THE ECONOMIC FOOTPRINT OF ENGINEERING CONSTRUCTION

A REPORT FOR THE ECITB
November 2017

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 report does not necessarily reflect the views of ECITB. London, November 2017

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Introduction

This report, commissioned by the Engineering Construction Industry Training Board (ECITB) and produced by Cebr, seeks to estimate the size of the engineering construction industry (ECI) and its importance to the UK economy – both today and in the future.

Engineering construction refers to the design, planning, construction, maintenance and decommissioning of energy and process plant infrastructure. Those working in this field include mechanical and electrical workers, technicians, engineers and many more. They operate across a number of sectors, including oil and gas, nuclear, renewables, petrochemicals, pharmaceuticals and waste and food processing.

Through the research we consider how many people are employed in the industry in total, the gender and age distribution of employment and the Gross Value Added (GVA) contribution of the industry. Additionally, the report takes into account a number of macroeconomic developments, the potential impacts of Brexit and a range of other sector-specific considerations in order to produce estimates of how the size of the industry will change in the decade up to 2026.

The definition of engineering construction used throughout this report differs from the definition ECITB uses to identify its in-scope employers, which are employers who are liable to pay a training levy as they operate establishments in which at least 50% of the workforce undertakes engineering construction activities as defined in the legislation (the Industrial Training Act, 1982 and associated regulations). Instead, we consider the engineering construction workforce in the broadest possible sense, which includes employers out of scope to ECITB.

Number of people employed in engineering construction

188,100

0.6% SHARE OF TOTAL EMPLOYMENT

Core Roles
64.4%
121,200

Supporting Roles
35.6%
66,900

Every engineering construction job
SUPPORTS
2.96
ADDITIONAL JOBS
within the economy as a whole

744,908
Aggregate Employment Impact
in the economy as a whole

It pays to work in engineering

IN 2016, THE GROSS MEDIAN WEEKLY PAY IN THE ENGINEERING CONSTRUCTION INDUSTRY WAS

£631

VS

£439

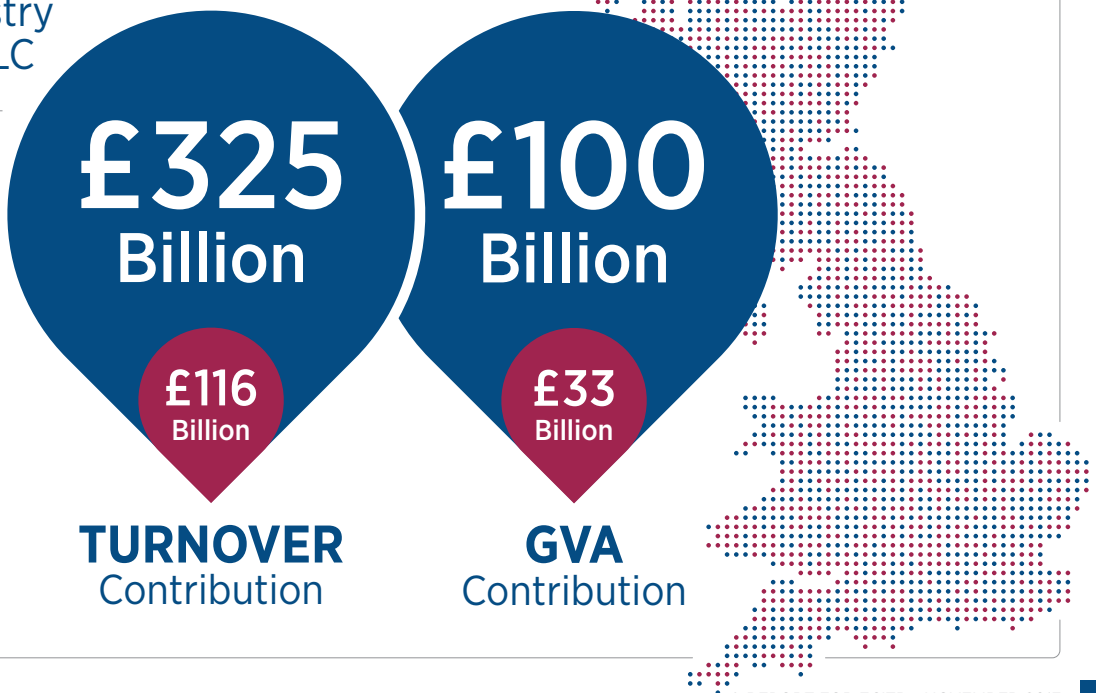
ACROSS ALL SECTORS

EMPLOYMENT FORECAST TO EXPAND BY

17.7%
33,300 JOBS

2016 — 2026

What the industry brings to UK PLC



KEY FINDINGS

188,100

In 2016, 188,100 individuals were employed within the engineering construction industry. Of these, 121,200 were in core roles with the remaining 66,900 in supporting ones.[2]

26%

Employment in engineering construction has been expanding more rapidly than employment across the economy as a whole, rising by 26% between 2010 and 2016 compared to a 15% rise in overall private sector employment.

£100Bn

The Gross Value Added (GVA) contribution of the engineering construction industry is estimated to be £33 billion (occupation approach) and £100 billion (industry approach).

44%

The gross median weekly pay in the engineering construction industry is £631 – 44% higher than the £439 per week across all sectors.

92%

Among the engineering construction workforce, 92% of employees are men. This is higher than the 50% average across all sectors.

25-34

A quarter (26%) of those working in engineering construction are aged 25—34 with about 14% of the current engineering construction workforce expected to retire within the next 10 years

We have presented two sets of results for the economic impact analysis conducted for this report.

Occupation Approach

The 'occupation approach' links the scope of the engineering construction industry with the share of production in the relevant sub-sectors that can be attributed to the so-called 'core' and 'supporting' engineering construction roles in these industries.

Industry Approach

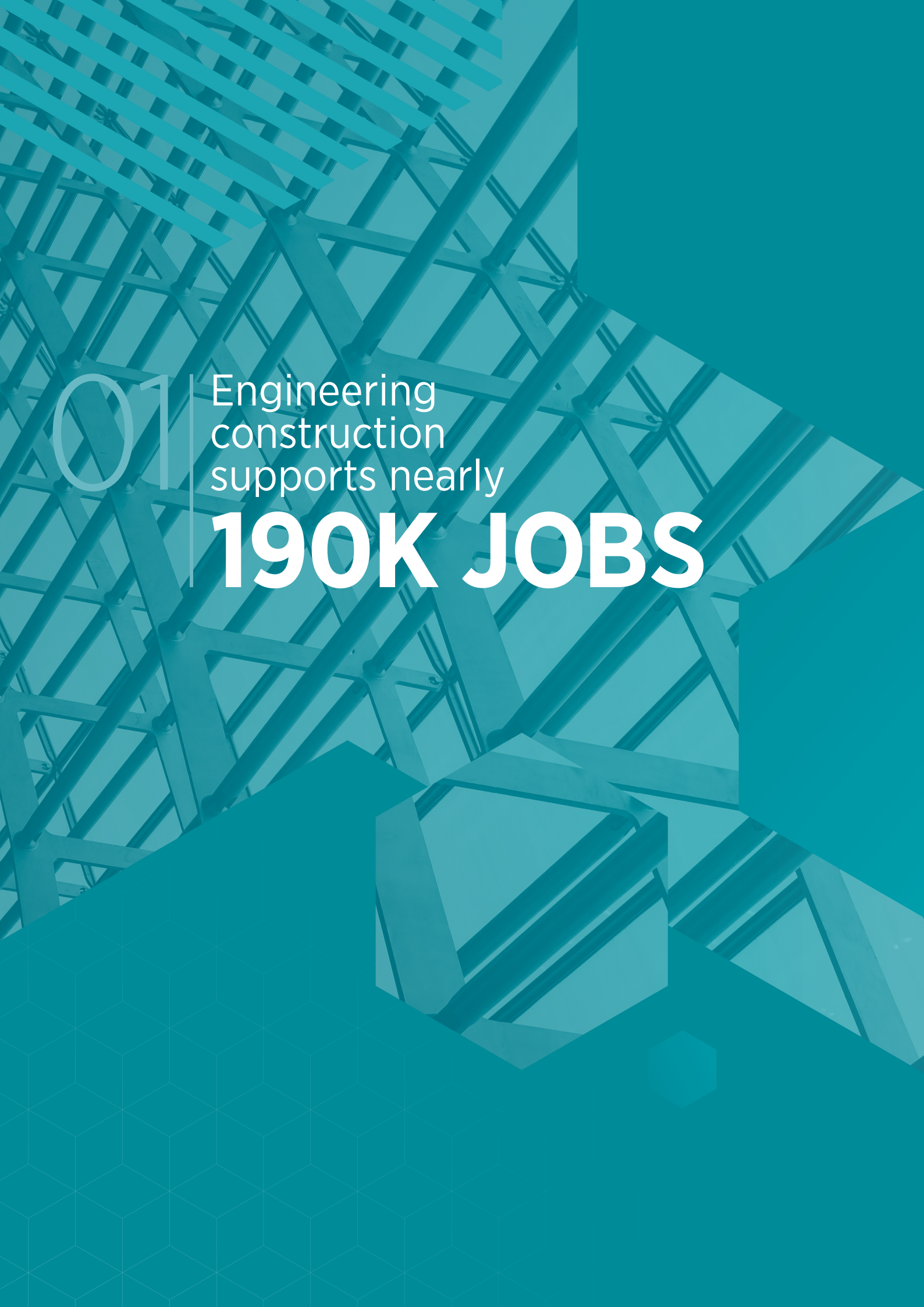
The 'industry approach' assumes that, without engineering construction roles, sectors serviced by engineering construction would not exist, which infers that all of the production of the relevant set of industries can be attributed to engineering construction.

[2] Core occupations are those that are essential for the key activities of the engineering construction industry, while supporting occupations capture the people working in the industry but in roles that are more removed from the key processes.

Key Findings continued...

- **Under the occupation approach, we estimate a £116 billion contribution to gross output (turnover)** (**3.3%** of total turnover), which **increases substantially to £325 billion under the industry approach** (**9.2%**). Under the industry approach, the estimates suggest a sharp decline in turnover of the engineering construction industry between 2014 and 2015. This, we suspect, can be attributed to the decline in oil and gas sector activity that the UK has witnessed over recent years, which has been driven by the collapse in global oil prices and has led to structural retrenchment across the UK's oil and gas industry.
- The fact that, under both the occupational and industry approaches, the industry's GVA contribution has increased in 2015 when turnover has decreased might appear counterintuitive. **However, the employment data suggests that the bulk of the effect of job losses in oil and gas has occurred in 2016.** While there have been job losses in 2015 as well, it would be no surprise if the drop in the employee compensation part of GVA was offset by cost-cutting measures in the industry's intermediate supply chain, which would boost the profit part of GVA.
- The **GVA multiplier**[3], capturing indirect and induced GVA impacts arising from the productive activities of the engineering construction industry, **is estimated at 2.50 under the occupation approach**. This **rises to 2.97 under the industry approach**. Therefore, for every **£1** of GVA generated by engineering construction, an additional **£1.50** or **£1.97** is generated in the wider economy through indirect supply chain impact and induced employee spending impacts, depending on whether the occupation or industry approach is used. Combining this with the direct GVA contribution produces an estimate of **aggregate GVA impact of £82 billion under the occupational approach and £298 billion under the industry approach.**
- As already noted, **the engineering construction industry supported 188,100 jobs in 2016.** This includes so-called 'core' and 'supporting' roles from sub-sectors that are identified with engineering construction activities. The estimate can be considered therefore as an application of the occupation approach. **Core occupations** are those that are **essential** for the key activities of the engineering construction industry, while **supporting occupations** capture the people working in **relevant industries** but in roles more removed from the key processes.
- The **employment multiplier is estimated at 3.96**, meaning that, for every engineering construction job, the total jobs that can be expected to be supported in the economy as a whole is **3.96**, that is, an additional **2.96** jobs on top of the direct job supported by engineering construction. Combining this multiplier with the direct employment impact produces an **aggregate employment impact of 744,908 jobs** in the economy as a whole.
- Keeping in mind the macroeconomic picture, oil sector outlook, the infrastructure pipeline, and potential impacts of Brexit **we expect engineering construction employment to decline in 2017 before picking up in 2018 and growing at subdued levels thereafter. Over the period 2016 to 2026, we forecast employment to expand by 17.7% or 33,300 jobs.** Over the same time period core employment will expand by 14.6% while supporting employment is expected to grow by 23.3%.
- In terms of GVA contribution we expect engineering construction to expand by around **12.5%** in the period up to 2026. **Under the occupational approach this means that the GVA contribution will stand at £38 billion in 2026, while under the industry approach it will be at £116 billion.** We expect the engineering construction industry to continue growing despite marginally underperforming the economy as a whole.

[3] The type II GVA multiplier is a factor of proportionality that captures how much a change in direct GVA propagates through the economy via the indirect and induced impacts. The indirect impact captures the increases in employment and economic activity along the supply chains supporting the direct activities of the engineering construction industry. The induced impact captures increases in employment and economic activity generated through the increased spending power of employees of the engineering construction industry and its supply chains.



01

Engineering construction supports nearly

190K JOBS

This report establishes the size of the engineering construction industry and its importance to the UK economy – both today and in the future. While the following section quantifies the contribution of the sector to economic output in terms of Gross Value Added (GVA), we first focus on employment. Specifically, this section considers how many people are employed in engineering construction occupations, pay and the demographic breakdown of the workforce.

The key to establishing engineering construction employment is formulating a specific definition of the sector. In collaboration with ECITB, Cebr has developed a list of Standard Occupational Classifications (SOC) codes and Standard Industrial Classification (SIC) codes that when cross referenced capture engineering construction. SOC codes are a system of classifying occupations while SIC codes distinguish between industries.[4] Therefore, the employment figures presented in this report capture the individuals working in specific occupations for a particular set of industries. While this approach ensures that our analysis primarily captures the individuals relevant to the field, it is impossible to establish what each worker in the economy does on a daily basis. Hence, a drawback of this approach is that some workers in a given SIC and SOC code will not primarily be completing activities that contribute to the engineering construction field. Additionally, some individuals that do work in the field may be classified under less common SIC and SOC codes meaning that their contribution should have been captured but was not. The engineering construction definition used throughout this report differs from the definition that the ECITB uses to identify its in-scope levy paying employers, which are employers operating establishments in which at least 50% of the workforce engages in principal or related activities as defined in the Industrial Training Levy (Engineering Construction Industry Training Board) Order 2017.[5]

Creating a list of SIC and SOC codes that captures the broader engineering construction industry is a challenging task and the approach implemented here is not without its shortcomings. For instance, certain SIC codes had to be excluded from the research as only a portion of the workers fall within the engineering construction definition but, due to data restrictions, it is impossible to separate them out. This is the case for SIC codes 33.12 and 33.14 (repair of machinery and electrical equipment), for which the work only falls within engineering construction if it is carried out on engineering construction sites. Similarly, SIC code 41.21, construction of commercial buildings, comes into scope of engineering construction only if the buildings are steel framed. As these distinctions cannot be made with the available data, they are excluded from our analysis. Therefore, it is reasonable to say that the employment estimates provided in the research are on the conservative side.

The list of occupations included in the research is divided into core and supporting ones. **Core occupations** are those that are essential for the key activities of the engineering construction industry e.g. mechanical engineers and steel erectors, while supporting occupations capture the people working in the industry but in roles that are more removed from the key engineering construction processes. **Supporting roles** may include business sales executives and marketing professionals working at an engineering construction firm. The full list of SOC codes is provided in the table on page 8, while the list of SIC codes can be found in the Appendix.

[4] For a more detailed discussion of the industry definition please see the Appendix.
[5] The Industrial Training Levy (Engineering Construction Industry Training Board) Order 2017, Statutory Instrument 2017 No. 485
To learn more on which companies are in-scope to the ECITB please visit: **www.ecitb.org.uk/Training-Levy/Am-I-in-Scope**

Table 1

Defining the engineering construction industry: SOC codes used.

CORE OCCUPATIONS

SOC code	Occupation
2121	Civil engineers
2122	Mechanical engineers
2123	Electrical engineers
2124	Electronics engineers
2126	Design and development engineers
2129	Engineering professionals
2436	Construction project managers and related professionals
2461	Quality control and planning engineers
3112	Electrical and electronics technicians
3113	Engineering technicians
3115	Quality assurance technicians
3116	Planning, process and production technicians
3122	Draughtspersons
5214	Metal plate workers, and riveters
5215	Welding trades
5216	Pipe fitters
5223	Metal working production and maintenance fitters
5241	Electricians and electrical fitters
5249	Electrical and electronic trades
5250	Skilled metal, electrical and electrical trades supervisors
5311	Steel erectors
8141	Scaffolders, stagers and riggers
8221	Crane drivers
9132	Industrial cleaning process occupations

SUPPORTING OCCUPATIONS

SOC code	Occupation
1131	Financial managers and directors
1132	Marketing and sales directors
1133	Purchasing managers and directors
1135	Human resource managers and directors
1162	Managers and directors in storage and warehousing
2113	Physical scientists
2142	Environment professionals
2424	Business and financial project management professionals
2434	Chartered surveyors
2472	Public relations professionals
3412	Authors, writers and translators
3511	Air traffic controllers
3513	Ship and hovercraft officers
3541	Buyers and procurement officers
3542	Business sales executives
3543	Marketing associate professionals
3562	Human resources and industrial relations officers
3567	Health and safety officers
4159	Other administrative occupations
7214	Communication operators
8232	Marine and waterways transport operatives
8233	Air transport operatives

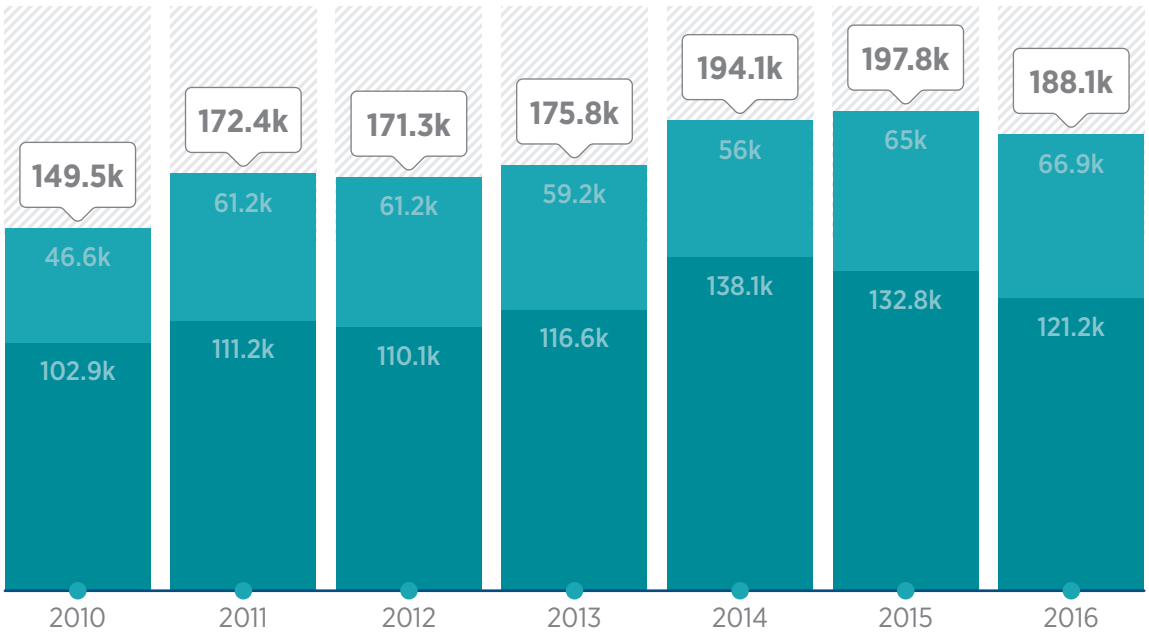
By using the specific SIC codes (*see Appendix p29*) to extract the relevant portions of the employment from the aforementioned SOC codes, we find that at present there are **188,100** individuals employed within the engineering construction industry. Of these, **121,200** are in core roles with the remaining **66,900** in supporting ones.

Figure 1

Number of individuals employed in engineering construction, by year.

Source

Annual Population Survey, Cebr analysis.



In the past few years growth has been stronger among the supporting occupations than the core ones. For instance between 2014 and 2016 supporting employment expanded by **19.5%** while core employment contracted **12.3%**. This is shown in the Table 2 below. The drastic decline in oil prices from around **$110** per barrel at the start of 2014 to **$55** per barrel at the end of 2016 has impacted core engineering construction employment which relies on the oil and gas sector. On the other hand certain supporting occupations performed particularly well within the same time frame. For instance employment among physical scientists expanded from **1,872** in 2014 to **5,702** in 2016. Similarly, the number of marketing associate professionals working in engineering construction grew from **471** to **1,255** within the same time frame.

Table 2

Annual employment levels and growth rates

Source

Annual Population Survey, ONS, Cebr analysis

	2010	2011	2012	2013	2014	2015	2016
No. of employed individuals							
Core employment	102,900	111,200	110,100	116,600	138,100	132,800	121,200
Supporting employment	46,600	61,200	61,200	59,200	56,000	65,000	66,900
Total engineering construction employment	149,500	172,400	171,200	175,900	194,100	197,800	188,100
Year-on-year change							
Core employment	-	8%	-1%	6%	18%	-4%	-9%
Supporting employment	-	31%	0%	-3%	-5%	16%	3%
Total engineering construction employment	-	15%	-1%	3%	10%	2%	-5%
Total private sector employment	-	1%	3%	2%	4%	2%	2%

Employment in engineering construction has been expanding more rapidly than employment across the economy as a whole. Between 2010 and 2016 employment in engineering construction rose by **26%**, compared to a **15%** rise in overall private sector employment. Looking at all SOC codes considered as a part of the research, the fastest growing occupations in the 2010-2016 period were financial managers and directors, business and financial project management professionals and human resource managers and directors. Among the core jobs, expansion was most rapid for quality control and planning engineers.

As engineering construction is a complex and far-reaching field dependent on numerous economic developments it is difficult to pinpoint the exact drivers behind the strong employment performance over much of the past six years. Contributing factors may include the high oil prices in the 2010-2013 period supporting companies within that field. Additionally, relatively high infrastructure investment over a number of those years may have driven demand for engineering construction workers.

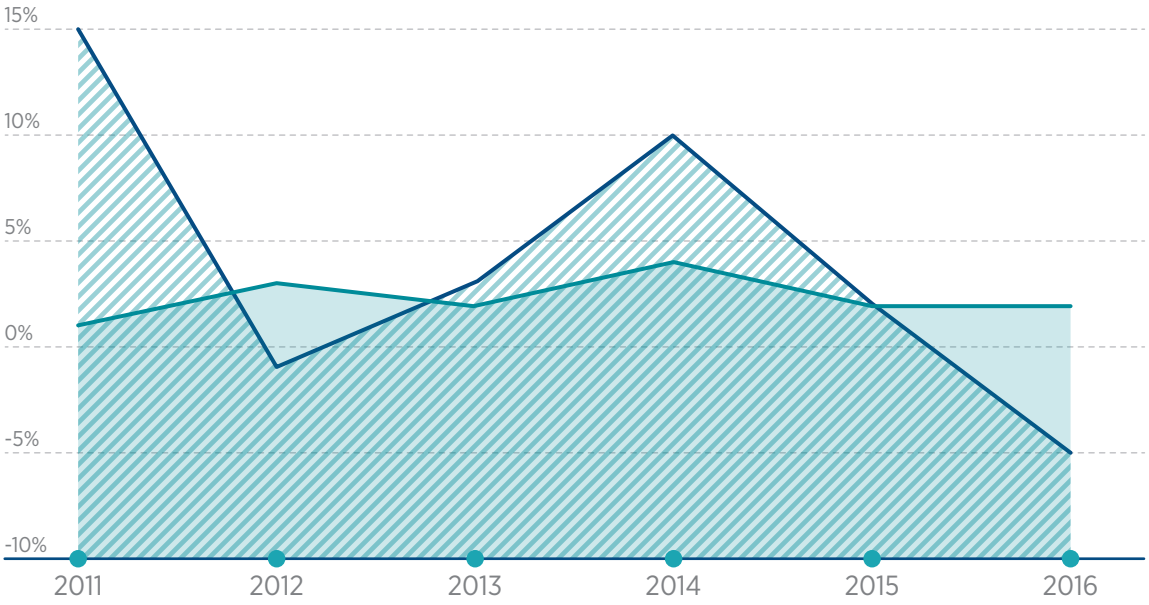


Figure 2

Annual growth in employment, engineering construction and private sector total, by year

Source

Annual Population Survey, ONS, Cebr analysis

Annual growth rates for engineering construction have been quite volatile in the past few years. For instance, in 2014 total engineering construction employment expanded by **10%**, but then grew just **2%** in 2015 before contracting **5%** in 2016. This is partially explained by the highly cyclical nature of demand within engineering construction. Additionally, the weaker performance in the most recent years has been driven by lower employment levels among the core workers, some of which have faced headcount cuts brought on by the weakened oil sector. On the other hand, supporting employment has outperformed the field as a whole. This could reflect the fact that in the face of a declining work load some companies have put an increased emphasis on winning work which engages more supporting workers e.g. those working in sales.

In addition to growing faster than all sectors combined, engineering construction also enjoys higher median salaries. In 2016, the gross median weekly pay in the engineering construction industry[6] stood at **£631** – **44%** higher than the **£439** per week across all sectors.

Since 2010 the median salary within engineering construction has increased by **11%**, with growth recorded in every year except for 2012. This is shown below. Over the same period the median salary across all occupations increased at the slightly lower rate of **9%**.

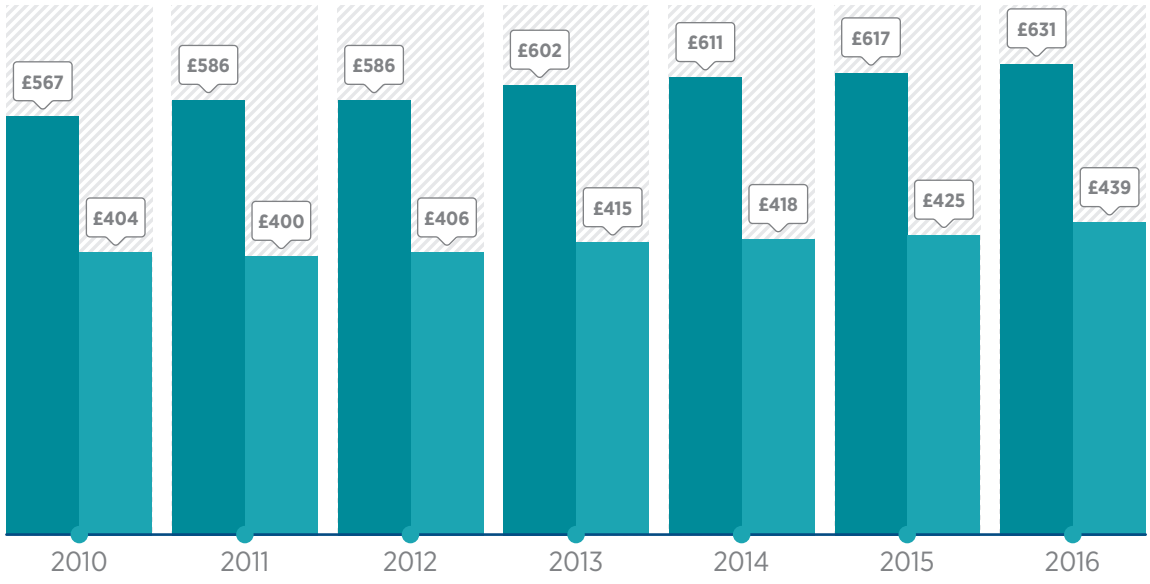


Figure 3

Engineering construction occupations, median salary

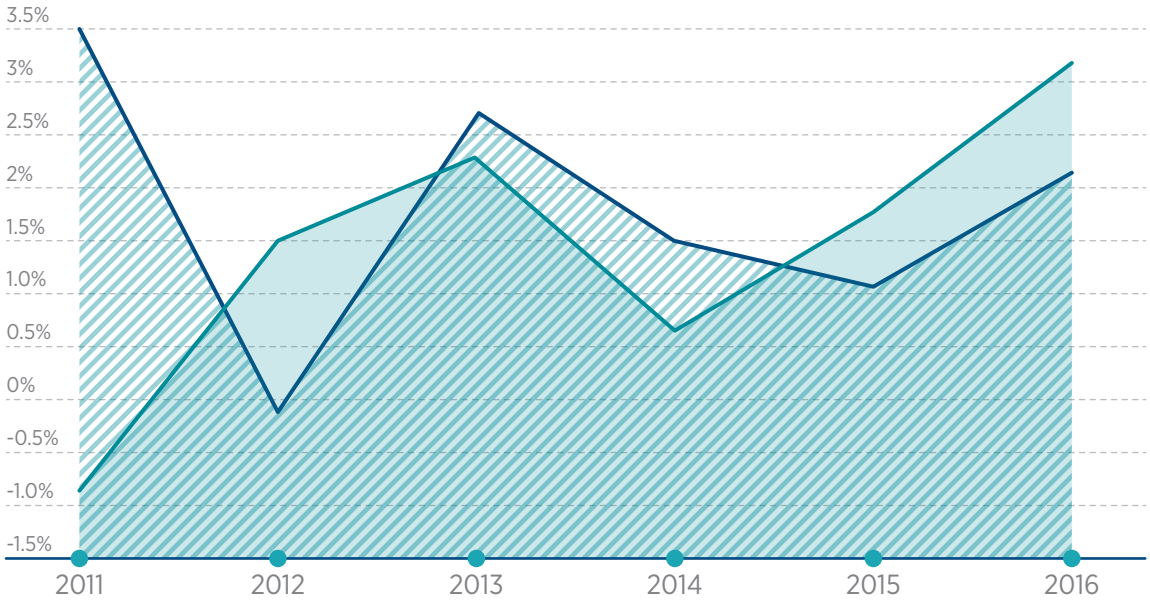
Source

Annual Survey of hours and earnings, Cebr analysis

[6] The calculation is based on ASHE data, using the SOC codes which constitute core engineering construction employment.

Figure 4

Median salary year-on-year growth, engineering construction and all occupations



Having discussed the volume of employment in engineering construction and salaries in the sector we now turn to a demographic analysis. Among the engineering construction workforce as a whole, **92%** of employees are men. This is higher than the **50%** average across all sectors. Looking at data going back to 2012 shows that the gender split in engineering construction has remained virtually unchanged over the past five years. While the data does not allow us to distinguish between the engineering construction workforce that work onsite and offsite, an analysis by the ECITB of their statutory returns shows that **21%** of offsite workers were female in 2016, compared to approximately **4.4%** of onsite workers.

In terms of the age profile, engineering construction is more in line with the divide across all sectors. This is shown in figure 5 below.

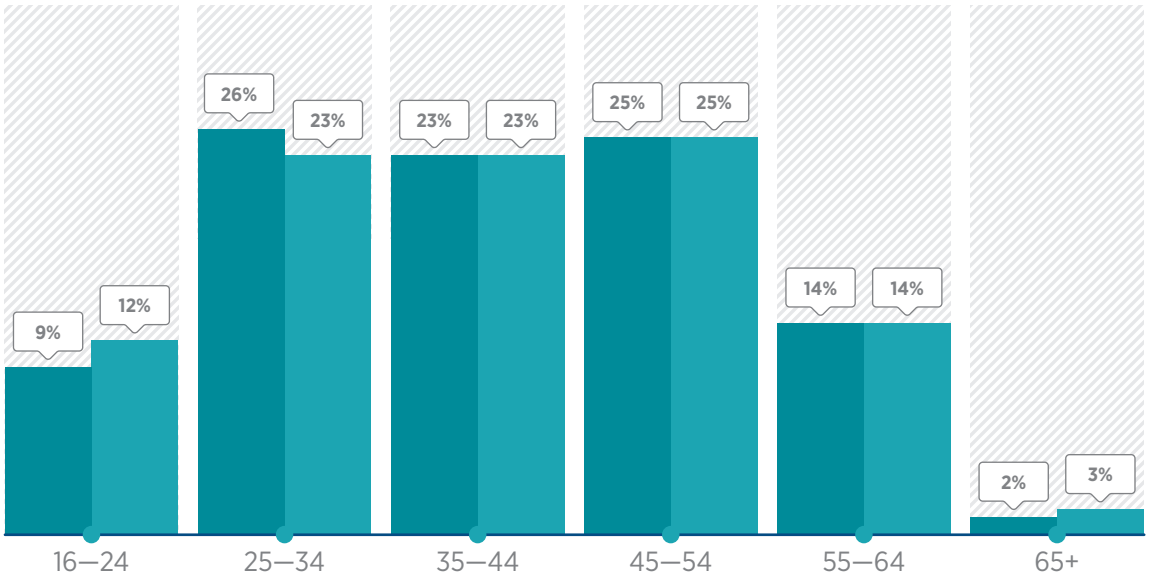
Three quarters of the workers in engineering construction are between the ages of **25-54** with the highest concentration (**26%**) in the **25-34** category. One in 10 (**9%**) engineering construction workers is **16-24** (compared to **12%** across all sectors) and one in 50 (**2%**) is over **65**.

Figure 5

Age distribution of the UK workforce, engineering construction and all sectors, 2014

Source

Annual Population Survey, Cebr analysis



02 | Economic impact of ENGINEERING CONSTRUCTION

In this section we present the ongoing annual contributions of the engineering construction industry to the UK macro economy. Using data from the Annual Business Survey, the Business Register and Employment Survey and the Annual Survey of Hours and Earnings, we present estimates of the direct economic contributions of the engineering construction industry. We also estimate the multipliers associated with the productive activities of the engineering construction industry which, when used alongside the direct contributions, has allowed us to quantify the indirect and induced impacts of the engineering construction industry to the UK macro economy.

There are a number of ways to interpret the reach or the 'footprint' of the engineering construction industries:

- ECITB has provided a detailed SIC-SOC breakdown of engineering construction jobs. We have split these into so-called 'core' and 'supporting' roles as shown in **Table 1**.
- One approach is to assume that the scope of the engineering construction industry reflects the share of production in the relevant sectors that can be attributed to these job roles. We call this the 'occupational approach', but this is quite a narrow interpretation of the 'footprint'.
- Another approach is to assume that, without engineering construction occupations, the individual sectors that are serviced by the engineering construction industry would otherwise not exist. This involves assuming that all of the production of the relevant set of industries can be attributed to engineering construction. We call this the 'industry approach'. This is a broader interpretation of the 'footprint'.

Neither approach is comprehensive though because, ideally, the 'footprint' should capture:

- Engineering construction roles in the engineering construction sub-sectors that make up the industry;
- Non-engineering construction roles in the engineering construction sub-sectors; and
- Engineering construction roles in non-engineering construction industries (which captures the fact that not all engineering construction roles will be in the engineering construction industry).

The occupational approach essentially captures a significant proportion of the first two items, while the industry approach captures all of the first two items. What is missing from both the occupational and industry approaches is the third item, the extent to which there are engineering construction roles in non-engineering construction industries. Only once this, and the economic output that can be attributed to these roles, is established can a full picture of the reach of engineering construction be captured.

We have implemented both approaches in the report. In **section 2.1** we present the results for the **occupational approach** and in **section 2.2** the results for the **industry approach**.

The complication with this and any study that seeks to measure the contribution and impacts of industry activities that are linked to a particular industry like engineering construction, is that the relevant set of activities does not correspond neatly with the sector breakdowns for which data are available. Where data is only published for industries at a higher level of aggregation, the task is to establish the share of measures such as turnover and GVA that can be attributed to the specific subject being examined.

2.1

The Occupational Approach

To implement the occupation approach, we have used ECITB's SIC-SOC breakdown of engineering construction roles alongside earnings data from the Annual Survey of Hours and Earnings (ASHE). Earnings should reflect the marginal or average productivity of labour, and engineering construction roles would be expected to command higher earnings than non-engineering construction roles.

For each relevant SIC sector, therefore, we calculated a total salary bill for all the engineering construction roles and then a total salary bill for the broader industry (for which the data we need are published) of which those roles form part. The ratio between the two gave our estimates of the shares of the broader engineering sub-sectors (and hence the broader industry) that can be attributed to engineering construction.

GROSS OUTPUT (TURNOVER)

Direct impact

According to our estimates based on this occupation approach, the aggregate turnover of the UK's engineering construction industries was **£116** billion in 2015, constituting a **3.3%** share of the turnover of the entire UK business economy. **Figure 6** illustrates how this has evolved since 2010, with with numbers suggesting that the ECI's contribution to turnover has increased by **0.4%** since then. However, 2015 saw a drop in this measure of turnover of the engineering construction industry, by nearly **10%** from 2014.

Indirect and induced multiplier impacts

Figure 7 illustrates our estimate of the indirect and induced multiplier impacts associated with the productive activities of the engineering construction industry.

ECI turnover using occupational approach

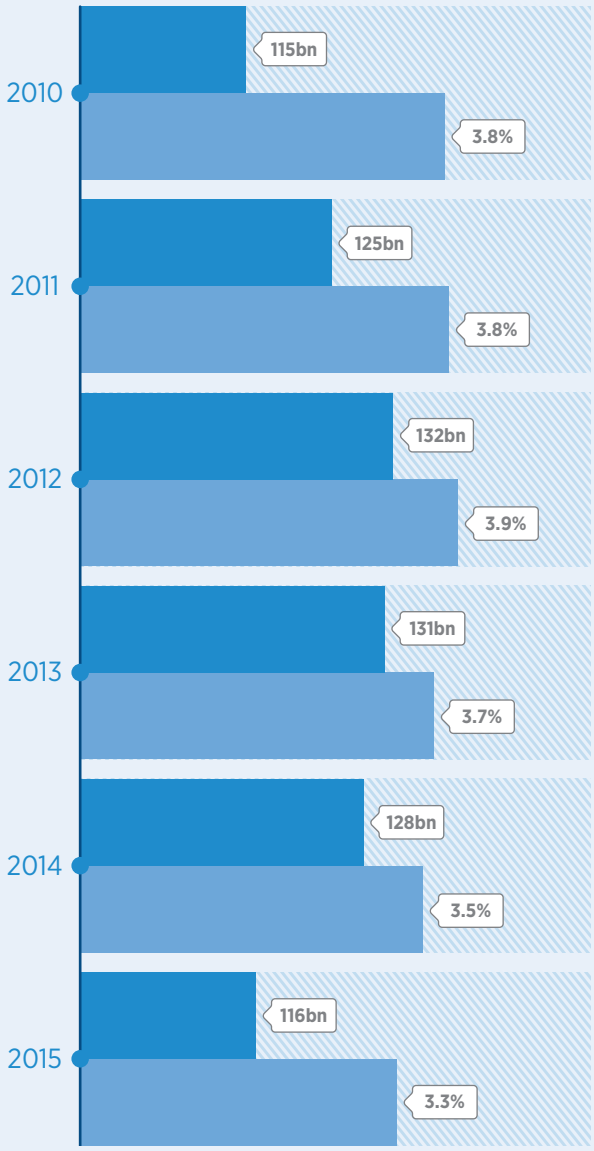


Figure 6

UK's turnover in the ECI, 2010-15, £ billions, current prices

Source

ABS, Cebr analysis

[7] The type I gross output multiplier is a factor of proportionality that captures how much a change in direct gross output propagates through the economy via the indirect impact. The indirect impact captures the increases in employment and economic activity along the supply chains supporting the direct activities of the engineering construction industry. For more detail, please see the appendix.

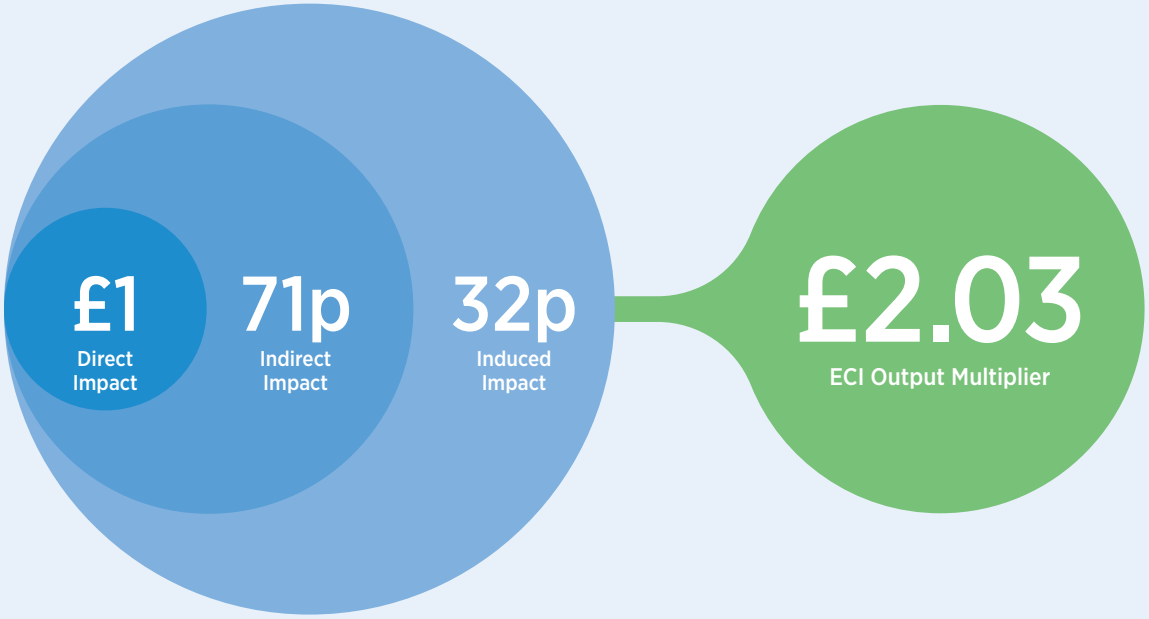


Figure 7

ECI output multiplier

Source

ONS, Cebr analysis

Direct Impact

Expenditure on the ECI triggers the ECI's supply response. In providing its services, the ECI produce additional output. Assume sufficient expenditure to generate **£1** of output. **This £1 of output is the direct output impact of the relevant increment in expenditure on the ECI**.

Indirect Impact

To increase its supply, the ECI must increase its demands on its suppliers, who increase demands on their suppliers and so on down the supply chain. **This generates the indirect impact, an increase in output throughout the supply chain of £0.71 for every additional £1 of engineering construction-based industry's output**.

Induced Impact

The combined direct and indirect impacts have an impact on household income throughout the economy, through increased employment, profits etc. A proportion of this income will be re-spent on final goods and services, producing a supply response by the producers of these goods/services and further impacts through their supply chains. **This produces the induced impact of £0.32 of output for every additional £1 of the engineering construction-based industry's output**.

Type I multiplier

The Type I multiplier[7] is the sum of direct and indirect impacts and is equal to **1.71**. This means that for every **£1** of gross output produced by the engineering construction industries, an additional **£0.71** of turnover is generated in the supply chains of these industries. This represents the economic activity generated in the industries from which the engineering construction industries purchase goods and services as inputs to their own production processes, in the industries that provide inputs to these suppliers, and so on.

Type II multiplier

The Type II multiplier, which is the sum of the direct, indirect and induced impacts, is equal to **2.03**. The additional **£0.32** of induced impact represents the turnover generated in the industries that supply final goods and services to households when direct and indirect employees of the engineering construction industries spend their earnings in the wider economy.

This means that for every £1 of engineering construction-based turnover, the economy wide increase in turnover due to direct, indirect and induced impacts is...

£2.03

GROSS VALUE ADDED

Direct impact

Based on the occupation approach, the gross output estimates presented above are estimated to produce a Gross Value Added (GVA) contribution by the engineering construction industry of **£33** billion in 2015. Despite the almost 10% drop in turnover, the GVA contribution of the engineering construction industry grew by **3.3%** between 2014 and 2015.

The **£33** billion generated in 2015 constitutes a **2.8%** share of the GVA of the entire UK business economy and a **1.8%** share of GDP.[8] The latter is illustrated in **Figure 8**, which also illustrates how the GVA contributions of the engineering construction industry has evolved since 2010, with growth of **6.6%** between then and 2015.

Indirect and induced multiplier impacts

Figure 9 illustrates our estimate of the indirect and induced multiplier impacts on GVA associated with the productive activities of the engineering construction industries.

ECI gross value added using occupational approach

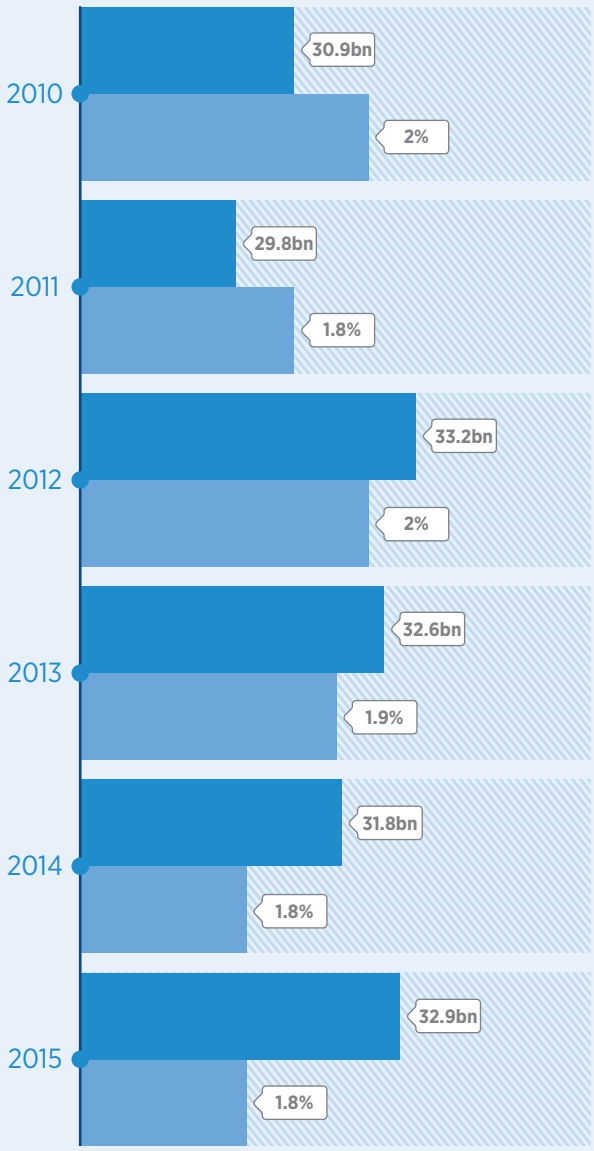


Figure 8

UK's GVA in the ECI, 2010-15, £ billions

Source

Cebr analysis

[8] 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. 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). This is the reason why the ECI's share of GDP is smaller than the share of GVA.

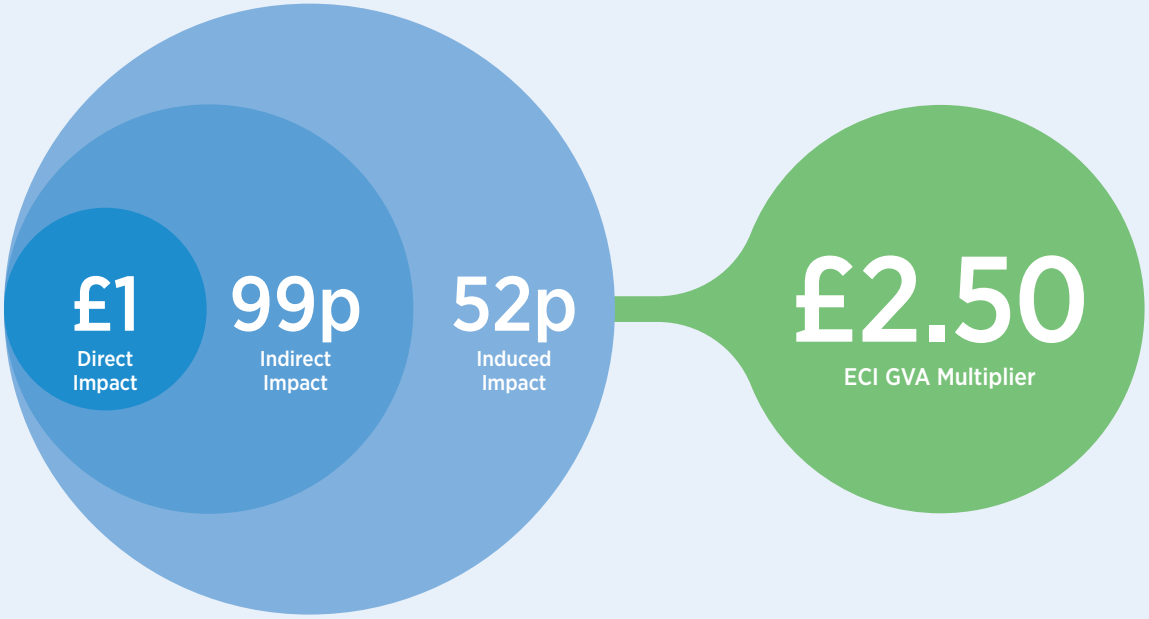


Figure 9
ECI GVA multiplier

Source
ONS, Cebr analysis

Direct Impact

Expenditure on the ECI triggers the ECI's supply response. In providing its services, the ECI generates additional value added. Assume sufficient expenditure to generate £1 of GVA. **This £1 of GVA is the direct GVA impact of the relevant increment in expenditure on the ECI.**

Indirect Impact

To increase its supply, the ECI must increase its demands on its suppliers, who increase demands on their suppliers and so on down the supply chain. **This generates the indirect impact, an increase in GVA throughout the supply chain of £0.99 for every additional £1 GVA in the engineering construction-based industry.**

Induced Impact

The combined direct and indirect impacts have an impact on household income throughout the economy, through increased employment, profits etc. A proportion of this income will be re-spent on final goods and services, producing a supply response by the producers of these goods/services and further impacts through their supply chains. **This produces the induced impact of £0.52 for every additional £1 of GVA in the engineering construction-based industry.**

Type I multiplier

The Type I multiplier, consisting of direct and indirect GVA impacts comes to **1.99**, meaning that for **£1** of GVA generated by the engineering construction industry, a further **£0.99** is generated within the supply chains of those industries and in the industries that provide inputs to these suppliers, and so on.

Type II multiplier

The Type II multiplier is the sum of the direct, indirect and induced impacts and equals **2.50**. That is, for every **£1** of engineering construction GVA, a further **£0.52** is generated in the industries that provide final goods and services to households when the direct and indirect employees of engineering construction spend their earnings in the wider economy.

This means that, for every £1 of engineering construction GVA, the economy-wide boost in GVA is... **£2.50**

Using this, in combination with the direct GVA contribution produces an estimate of aggregate GVA impact of **£82.4** billion

2.2

The Industry Approach

This approach is based on the assumption that, without engineering construction occupations, the sectors serviced by the engineering construction industry would not exist. This involves assuming that all of the production of the relevant set of industries can be attributed to engineering construction.

GROSS OUTPUT (TURNOVER)

Direct impact

Using this approach suggests that the gross output (or turnover) of the engineering construction industries amounted to **£325** billion in 2015, constituting a **9.2%** share of the turnover of the entire UK business economy. **Figure 10** illustrates how this has evolved since 2010. Having grown by **10.2%** between 2010 and 2011, turnover appears to have been in decline since. Between 2010 and 2015 the sector declined **9.9%** in total.

In 2015, turnover of the engineering construction decreased by **14%** compared to 2014. This reduction can be attributed to a significant extent to the decline in the oil and gas sector in the UK. Behind this decrease is a combination of significantly lower global oil prices and the recent period of retrenchment and cost reduction in the UK. It is, however, important to note that there is still an estimated 10-20 million barrels of oil to be produced in the UKCES.[9] Whilst this industry is an important contributor to the engineering construction industry's turnover, removing it from the figures reveals that turnover would actually have suffered a less severe drop between 2010 and 2014, (a **4%** drop vs. **5%** drop).

Indirect and induced multiplier impacts

Figure 11 illustrates our estimate of the engineering construction industries' multiplier impacts on gross output (turnover) under the industry approach.

ECI turnover using industry approach

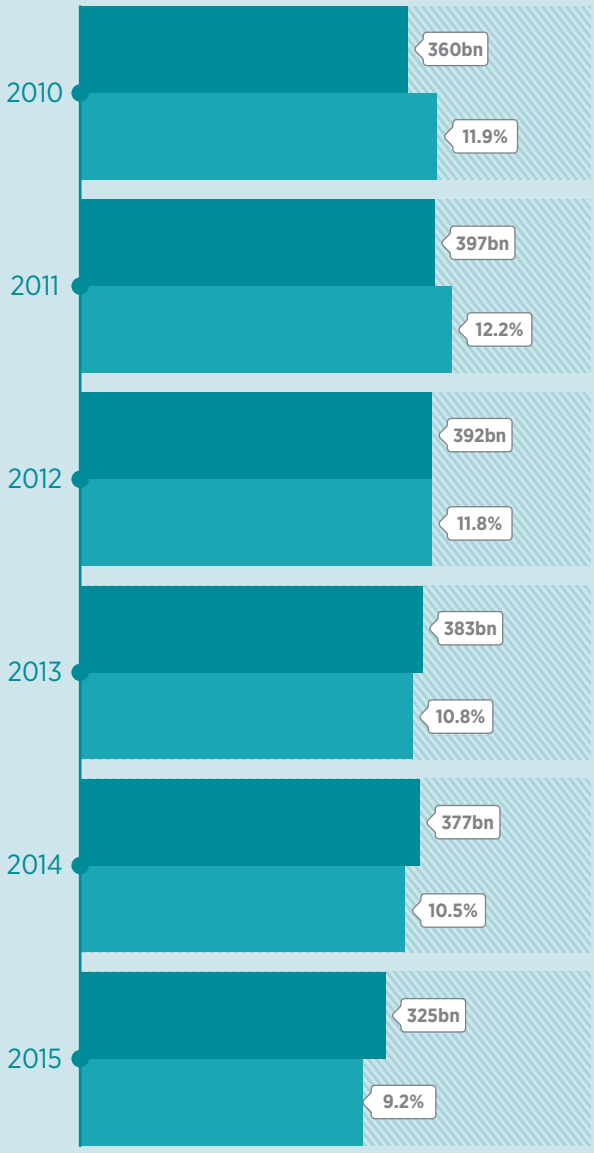


Figure 10

UK's turnover in the ECI, 2010-15, £ billions

Source

Cebr analysis

[9] Economic Report, 2016, Oil & Gas UK, September 2016

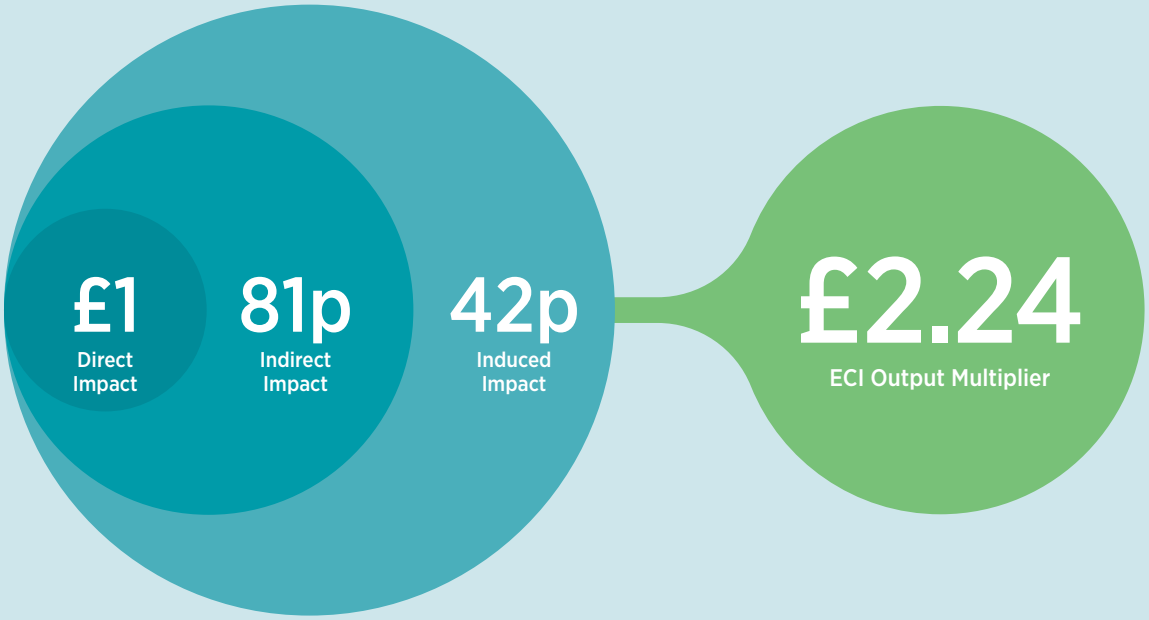


Figure 11

ECI output multiplier

Source

ONS, Cebr analysis

Direct Impact

Expenditure on the ECI triggers the ECI's supply response. In providing its services, the ECI produce additional output. Assume sufficient expenditure to generate **£1** of output. **This £1 of output is the direct output impact of the relevant increment in expenditure on the ECI.**

Indirect Impact

To increase its supply, the ECI must increase its demands on its suppliers, who increase demands on their suppliers and so on down the supply chain. **This generates the indirect impact, an increase in output throughout the supply chain of £0.81 for every additional £1 of engineering construction-based industry's output.**

Induced Impact

The combined direct and indirect impacts have an impact on household income throughout the economy, through increased employment, profits etc. A proportion of this income will be re-spent on final goods and services, producing a supply response by the producers of these goods/services and further impacts through their supply chains. **This produces the induced impact of £0.42 of output for every additional £1 of the engineering construction-based industry's output.**

Type I multiplier

The Type I multiplier of **1.81** suggests that for every **£1** of turnover of the ECI, an additional **£0.81** is generated through the industries that the engineering construction industries purchase goods and services from as inputs to their own production processes and in the industries that provide inputs to these suppliers, and so on.

Type II multiplier

The Type II multiplier is estimated at **2.24**, meaning an additional **£0.42** of turnover is generated in the industries that produce the goods and services purchased by the direct and indirect employees of the engineering construction industries when they spend their earnings in the wider economy.

So, when all direct, indirect and induced impacts are counted under this approach, the aggregate economy-wide boost to turnover resulting from £1 of engineering construction turnover is...

£2.24

This is a stronger multiplier effect than under the occupational approach, which reflects stronger supply chain impacts when this broader view of the footprint of the sector is considered. This, in turn, leads to stronger induced impacts.

GROSS VALUE ADDED

Direct impact

Based on the industry approach, the direct GVA contribution of the engineering construction industries is an estimated **£100** billion in 2015, constituting an **8.6%** share of the GVA of the entire UK business economy. Figure 12 illustrates how this direct GVA contribution translates into a share of UK GDP, measuring **5.4%** in 2015.

Figure 12 illustrates how this has evolved since 2010. Following a dip in 2011 and 2012, the sector appears to have recovered since. Growth over the whole period is estimated at **5.7%**. The nadir for the sector appears to have been 2012, when GVA dropped to just over **£91** billion. The growth from 2012 onwards is consistent with the trends observed in the wider engineering sector.

The fact that, under both the occupational and industry approaches, the industry's GVA contribution has increased in 2015 when turnover has decreased might appear counterintuitive. However, the employment data suggests that the bulk of the effect of job losses in oil and gas have occurred in 2016. While there have been job losses in 2015 as well, it would be no surprise if the drop in the employee compensation part of GVA was offset by cost-cutting measures in the industry's intermediate supply chain, which would boost the profit part of GVA.

Indirect and induced multiplier impacts

Figure 13 illustrates our estimate of the indirect and induced multiplier impacts on GVA associated with the productive activities of the engineering construction industry using this industry approach.

This again is a stronger multiplier estimate than was found under the occupational approach. This reflects a strengthening of indirect supply chain impacts under the industry approach, which feed through into higher induced impacts. The stronger multiplier estimate means that, for each **£1** of turnover, a greater proportion of that **£1** is spent on intermediate inputs than under the occupational approach. The industry approach will also be more likely to capture non-engineering construction roles that probably pay less on average than engineering construction roles. This would tend to pull down the amount of GVA that can be expected from each **£1** of turnover under this approach, which would also act to boost the multiplier estimate.

ECI gross value added using industry approach

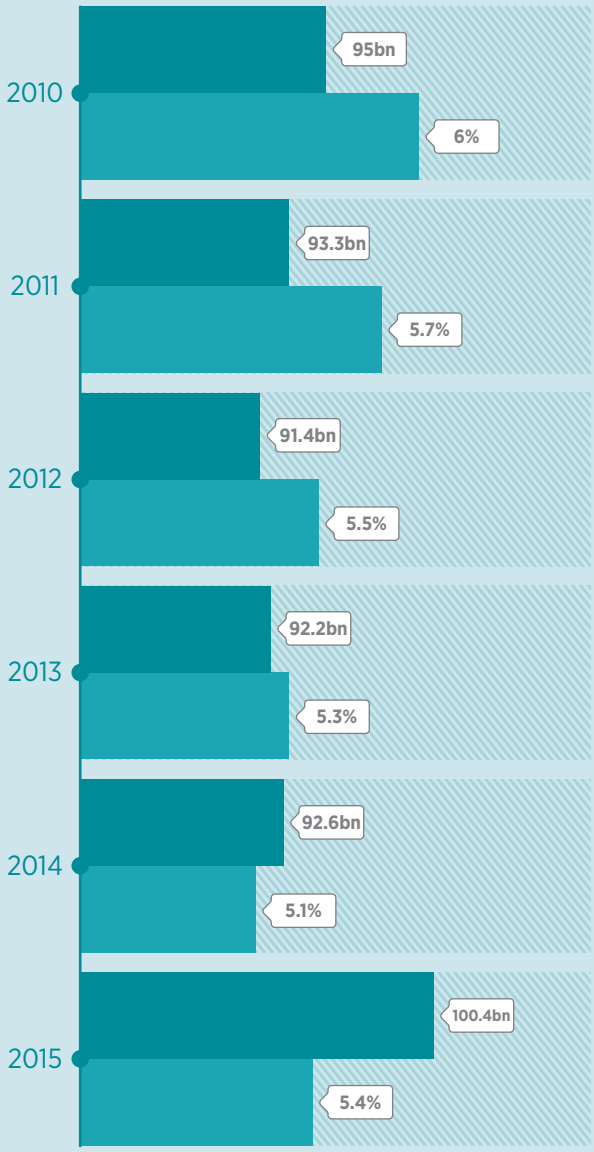


Figure 12

UK's GVA in the ECI, 2010-15, £ billions

Source

ABS, Cebr analysis

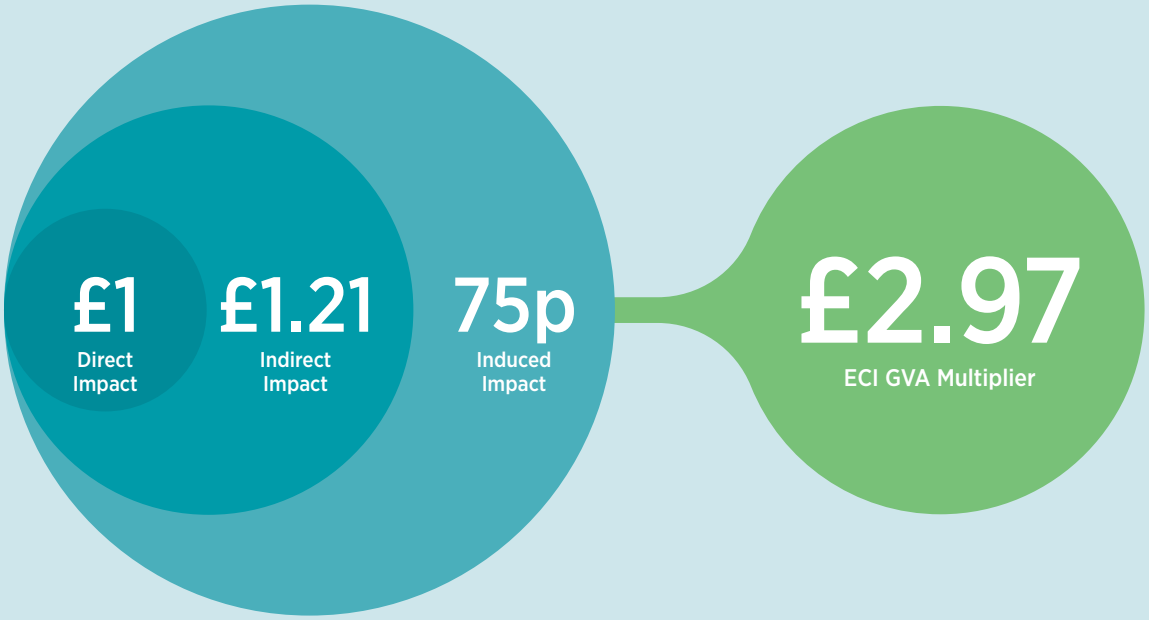


Figure 13

ECI GVA multiplier, industry approach

Source

ONS, Cebr analysis

Direct Impact

Expenditure on the ECI triggers the ECI's supply response. In providing its services, the ECI generates additional value added. Assume sufficient expenditure to generate **£1** of GVA. **This £1 of GVA is the direct GVA impact of the relevant increment in expenditure on the ECI.**

Indirect Impact

To increase its supply, the ECI must increase its demands on its suppliers, who increase demands on their suppliers and so on down the supply chain. **This generates the indirect impact, an increase in GVA throughout the supply chain of £1.21 for every additional £1 GVA in the engineering construction-based industry.**

Induced Impact

The combined direct and indirect impacts have an impact on household income throughout the economy, through increased employment, profits etc. A proportion of this income will be re-spent on final goods and services, producing a supply response by the producers of these goods/services and further impacts through their supply chains. **This produces the induced impact of £0.75 for every additional £1 of GVA in the engineering construction-based industry.**

Type I multiplier

The Type I multiplier, consisting of direct and indirect GVA impacts comes to **1.21**, meaning that for **£1** of GVA generated by the engineering construction industry, a further **£0.21** is generated within the supply chains of those industries and in the industries that provide inputs to these suppliers, and so on.

Type II multiplier

The Type II multiplier is the sum of the direct, indirect and induced impacts and equals **2.97**. That is, for every **£1** of engineering construction GVA, a further **£0.75** is generated in the industries that provide final goods and services to households when the direct and indirect employees of engineering construction spend their earnings in the wider economy.

This means that, for every £1 of engineering construction GVA, the economy-wide boost in GVA is...

£2.97

Combining this with the direct contribution of **£100** billion in 2015, produces an aggregate GVA impact of **£298** billion.

2.3

Employment Impacts

ECITB has provided a detailed SIC-SOC matrix of engineering construction roles in the economy. We have used this matrix combined with the Annual Population Survey to produce the employment estimates presented in Section 1 of this report.

Direct impact

According to the employment estimates, the engineering construction industries provided **188,108** jobs across the UK in 2016. This is a **0.6%** share of aggregate employment in the economy. Note this estimate is higher than ECITB's estimates of the size of the "in-scope" worker population, due to the fact that we have included all ECI jobs, not just workers engaged in ECITB's in-scope establishments (i.e. those who are 'wholly or mainly' engaged in engineering construction activities, as defined in the legislation).

This is compared with a selection of other broad sectors in **Figure 14**. The share of engineering construction employment of **0.6%** compares with the broader manufacturing sector with a share of **8.6%** and with engineering, which has a **19.5%** share.

Indirect and induced multiplier impacts

To produce estimates of employment multiplier impacts for engineering construction, we have focused on the roles identified by ECITB as core and supporting engineering construction roles. It made more sense, therefore, to apply the occupation approach. An application of the industry approach would involve taking all jobs (whether engineering construction roles, core or supporting) in the relevant set of industries, on the assumption that these industries (and the jobs supported by them) would not exist without engineering construction. This would inevitably produce a higher estimate of the direct jobs that could be attributed to engineering construction. It would also be likely to change the multiplier impacts. Likewise, if we were to include the missing element from both occupation and industry approaches – engineering construction roles in non-engineering construction industries – the estimates would likely change as well.

Figure 15 illustrates our estimate of the indirect and induced employment multiplier impacts associated with the productive activities of the engineering[10] construction industry under the occupation approach.

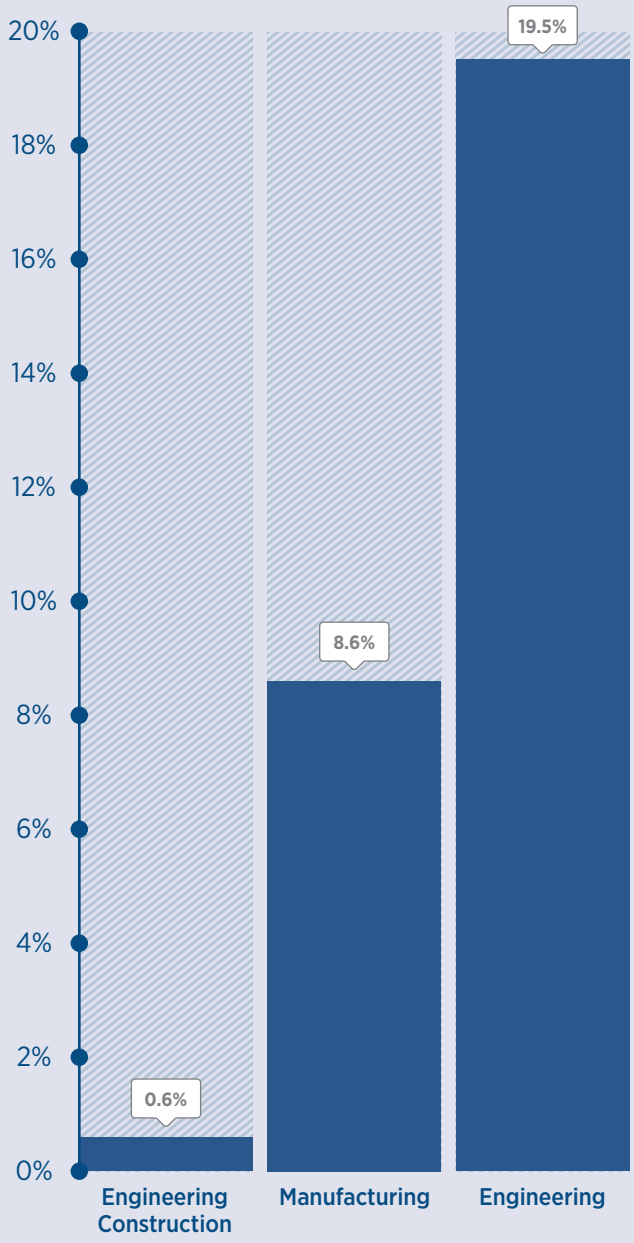


Figure 14

Share of engineering construction employment in the UK economy compared with other broad sectors

Source

Cebr analysis

[10] The numbers for the engineering sector presented in this report are based on Cebr's work for Engineering UK, as devised by Engineering UK

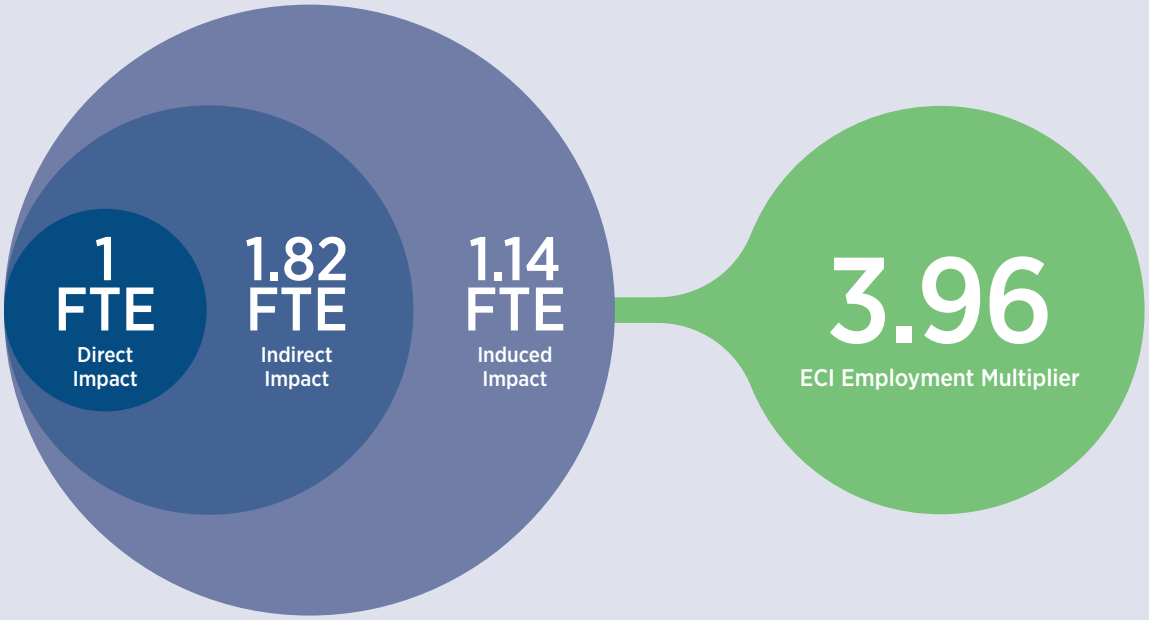


Figure 15

ECI employment multiplier

Source

ONS, Cebr analysis

Direct Impact

Expenditure on the ECI supply response. In providing its services, the ECI hires additional staff. Assume sufficient expenditure to generate **1 additional FTE** job. **This FTE job is the direct employment impact of the relevant increment in expenditure on the ECI.**

Indirect Impact

To increase its supply, the ECI must increase its demands on its suppliers, who increase demands on their suppliers and so on down the supply chain. **This generates the indirect impact, an increase in employment throughout the supply chain of 1.82 of a FTE job for every additional FTE job in the engineering construction-based industry.**

Induced Impact

The combined direct and indirect impacts have an impact on household income throughout the economy, through increased employment, profits etc. A proportion of this income will be re-spent on final goods and services, producing a supply response by the producers of these goods/services and further impacts through their supply chains. **This produces the induced impact of 1.14 of a FTE job for every additional FTE job in the engineering construction-based industry.**

Type I multiplier

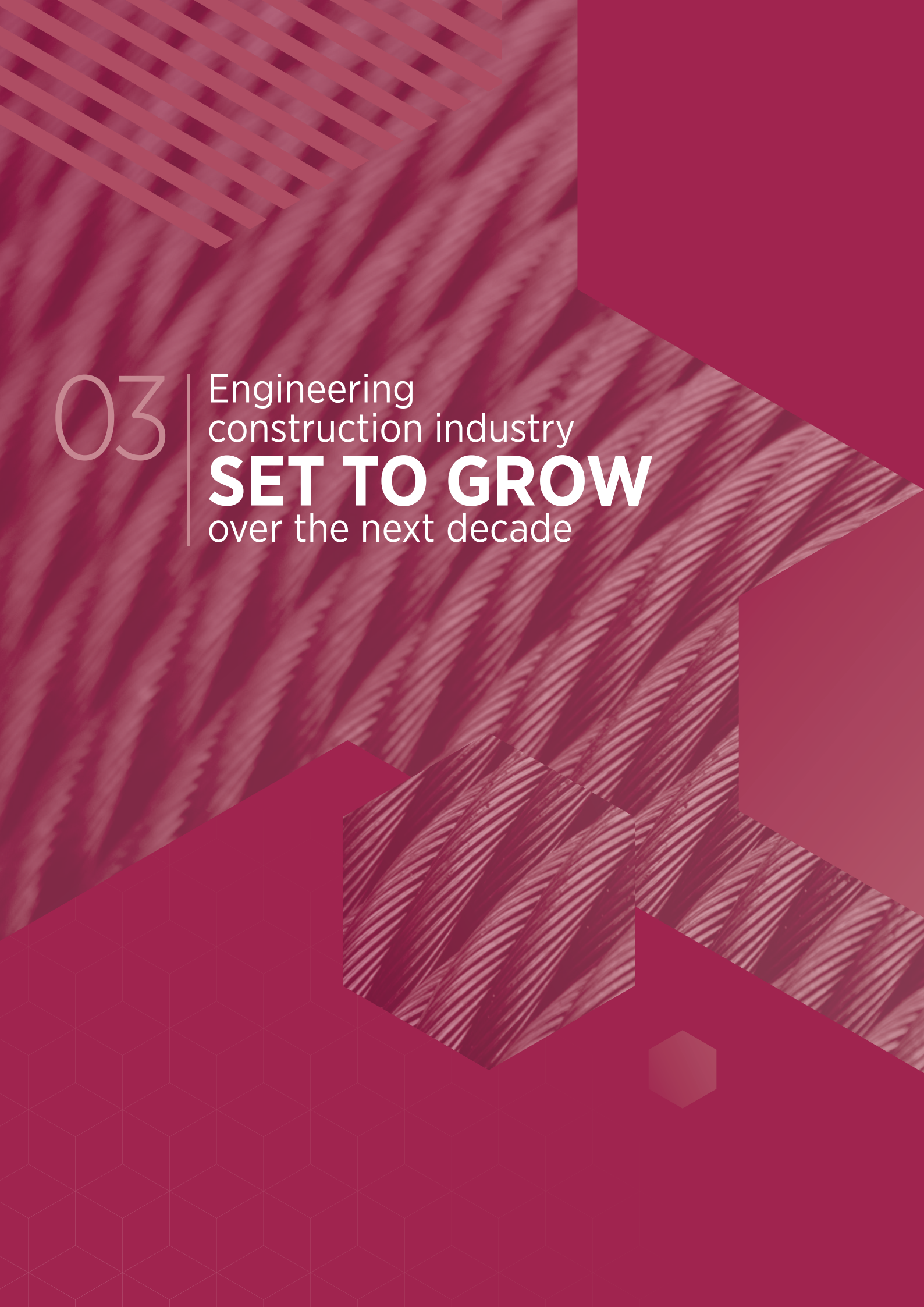
The Type I multiplier suggests that for every job provided in engineering construction, a further **1.82** jobs are supported in the supply chains of the engineering construction industries, and in their supply chains, and so on.

Type II multiplier

The Type II multiplier suggests an additional induced impact of **1.14** jobs supported in the industries that supply final goods and services to households when direct and indirect employees spend their earnings in the wider economy.

In aggregate, therefore, for every engineering construction job, the total jobs that will have or can be expected to be supported in the economy as a whole is... **3.96**

Combining this multiplier with the direct impact of **188,100** jobs produces an aggregate employment impact of **744,908** jobs in the economy as a whole.



03 Engineering construction industry **SET TO GROW** over the next decade

Having established that engineering construction supports 188,100 jobs and boosts the UK economy with an annual GVA contribution of at least £34 billion, we now examine the extent to which the size of the industry is likely to change over the next 10 years.

Our forecasts are based on a number of considerations, both macroeconomic and sector specific. From a macroeconomic point of view, we consider Cebr's expectations for GDP growth and business investment – both of which are likely to have an impact on demand for engineering construction work. Cebr expects GDP growth to slow but remain firmly in positive territory in 2017/18 while business investment grows only marginally. In the longer term we expect both GDP and investment growth to recover.

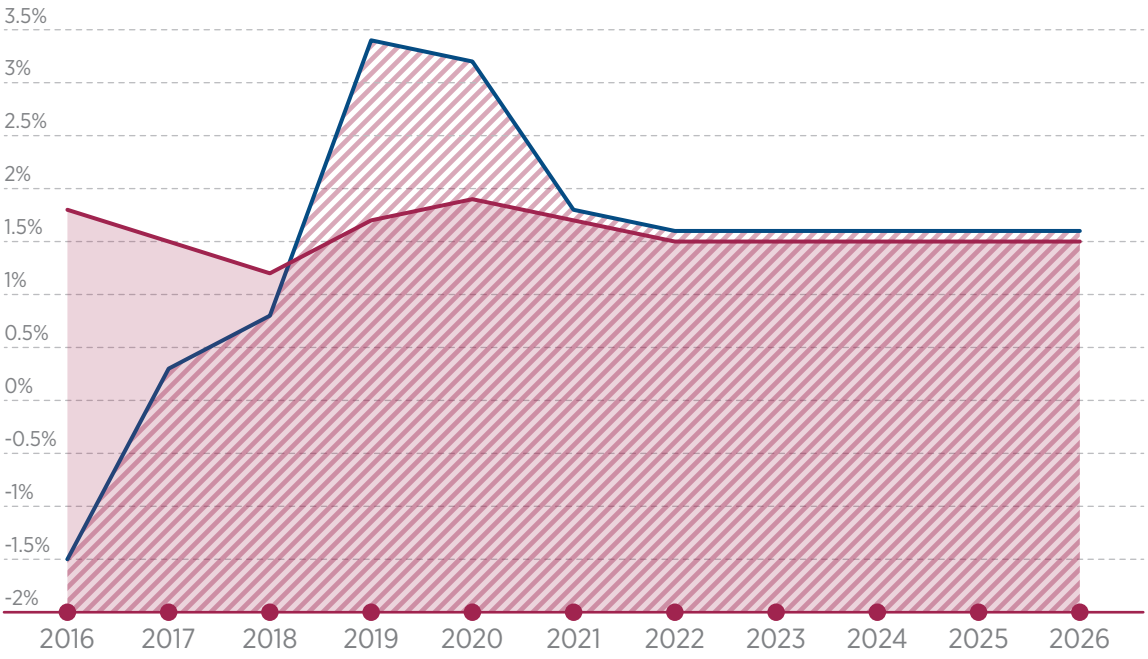


Figure 16

UK real GDP and Business investment, annual percentage change

Source

ONS, Cebr analysis

Part of the reason Cebr expects an economic slowdown in 2017/18 is the UK's decision to withdraw from the European Union. Households are feeling the squeeze from higher inflation, as sterling weakness translates into higher import costs and prices of essentials rise. Consumer and business confidence came under pressure following the surprise outcome of the June 2017 General Election and is set to remain subdued in the near term – this too will hamper GDP performance. On the bright side, business investment has fared better than expected in the post-Brexit period.

One of the sector-specific factors considered in the forecasts is the infrastructure investment plan. Based on the National Infrastructure Pipeline the expenditure for 2016/17 was **£61** billion.[11] This is expected to rise in 2017/18 before gradually starting to decline.

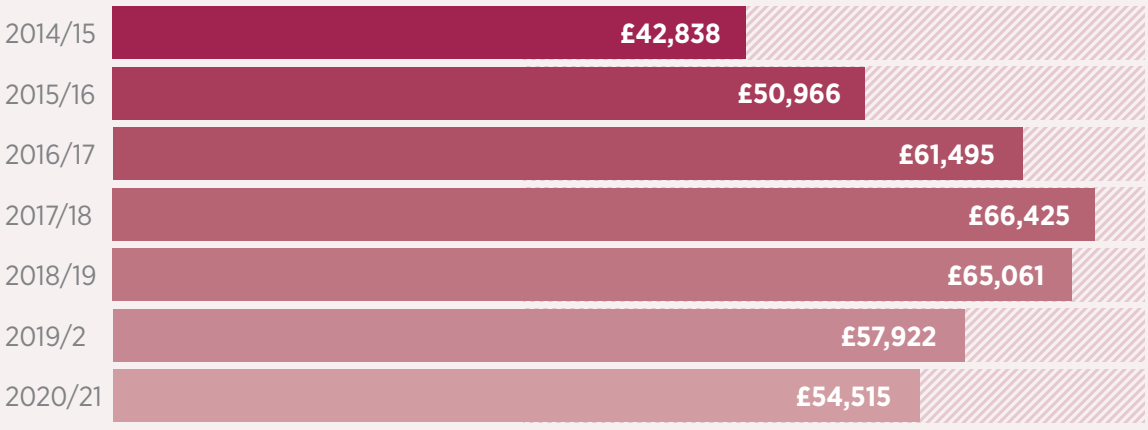


Figure 17

Projected expenditure on infrastructure projects, £ million

Source

National infrastructure pipeline

[11] Although not all of this spending is engineering construction related, a portion of it is which makes it a relevant input.

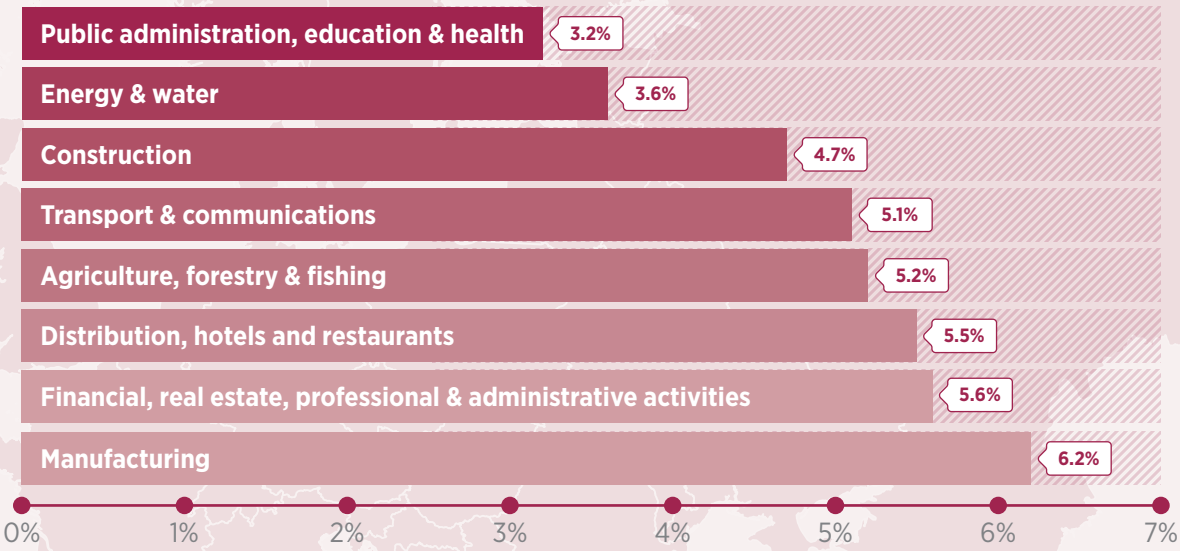
The engineering construction employment outlook is somewhat harmed by the possible implications of skill shortages made worse by restrictions on foreign workers. As **Figure 18** below shows, sectors which employ engineers, such as construction and energy, depend on non-UK EU born nationals for a share of their workforce. Data for **Figure 18** relies on the latest census which was conducted in 2011. Since then the dependence on EU born workers in these sectors has expanded. For instance, the Migration Observatory estimates that in 2015 **7%** of construction workers were born in the EU.[12]

Figure 18

Share of workers in industry who were born in the EU (excluding the UK), 2011

Source

2011 Census



Restricting the employment pool by implementing migration restrictions on EU nationals, could limit the number of infrastructure projects that can be delivered simultaneously. The extent to which this may happen depends on the immigration policy that the UK pursues thereafter.

Keeping in mind the macroeconomic picture, the infrastructure pipeline, and potential impacts of Brexit on engineering construction we now turn to Cebr's expectations regarding the size of the sector in terms of employment and GVA contribution. As growth drivers behind core and supporting employment differ, our expectations for the two differ as well. We expect core employment to decline in 2017 as OPEC's attempts to boost prices by limiting output have shown little result. In the 2018-2021 period we expect core employment to grow but at more subdued levels as the value of the infrastructure pipeline gradually declines. Beyond 2021 many of the existing projects will be completed and we therefore expect employment growth to hover below **2%**. Another key factor our forecasts take into account is the oil and gas sector outlook. Cebr expects Brent prices to reach **$52** by the end of 2017, marginally below the **$53** average seen over December 2016. We expect a partial recovery throughout 2018 and 2019 as an improving global picture drives demand. In terms of the infrastructure sector one upside risk to our forecasts is that major new infrastructure projects not currently in the pipeline could be announced in the coming years.

Supporting employment is less concentrated in fields dependent on infrastructure investment and therefore our forecasts rely more on our view of the economy as whole. Despite downside risks, the UK labour market continues to post a robust performance. Hence, we do not expect any year-on-year declines within supporting employment over the forecast horizon.

[12] www.ukandeu.ac.uk/fact-figures/where-do-eu-migrants-in-the-uk-work

Based on our forecasts, overall employment in engineering construction will expand from **188,100** in 2016 to **221,400** in 2026 – this signifies growth of **17.7%**. Over the same time period core employment will expand by **14.6%** while supporting employment expands **23.3%**.

Table 3

Annual employment levels and growth rates

Source

Cebr analysis

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
No. of employed individuals										
Core employment	117,400	119,800	123,200	125,400	128,200	130,400	132,300	134,600	136,900	138,900
Supporting employment	68,200	69,200	71,300	73,500	74,900	76,400	77,800	79,400	80,900	82,500
Total engineering construction employment	185,600	189,000	194,500	198,900	203,000	206,700	210,100	214,000	217,800	221,400
Year-on-year change										
Core employment	-3.1%	2%	2.8%	1.8%	2.2%	1.7%	1.5%	1.5%	1.5%	1.5%
Supporting employment	1.9%	1.5%	3%	3.1%	1.9%	2%	1.8%	2.1%	1.9%	2%
Total engineering construction employment	-1.3%	1.8%	2.9%	2.3%	2.1%	1.8%	1.6%	1.9%	1.8%	1.7%

In terms of GVA contribution we expect engineering construction to expand by around **12.5%** in the period up to 2026. Under the occupational approach this means that the GVA contribution will stand at **£38** billion in 2026, while under the industrial approach it will be at **£116** billion. We expect engineering construction to marginally underperform compared to the economy as a whole, but still post positive growth figures throughout the forecast horizon. Growth will be supported by a partial recovery in oil prices, but limited by the decline in the infrastructure projects pipeline.

Table 4

GVA contribution and growth rates

Source

Cebr analysis

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
GVA Contribution (£ million)										
Occupational approach	34,200	34,600	35,000	35,400	35,900	36,400	36,800	37,400	37,900	38,200
Industry approach	104,200	105,600	106,600	107,900	109,300	111,000	112,100	113,800	115,300	116,300
Year-on-year change										
Occupational approach	-	1.2%	1.2%	1.1%	1.4%	1.4%	1.1%	1.6%	1.3%	0.8%
Industry approach	-	1.3%	0.9%	1.2%	1.3%	1.6%	1%	1.5%	1.3%	0.9%

APPENDIX

As indicated in the first section of the report, the definition of engineering construction used in this report is broader than the one utilised by ECITB for the purposes of identifying its in-scope levy paying employers. Therefore, the employment figures presented in the report may be higher than ones cited elsewhere by ECITB. This is because only employers who operate establishments in which at least 50% of the workforce is engaged in engineering construction activities during the ECITB's levy period are counted as in-scope in regard to the levy.

For more details on how ECITB describes engineering construction activities for the sake of identifying levy paying employers, please refer to the following:

Principal Activities

Activity	Location	Type/product
Assembly, construction, dismantling, erection, fabrication, fitting, inspection, installation, maintenance, repair, replacement or testing on site of any chemical, electrical or mechanical apparatus, machinery or plant.	Chemical works, gas making or gas treatment works, nuclear or thermal power station, nuclear waste reprocessing site, hydro-electric station, oil refinery or oil terminal or of other apparatus, machinery or plant.	Concerned with the exploration for or exploitation of oil or gas, metal smelter, steel mill, paper mill or brewery, the processing and production of human or animal food, pharmaceutical, cosmetic and petrochemical products, cement, concrete bricks, distilling alcohol or other products, glass, paper and sewerage and any other installation involving the processing of any product.
Planning, designing, commissioning or procuring by way of contract or otherwise of any apparatus, machinery or plant.		
Supervision of the assembly, construction, dismantling, erection, fabrication, fitting, inspection, installation, maintenance, repair, replacement or testing of any apparatus, machinery or plant.		
The erection and/or dismantling of the main framework of a building or other structure that is made of steel or other metal where the building or structure is erected or dismantled.	Any site (not necessarily on a site where a product is processed).	Types of structures erected or dismantled could include, for example, supermarkets, warehouses, stadiums, agricultural buildings, office blocks, etc.
The hiring out by an employer of individuals in his employment to employers who are engaged in any of the activities listed above where the individuals being hired out will be engaged in such activities.		

Related Activities

Research, development, design or engineering construction drawing (either created by hand or by computer related software) or dynamic simulation.	Buying, selling, hiring out, testing (including NDT), advertising, packing, distribution, transport or any similar operations.	Operations of a kind performed at office premises or laboratories, or at stores, warehouses or similar places.	Operations of a kind performed at office premises or laboratories, or at stores, warehouses or similar places.	Training of employees or apprentices.

On the other hand, the research presented in this report uses a broader definition of the engineering construction industry. The larger definition relies on a list of relevant SOC and SIC codes which identifies occupations and industries that fall under engineering construction. Standard Occupational Classifications (SOC) codes are a system of classifying occupations while Standard Industrial Classification (SIC) codes distinguish between industries. This approach captures firms where only a portion of the workforce engages in engineering construction, thereby casting a wider web than ECITB's scope defining approach. Another reason this approach captures a larger segment of the economy than just ECITB levy contributors is that we account for 'core' employment, but also 'supporting' employment. Core occupations are those that are essential for the key activities of the engineering construction industry (e.g. mechanical engineers), while supporting occupations capture the people working in relevant industries but in roles more removed from the key processes (e.g. marketing professionals at an engineering construction firm). Some, although not all of these occupations will be captured by the ECITB levy.

The full list of SOC codes used is provided in Section 1, while the SIC codes included as part of the engineering construction industry definition are listed here:

SIC code	Industry
9.1	Supp act petrol & nat gas extracn
10.11	Processing and preserving of meat
10.12	Proc and preservng of poultry meat
10.13	Produc of meat & poultry meat prod
10.2	Proc fish, crustaceans & molluscs
10.31	Procesg and preserving of potatoes
10.32	Manu of fruit & vegetable juice
10.39	Othr proc & preserv of fruit & veg
10.41	Manufacture of oils and fats
10.42	Man of margarine & sim edible fats
10.51	Operat of dairies & cheese making
10.511	Liquid milk and cream production
10.512	Butter and cheese production
10.519	Man milk prod, not cheese; nec
10.52	Manufacture of ice cream
10.61	Manufacture of grain mill products
10.611	Grain milling
10.612	Man brkfst cereal & cer-basd fds
10.62	Manu of starches & starch products
10.71	Man bread, frsh pastry gds & cakes
10.72	Man ruskbiscpres pastry gdcakes
10.73	Man mac, nood, couscous & sim prod
10.81	Manufacture of sugar
10.82	Man cocoa, chocolate & sugar conf
10.821	Manu of cocoa, & chocolate conf
10.822	Manuf of sugar confectionery
10.83	Processing of tea and coffee
10.831	Tea processing
10.832	Prod of coffee & coffee substits
10.84	Manu of condiments & seasonings
10.85	Manu of prepared meals & dishes
10.86	Man homogen food preps & diet food
10.89	Manu other food products n.e.c.
10.91	Manu preprd feeds for farm animals
10.92	Manufacture of prepared pet foods
11.01	Distil, rectifyg & blendng spirits
11.02	Manufacture of wine from grape
11.03	Manuf of cider & other fruit wines
11.04	Man other non-distil fermentd bev
11.05	Manufacture of beer
11.06	Manufacture of malt
11.07	Manu soft drinks & mineral waters
17.11	Manufacture of pulp
17.12	Manufacture of paper & paperboard
17.21	Man & cont corrgatd pper & pperbrd

SIC code	Industry
17.211	Man corrugtd pperppprbdsackbag
17.219	Man pperppprbd cont nt sackbag
17.22	Manu of hhold & sanittoilet goods
17.23	Manufacture of paper stationery
17.24	Manufacture of wallpaper
17.29	Man of othr art of ppr & pprbd nec
19.1	Manufacture of coke oven products
19.2	Manu of refined petroleum prod
19.21	Mineral oil refining
19.29	Othr treatmnt of petrol products
20.11	Manufacture of industrial gases
20.12	Manufacture of dyes and pigments
20.13	Manu of other inorganic basic chem
20.14	Manuf of other organic basic chem
20.15	Man fertilisers & nitro compounds
20.16	Manuf of plastics in primary forms
20.17	Manu synth rubber in primary forms
20.2	Manu of pest & other agrochem prod
20.3	Manu of paints & related products
20.31	Man paintvarnshcoatmastcseal
20.32	Manufacture of printing ink
20.41	Man soap & detgt, clean & pol prep
20.411	Manufac of soap and detergents
20.412	Man of cleaning & polishing prep
20.42	Man perfumes & toilet preparations
20.51	Manufacture of explosives
20.52	Manufacture of glues
20.53	Manufacture of essential oils
20.59	Manu of other chemical prod n.e.c.
20.6	Manufacture of man-made fibres
21.1	Manuf of basic pharmaceutical prod
21.2	Man of pharmaceutical preparations
22.11	Manu, retread of rub tyres & tubes
22.19	Manufac of other rubber products
22.21	Manu plastic plates, sheets, tubes
22.22	Manuf of plastic packing goods
22.23	Manuf of buildersż ware of plastic
22.29	Manuf of other plastic products
23.11	Manufacture of flat glass
23.12	Shapng & processing of flat glass
23.13	Manufacture of hollow glass
23.14	Manufacture of glass fibres
23.19	Man & proc oth glas, inc tech glas
23.2	Manufacture of refractory products
23.31	Manuf of ceramic tiles and flags

SIC code	Industry
23.32	Man of bricks, tiles & constr prod
23.41	Man of ceramic hhold & ornm artcls
23.42	Manu ceramic sanitary fixtures
23.43	Manu of ceramic inslts & inslg fit
23.44	Manuf other technical ceramic prod
23.49	Manuf of other ceramic products
23.51	Manufacture of cement
23.52	Manufacture of lime and plaster
23.61	Man of conc prod for constrcn purp
23.62	Man plaster prod for constrcn purp
23.63	Manuf of ready-mixed concrete
23.64	Manufacture of mortars
23.65	Manufacture of fibre cement
23.69	Man othr art of conc, plstr & cmnt
23.7	Cutting, shaping & finishing stone
23.91	Production of abrasive products
23.99	Man of othr non-met min prod nec
24.1	Man basic iron, steel & ferro-ally
24.2	Man holow prof & rltd fit of steel
24.31	Cold drawing of bars
24.32	Cold rolling of narrow strip
24.33	Cold forming or folding
24.34	Cold drawing of wire
24.41	Precious metals production
24.42	Aluminium production
24.43	Lead, zinc and tin production
24.44	Copper production
24.45	Other non-ferrous metal production
24.46	Processing of nuclear fuel
24.51	Casting of iron
24.52	Casting of steel
24.53	Casting of light metals
24.54	Casting of other non-ferrous metal
33.2	Installatn of ind mchn & equipmnt
35.11	Production of electricity
35.21	Manufacture of gas
35.3	Steam and air conditioning supply
36	Water collectn, treatmnt & supply
38.21	Treatmnt & disp of non-hzard waste
38.22	Treatment & disp of hzardous waste
38.32	Recovery of sorted materials
42.21	Constr utility projects for fluids
42.22	Constr util proj for elec & telcom

GLOSSARY

Aggregate impact

The sum of the direct, indirect and induced impacts on an economy.

Compensation of employees

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.

Direct impact

The impact related to the industry under consideration.

Employment

The number of persons employed by an industry, be it part-time, full-time or self-employed.

Gross output

The total value of an industry's output.

Gross Value Added

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.

Indirect impact

Increases in employment and economic activity along the supply chains supporting the direct activities of the industry under consideration.

Induced impact

Increases in employment and economic activity generated through the increased spending power of employees of the industry under consideration and their supply chains.

Supply chain

The companies or industries which produce products or services necessary for the production of another industry's product or service.

Turnover

Turnover comprises the totals invoiced during the reference period, and this corresponds to market sales of goods or services supplied to third parties. Turnover also includes all other charges (transport, packaging etc.) passed on to the customer, even if these charges are listed separately in the invoice.

Type I multiplier

It estimates the impact on the supply chain resulting from a producer of a certain product increasing their output to meet additional demand. In order to meet the additional demand the producer must in turn increase the goods and/or services they purchase from their suppliers to produce the product in question. These suppliers in turn increase their demands for goods and services and so on down the supply chain. These effects are measured in terms of unit changes. Therefore, the type I multiplier is the ratio of the direct and indirect changes to the direct change due to a one unit increase in final demand.

Type II multiplier

Similar to the Type I multiplier, but covers the induced effects as well. Therefore, it is the ratio of the direct, indirect and induced changes to the direct change due to a one unit increase in final demand.

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