts of the MES industry in the UK.

8 ONS, 2019. Subregional Productivity: Labour Productivity (GVA per hour worked and GVA per filled job) indices by UK ITL1, ITL2 and ITL3 subregions.

9 Ibid.

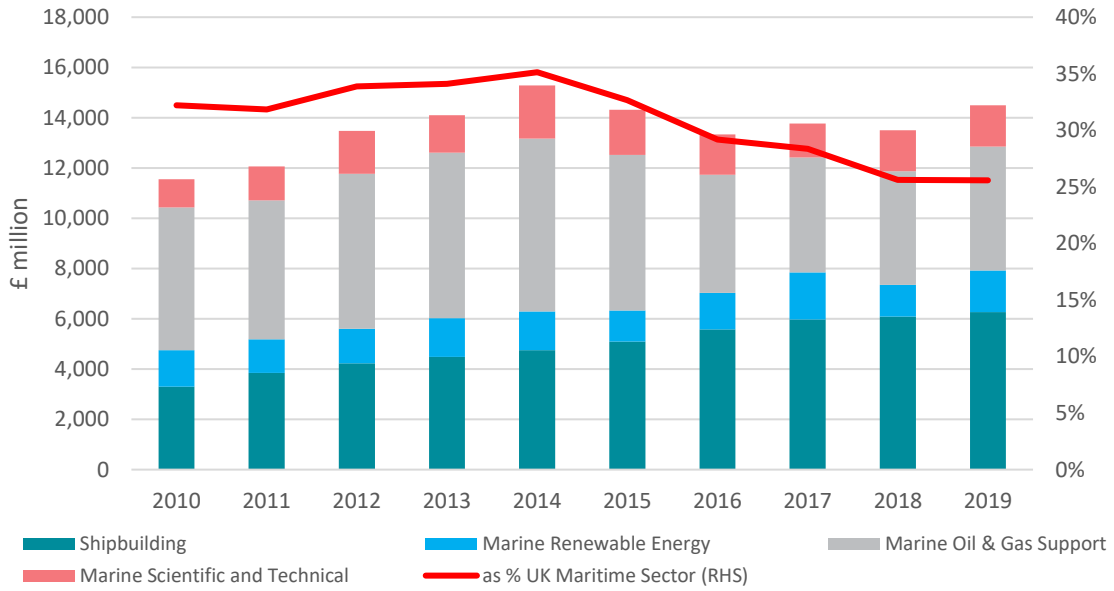
3. The direct economic impact of the MES industry

The direct contribution of the MES industry 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.

3.1 The direct economic impact through turnover

Figure 1 below shows the breakdown of business turnover generated by the MES industry and its constituent activities between 2010 and 2019. Overall, the industry is estimated to have contributed £14.5 billion in business turnover in 2019, an increase of 7.4% from 2018. The turnover peaked in 2014 at £15.7 billion. The overall increase since 2010 can be attributed to persistent turnover growth experienced among shipbuilding and marine renewable energy activities.

Figure 1: The estimated turnover of the MES industry, and expressed as a share of the Maritime Sector's total turnover, 2010 to 2019, £ million



Source: FAME, SMI, ONS, Cebr analysis

The data displayed above is also presented in a tabular format below.

Table 7: The estimated turnover of the MES industry, and expressed as a share of the Maritime Sector's total turnover, 2010 to 2019, £ million

Turnover	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Shipbuilding	3,295	3,852	4,230	4,490	4,752	5,091	5,584	5,970	6,087	6,267
Marine Renewable Energy	1,450	1,336	1,371	1,530	1,546	1,244	1,444	1,882	1,260	1,655
Marine Oil & Gas Support	5,685	5,525	6,166	6,587	6,869	6,187	4,698	4,570	4,521	4,924
Marine Scientific & Technical	1,125	1,351	1,715	1,487	2,120	1,800	1,612	1,345	1,630	1,651
MES industry	**11,556**	**12,064**	**13,482**	**14,094**	**15,286**	**14,322**	**13,338**	**13,767**	**13,497**	**14,498**
% UK Maritime Sector	**32%**	**32%**	**34%**	**34%**	**35%**	**33%**	**29%**	**28%**	**26%**	**26%**

Source: FAME, SMI, ONS, Cebr analysis

Shipbuilding activities generated the largest share of business turnover, with £6.3 billion (43%) of turnover in 2019; Marine Oil and Gas Support and Marine Renewable Energy activities were the next largest contributors with £4.9 billion and £1.7 billion respectively. Overall, turnover from the MES industry represented 26% of the Maritime Sector total in 2019.

Notably, Marine Renewable Energy turnover has grown 14% over the period 2010 to 2019. This is significant given the Maritime 2050 strategy report placing emphasis on the wider Maritime Sector reducing carbon emissions by 50% by 2050.[10]

Despite increases in business turnover directly generated by the MES industry, profitability (as measured using the ratio of gross profits to turnover) has fallen from 18% in 2010 to 12% in 2019. Table 8 shows trends in profitability across each industry activity. The data for Shipbuilding suggests that the subindustry is a high-risk, low-margin business. This, together with the declining output and profitability of Marine Oil & Gas Support activities, explain why profitability in the MES industry is lower than in the overall Maritime Sector. For every £1 in turnover generated by the MES industry in 2019, an estimated 12 pence was generated in gross profit. This compares to 20 pence across the entire Maritime Sector in the same year.

10 Department for Transport. (2019). 'Maritime 2050'.

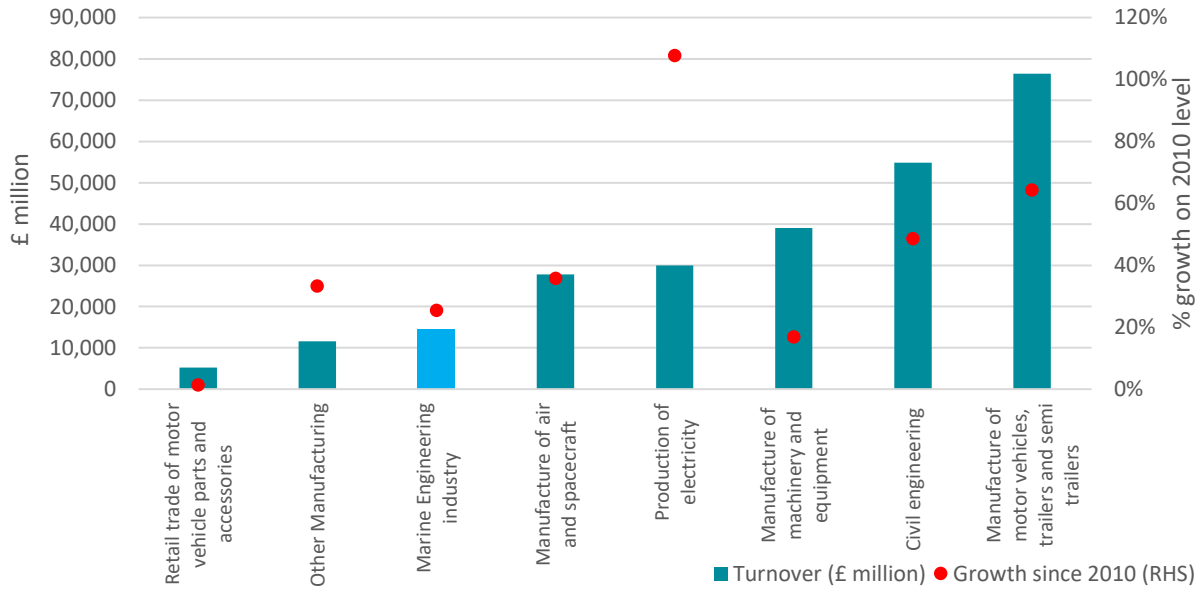
Table 8: Estimated profitability (gross profit ratio) of the MES industry and its constituent activities, 2010 to 2019

Profitability	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
UK Maritime Sector	**17%**	**18%**	**19%**	**19%**	**20%**	**19%**	**21%**	**20%**	**19%**	**20%**
UK MES industry	**18%**	**19%**	**19%**	**18%**	**16%**	**13%**	**11%**	**10%**	**11%**	**12%**
Shipbuilding	8%	7%	6%	7%	7%	6%	4%	4%	5%	3%
Marine Renewable Energy	8%	8%	13%	13%	14%	14%	12%	12%	11%	11%
Marine Oil & Gas Support	25%	28%	26%	25%	19%	15%	15%	12%	13%	17%
Marine Scientific & Technical	22%	24%	26%	25%	25%	23%	23%	26%	27%	28%

Source: FAME, SMI, ONS, Cebr analysis

To place this direct contribution in context, Figure 2 below compares the turnover of the MES industry against that of comparable industries and activities; nominal turnover growth against the 2010 level is also shown for each industry activity. Turnover data for the comparable industries has been sourced from the ABS.

Figure 2: The estimated turnover of the MES industry against comparable industries in 2019, and growth against the 2010 level



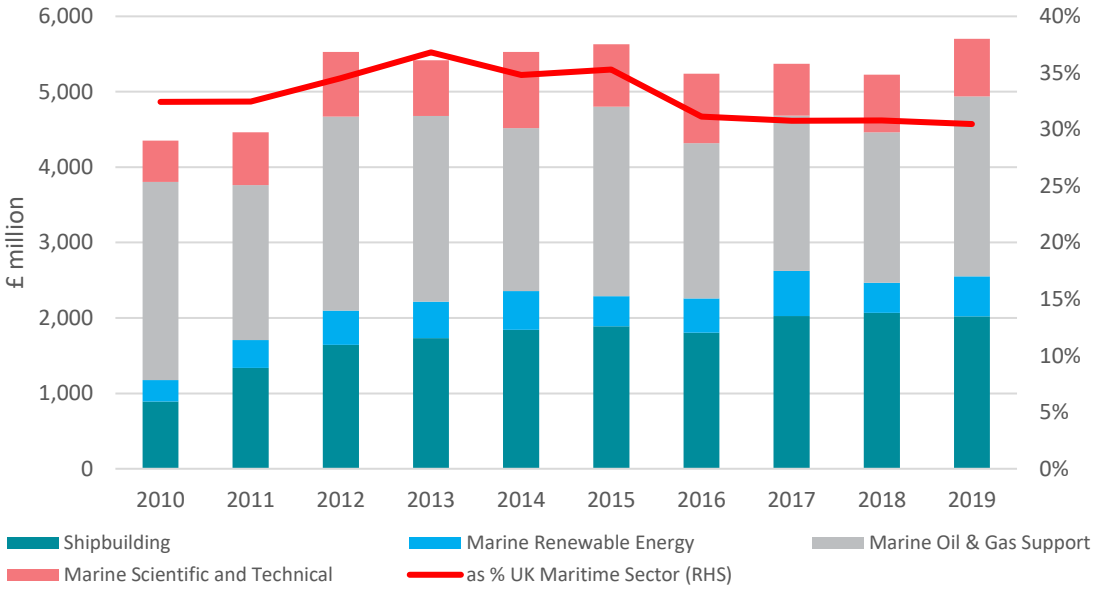
Source: FAME, SMI, ABS, ONS, Cebr analysis

In 2019, turnover from the MES industry was £14.5 billion and stood higher than other manufacturing (£11.6 billion), and retail trade of motor vehicles (£5.2 billion). However, it lay behind turnover from the manufacture of motor vehicles (£76.4 billion), civil engineering (£54.9 billion), manufacture of machinery and equipment (£39.0 billion), manufacture of air and spacecraft (£27.8 billion), and production of electricity (£29.9 billion). Total turnover in the MES industry grew 25% from 2010 to 2019, ahead of other personal service activities (5%) and trailing total UK turnover growth of 33% over the same period.

3.2 The direct economic impact through GVA

Figure 3 below shows this direct impact, disaggregated by industry activities in the years 2010 to 2019, as well as the MES industry's share of the GVA directly generated by the Maritime Sector.

Figure 3: The direct contribution of the MES industry through GVA, and the industry's share of the Maritime Sector's total direct contribution through GVA, 2010 to 2019, £ million



Source: FAME, SMI, ONS, Cebr analysis

The data displayed above is also presented in a tabular format below.

Table 9: The estimated GVA of the MES industry, and expressed as a share of the Maritime Sector's total GVA, 2010 to 2019, £ million

GVA by activity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Shipbuilding	892	1,340	1,645	1,731	1,842	1,889	1,806	2,024	2,066	2,022
Marine Renewable Energy	285	369	452	487	515	400	455	601	402	528
Marine Oil & Gas Support	2,626	2,054	2,574	2,463	2,163	2,512	2,058	2,060	1,995	2,388
Marine Scientific and Technical	549	698	855	736	1,009	827	919	687	763	765
MES industry	**4,352**	**4,461**	**5,526**	**5,417**	**5,528**	**5,628**	**5,238**	**5,372**	**5,226**	**5,703**
% UK Maritime Sector	**32%**	**32%**	**36%**	**37%**	**35%**	**35%**	**31%**	**31%**	**31%**	**30%**

Source: FAME, SMI, ONS, Cebr analysis

It is estimated that the MES industry directly contributed a total of £5.7 billion in GVA in 2019, rising from £4.4 billion in 2010. Marine Oil and Gas Support and Shipbuilding activities contributed 77% of GVA of the entire MES industry in 2019. Marine Oil and Gas Support has

consistently been the highest contributor to GVA from 2010 to 2019 (with the exception of 2018 where Shipbuilding activities contributed the highest share to GVA).

Total GVA for the MES industry fell by 7% from 2015 to 2016, largely caused by a decrease in GVA for the Marine Oil and Gas Support industry, where GVA fell by almost 20%. The fall in GVA for Marine Oil and Gas can most likely be linked to the global decline of the price of crude oil. From June 2014 to February 2016, the price of crude oil fell by 67%.[11]

A similar trend can be noted in the UK gas prices which more than halved between November 2014 and April 2016.[12] However, GVA for Marine Oil and Gas recovered since 2017, increasing by 16% until 2019, which follows the trend of rising oil and gas prices. In contrast, GVA for Marine Renewable Energy has almost doubled from 2010 to 2019, reaching a high of £0.6 billion in 2017. This is encouraging as one of Maritime UK's key strategies is to invest in more renewable energy and to significantly reduce carbon emissions by 2050.[13] Overall, the MES industry was responsible for 30% of the total GVA directly contributed by the UK Maritime Sector in 2019.

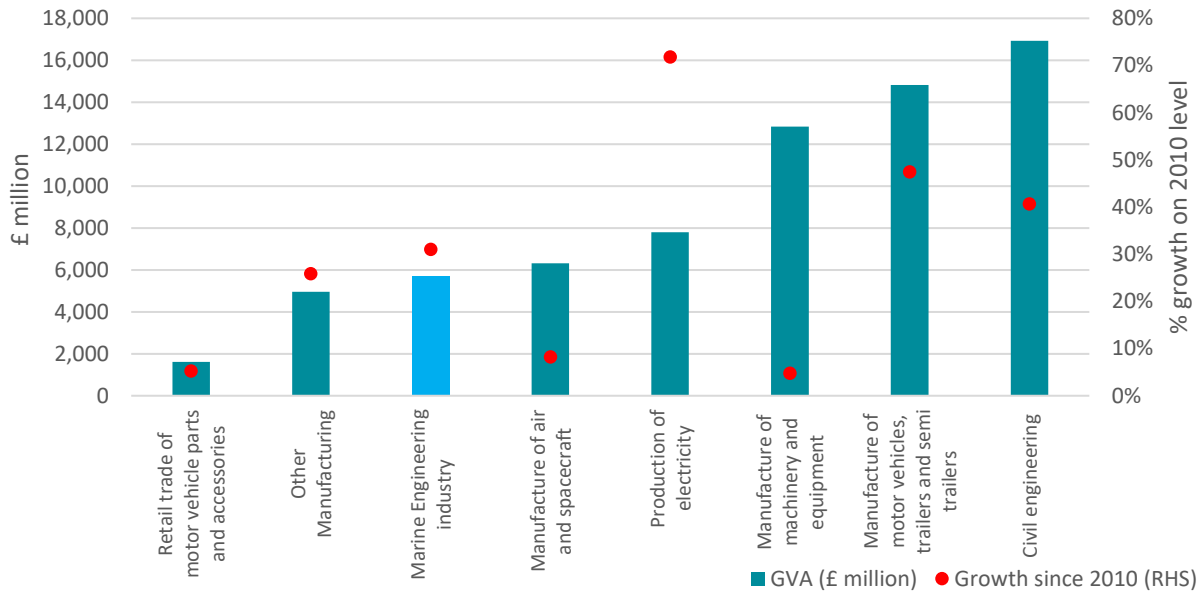
Following Figure 3, Figure 4 below compares GVA trends in the MES industry against those of comparable activities. In terms of the direct GVA contribution in 2019, the MES industry was larger than retail trade of motor vehicles, and other manufacturing. Nominal GVA growth between 2010 and 2019 for the MES industry was 31%, ahead of other manufacturing (26%) but behind total UK GVA growth (39%).

11 Macrotrends (2019). 'Crude Oil Prices – 70 year historical chart.'

12 ERCE (2019). 'Gas Spot Price.'

13 Department for Transport. (2019). 'Maritime 2050.'

Figure 4: The estimated GVA of the MES industry against comparable industries in 2019, and growth against the 2010 level

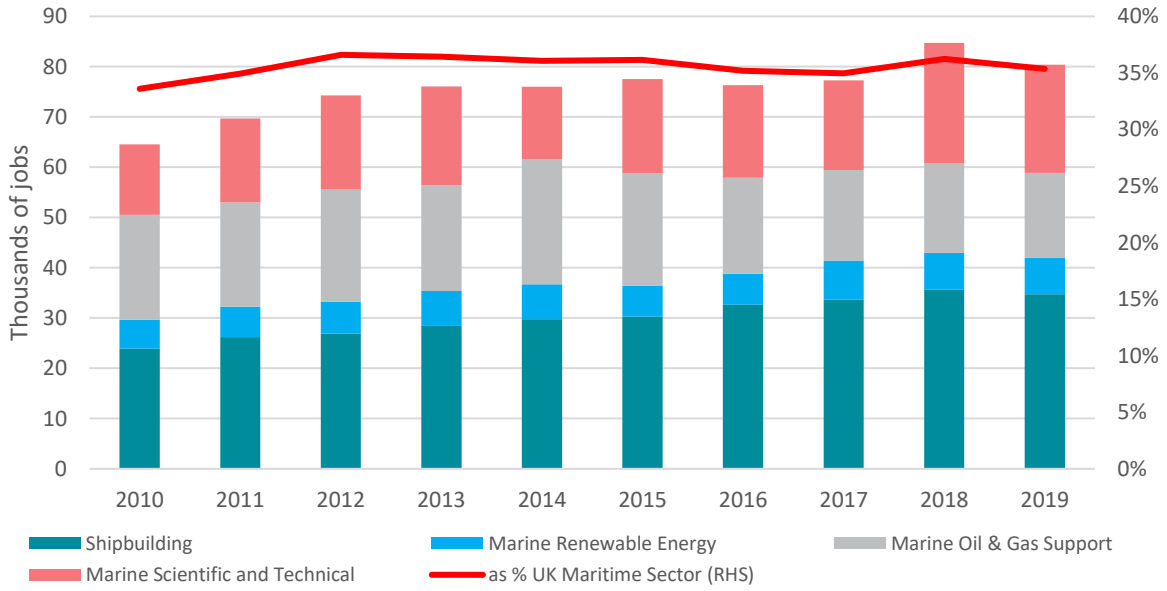


Source: FAME, SMI, ABS, ONS, Cebr analysis

3.3 The direct economic impact through employment

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

Figure 5: The direct contribution of UK MES through employment, and the industry's share of the Maritime Sector's direct contribution through employment, 2010 to 2019



Source: FAME, SMI, ONS, Cebr analysis

The data displayed above is also presented in a tabular format below.

Table 10: The estimated employment of the MES industry, and expressed as a share of total employment in the overall Maritime Sector, 2010 to 2019, thousands of jobs

Employment by activity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Shipbuilding	24	26	27	28	30	30	33	34	36	35
Marine Renewable Energy	6	6	6	7	7	6	6	8	7	7
Marine Oil & Gas Support	21	21	22	21	25	22	19	18	18	17
Marine Scientific and Technical	14	17	19	20	14	19	18	18	24	22
MES industry	**65**	**70**	**74**	**76**	**76**	**78**	**76**	**77**	**85**	**80**
% UK Maritime Sector	**34%**	**35%**	**37%**	**36%**	**36%**	**36%**	**35%**	**35%**	**36%**	**35%**

Source: FAME, SMI, ONS, Cebr analysis

It is estimated that the MES industry directly supported 80,000 jobs in 2019, an increase from 69,000 jobs in 2010. The MES industry's share of the employment directly supported by the Maritime Sector remained broadly constant over this period, on average around 35% of the Maritime Sector total. Shipbuilding activities made the largest direct contribution through employment within the industry – 35,000 jobs, or 44% of employment in 2019. After this, Marine Scientific & Technical activities directly contributed 22,000 jobs.

Employment within Shipbuilding activities has the possibility of expanding further in the next few years as investments are made into the development and building of autonomous vessels. The development of new technologies is one of the key focuses of the Maritime UK 2050 report,[14] with the aim of retaining the UK's position as a global leader in maritime technologies and comparative advantage of skills and outputs.

Table 11 below shows the estimated productivity of each MES sub-industry activity across the years 2010 to 2019 and compared against the average productivity level of the Maritime Sector and the UK as a whole. Productivity here is defined as GVA per job; we observe that productivity across the MES industry is considerably in excess of the UK average but below that of the wider Maritime Sector in all years other than 2013.

14 Department for Transport. (2019). 'Maritime 2050 Navigating the Future'.

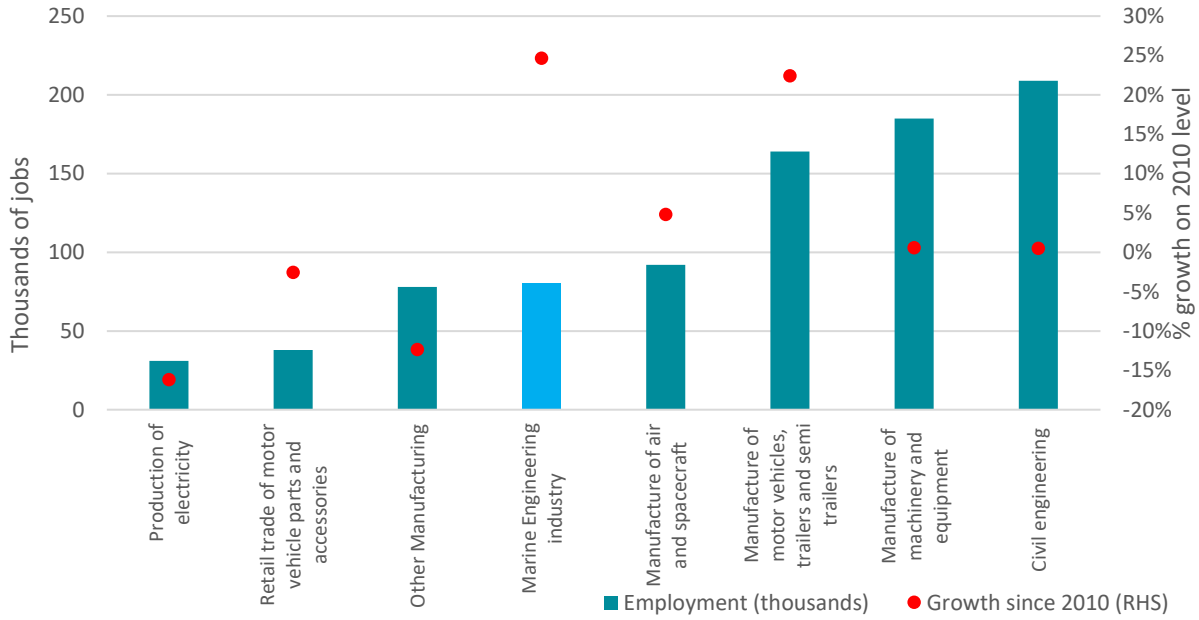
Table 11: Productivity (GVA per job) in the MES industry and constituent activities, the Maritime Sector and UK economy, 2010 to 2019

GVA per employee	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
UK economy	**46,953**	**47,857**	**48,973**	**50,158**	**51,356**	**52,546**	**53,779**	**55,066**	**56,088**	**56,670**
UK Maritime sector	**69,874**	**68,882**	**78,847**	**70,510**	**75,398**	**74,352**	**77,567**	**79,005**	**72,625**	**82,310**
MES industry	67,471	63,985	74,386	71,240	72,767	72,618	68,650	69,545	61,686	70,926
Shipbuilding	37,339	51,205	61,118	60,873	61,940	62,465	55,369	60,197	58,001	58,196
Marine Renewable Energy	49,766	60,832	71,223	70,314	73,507	65,426	73,326	77,029	55,089	73,393
Marine Oil & Gas Support	125,500	98,757	115,416	117,009	87,223	111,887	107,916	114,299	112,070	140,889
Marine Scientific & Technical	39,331	41,838	45,672	37,494	69,877	44,234	49,918	38,602	31,795	35,539

Source: FAME, SMI, ONS, Cebr analysis

Figure 6 below compares the direct contribution that the MES industry made through UK employment in 2019 against comparable industries and activities.

Figure 6: The estimated employment of the MES industry against comparable industries in 2019, and growth against 2010 level



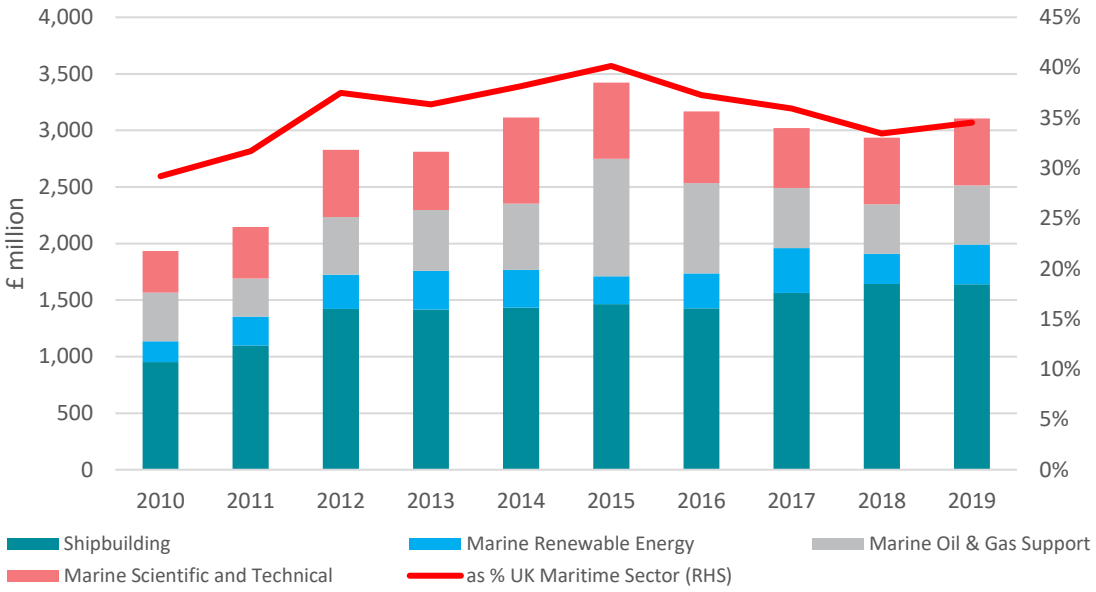
Source: FAME, SMI, ABS, ONS, Cebr analysis

Employment in the MES industry in 2019 was 25% higher than in 2010, over double the total UK employment growth (12%) in the same time period. In terms of direct employment contribution in 2019, the MES industry employed more people than other manufacturing, retail trade of motor vehicle parts and accessories, and production of electricity.

3.4 The direct economic impact through the compensation of employees

Figure 7 below illustrates the compensation of employees which is directly supported by the MES industry, disaggregated by activity. 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 MES industry through the compensation of employees, 2010 to 2019, £ million



Source: FAME, SMI, ONS, Cebr analysis

The data displayed above is also presented in a tabular format below.

Table 12: The direct contribution of the MES industry through the compensation of employees, 2010 to 2019, £ million

COE by activity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Shipbuilding	953	1,100	1,423	1,415	1,433	1,464	1,427	1,562	1,643	1,639
Marine Renewable Energy	182	253	301	343	333	247	309	398	267	351
Marine Oil & Gas Support	432	339	510	537	587	1,038	798	531	437	524
Marine Scientific and Technical	366	455	595	516	760	673	636	530	588	591
MES industry	**1,934**	**2,147**	**2,828**	**2,812**	**3,113**	**3,422**	**3,168**	**3,021**	**2,935**	**3,105**
% UK Maritime Sector	**29%**	**32%**	**38%**	**36%**	**38%**	**40%**	**37%**	**36%**	**34%**	**35%**

Source: FAME, SMI, ONS, Cebr analysis

It is estimated that the MES industry directly contributed just over £3.1 billion through the compensation of employees in 2019; this total has increased by around £1.2 billion since 2010. Marine Oil and Gas Support and Shipbuilding activities contributed 70% to the direct impact

of compensation of employees. Overall, the total value of compensation of employees directly supported across the Maritime Sector from the MES industry is estimated to have remained relatively stable from 2010 to 2019 at around 35% (peaking in 2015 at 40%).

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

This section discusses the contribution of the Marine Engineering and Scientific industry to the UK Exchequer. For each activity within this industry, Cebr has calculated the contributions in terms of:

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

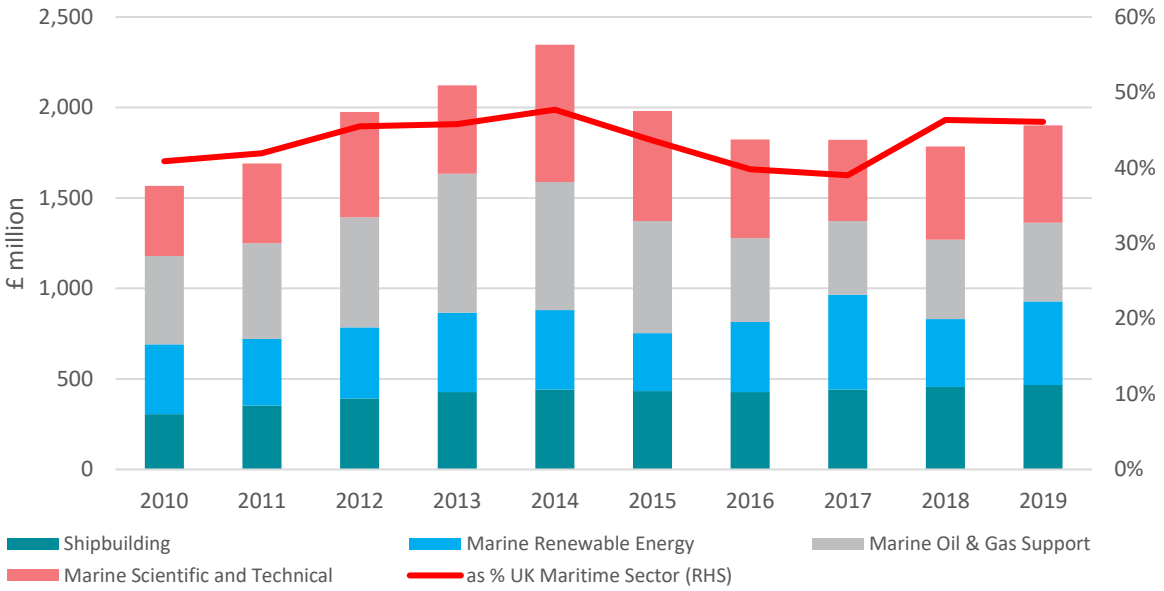
For the personal taxes listed above, Income Tax and NICs revenues have been calculated by applying tax rates to the estimated wages and salaries paid to employees operating in each industry; rates and thresholds have been sourced from HMRC for the years 2010 to 2019. Wages and salaries for employees have been sourced from FAME and the Annual Survey for Hours and Earnings (ASHE).[15]

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 below depicts the direct contribution of the MES industry to the UK Exchequer across 2010-2019, both in absolute levels (left side) and as a percentage of the overall Maritime Sector.

15 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.

Figure 8: The direct contribution of the MES to the UK Exchequer, 2010 to 2019, £ million

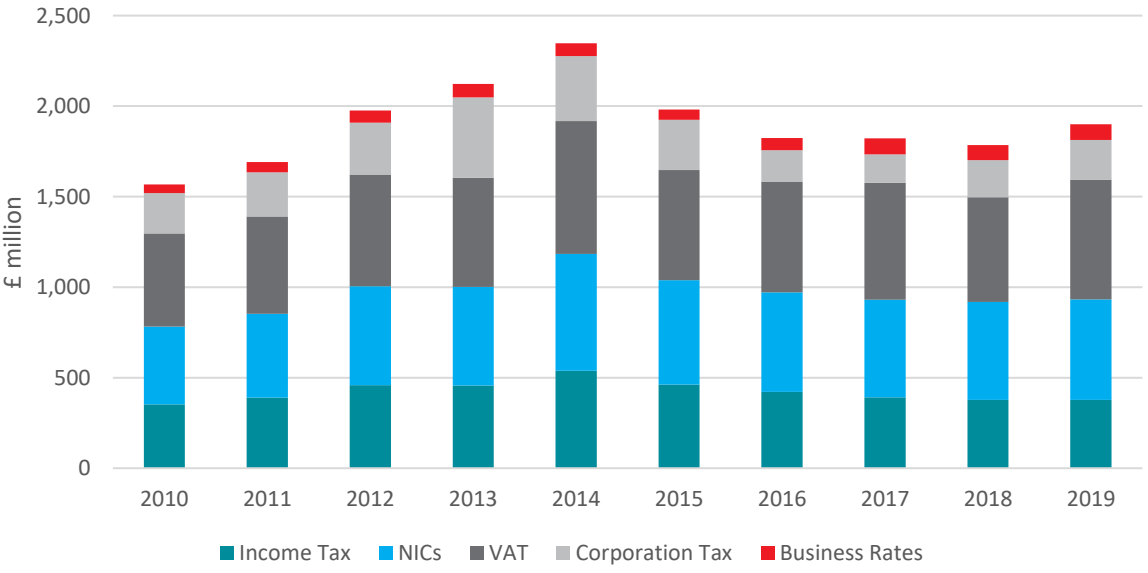


Source: HMRC, FAME, SMI, ONS, Cebr analysis

The MES industry directly contributed £1.9 billion in tax revenues in 2019; this corresponds to approximately 37% of the total Maritime Sector tax contribution. In aggregate, the MES industry's direct Exchequer contribution grew by 21%, from £1.6 billion in 2010 to £1.9 billion in 2019. Marine Scientific & Technical contributed the most to this direct impact, generating £536 million in tax revenues (28% of the direct contribution).

Figure 9 disaggregates the Exchequer contribution of the MES industry by tax head. VAT forms the largest component of Exchequer contributions from the industry, averaging 32% of total tax receipts from the industry from 2010 to 2019. After VAT, the industry is estimated to have contributed £932 million in Income Tax and National Insurance Contributions in 2019.

Figure 9: The direct contribution of the MES industry to the UK Exchequer by tax head, 2010 to 2019, £ million



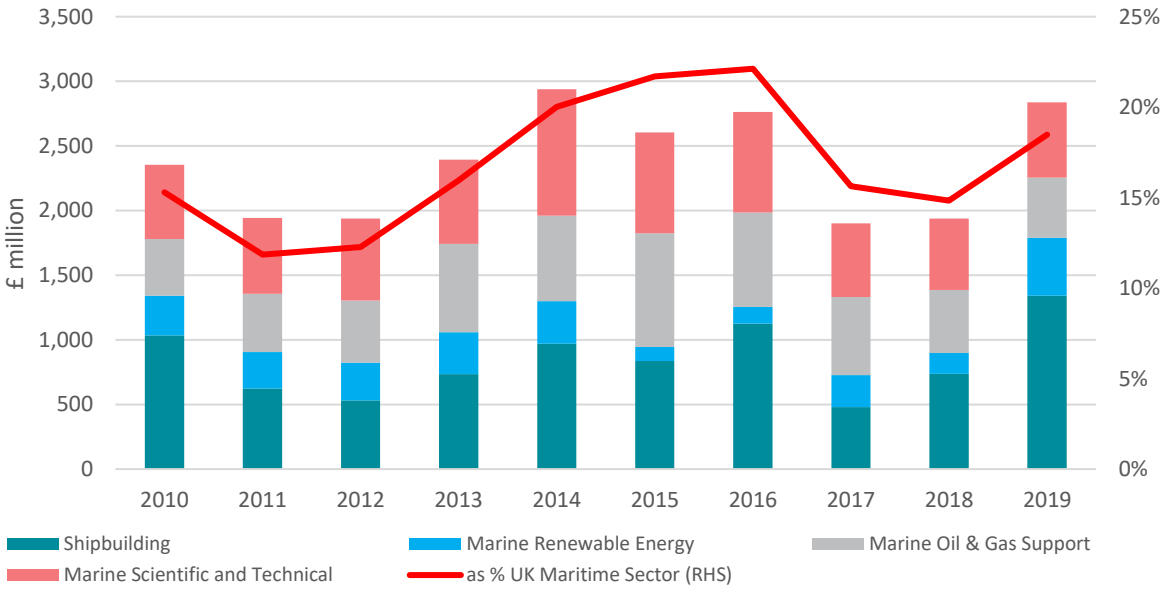
Source: HMRC, FAME, SMI, ONS, Cebr analysis

3.6 The direct contribution of the UK's exports of goods and services

Exports for the activities of the MES industry have been estimated by assuming that the level of exports for an industry activity is the same as that of the wider sector within which it sits. For example, exports from Marine Renewable Energy expressed as a proportion of turnover from this activity is assumed to be the same as that of the wider Energy Sector. Specifically, exports of goods and services across each industry activity have been estimated using the ratio of goods and services exports to wider industry turnover as sourced from the ONS Supply Use Tables.

Figure 10 below shows trends in exports of goods and services from the MES industry between 2010 and 2019, and exports expressed as a share of total Maritime Sector exports across the same period.

Figure 10: Exports of goods and services from the MES industry, 2010-2019, £ million



Source: FAME, SMI, ONS, Cebr analysis

The data displayed above is also presented in a tabular format below.

Table 13: Exports of goods and services from the MES industry, 2010-2019, £ million

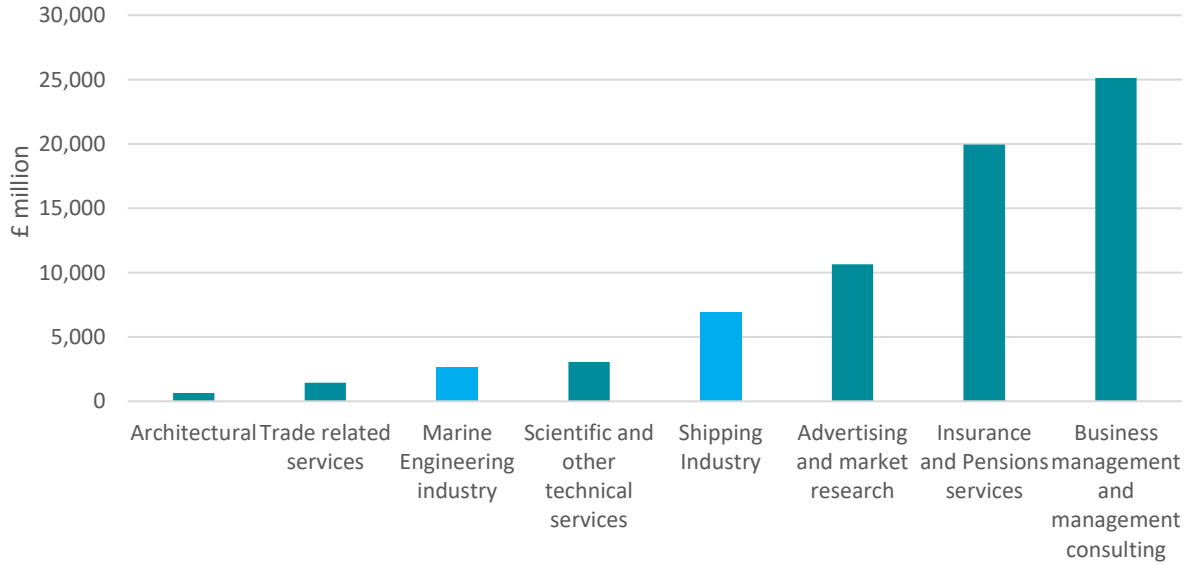
Exports by activity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Shipbuilding	1,034	623	532	735	970	835	1,180	542	548	1,144
Marine Renewable Energy	308	283	291	325	328	110	127	247	160	449
Marine Oil & Gas Support	438	450	482	683	663	881	732	605	490	467
Marine Scientific and Technical	574	586	633	652	978	778	777	569	551	581
MES industry	**2,353**	**1,943**	**1,938**	**2,394**	**2,939**	**2,603**	**2,816**	**1,962**	**1,750**	**2,640**
% UK Maritime Sector	**15%**	**12%**	**12%**	**16%**	**20%**	**22%**	**22%**	**16%**	**14%**	**17%**

Source: FAME, SMI, ONS, Cebr analysis

The MES industry exported goods and services valued at £2.6 billion in 2019. Shipbuilding followed by Marine Scientific & Technical contributed the most of the MES industry's exported goods, £1.1 billion and £581 million respectively. Growth in MES exports have been varied from 2010-2019. On average, the proportion of industry exports supported by the MES industry has remained around 15%.

Figure 11 below compares exports from the MES industry against exports of goods and services from other comparable activities in 2019, as taken from the Pink Book. The MES industry is estimated to have exported £2.6 billion of goods and services in 2019; this compares to £25.1 billion from Business management and management consulting, £19.9 billion from Insurance and Pensions services, £6.9 billion from the Shipping industry, £10.6 billion from the entire advertising and market research industry and £3.1 billion from Scientific and other technical activities. The MES industry exports exceeded that of trade-related services (£1.4 billion) and architectural services (£0.6 billion).

Figure 11: Exports of goods and services from the MES industry in 2019 against those from comparable activities, £ million



Source: FAME, SMI, ONS, Cebr analysis

4. The aggregate economic impact of the Marine Engineering and Scientific industry in the UK

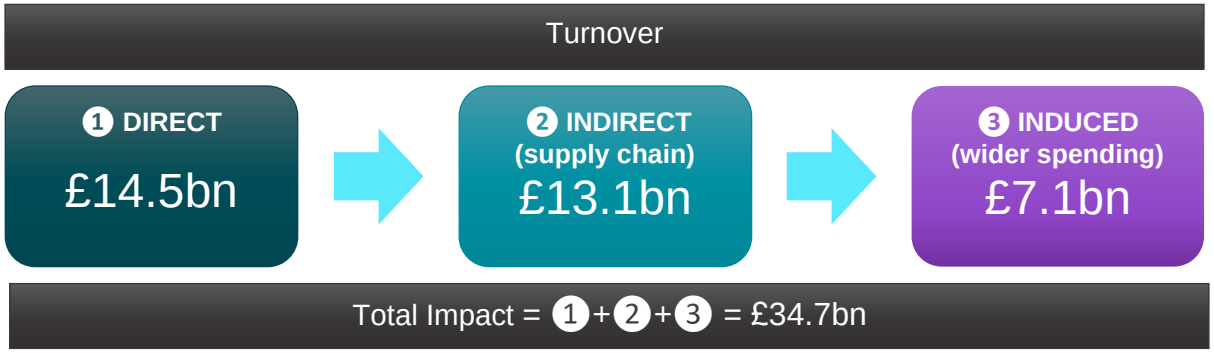
The aggregate economic impacts of the MES industry, taking into account the indirect (or supply chain) and induced (employee spending) impacts that arise from the activities of firms within this industry.

4.1 The aggregate economic impacts through turnover

Figure 12 below illustrates the multiplier impacts of the MES industry within the UK. The MES industry directly contributed £14.5 billion in turnover in 2019, where £13.1 billion worth of turnover is stimulated in the supply chains and £7.1 billion worth of turnover in the wider economy when direct and indirect employees spend their earnings.

Alternatively, this can be interpreted as for every £1 of turnover initially generated by the MES, a further £1.39 of turnover is supported through its indirect and induced impact layers.

Figure 12: Turnover multiplier impacts of the UK MES industry, 2019



Source: FAME, SMI, ONS, Cebr analysis

Table 14 shows the estimated aggregate turnover impacts from the individual industry activities when taken in isolation. Shipbuilding had the largest direct turnover impact in 2019 at £6.3 billion followed by Marine Oil and Gas Support at £4.9 billion. Similarly, Shipbuilding contributed to the largest aggregate turnover impact at £15 billion, equivalent to 43% of the total MES industry.

Table 14: Domestic turnover impact of the MES industry, 2019, £ million

Turnover in 2019	Direct Impact	Indirect Impact	Induced Impact	Total Impact
TOTAL	**14,498**	**13,106**	**7,073**	**34,676**
Shipbuilding	6,267	5,665	3,058	14,990
Marine Renewable Energy	1,655	1,496	807	3,959
Marine Oil & Gas Support	4,924	4,452	2,402	11,778
Marine Scientific & Technical	1,651	1,493	806	3,949

Source: FAME, SMI, ONS, Cebr analysis

Table 15 below presents for each year the direct contribution to turnover from the MES industry, alongside our estimate of the composite turnover multiplier that applies to the entire industry, together with some indicative estimates for the aggregate impact.[16] We observe that both the turnover multiplier and direct impact are higher in 2019 than in 2010, and thus so too is the total turnover impact.

Table 15: Direct and total turnover impact of the MES industry, 2010 to 2019, £ million

	Direct Impact	Composite Turnover multiplier	Total turnover impacts
2010	11,556	2.39	27,641
2011	12,064		28,855
2012	13,482		32,247
2013	14,094		33,712
2014	15,286		36,563
2015	14,322		34,255
2016	13,338		31,902
2017	13,767		32,930
2018	13,497		32,284
2019	14,498		34,676

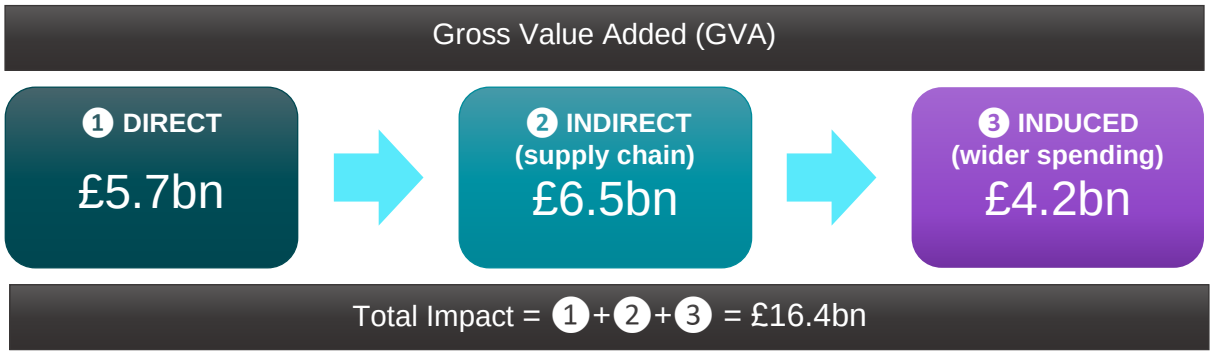
Source: FAME, SMI, ONS, Cebr analysis

4.2 The aggregate economic impacts through GVA

Figure 13 below illustrates the GVA multipliers for the MES industry within the UK. The MES industry directly contributed £5.7 billion towards UK GDP in 2019; once the indirect and induced economic channels are taken into consideration, the MES industry contributed £16.4 billion.

Therefore, after combining each industry activity, for every additional £1 of GVA initially contributed by the MES industry, a further £1.88 of GVA is supported through its indirect and induced impact layers.

Figure 13: GVA multiplier impacts of the UK MES industry, 2019



Source: FAME, SMI, ONS, Cebr analysis

16 Note that we are applying our multipliers as calculated using our latest input-output model, to the figures for the whole decade. So we are in effect assuming the multipliers calculated based on the 2019 direct impacts also apply back to 2010.

Table 16 below shows the estimated aggregate GVA impacts from MES industry activities when taken in isolation. Marine Oil and Gas Support had the largest aggregate GVA impact at £6.9 billion in 2019, followed by Shipbuilding (£5.8 billion) and Marine Scientific & Technical (£2.2 billion).

Table 16: GVA impact of the MES industry disaggregated by activity, 2019, £ million

GVA in 2019	Direct Impact	Indirect Impact	Induced Impact	Total Impact
TOTAL	**5,703**	**6,475**	**4,223**	**16,401**
Shipbuilding	2,022	2,296	1,497	5,814
Marine Renewable Energy	528	600	391	1,520
Marine Oil & Gas Support	2,388	2,711	1,768	6,868
Marine Scientific & Technical	765	868	566	2,199

Source: FAME, SMI, ONS, Cebr analysis

Table 17 below presents the direct contribution to GVA alongside our estimate of the composite GVA multiplier that applies to the entire industry, an estimated 2.88 in 2019. The aggregate GVA impact from the MES industry increased from £12.5 billion in 2010 to £16.4 billion in 2019. Note that just like for Table 15, the aggregate impacts timeseries is an indicative estimate.

Table 17: Direct and aggregate GVA impact of the MES industry, 2010 to 2019, £ million

	Direct Impact	Composite GVA multiplier	Total GVA impacts
2010	4,352	2.88	12,517
2011	4,461		12,829
2012	5,526		15,893
2013	5,417		15,578
2014	5,528		15,899
2015	5,628		16,185
2016	5,238		15,064
2017	5,372		15,451
2018	5,226		15,030
2019	5,703		16,401

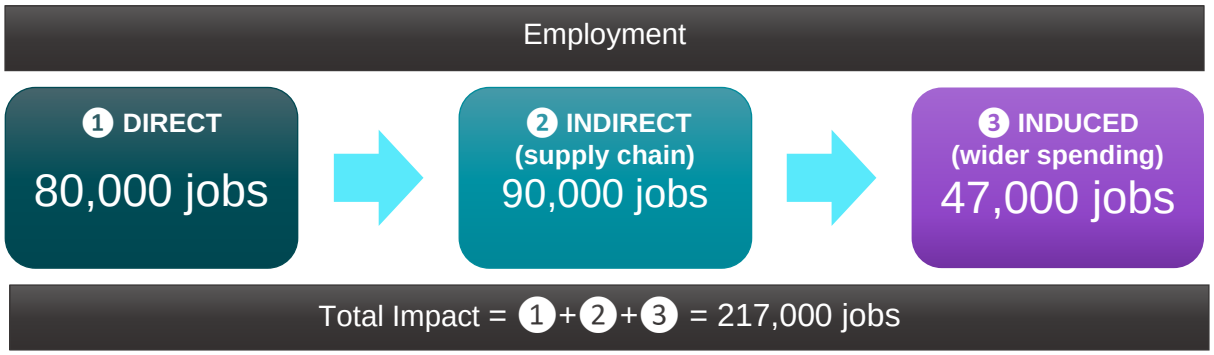
Source: FAME, SMI, ONS, Cebr analysis

4.3 The aggregate economic impacts through employment

Figure 14 below illustrates the employment multipliers for the MES industry within the UK. The number of jobs directly supported by the MES industry in 2019 was 80,000, while 137,000 jobs were supported once the indirect and induced impacts of the industry are taken into account. The aggregate employment supported by the MES industry was 217,000 jobs in 2019.

On an individual level, this can be interpreted as for every 10 additional jobs generated by the MES industry, a further 17 jobs are supported through its indirect and induced impact layers.

Figure 14: Employment multiplier impacts of the UK MES industry, 2019



Source: FAME, SMI, ONS, Cebr analysis

Table 18 below shows the estimated disaggregated employment impacts from the MES industry activities, when taken in isolation. Shipbuilding has the highest aggregate impact on employment at 94,000 jobs followed by Marine Oil and Gas Support at 46,000 jobs.

Table 18: Employment impact of the MES industry, 2019, thousands of jobs

Employment in 2019	Direct Impact	Indirect Impact	Induced Impact	Total Impact
TOTAL	**80**	**90**	**46**	**217**
Shipbuilding	35	39	20	94
Marine Renewable Energy	7	8	4	19
Marine Oil & Gas Support	17	19	10	46
Marine Scientific & Technical	22	24	12	58

Source: FAME, SMI, ONS, Cebr analysis

Table 19 shows the direct and aggregate employment impacts of the MES industry between 2010 and 2019. In line with an increasing direct contribution to UK employment between 2010 and 2019, the aggregate employment impact has also increased, from 174,000 jobs in 2010 to 217,000 jobs in 2019. Note that just like for Table 15 and Table 19, the aggregate impacts timeseries presented below is an indicative estimate.

Table 19: Direct and aggregate employment impact of the MES industry, 2010 to 2019

	Direct Impact	Composite Employment multiplier	Total GVA impacts
2010	64,508	2.70	174,266
2011	69,719		188,345
2012	74,291		200,695
2013	76,033		205,401
2014	75,973		205,238
2015	77,501		209,366
2016	76,299		206,120
2017	77,252		208,694
2018	84,720		228,868
2019	80,407		217,216

Source: FAME, SMI, ONS, Cebr analysis

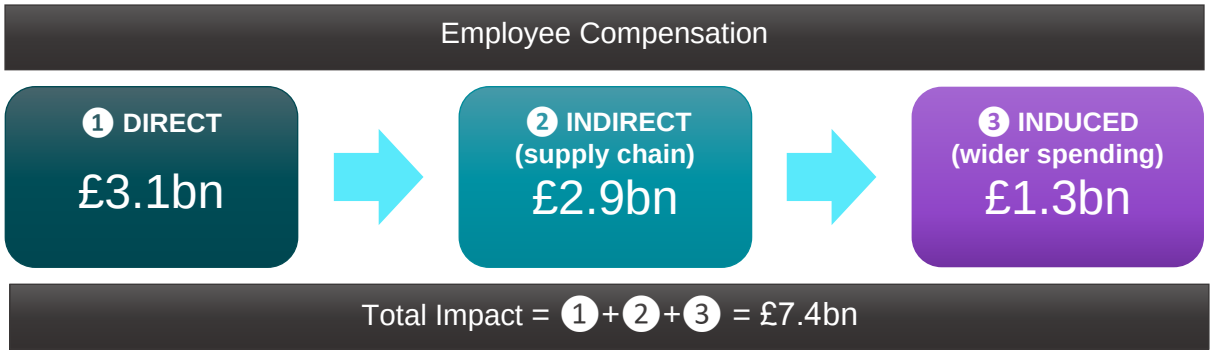
4.4 The aggregate economic impacts through the compensation of employees

Figure 15 below illustrates the direct, indirect and induced compensation of employee impacts associated with the MES industry.

The direct impact of the compensation of employees from the MES industry was £3.1 billion in 2019, whereas £2.9 billion of employee compensation is stimulated in the supply chains and £1.3 billion in the wider economy when direct and indirect employees spend their earnings. The total impact of the compensation of employees was £7.4 billion.

Alternatively, this can be interpreted as follows; for every £1 of employee compensation directly paid out by the MES industry, a further of £1.37 of employee compensation was supported in the UK economy by its indirect an induced impact layers.

Figure 15: Aggregate contribution of the MES industry through the compensation of employees, 2019



Source: FAME, SMI, ONS, Cebr analysis

Table 20 below shows the estimated aggregate impacts through the compensation of employees from MES industry activities, when taken in isolation. A total of £7.4 billion through the compensation of employees was supported by the Marine industry in 2019, the majority of this contribution stemmed from Shipbuilding activities (£3.9 billion) and Marine Scientific & Technical (£1.4 billion).

Table 20: Impact through the compensation of employees in the MES industry, 2019, £ million

Compensation of Employees in 2019	Direct Impact	Indirect Impact	Induced Impact	Total Impact
TOTAL	**3,105**	**2,937**	**1,319**	**7,360**
Shipbuilding	1,639	1,550	696	3,885
Marine Renewable Energy	351	332	149	832
Marine Oil & Gas Support	524	495	222	1,241
Marine Scientific & Technical	591	560	251	1,402

Source: FAME, SMI, ONS, Cebr analysis

Table 21 presents the direct contribution to GVA alongside our estimate of the composite compensation of employees (COE) multiplier that applies to the entire MES industry, an estimated 2.37 in 2019, as well as indicative estimates for the aggregate impacts for the preceding years.

Table 21: Direct and aggregate impacts through the compensation of employees from the MES industry, 2010 to 2019, £ million

	Direct Impact	Composite Employee Compensation multiplier	Total COE impacts
2010	1,934	2.37	4,585
2011	2,147		5,090
2012	2,828		6,706
2013	2,812		6,666
2014	3,113		7,381
2015	3,422		8,113
2016	3,168		7,512
2017	3,021		7,163
2018	2,935		6,958
2019	3,105		7,360

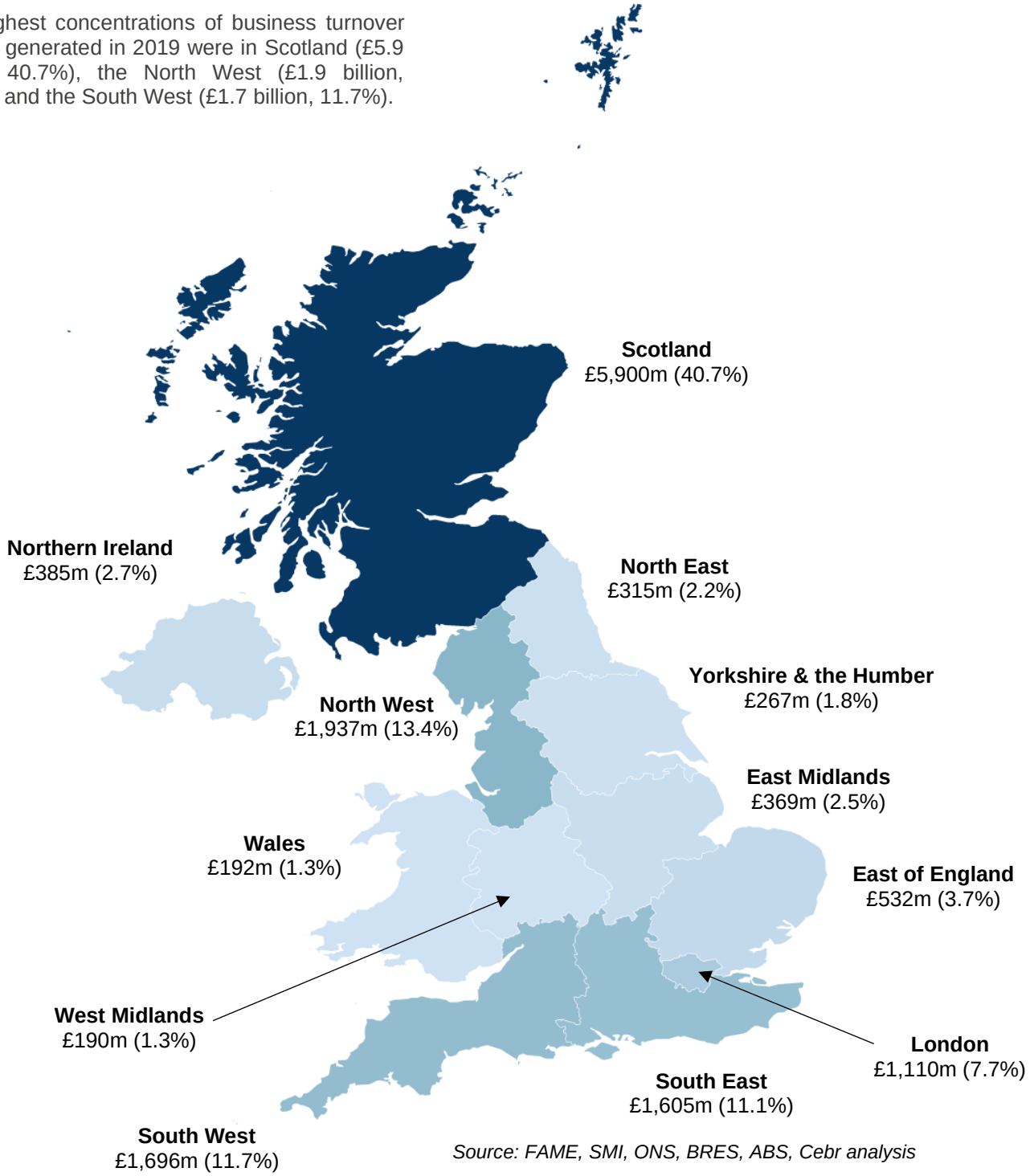
Source: FAME, SMI, ONS, Cebr analysis

5. The regional economic impact of the Maritime Sector

5.1 The direct economic impact of the Marine Engineering and Scientific industry by UK region

Figure 16: Regional breakdown of turnover directly contributed by the MES industry, £ million, 2019

The highest concentrations of business turnover directly generated in 2019 were in Scotland (£5.9 billion, 40.7%), the North West (£1.9 billion, 13.4%) and the South West (£1.7 billion, 11.7%).

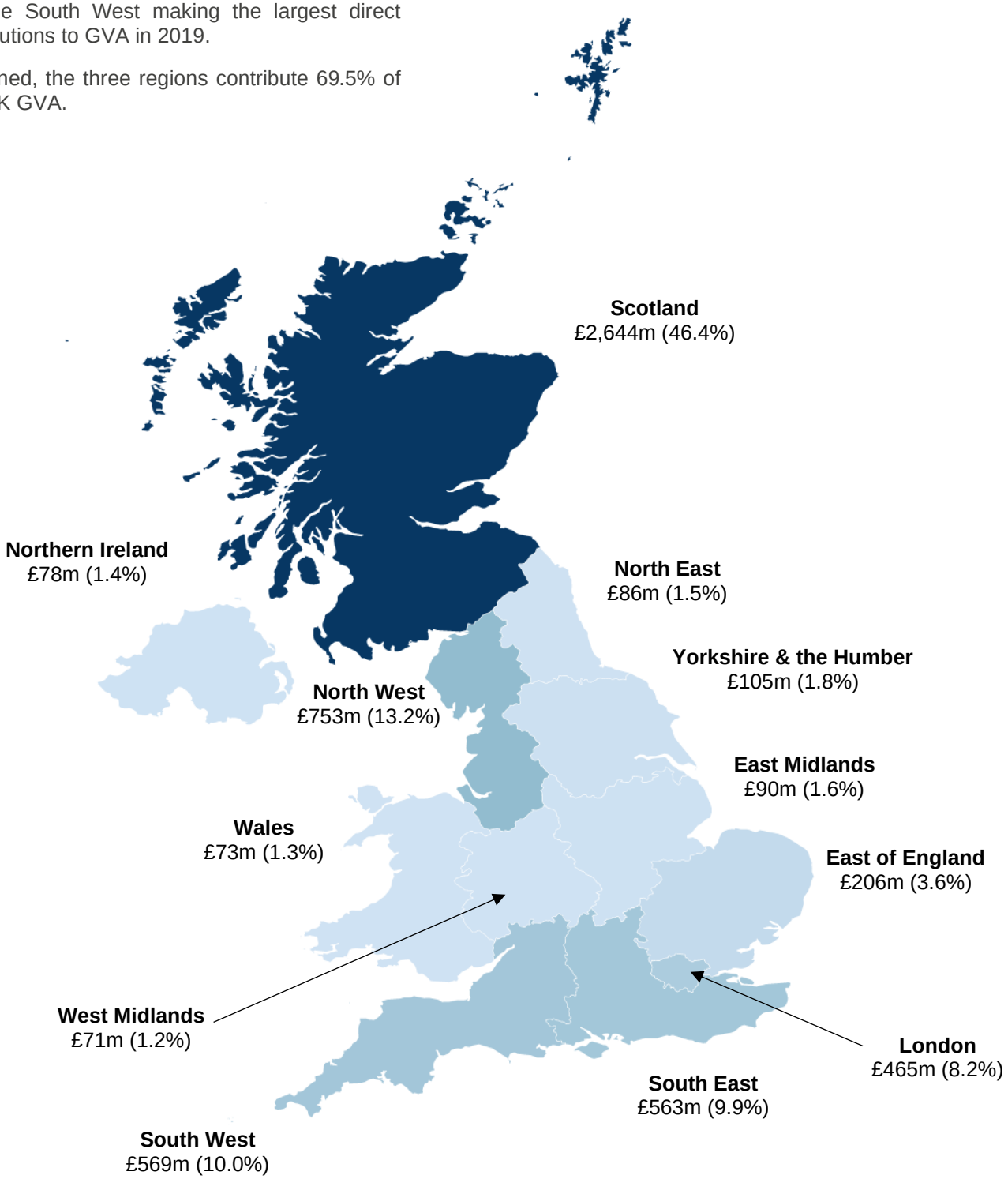


Source: FAME, SMI, ONS, BRES, ABS, Cebr analysis

Figure 17: Regional breakdown of GVA directly contributed by the MES industry, £ million, 2019

An inspection of the regional breakdown of GVA yields similar results, with Scotland, North West and the South West making the largest direct contributions to GVA in 2019.

Combined, the three regions contribute 69.5% of total UK GVA.

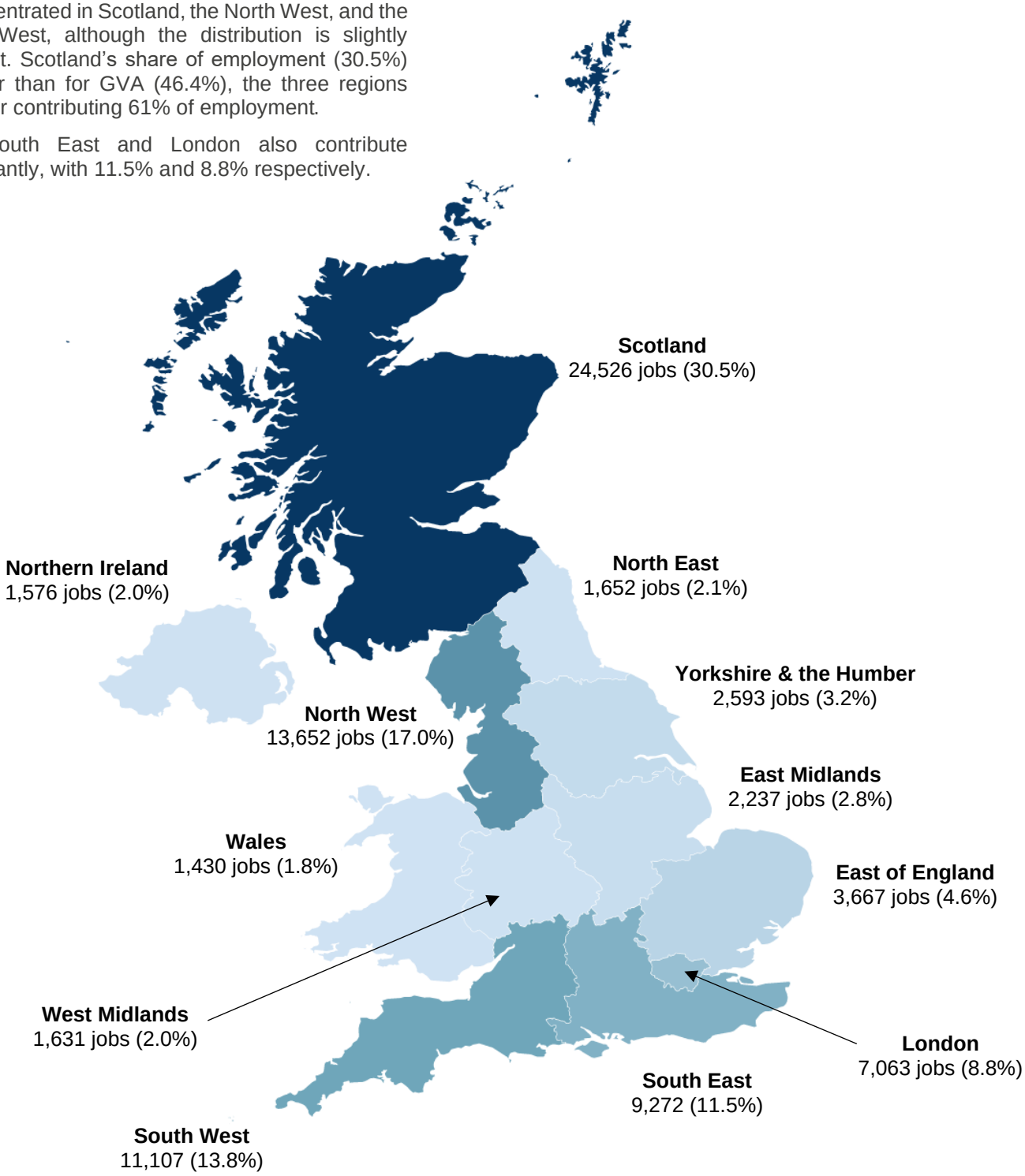


Source: FAME, SMI, ONS, BRES, ABS, Cebr analysis

Figure 18: Regional breakdown of employment directly contributed by the MES industry, 2019

Once again, the majority of the direct employment is concentrated in Scotland, the North West, and the South West, although the distribution is slightly different. Scotland's share of employment (30.5%) is lower than for GVA (46.4%), the three regions together contributing 61% of employment.

The South East and London also contribute significantly, with 11.5% and 8.8% respectively.

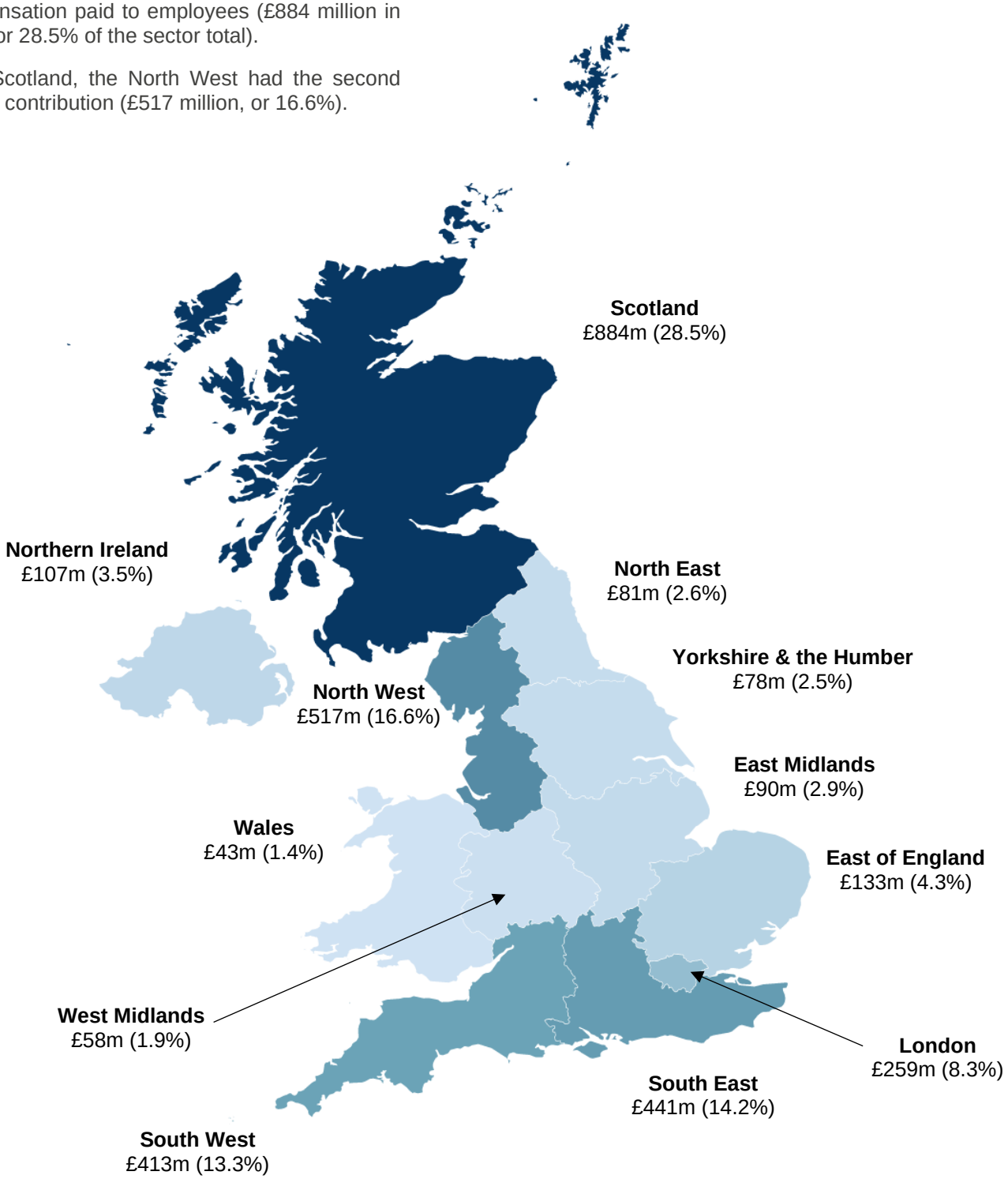


Source: FAME, SMI, ONS, BRES, ABS, Cebr analysis

Figure 19: Regional breakdown of the COE directly contributed by the MES industry, £ million, 2019

Similarly to other metrics, Scotland directly contributes the highest proportion of the total compensation paid to employees (£884 million in 2019, or 28.5% of the sector total).

After Scotland, the North West had the second largest contribution (£517 million, or 16.6%).



Source: FAME, SMI, ONS, BRES, ABS, Cebr analysis

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

This final subsection examines the aggregate economic impact of the MES industry across each region for the four macroeconomic indicators covered in the previous subsection. In order to estimate the aggregate economic impact of the industry at a regional level, the direct economic impacts as already estimated were combined with Cebr's regional economic impact models, within which the activities of the MES industry were separately identified and isolated.

It is important to note that the economic impact multipliers as estimated for each region are necessarily lower than the equivalent multiplier for the MES industry as a whole, reflecting the leakage of impacts when the activity of the industry 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

Table 22 shows the breakdown of direct and aggregate economic impacts for business turnover and GVA in 2019, alongside the composite industry multiplier for each region. The region with largest aggregate impacts through turnover and GVA was Scotland, with an aggregate impact of £14.1 billion and £10.0 billion respectively. For GVA, the highest multiplier impacts are associated with Scotland, the South West, and the South East.

Table 22: Regional breakdown of the aggregate economic impact through turnover and GVA contributed by the MES industry, 2019

	Turnover			GVA		
Region	Direct Impact	Industry Multiplier	Total impact	Direct Impact	Industry Multiplier	Total impact
Scotland	5,900	2.39	14,085	2,644	3.78	10,007
Wales	192	1.98	381	73	2.50	181
Northern Ireland	385	2.12	815	78	2.38	186
East of England	532	2.08	1,105	206	2.52	519
East Midlands	369	2.08	766	90	2.33	210
London	1,110	2.05	2,276	465	2.39	1,112
North East	315	1.92	606	86	2.08	179
North West	1,937	2.14	4,141	753	2.53	1,907
South East	1,605	2.32	3,717	563	2.70	1,522
South West	1,696	2.35	3,988	569	2.73	1,554
West Midlands	190	1.83	348	71	1.92	136
Yorkshire and the Humber	267	2.00	532	105	2.28	239

Source: FAME, SMI, ONS, BRES, ABS, Cebr analysis

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

Finally, Table 23 below shows the breakdown of direct and aggregate economic impacts for employment and the compensation of employees in 2019, alongside the composite industry multiplier for each region. The region with the largest aggregate impacts through employment and the compensation of employees was Scotland, with an aggregate impact of 74,300 and £2.3 billion, respectively.

Table 23: Regional breakdown of the aggregate economic impact through employment and the compensation of employees contributed by the MES industry, 2019

	Employment (thousands of jobs)			Compensation of Employees (£ millions)		
Region	Direct Impact	Industry Multiplier	Total impact	Direct Impact	Industry Multiplier	Total impact
Scotland	24.5	3.03	74.3	898	2.52	2,266
Wales	1.4	2.09	3.0	43	1.77	76
Northern Ireland	1.6	2.18	3.4	78	1.94	151
East of England	3.7	2.48	9.1	124	2.00	249
East Midlands	2.2	2.18	4.9	57	1.61	92
London	7.1	2.42	17.1	307	1.85	569
North East	1.7	2.08	3.4	58	1.79	105
North West	13.7	2.21	30.2	538	1.98	1,062
South East	9.3	2.52	23.4	451	2.16	976
South West	11.1	2.51	27.9	413	2.18	899
West Midlands	1.6	2.08	3.4	54	1.65	89
Yorkshire and the Humber	2.6	2.20	5.7	84	1.73	145

Source: FAME, SMI, ONS, BRES, ABS, Cebr analysis

6. The Marine Engineering and Scientific industry: A forward look

In this final section of the report, we present projections of the Marine Engineering and Scientific industry for the period 2021-2025. The section starts off by discussing the conceptual approach that we have developed to produce projections of the direct economic impacts after 2019 and then presents our 2020 nowcast as well as our forecasts of the turnover and GVA over the period 2021-2025.

The MES industry Forecast (2021-2025)

Modelling approach

We investigate the relationship between the Marine Engineering and Scientific industry and a number of relevant economic variables through an econometric approach. Our findings show that the performance of the MES industry is primarily explained by trends in the manufacturing sector turnover and the index of services for water transport. By modelling growth in turnover over growth in these two variables, we find that the MES industry is more strongly correlated with the manufacturing sector; an increase of 1% in the manufacturing sector turnover is associated with a 1.76% increase in the MES industry turnover.

Modelling Assumptions

Manufacturing sector growth rate, index of water transport

Cebr's Forecasting and Thought Leadership team produces regular forecasts of key economic indicators for the UK national and regional economies which have directly informed our analysis. For our Marine Engineering and Scientific industry forecast we rely on our own projections for UK manufacturing and transportation sectors. After a slight improvement in 2021, Cebr expects growth to slow down over the period 2022-2025. This is not in line with our view of the GDP trajectory, which is expected to grow at a moderate Compounded Annual Growth rate (CAGR) of 2.4% over 2021-2025 in real terms. A high level of uncertainty characterises the forecast as the global recovery from the pandemic and the potential development of new variants, as well as the uncertain long-term impacts of Brexit.

The 2021-2025 forecast

over the 2021-2025 period is -0.1%.

Figure 20 shows the MES industry experiencing a high initial rate of growth given the rebound over 2020, and then gradually having a slower rate of increase over the five-year horizon. Using macroeconomic indicators,[17] such as the manufacturing sector GVA, we were able to

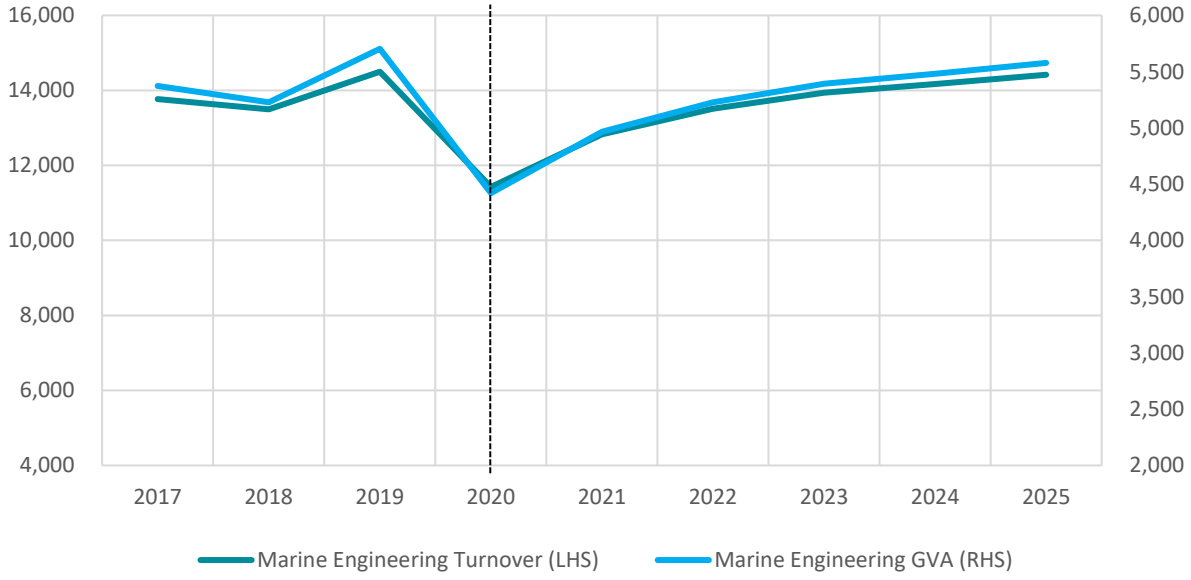
17 These are published with more frequency than most of the other data sources used within our study, which for the most part operate on a two-year data lag.

produce a nowcast for the MES industry in 2020. Cebr estimates that the industry suffered a contraction in the range of 21% in 2020 as a result of the pandemic.

Our forecast indicates that turnover and GVA are set to grow at a Compounded Annual Growth rate (CAGR) of 3.0% over the considered period. This translates into cumulative nominal growth of 12.3% for 2021-2025, which is stronger growth than that of the years before the pandemic hit if taking this five-year period at face value. However, due to the contraction suffered in 2020, we do not expect the industry to reach its 2019 levels until 2025. This can also be explained in part by the declining output of the support activities for offshore oil & gas, which at its peak in 2010 represented around half of the industry's output and, over the decade that followed, shrunk by over 13% in nominal terms.

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, real cumulative growth over the 2021-2025 period is -0.1%.

Figure 20: Marine Engineering and Scientific industry's turnover and GVA trends and projections, 2017 to 2025, £ million



Source: British Marine, FAME, ONS, Cebr analysis

7. Annex: Full set of direct economic impacts by region

Table A.1: Direct economic impact of the marine engineering industry through turnover, £ million, 2010 to 2019

TURNOVER	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	**4,943**	**5,650**	**6,911**	**6,736**	**7,580**	**6,513**	**7,128**	**7,559**	**7,414**	**8,020**
Scotland	**6,327**	**6,124**	**6,311**	**6,921**	**7,323**	**7,139**	**5,669**	**5,759**	**5,595**	**5,900**
Wales	**158**	**138**	**120**	**187**	**141**	**399**	**195**	**171**	**176**	**192**
Northern Ireland	**128**	**152**	**140**	**250**	**242**	**271**	**346**	**279**	**312**	**385**
East of England	606	522	656	651	605	532	716	548	367	532
East Midlands	170	155	268	207	646	335	330	291	349	369
London	720	887	1,090	996	1,146	907	1,069	930	869	1,110
North East	327	368	282	249	283	270	332	434	262	315
North West	1,089	974	990	1,129	1,262	1,281	1,247	3,189	3,285	1,937
South East	628	1,129	1,982	1,480	1,344	1,058	1,148	813	822	1,605
South West	1,075	1,237	1,277	1,569	1,674	1,635	1,734	991	1,120	1,696
West Midlands	131	132	179	186	196	253	199	171	148	190
Yorkshire and the Humber	196	246	187	270	424	241	353	192	192	267

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

Table A.2: Direct economic impact of the marine engineering industry through GVA, £ million, 2010 to 2019

GVA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	**1,598**	**2,171**	**2,839**	**2,662**	**2,863**	**2,653**	**2,767**	**2,720**	**2,725**	**2,908**
Scotland	**2,680**	**2,187**	**2,596**	**2,632**	**2,545**	**2,832**	**2,324**	**2,513**	**2,358**	**2,644**
Wales	**47**	**61**	**47**	**64**	**59**	**76**	**76**	**61**	**65**	**73**
Northern Ireland	**27**	**42**	**44**	**58**	**62**	**67**	**72**	**78**	**78**	**78**
East of England	208	182	251	240	219	225	267	222	161	206
East Midlands	70	64	110	77	111	111	78	83	84	90
London	271	404	464	427	488	374	514	406	404	465
North East	110	132	108	92	105	81	95	115	84	86
North West	272	358	418	494	582	660	574	656	682	753
South East	231	441	890	601	556	444	461	464	529	563
South West	314	419	441	544	574	548	536	612	615	569
West Midlands	39	52	76	64	81	103	77	68	62	71
Yorkshire and the Humber	81	119	81	123	146	107	165	95	104	105

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

Table A.3: Direct economic impact of the marine engineering industry through employment, jobs, 2010 to 2019

EMPLOYEES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	**35,593**	**41,056**	**45,842**	**46,156**	**41,607**	**44,983**	**47,281**	**47,447**	**54,789**	**52,873**
Scotland	**26,882**	**26,289**	**26,734**	**27,340**	**32,223**	**29,763**	**26,057**	**27,040**	**26,770**	**24,526**
Wales	**1,222**	**1,420**	**875**	**1,405**	**1,041**	**1,490**	**1,512**	**1,278**	**1,529**	**1,430**
Northern Ireland	**810**	**955**	**841**	**1,132**	**1,102**	**1,264**	**1,449**	**1,486**	**1,632**	**1,576**
East of England	4,374	3,410	4,128	4,108	3,238	3,803	4,642	3,725	3,554	3,667
East Midlands	1,306	1,273	2,095	1,606	1,824	2,238	1,604	1,980	2,472	2,237
London	4,228	6,256	5,819	6,782	5,021	5,259	6,610	5,879	7,418	7,063
North East	2,295	2,588	1,935	1,734	1,737	1,483	1,813	2,065	1,919	1,652
North West	6,967	7,366	7,878	9,336	9,365	11,097	10,605	11,517	12,953	13,652
South East	5,081	7,455	12,763	8,456	7,295	7,016	7,442	7,468	9,551	9,272
South West	8,448	8,894	8,060	10,079	9,525	9,620	10,212	11,172	12,354	11,107
West Midlands	1,032	1,230	1,643	1,534	1,332	2,422	1,565	1,439	1,748	1,631
Yorkshire and the Humber	1,862	2,583	1,520	2,521	2,269	2,046	2,786	2,200	2,820	2,593

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

Table A.4: Direct economic impact of the marine engineering industry through the compensation of employees, £ million, 2010 to 2019

COMPENSATION OF EMLOYEES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
England	**1,212**	**1,430**	**1,957**	**1,842**	**2,069**	**1,950**	**1,916**	**2,018**	**2,012**	**2,086**
Scotland	**657**	**623**	**796**	**853**	**953**	**1,355**	**1,129**	**887**	**813**	**898**
Wales	**30**	**43**	**23**	**46**	**28**	**49**	**52**	**43**	**43**	**43**
Northern Ireland	**35**	**51**	**53**	**71**	**63**	**68**	**72**	**73**	**67**	**78**
East of England	116	98	150	161	136	140	172	156	99	124
East Midlands	28	27	49	53	77	72	58	60	62	57
London	160	241	297	320	343	269	325	269	254	307
North East	73	79	69	66	78	64	70	101	62	58
North West	301	241	290	276	378	391	318	413	489	538
South East	183	315	604	379	370	362	346	387	405	451
South West	270	326	382	469	537	484	465	508	519	413
West Midlands	25	31	61	46	64	88	59	53	49	54
Yorkshire and the Humber	55	73	56	71	85	80	101	72	73	84

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


Cebr