European Construction Sector Observatory

Country profile **United Kingdom**

September 2020

In a nutshell

Since 2010, the United Kingdom (UK) GDP grew at an average rate of 1.9%, amounting to GBP 2,045.7 billion (EUR 2,261.0 billion) in 2019. This is 1.5% above the 2018 levels.

However, since 2016, the GDP growth rate slowed down primarily due to a limited growth in private consumption despite a rising real wage growth. Overall, the general investment also remained muted owing to the uncertainty over UK's future trading relations with the EU[1].

In line with the overall economy, the broad construction sector in the UK also gained momentum. The **number of enterprises** in the broad construction sector totalled 554,594 in 2019[2], representing an increase of 32.3% over the 2010-2019 period. This growth is primarily attributable to a 74.5% increase in the architectural and engineering sub-sectors.

Number of enterprises in the broad construction sector between 2010 and 2019	↑	**32.3%**

After witnessing a drop in 2012, the **volume index of production** in the broad construction sector has been on a constant rise, increasing by 12.7% over the 2015-2019 period. In parallel, the construction of civil engineering and buildings also experienced a growth of 22.6% and 11.3% respectively during the above-referred period.

Volume index of production in the broad construction sector over the 2015-2019 period	↑	**12.7%**

The **total turnover** in the broad construction sector stood at EUR 450.1 billion in 2017, representing an increase of 32.9% compared to 2010 (EUR 338.7 billion). It further increased to EUR 491.6 billion in 2019, a 45.2% increase since 2010. This overall increase was mainly driven by growths in the narrow construction (+46.6%), architectural and engineering activities (+64.4%) and real estate activities (+36.5%) sub-sectors over the 2010-2019 period.

Turnover in the broad construction sector between 2010 and 2019	↑	**45.2%**

Similarly, the **gross operating surplus** of the broad construction sector recorded a substantial increase of 65.0% between 2010 and 2017, reaching EUR 118.1 billion. This was primarily driven by an increase in the manufacturing sub-sector (142.6%), followed by the narrow construction (101.5%) and architectural and engineering activities sub-sectors (74.9%) over the same period.

Correspondingly, the **gross operating rate** of the broad construction sector, an indicator of the sector's profitability, increased from 21.1% in 2010 to 26.2% in 2017. This is well above the EU-27 average of 16.6%.

In terms of employment, there were 2,748,292 **persons employed** in the UK broad construction sector in 2019, representing an increase of 12.1% over 2010. This was driven by a rise in employment in the architectural and engineering activities (32.3%), real estate activities (9.0%) and narrow construction (8.4%) sub-sectors during the same period.

In parallel to the growth in employment, the UK **housing market** is facing two key issues. House prices have increased significantly in recent years, adding pressure to the shortage of affordable housing in the country. Although **residential construction** also picked up recently partly due to the implementation and further extension of the government's 'Help to Buy' scheme through March 2023, it is still not enough to meet the overall market demand.

According to a research by Heriot-Watt University, England has a backlog of 3.9 million homes. This means that to satisfy the actual demand, 340,000 new homes need to be built each year until 2031 (including 90,000 for social rent). This is well above the government current target of 300,000 homes annually[3].

To address this issue, the government added GBP 500.0 million (EUR 552.6 million) in 2018 to the **Housing Infrastructure Fund,** which is now worth GBP 5.5 billion (EUR 6.1 billion) to support the construction of 400,000 homes by 2021. The British Business Bank also aims to provide guarantees supporting up to GBP 1.0 billion (EUR 1.11 billion) of lending to SME house builders through its new scheme.

House price index growth between 2015 and 2019 ↑ **16.8%**

Further, the UK government has also extended its **National Productivity Investment Fund (NPIF)** until 2024, to be used for productivity investment in transport, digital communication, R&D and housing. The NPIF is also financing investments in infrastructure, housing and research and development (R&D) over 2017-2022. In addition, the **National Infrastructure Delivery Plan 2016-2021** includes a GBP 600.0 million (EUR 663.2 million) infrastructure pipeline.

Currently, UK's infrastructure networks are under pressure with its rail, road and aviation networks reaching their capacity limit. The country has already started taking steps to cover its infrastructure deficit. In July 2018, the National Infrastructure Commission (NIC) published its long-term infrastructure needs assessment for the period 2018-2050. A full government response under 'National Infrastructure Strategy' is under consideration.

Post Brexit, UK's access to European Investment Bank (EIB) funding will cease. This will have a major impact on the country's future construction pipeline as the EIB held an important role in funding particularly infrastructure projects[4].

The UK broad construction sector is also suffering from **labour shortages**. By early 2020s, almost 20.0% of the construction workforce will have already reached or be close to retirement age, creating a serious labour shortage situation for the sector. UK's exit from the EU Single Market is mostly likely to worsen the current skill shortage for the construction sector, particularly if no follow-up agreements on free movement of people is enacted with the EU[5].

The ongoing **COVID-19 pandemic** is also expected to have both short- and long-term impacts on the construction sector. With most of the construction projects being put on hold or shut down, this has resulted in a substantial negative effect on the construction sector in the form of higher project costs, skilled labour shortage and additional business insolvencies.

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Key figures

Construction market

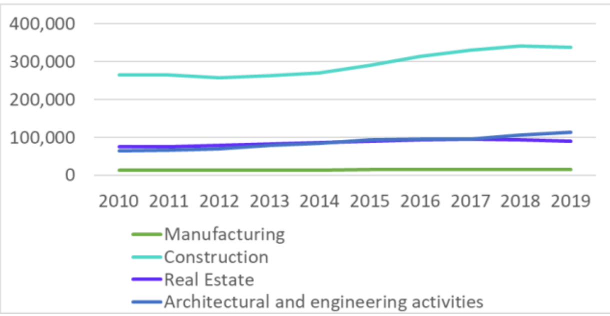
The **number of enterprises** in the broad construction sector totalled 554,594 in 2019[6], increasing by 32.3% between 2010 and 2019 (Figure 1). This growth is primarily attributable to the 74.5% increase in the architectural and engineering sub-sector. The narrow construction sub-sector accounted for 60.7% of the total number of enterprises, followed by the architectural and engineering activities (20.5%), real estate activities (16.3%) and manufacturing (2.6%) sub-sectors.

Number of enterprises in the broad construction sector between 2010 and 2019	↑ **32.3%**

The **volume index of production** in the broad construction sector increased by 12.7% in 2019 as compared to 2015 level. In parallel, the volume index of production in construction of buildings increased by 11.3% between 2015 and 2019, while it grew by 22.6% for the civil engineering over the same period.

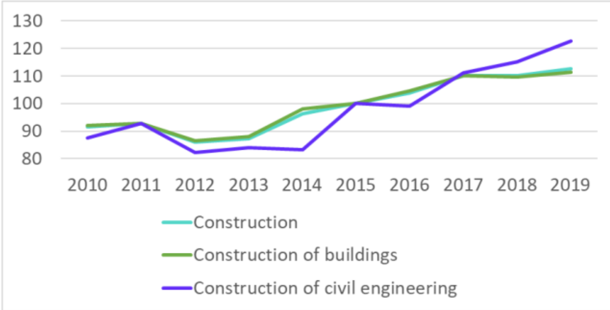
Production of the broad construction sector between 2015 and 2019	↑ **12.7%**

Figure 1: Number of enterprises in the broad UK construction sector between 2010 and 2019



Source: Eurostat, 2020.

Figure 2: Volume index of production in the UK construction sector between 2010 and 2019 (2015=100)



Source: Eurostat, 2020.

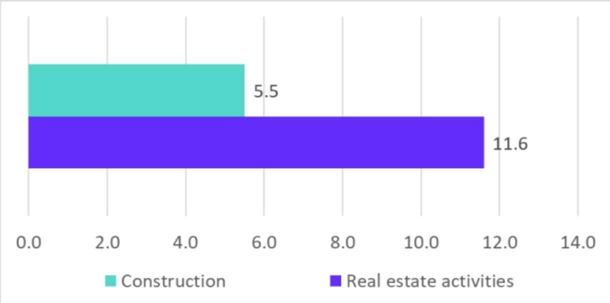
The broad construction sector's total added value[7] amounted to EUR 199.6 billion in 2019[8], with the narrow construction sub-sector contributing 52.4% of the aggregate (EUR 104.5 billion), followed by the architectural and engineering activities (21.6%), real estate activities (20.6%) and manufacturing sub-sectors (5.4%).

Overall, the **share of gross value added** by the narrow construction sub-sector to the GDP reached 5.5% in 2019, slightly above the EU-27 average of 5.0% as well as its 2010 level of 5.0%. Similarly, the share of gross value added by the real estate activities sub-sector to the GDP totalled 11.6% in 2019, well above the EU-27 average of 9.7% and marginally better than its 2010 level of 11.0%[9].

There are 42 statistical regions in the UK. Surrey, East and West Sussex had the highest share (4.7%) in gross value added in the narrow construction sub-sector among all regions of the UK in 2018. Bedfordshire and Hertfordshire reported the largest increase of 6.8%, while Northern Ireland saw the sharpest decline (- 2.4%) in gross value added in the narrow construction sub-sector during 2017-2018. In the real estate activities sub-sector, Inner London accounted for the maximum share (8.3%) in gross value added in 2018. Inner

London witnessed the largest increase of 3.2% while North East Scotland reported the largest decline of 4.9% over the 2017-2018 period[10].

Figure 3: Gross value added as a share of GDP in the UK broad construction sector in 2019[11] (%)



Source: Eurostat, 2020.

Productivity

Overall, **apparent labour productivity**[12] in the UK broad construction sector increased from EUR 59,428 in 2010 to EUR 75,535 in 2017[13] (27.1%), being well above the EU-27 average of EUR 50,079. Manufacturing activities saw the highest increase in labour productivity, growing from EUR 40,003 in 2010 to EUR 61,605 in 2017 (54.0%), followed by architectural and engineering activities increasing from EUR 65,800 to EUR 87,000 over the 2010-2017 period (32.2%). However, both saw a decline in the 2018-2019 period, currently ending at EUR 54,592 (-11.4% decline over 2017) and EUR 80,823 in 2019[14] (-7.1% decline over 2017) respectively.

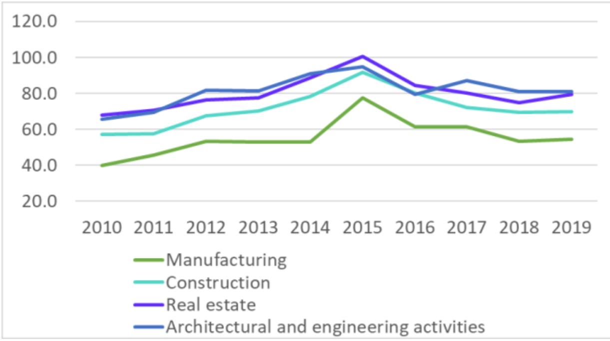
Labour productivity in real estate activities saw the weakest growth among all sub-sectors, rising from EUR 67,900 in 2010 to EUR 80,100 (18.0%), before declining (-0.7%) during the 2018-2019 period and ending at EUR 79,539 in 2019. Productivity in the narrow construction sub-sector experienced a 26.1% growth during 2010-2017 before declining to EUR 69,753 (-3.1%) over the 2018-2019 period.

The largest labour productivity growth was reported by the manufacturing sub-sector, increasing from EUR 41,003 in 2010 to EUR 54,592 in 2019 (+36.5%).

Nonetheless, since 2018, the construction sector productivity growth has slowed down. While the overall construction output grew well till 2017 before levelling off, the construction sector's output per hour started declining since 2016 and was notably weak in 2018[15]. The COVID-19 pandemic in 2020 has further impacted the construction sector significantly with the lockdown closing all work sites, causing supply chain to temporarily shut down and inducing large-scale staff terminations[16].

According to a new research by Turner and Townsend, the COVID-19 pandemic has resulted in around 35% of productivity losses at UK construction sites, resulting in massive programme delays and rising costs. Uncertainty related to labour arrival on site, social distancing measures and delays in material delivery have further worsened the productivity gap[17].

Figure 4: Labour productivity in the broad construction sector in UK between 2010 and 2019 (EUR k)



Source: Eurostat, 2020.

Turnover and profitability

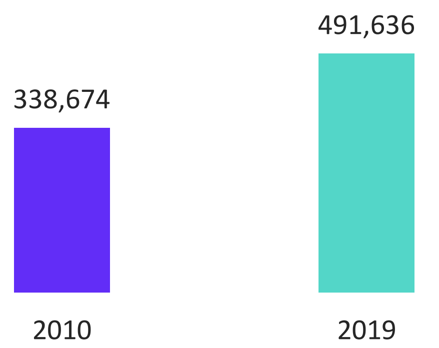
The **turnover** of the broad construction sector stood at EUR 450.1 billion in 2017, representing an increase of 32.9% compared to 2010 (EUR 338.7 billion). This further increased to EUR 491.6 billion in 2019[18], a 45.2% increase since 2010.

Similarly, the **gross operating surplus** for the broad construction sector has been increasing since 2010, reaching EUR 134.8 million in 2015 and then declining by a sharp 12.4% in 2017 to reach EUR 118.1 million, being 65.0% above the 2010 level (EUR 71.6 million). In terms of its sub-sectors, the largest increase was reported by the manufacturing activities (142.6%), followed by narrow construction (101.5%) and architectural and engineering activities (74.9%) over the 2010-2019 period. The real estate activities sub-sector witnessed the lowest growth rate of 42.4% over the same period.

The **gross operating rate** of the broad construction sector[19], which gives an indication of the sector's profitability, stood at 26.2% in 2017, 5.1

percentage points above the 2010 value (21.1%)[20]. In the case of the sub-sectors, the real estate activities had the highest gross operating rate (45.4%), followed by the architectural and engineering activities (29.6%), the narrow construction (22.0%) and the manufacturing sub-sector (18.0%) over the 2010-2017 period.

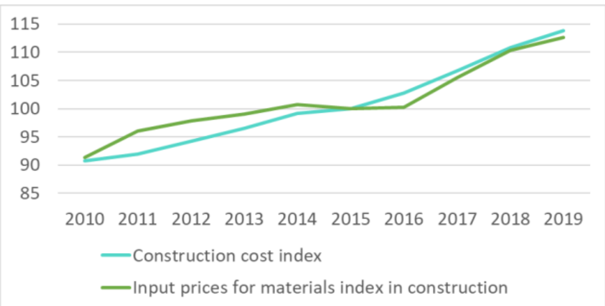
In parallel, **construction costs** for residential buildings have been experiencing an increasing trend, with the construction cost index rising by 13.8% over 2015-2019 period. This is partly driven by the 12.6% increase in input prices for materials (Figure 5). In fact, construction materials such as ready-mix concrete (21.9%), cement (24.5%), pre-cast concrete products (29.3), doors and windows (29.7%), particle board (41.9%) and insulating materials (45.9%) had the highest price rise during 2010-2019[21].



Turnover of the broad construction sector in EUR million

Turnover of the broad construction sector over 2010-2019 period **45.2%**

Figure 5: Construction cost index between 2010 and 2019 (2015=100)



Source: Eurostat, 2020.

Employment

The number of persons employed in the broad construction sector stood at 2,748,292 persons in 2019[22], representing a 12.1% increase compared to 2010.

The narrow construction sub-sector employed 54.5% (i.e. 1,498,288 persons) of the total workforce in the broad construction sector in 2019, representing a 8.4% growth since 2010 (Figure 6). According to the UK Office for National Statistics' report on "Migrant labour force within UK's construction industry", 47% of total construction workers in 2018 were engaged in the narrow construction sub-sector, in which 8% were non-UK nationals[23].

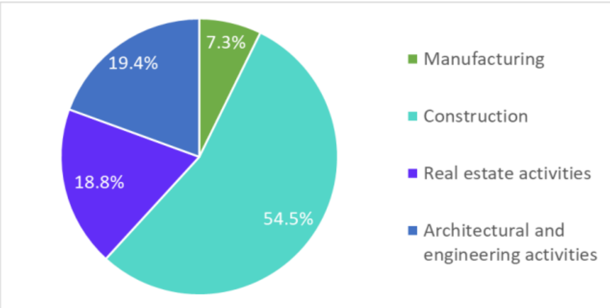
19.4% (i.e. 533,870 persons) of total broad construction labour force in 2019 was involved in the architectural and engineering activities sub-sector, 18.8% (i.e. 516,307 persons) was engaged in the real estate activities sub-sector and the remaining 7.3% (i.e. 199,827 persons) in the manufacturing sub-sector. (Figure 6).

Since 2009, Surrey, and the East and West Sussex regions have had the highest number of persons employed in the narrow construction sub-sector in the UK.

However, Tees Valley and Durham recorded the strongest increase of employment in the narrow construction sub-sector (+20.7%) over 2017-2018. This was followed by Shropshire and Staffordshire (+14.5%) and West Midlands (+12.0%). In contrast, the sharpest decline was reported in the Outer London (-9.6%) over the same period. When it comes to employment in the real estate activities sub-sector, Inner London recorded the highest number of persons employed (61,000). This is on average five times higher than the number of employed persons in real estate in the other regions of the UK.

As for **employment by specific occupation**, the number of clerical support workers in the narrow construction sub-sector saw the largest decline, from 150,100 in 2010 to 113,600 in 2019 (-24.3%), followed by craft and related trades workers (-8.9%). Conversely, the number of service and sales workers increased significantly from 6,300 to 23,800 (+277.8%) over the same period, followed by professionals (+58.7%). In the real estate sub-sector, professionals experienced the highest increase, from 18,700 in 2010 to 49,800 in 2019 (+166.3%), followed by craft and related trades workers (+107.2%), which saw the second-largest occupation growth in this sub-sector. In the manufacturing sub-sector, plant and machine operators and assemblers showed the largest decline, from 589,700 in 2010 to 379,500 in 2019 (-35.6%). Conversely, service and sales workers experienced the highest increase, from 30,100 in 2010 to 83,600 in 2019 (177.7%). This was followed by professionals, rising by 106.4% over the same time period.

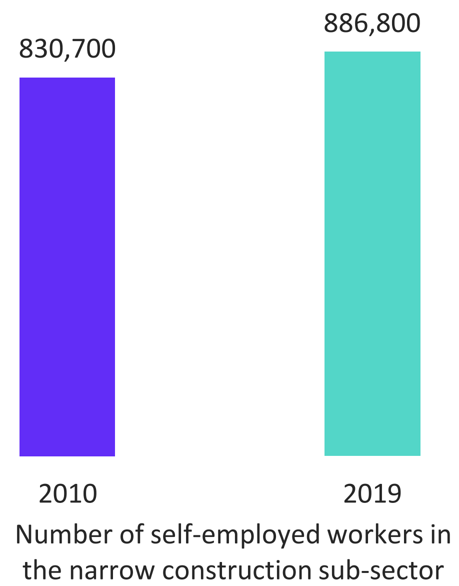
Figure 6: Percentage of people employed per construction sub-sectors in the UK in 2019



Source: Eurostat, 2020.

The number of **self-employed** workers in the narrow construction sub-sector increased from 830,700 in 2010 to 886,800 in 2019 (6.8%). This represents 19.8% of the self-employed workers in the general economy, well above the EU-27 average of 11.9%. Similarly, self-employed workers in real estate activities grew from 40,000 to 58,100 over the same period (+45.3%), representing only 1.3% of the self-employed workers in the general economy. This is slightly below the EU-27 average of 1.4% for 2019.

In parallel, **full-time employment** in the narrow construction sub-sector increased by 5.2% between 2010 and 2019, reaching 2,121,000 from 2,017,000 respectively. In contrast, a significant increase of 37.5% was recorded in the real estate activities sub-sector during the above period, reaching 279,000 in 2019 from 202,900 in 2010.



2

Macroeconomic indicators

Economic development

Since 2016, UK's economic growth has slowed down with its GDP amounting to GBP 2,045.7 billion (EUR 2,261.0 billion) in 2019 as compared to GBP 2,017.3 billion (EUR 2,229.6 billion) in 2018.

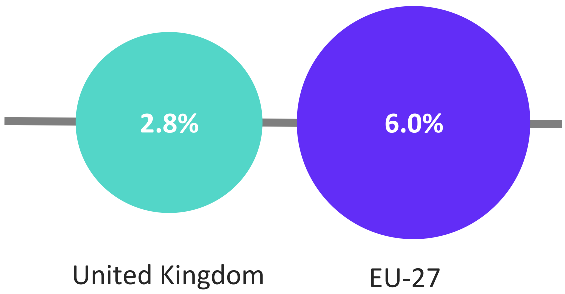
This is primarily due to a slow growth in private consumption, despite rising real wage. General investment also remained muted due to uncertainty over UK's future trading relations with the EU[24]. The **inflation rate** has been picking up since 2016, going from 0% in 2015 to 2.7% in 2017 and decreasing to 1.8% in 2019.

Demography and employment

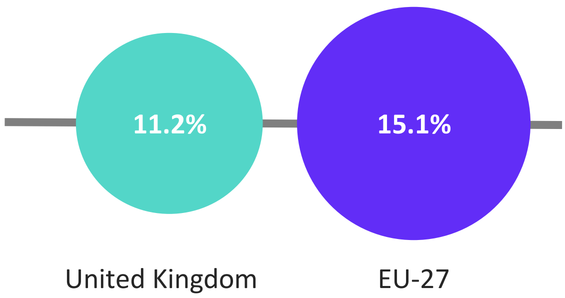
In terms of demographics, UK's **total population** reached 66.6 million in 2019, and is projected to increase to 70.0 million by 2031 (+5.1%) and to 72.4 million by 2043 (+8.7%). In parallel, net migration has been positive since 2000, with 265,000 people entering the country in 2019. UK's **working age population**, which made up 79.1% of the total in 2019[25] as compared to the EU-27 average of 64.6%, will shrink to 61.0% by 2043, while people aged 65 or older will make up 22.0% of the total[26]. Because of the ageing population, healthcare expenditure is expected to increase by 1.3 percentage points of GDP between 2013 and 2060[27]. According to National Health Service (NHS) and Institute for Fiscal Studies (IFS), spending on healthcare will rise by an average 3.3 % per annum over the next 15 years — and the increases will need to be front-loaded at 4% a year over the next five years in order to address the backlog of funding problems[28].

The **unemployment rate** reached 2.8% in 2019, below the EU-27 average of 6.0% and the lowest since 2002. Similarly, youth unemployment (below the age of 25) stood at 11.2% in 2019, below the EU-27 average of 15.1% and the lowest since 2005.

Unemployment rate in 2019



Youth unemployment rate in 2019



Public finance

In 2019, general **government expenditure** in the UK accounted for 41.0% of GDP, which was less than the EU-27 average of 46.7% of GDP, representing a significant decline since 2010 (47.4%). **General government deficit** in 2019 stood at -2.1% of GDP, well above the EU-27 average of -0.6% of GDP. General **government gross debt** accounted for 85.4% of GDP, well-above the EU-27 average of 77.8% of GDP. The relatively high deficit is mainly related to the increasing trade deficit as well as volatile trading linked to stockpiling activities ahead of the UK's withdrawal from the EU in March 2019, and subsequent unwinding[29].

Entrepreneurship and access to finance

According to the 2019 Global Competitiveness Report, the UK ranks 7th out of 141 economies in terms of overall financial system.

In fact, 'insurance premium volume to GDP', is the best performing indicator (5th), followed by 'venture capital availability' (10th), 'market capitalization' (12th), 'financing of SMEs' (16th) and 'domestic credit to private sector' (16th). In terms of stability of the financial system, the 'credit gap' was the best performance indicator (1st), followed by 'non-performing loans' (8th). Conversely, 'bank's regulatory capital ratio' and 'soundness of banks' scores were comparably worse (35th and 52nd respectively)[30]. The UK has achieved significant improvement in terms of bad debt loss as a percentage of total turnover. Although above the EU-28 average (1.7%), bad debt loss declined by more than half from 4.7% in 2017 to 2.2% in 2018[31].

According to the Survey on the Access to Finance of Enterprises (SAFE) Result 2019, only 5.7% of the respondent SMEs consider access to finance as the most problematic factor for doing business. About 75.0% of SMEs declared having applied for a loan and received the full requested amount, higher than the EU-28 average of 71.1%, while 7.5% of SMEs saw their application rejected, compared to 7.0% in the EU[32, 33].

As per the 2019 SBA Fact Sheet, UK's general score on 'Access to finance' is above the EU-28 average, being above average on five indicators and broadly in line with rest of the indicators[34].

The country implemented several measures to support businesses, such as the provision of an additional GBP 12.0 million (EUR 13.3 million) in 2017/2018 to local growth hubs, to enable them to support small businesses and help them grow. Women in Action is also a measure that seeks to invest GBP 200,000 (EUR 221,052) to encourage more innovation by women in sectors such as manufacturing, IT, enabling technologies and health and life sciences[35]. The New Business Basics Fund, introduced in 2018, is expected to give a boost of GBP 100 billion (EUR 110.5 billion) to the UK economy[36]. Moreover, the establishment of British Business Bank is also an important step in this direction. The BBB is a fully Government-owned bank working over 100 finance partners to improve lending conditions for smaller businesses[37].

Finally, the UK ranks 18th out of 190 economies in terms of **starting a business**, requiring four procedures to register a firm and taking 4.5 days to complete[38].

The UK government announced a further GBP 200.0 million (EUR 221.1 million) of support in 2019 for innovation for British businesses[39]. The government is also funding research and development through its Industrial Strategy Challenge Fund to support clean growth. it is also contributing GBP 505.0 million (EUR 576.0 million) over the 2015-2021 period through the Energy Innovation Programme to provide the private sector with ease of access to finance for developing low-carbon technologies[40].

3

Key economic drivers of the construction sector

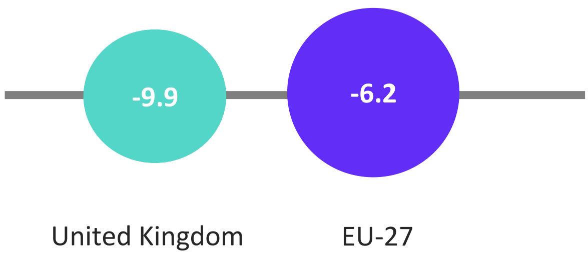
Business confidence

The **consumer confidence indicator** has been on a downward trend since 2015, falling to -9.9 in 2019, lower than the EU-27 average of -6.2. The **industry confidence indicator** has been fluctuating sharply since 2010 and recorded the worst performance, dropping to a negative territory of -11.0 in 2019 from 5.8 in 2018. This is significantly below the EU-27 average of -4.8 in 2019. Last, the **construction confidence indicator** also recorded a weak performance, ending at -8.4 in 2019 compared to -1.9 in 2018. This is in sharp contrast to the EU-27 average of 5.1 in 2019. This may be explained by the collapse of Carillon, which generated a significant number of bankruptcies down the supply chain.

Reflecting these trends, the **investment ratio** declined marginally to 16.8% compared to 16.9% in 2018 and 17.2% in both 2017 and 2016. This is still above the 2010 levels of 16.2%, but well below the EU-27 average of 21.7% in 2019.

However, **investment per worker** in the broad construction sector increased from EUR 66,826 in 2010 to EUR 68,851 in 2017[41]. In the narrow construction sub-sector, investment per worker increased from EUR 5,800 in 2010 to EUR 9,400 in 2017. In the real estate activities sub-sector, investment per worker increased comparatively less, from EUR 12,400 in 2010 to EUR 14,700 in 2017[42].

Consumer confidence indicator in 2019



Domestic sales

Between 2010 and 2018, there has not been a significant shift in ranking of the **most domestically sold construction products** in the UK except for 'Windows, French windows, etc.' being replaced by 'Tiles, flagstones, bricks, etc.'. 'Other structures, etc.' experienced a 39.6% decline in its value over 2010-2018 while 'Doors, windows, etc.' and 'Ready-mixed concrete' saw an increase of 58.5% and 71.2% respectively in their domestic sale value over the same period. Table 1 presents the top five most domestically sold construction products, both in the UK and the EU-27, which made up 41.1% of all UK construction product sales in 2018[43].

Table 1: 5 most domestically sold construction products in the UK and EU in 2018

	UK			EU-27
	Product	**Value (EUR m)**	**Share in construction product domestic sales (%)**	**Product**
1	Other structures, etc. (group 251123)	3,122.4	11.5	Other structures (group 251123)
2	Doors, windows, etc. (group 251210)	2,463.1	9.0	Doors, windows, etc. (group 251210)
3	Ready-mix concrete (group 236310)	2,180.0	8.0	Ready-mixed concrete (group 236310)
4	Tiles, flagstones, bricks, etc. (group 236111)	1,728.4	6.3	Prefabricated buildings of metal (group 251110)
5	Builders' joinery and carpentry of wood (group 162319)	1,715.6	6.3	Prefabricated structural components for building or civil engineering, etc. (group 236112)

Source: PRODCOM, 2020[44].

Export of construction-related products and services

The ranking of the **most exported construction products** has experienced slight variations since 2010 involving 'Bridges and bridge-sections of iron or steel' in 2010 being replaced by 'Windows, French windows, etc.' in 2018. The value of exports of 'Other structures and parts of structures' decreased by 53.5% over 2010-2018, whereas 'Doors, windows and their frames, etc.' and 'Prefabricated buildings of metal' experienced a 67.2% and 108.3% increase in export value respectively. The top five most exported construction products from the UK and the EU-27 are summarised in Table 2. Together, these made up 46.0% of all construction product exports in 2018[45].

Table 2: 5 most exported construction products in the UK and EU in 2018

	UK			EU-27
	Product	**Value (EUR m)**	**Share in construction product export sales (%)**	**Product**
1	Other structures, etc. (group 251123)	206.6	19.5	Ceramic tiles and flags (group 233110)
2	Prefabricated buildings of metal (group 251110)	93.3	8.8	Other structures, etc. (group 251123)
3	Doors, windows and their frames, etc. (group 251210)	76.5	7.2	Fibreboard of wood, etc. (group 162115)
4	Portland cement, aluminous cement, slag cement and similar hydraulic cements (group 235112)	60.9	5.8	Doors, windows, etc (group 251210)
5	Windows, French windows and their frames, doors etc. (group 162311)	49.2	4.6	Marble, travertine, alabaster, etc. (group 237011)

Source: PRODCOM, 2020[46].

In terms of cross-border provision of construction services[47], the UK exported EUR 1.1 billion to the EU-27 and 2.4 billion worldwide in 2018[48]. This represents an increase of 51.2% compared to EUR 1.6 billion exported to the world in 2010.

In parallel, it imported EUR 1.4 billion from EU-27 and EUR 2.4 billion worldwide in construction services in 2018, a 48.5% rise since 2010. The UK therefore reported a **trade deficit** of EUR 22.6 million in 2018.

Access to finance in the construction sector

Despite the reduction in the UK banks' lending operations after the economic crisis, there has been progress in the area of access to finance and in particular, over 2017-2018.

In 2017, the government merged British Business Bank (BBB) and the Start Up Loans Company together to provide improved access to finance for SMEs. Further, the government launched an online tool to enable SMEs to check when large businesses pay their suppliers. It also launched the Small Business Commissioner's website and the Small Business Commissioner's complaint-handling service to ensure fair payment practices for small businesses[49].

However, according to the National Federation of Builders (NFB), while access to finance in the construction sector has improved since 2010, it is still considered to be insufficient, especially for SMEs. The government has been supporting several initiatives such as the Funding for Lending Scheme (until January 2018) and Supply Chain Finance Scheme. The scheme helps small and local businesses secure financing and get paid earlier, and secures the supply chains of UK's biggest companies, thereby protecting thousands of jobs.

The **net annual lending** to construction companies amounted to GBP 31.6 billion (EUR 34.9 billion) in 2019, 32.6% above the 2010 level. Nevertheless, it has been declining since 2013 levels (GBP 52.3 billion). The Funding for Lending Scheme aims to encourage banks and building societies to lend more to households and businesses. Smaller house-builders in particular are facing funding issues. The high cost of land and difficulty in obtaining planning permission increases the up-front capital requirements for building dwellings, as well as the uncertainty over whether completed units can be sold[50]. Recently, the UK government adopted various initiatives to improve access to finance:

- the British Business Bank (BBB) launched a new interactive online Finance Hub offering independent information on finance options for scale-up, high-growth and potential high-growth businesses. It also includes the BBB's new Finance Finder that allows smaller businesses to explore and identify likely practical financing options[51].
- new provisions to allow small businesses to claim legal assistance against unfair contracts that stop them from raising money from unpaid invoices. Under the new laws, most of the contractual restrictions entered after 31 December 2018 will have no effect and can be disregarded by small businesses and finance providers[52].
- a EUR 1.17 billion (GBP 1.0 billion) loan financing facility from The Housing Delivery Fund, to support SME housing developers and speed up the final delivery of new homes across England. Loans ranging from EUR 5.8 million (GBP 5.0 million) to EUR 117.0 million (GBP 100.0 million) are made available for developers demonstrating required experience and commitment as well as a good track record of delivering challenging projects on time[53].
- trade bodies have been permitted to highlight the best and worst payment practices followed by large companies with market dominance. Innovative technologies are being promoted to assist small firms in managing their payment processes. Further, the UK government has also announced a commitment to pay 90.0% of undisputed invoices from SMEs within five days[54].

Some of the older schemes relevant to the construction sector include:

- the **Supply Chain Finance** scheme offering to release cash to the supply chain in advance of contracted payment terms. Large companies can notify their supplier's bank when an invoice has been approved for payment. The bank is then able to offer an immediate advance to the supplier at lower interest rates, knowing the bill will be paid. Major UK construction companies adopted this scheme, reporting a substantial number of adherents among their suppliers[55].
- the **Project Bank Accounts (PBAs)**, set up by the Cabinet Office to facilitate payments to the higher-tier contractors. The GBP 2.0 billion (EUR 2.4 billion) spent via PBAs have reached tier 3 contractors within five business days. Successful examples of PBA implementation include Highways England, the government-owned company managing motorways and major roads, which can serve as a best practice[56]. A cash retention (generally 3% or 5% of the value of the work completed) is withheld

by the client and is often not released at all or in a timely manner, which is a serious issue for many cash flow dependent SMEs.

Another successful funding initiative includes the **Home Building Fund**, a flexible funding source managed by the Homes and Communities Agency (HCA) and is open to small builders, community builders, custom builders and regeneration specialists. Loans ranging from GBP 250,000 (EUR 276,315) to GBP 250.0 million (EUR 276.3 million) are available, with smaller loans considered for innovative housing solutions and serviced plots for custom builders. The fund provides loan funding to convey the development costs of building homes for sale or rent (development finance)[57].

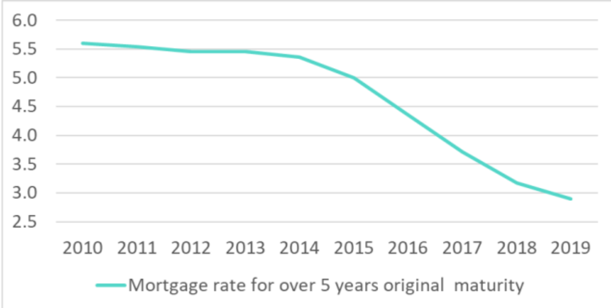
Access to housing

In 2018, 91.5% of the UK total population lived in cities and greater cities, adding to the existing pressure on the construction of residential housing in major cities like London.

In parallel, the **number of households** increased by 8.1% between 2010 and 2019, reaching 29.5 million in 2019. Moreover, the **mean equivalised net income** saw a 28.9% increment over 2010-2018, amounting to GBP 22,686 in 2018 (EUR 25,642), well above the EU-27 average of EUR 19,078.

Mortgage lending to households experienced a continuous growth after the crisis, with total **outstanding residential loans** increasing by 13.1%, from EUR 1,393.0 billion in 2010 to EUR 1,576.0 billion in 2018[58]. This revival is also due to plummeting **mortgage interest rates** (Figure 8), which reached a bottom-low of 2.9% in 2019. Nevertheless, the low interest rates and increasing lending may worsen the indebtedness situation of UK households. The average total debt per household including mortgage amounted to GBP 60,363 (EUR 66.716.8) as of January 2020. As per the Office for Budget Responsibility's March 2020 forecast, total household debt is expected to increase from GBP 2.1 trillion (EUR 2.3 trillion) in 2019-20 to GBP 2.4 trillion (EUR 2.7 trillion) in 2023-24. This would result in an average household debt of GBP 86,388 (EUR 95,481), a rise of 43.1% since January 2020. In addition, these forecasts may be worsened by the impacts COVID-19[59].

Figure 7: Mortgage rates for loans for over 5 years original maturity (%) between 2010 and 2019



Source: ECB MFI Interest Rate Statistics, 2020.

At the same time, residential construction activities have been picking up. In fact, the building of about 151,020 permanent dwellings had started in 2019, an increase of 36.5% compared to 2010 value of 110,660 and 10.0% decrease compared to 2018 value of 167,820[60]. Similarly, 178,800 dwellings were completed in 2019, representing a 67.5% and 8.8% increase compared to completions in 2010 and in 2018 respectively[61]. This increase of residential construction is also linked to the implementation and further extension of the UK Government's 'Help to Buy' scheme through to March 2023, which further boosts demand for new build.

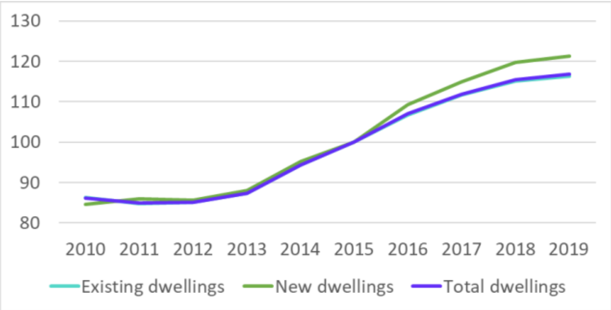
The UK faces a housing crisis despite fair social housing being defined as a priority by the government. As per Housing Charity Shelter, 1.2 million affordable homes would be required for younger families who cannot afford to buy or rent. In response, the government plans to build 250,000 homes by 2022, including homes for social rent[62].

According to a research by Heriot-Watt University, England has a backlog of 3.9 million homes, meaning 340,000 new homes need to be built each year until 2031 (including 90,000 for social rent), substantially higher than the government's current target of 300,000 homes annually[63].

The shortage is particularly predominant in Greater London and the South East (Kent, Surrey and Sussex), partly due to complex and costly planning permissions. Contributing to this crisis are the rising prices, outpacing the increase in disposable income[64]. Moreover, the housing cost in UK is predominantly linked to the price of the land with residential planning permission (70%) than to the value of building itself (30%)[65].

The UK property market has experienced a steady rise since 2013, with the **house price index** in the country increasing by 16.8% between 2015 and 2019 alone (Figure 7).

Figure 8: House price index in the UK between 2010 and 2019 (2015=100)



Source: Eurostat, 2020.

Real house prices rose by 0.8% in Q1 2020 compared to Q1 2019 which saw a decline of 1.4% during the above referred period. Some of the leading performers include Wales (4.6%) followed by Yorkshire and the Humber (2.6%) and North West (2.4%). Real house prices in London fell by 0.7% in Q1 2020 compared to Q1 2019[66].

House price index growth between 2015 and 2019 **16.8%**

Since 2010, UK's **home ownership rate** has declined, standing at 65.2% in 2018 compared to 70.0% in 2010. This rate increases to 69.1% for the population whose income is **above 60% of the median equivalised income** but drops to 47.6% for those below this threshold in 2018[67]. Conversely, the share of tenants has been increasing, from 30.0% in 2010 to 34.8% in 2018 (from 47.6% to 52.4% for the population below 60% of median equivalised income), as ownership becomes increasingly unattainable. In addition, housing affordability issues are also reflected by the **housing cost overburden rate**[68], which stood at 15.1% in 2018, above the EU-27 average of 9.6%[69]. Several actions are being adopted by the government to address the housing shortage and the issue of affordability (see Section 6 National and regional regulatory framework).

Nevertheless, the **overcrowding rate**[70] in 2018 stood at 4.8%, significantly below the EU-27 average of 17.1%[71]. Similarly, the **severe housing deprivation rate**[72] declined from 2.8% in 2010 to 1.9% in 2018, much below the EU-27 average of 4.0%[73].

Infrastructure

The UK ranks 11th out of 141 in terms of its infrastructure, according to the 2019 Global Competitiveness Report. In terms of electricity access, the country holds the 2nd position. It also ranks 6th and 9th in terms of airport connectivity and linear shipping connectivity respectively[74].

Meanwhile, it ranks 20th with regard to road connectivity, 21st in terms of efficiency of seaport services and 36th in terms of both quality of road infrastructure as well as efficiency of air transport services.

Currently, UK's infrastructure networks are under pressure with its rail, road and aviation networks reaching their capacity limit. Historically, the UK has often struggled to deliver timely and cost-effective infrastructure due to short termism, fragmented decision-making as well as complex and restrictive spatial planning system. The country has already started taking steps to cover the infrastructure deficit. In July 2018, the National Infrastructure Commission (NIC) published its long-term infrastructure needs assessment for the period 2018-2050. A full government response under ''National Infrastructure Strategy' is under consideration[75].

In 2018, an ambitious pipeline of infrastructural projects amounting to GBP 600 billion (EUR 684 billion) was announced by the government, which relied both on public and private funds (see section on TO 1 – Investment conditions and volumes). Post Brexit, access to European Investment Bank (EIB) funding will cease. It is estimated that this will have a large impact on the country's future construction pipeline as the EIB held an important role in funding UK projects in the past, particularly in infrastructure and funding projects based around less established technologies[76].

4

Key issues and barriers in the construction sector

Company failure

Company births in the narrow construction sub-sector increased by 80.9%, from 27,345 in 2010 to 53,285 in 2017[77], whereas the number of **company deaths** decreased by 14.6%, from 39,095 to 38,275. Similarly, the real estate activities sub-sector experienced a 76.8% increase in company births (from 8,180 in 2010 to 14,030 in 2017) and a 36.0% increment in deaths (from 7,145 to 12,980). Company births in architectural and engineering activities sub-sector also experienced a 74.7% growth, from 6,315 to 11,025 over 2010-2017 period, whereas company deaths also increased by 29.9%, from 6,475 to 12,545.

Company births in the narrow construction sub-sector over 2010-2017 ↑ **80.9%**

Company deaths in the real estate activities sub-sector over 2010-2017 ↑ **36.0%**

In 2019, the narrow construction sub-sector reported the highest number of new company **insolvencies** (3,227), a 7.5% increase compared to 2018[78]. This includes 1,113 companies in construction of buildings, 176 companies in civil engineering and 1,938 companies in specialised construction activities, representing a 16.4%, 6.7% and 3.1% increase compared to 2018 respectively. As for the real estate activities sub-sector, it recorded around 484 new company insolvencies in 2019, reporting an increase of 32.2% compared to 2018[79].

The UK broad construction sector is highly competitive with liquidity still being a challenge as banks try to reduce their exposure to construction and related sectors. Construction insolvencies reached a new record high in 2019. Legacy contracts continued to be the primary cause of most business failures due to low to almost negligible profit margins[80].

According to Atradius Market Monitor Construction 2020 report, construction insolvencies are expected to increase by 5-7% across all sub-sectors in 2020. This could increase even further if there is a serious downturn in future economic growth and investment projections[81].

According to the NFB, **bankruptcy** in the construction sector is relatively high because, to secure contracts in the years of economic downturn, UK companies were bidding at much lower prices for their work. Following the crisis, however, these companies could no longer cope with the rising costs of labour and materials. This is exacerbated by the late payments and retentions issues (as in the example of the Carillion collapse).

Trade credit

According to the Doing Business 2020 Report, the UK performed better than OECD high income countries average in terms of getting trade credit, ranking 37th out of 190 countries[82].

As per the Global Competitiveness Report 2019, the UK ranked 16th out of 141 countries in 2019 in terms of domestic credit to the private sector[83]. More than GBP 340 billion (EUR 382.1 billion) of UK trade is being covered by trade credit policies[84].

As per the SME access to finance of enterprises (SAFE) 2019 results, on average, about 41.9% of SMEs had applied for trade credit financing in the past six months, well above the EU-28 average of

31.7%. Amongst them, almost 81.4% of the applicants received financing assistance as requested[85]. Similarly, about 78.1% of the respondents SMEs consider trade credit availability to have remained unchanged, while 13.8% of the respondents consider it to have improved as compared to the EU-28 average of 70.7% and 15.2% respectively[86].

Nonetheless, UK's exit from EU followed by the collapse of Carillion has led to losses across the trade credit industry and is expected to raise UK trade credit insurance prices by 5% in the coming years[87].

Late payment

According to the D&B Payment Study 2020, about 54.9% of the companies in the broad construction sector make payment within due date whereas almost 2.7% of the total sector companies pay after 90 days past the due date[88].

The average payment period for the British construction sector is 90 days. Given the rise in payment delays and the high level of protracted payments, instances of late or non-payments are expected to increase further in the first semester of 2020[89].

According to the European Payment Report 2019, 32.0% of the surveyed companies with international payments reported currency issues negatively impacting international payment in the UK, almost double of the EU-28 average of 16.0%. Additional factors negatively influencing international payments include customer payment methods (30.0% as compared to 23.0% EU-28 average) and local payment culture (28.0% as compared to 26.0% EU-28 average)[90]. As per the report, the top three causes for late payments relate to 'debtors in financial difficulties', 'intentional late payment' and 'administrative inefficiency'[91].

According to the National Federation of Builders (NFB), the situation of late payments remains very challenging. This issue is emphasised by cash retention wherein a certain percentage (usually 3% to 5%) of the amount certified as due for payment to a contractor or a subcontractor, is retained by the client to ensure the contractor properly completes the construction works. The retention value accumulates during the work to cover additional costs of completing the works if the contractor fails to do. Half of the retention fund (generally 1.5% or 2.5% of the contract value) is held after handover to cover defects in an agreed maintenance period (generally one year) if the contractor does not rectify them. Retentions when not released, result in cash flow problems for contractors/ subcontractors.

A **Retention Deposit Schemes Bill** was introduced to UK Parliament on 9 January 2018 but has not been approved yet. The proposed bill is expected to safeguard cash retentions withheld in connection with construction contracts by ensuring that the retention amount is held in a third-party trust scheme[92, 93].

Last but not least, SMEs across sectors, have been impacted by late payments during COVID. This is the case in particular for the construction sector, where 38% to 50% of businesses reported an increase in payment delays[94].

Time and cost of obtaining building permits and licences

According to the World Bank's Doing Business Report 2020, the UK ranked 23rd (out of 190 countries) in terms of 'dealing with construction permits', a decline from 17th position in 2019[95].

Generally, nine procedures and 86 days are required to complete administrative formalities to build a warehouse[96], significantly below the OECD high-income average (12.7 procedures and 152.3 days respectively). Furthermore, the cost of completing all the formalities to build a warehouse represents 1.1% of the value of the warehouse, well below the OECD high-income average of 1.5%. In the UK, licensing requirements to work on construction projects vary locally. A specialised and licensed construction professional, the Approved Inspector (AI), is required to oversee construction projects. The hiring cost of an AI amounts in average to GBP 2,964 (EUR 3,276.0) (Table 3).

Table 3: Construction procedures timing and costs in the UK

Procedure	Time to Complete	Associated Costs
Obtain planning permission	56 days	GBP 8,012 (EUR 8,855.3)
Hire an Approved Inspector	1 day	GBP 2,964 (EUR 3,276.0)
Approved Inspector files the initial notice to the Local Authority	5 days	no charge
Apply for water and sewage connection	1 day	GBP 485 (EUR 536.1)
Receive inspection from the water and sewage provider	1 day	no charge
Submit application to local Fire and Rescue Authority and obtain approval	21 days	no charge
Obtain water and sewerage connection	20 days	GBP 5,321 (EUR 5,881.1)
Request and receive energy performance certificate from Accredited Energy Assessor	1 day	GBP 78 (EUR 86.2)
File completion certificate with the Local Building Control Department	1 day	no charge

Source: Doing Business overview for the UK, World Bank, 2020.

Skills shortage

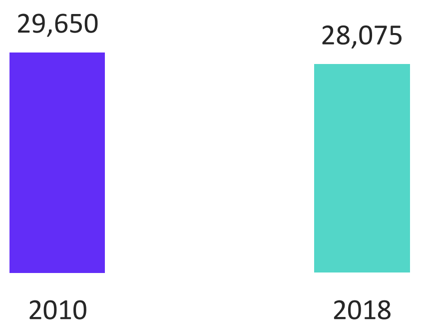
The number of job vacancies in the narrow construction sub-sector reached 26,500 in 2019, representing a substantial 152.4% increase compared to 10,500 in 2010.

Job vacancies in the real estate sub-sector grew by 80.0%, from 6,250 in 2010 to 11,250 in 2018, although still lower than its peak value of 12,000 in 2015.

Nevertheless, the **number of tertiary students graduating in engineering, manufacturing and construction**, and specifically in architecture and building, decreased by 5.3% over 2010-2018, from 29,650 to 28,075. Moreover, **adult participation in education and training** in the narrow construction sub-sector went down from 19.1% in 2010 to 17.1% in 2019, well below the peak of 20.6% in 2008. In real estate activities, adult participation in education and training fluctuated, initially growing from 22.5% in 2008 to 28.4% in 2010, but subsequently declining to 15.5% in 2019.

Number of tertiary students in engineering, manufacturing and construction, especially in architecture and building over 2010-2018

5.3%



Number of tertiary students in engineering, manufacturing and construction, primarily in architecture and building

The UK construction sector suffers from skilled labour shortage which is hindering its overall growth. As per the Royal Institute of Chartered Surveyors (RICS), the shortfall in skilled construction workers is currently at the highest point since 2007. RICS estimates that at least 200,000 new workers need to be recruited by 2020 to even be on the track announced by the government[97].

As per 2011 UK census, one out of every five construction employees were over 55 years of age. This implies that by early 2020s, almost 20.0% of the construction workforce will have already reached or be close to retirement age, creating a serious labour shortage situation for the sector[98].

According to estimates, almost 157,000 jobs will need to be filled by 2021[99]. As per the Construction Industry Training Board (CITB), 400,000 skilled workers will reach retirement age in the next ten years[100]. Particular shortages have been observed for professions such as scaffolders, logistics personnel and plant operatives[101]. These trends also imply an annual need of approximately 4,860 non-construction professionals (e.g. IT, technical and office-based staff), 3,420 other construction process managers, 2,380 wood trade professionals, 1,900 plumbing and HVAC trades, 1,420 surveyors and 1,400 senior executives/process managers[102]).

As per Skills Panorama forecasts, future employment growth in the country's broad construction sector for the period 2018-30 is expected to grow by 0.8%, below the EU-28 average of 4.3%.[103].

The sector is facing several issues including relatively ineffective education and training systems for basic and technical skills, slow career progression, low employee productivity and a negative perception of the industry among youngsters often considering it as old-fashioned and unappealing.

UK's exit from the EU Single Market is mostly likely to further worsen the current skill shortage for the construction sector, particularly if no follow-up agreements on free movement of people is enacted with the EU[104]. According to the National Federation of Builders (NFB), overall there is an annual need of 33,700 skilled workers between 2019 and 2023 to bridge skills shortage gap.

Several initiatives have been taken by the UK to tackle these issues (see Section 6 National and regional regulatory framework). However, some of the existing training initiatives do not place sufficient importance on civil engineering skills and are too focused at the local level. Additionally, the construction training mostly focuses on a specific trade skill rather than developing long-term careers, including development and upskilling. There is a growing importance of digital skills among construction workers. CITB aims to develop digital competencies for various roles by way of both structured training and continuous learning.

Sector and sub-sector specific issues

Material efficiency and waste management

In 2016[105], the UK generated 136.2 million tonnes of construction, demolition and excavation waste (CDW), comprising 61.0% of the total waste generation (222.9 million tonnes)[106].

In particular, non-hazardous CDW amounted to 66.2 million tonnes in 2016, 33.7% above the 49.5 million tonnes reported in 2010. Of these, 60.2 million were recovered, achieving a **recovery rate** of 91.0%, an improvement compared to 2010 (87.6%) and significantly above the 70% target imposed by the EU for 2020[107]. The total waste from household generation was 26.4 million tonnes in 2018 for UK. This shows decrease of 1.8% from 26.9 million tonnes in 2017. The recycling rate of waste from households in 2018 was 45.0% for the UK. England is responsible for most of the waste from household, generating 22.0 million tonnes (83% of the UK's total) in 2018. Wales contributed the highest in the recycling rate with 54.1%. Waste from household generation has decreased for the last two years in UK as a whole[108].

The 'Construction Commitments: Halving Waste to Landfill' is a voluntary agreement undertaken by construction companies. It recommends the adoption of such guidelines by all UK construction clients and contractors. Namely, data should be collected for all projects with a value of GBP 300,000 (EUR 331,578) or more, as this is the threshold for the legal requirement for a construction site waste management plan in England[109]. In addition, the UK have used incentives like landfill taxes and levies on virgin aggregate to decrease the amount of CDW sent to landfill[110].

Climate and energy

Emissions of greenhouse gases (carbon monoxide and dioxide, methane and nitrous oxides) from construction and real estate activities in the UK amounted to a total of 12.5 million tonnes and 661,971 tonnes in 2018[111] respectively. Emissions in the construction sub-sector increased by 9.0% during the period 2010-2017 whereas the real estate sub-sector experienced a decrease in emissions by 0.8%.

There has been a decrease in few greenhouse gases in 2018 from previous year. This decrease can largely be attributed to a change in the fuel mix for electricity generation, with less use of coal and gas and increased usage of renewables[112].

The current gap in as-built energy and carbon performance of buildings, i.e. the difference between the designed performance and the one physically achieved by the completed building, undermines the UK's capacity to meet the objectives of the national carbon reduction plan.

5

Innovation in the construction sector

Innovation performance

According to the European Innovation Scoreboard 2020, the UK is regarded as a Strong Innovator, with its innovation scoreboard performance is 20.9% above that of the EU in 2019[113].

The country performs above the EU-27 average for most dimensions and its relative strengths are in Employment impacts, Attractive research systems and Human resources. On the contrary, its relative weaknesses are in Intellectual assets, Innovation-friendly environment and Firm investments.

Business enterprise R&D expenditure (BERD) in the broad construction sector increased by 314.3% over 2010-2017 period to reach EUR 2.9 billion in 2017 (Figure 9).

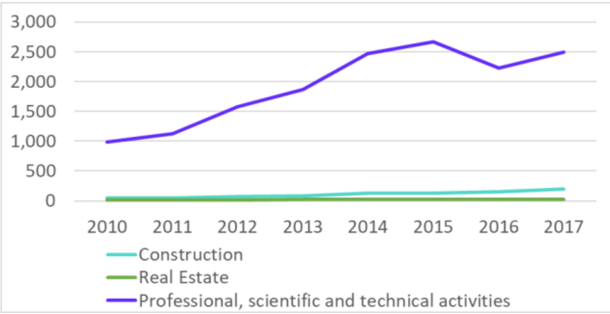
Namely, the greatest increase in BERD was recorded by the narrow construction sub-sector, which experienced a 334.6% soar between 2010 and 2017[114], from EUR 44.3 million to EUR 192.5 million. Similarly, BERD in professional, scientific and technical activities increased by 151.8%, from EUR 990.6 million in 2010 to EUR 25 billion in 2017. BERD in real estate activities also followed a similar trend, growing by 78.1%, from EUR 11.7 million in 2010 to EUR 20.8 million in 2017, the lowest across all sub-sectors.

Moreover, the annual average number of **construction-related patent applications** has been fluctuating over 2010-2019. In fact, over 2010-2015, an average of 310 patents were filed in the European Patent Office (EPO) and United States Patent and Trademark Office (USPTO) with the year 2015 reporting the highest number of applications (325), highlighting the focus of the UK construction sector on research and development. However, from 2016 the annual average number of construction-related patent applications has been decreasing to 293 in 2018 and 301 in 2019.

BERD in the narrow construction sub-sector between 2010 and 2017 **334.6%**

BERD in professional, scientific and technical activities between 2010 and 2017 **151.8%**

Figure 9: Business enterprise R&D expenditure (BERD) per construction sub-sector in the UK between 2010 and 2017[115] (EUR m)



Source: Eurostat, 2020.

In parallel, the total **R&D personnel** (full-time equivalents – FTE[116]) in the broad construction sector also experienced a growing trend. In line with the positive evolution of the BERD, the narrow construction sub-sector reported the highest FTE, which grew by 671.2%, from 416 in 2010 to 3,208 in 2017[117]. Likewise, the professional, scientific and technical activities saw a 129.1% increment in FTE, from 9,260 in 2010 to 21,216 in 2017. The total FTE in the real estate activities sub-sector also soared by 93.9% during the same period, from 196 in 2010 to 380 in 2017[118].

Number of FTE in the narrow construction sub-sector between 2010 and 2017 **671.2%**

In line with the above, the UK is undertaking significant research activity in the construction sector. In January 2019, the UK Research and Innovation (UKRI) announced four new research projects which will speed up assembly, save money, and improve the quality of UK building projects. It also announced GBP 13.3 million, to finance 24 collaborative research and development projects, delivered by Innovate UK, in the construction sector[119].

The Construction Innovation Hub (CIH) consists of a consortium including Manufacturing Technology Centre (MTC), the Buildings Research Establishment (BRE) and the Centre for Digital Built Britain (CDBB) at the University of Cambridge. It is funded by UKRI through the Industrial Strategy Challenge Fund[120].

The Hub supports collaboration across sectors and with businesses of all sizes. It supports governmental organisations, universities, technology partners and RTOs, to develop, commercialise and promote digital and manufacturing technologies for the construction sector[121].

In this regard, the UK government, in December 2019, announced its plans to accelerate public R&D funding, with more focus on high-risk, high-payoff research in emerging fields, a fast-track immigration scheme and minimizing bureaucracy in research funding. However, performing on these proposals and increasing R&D investment intensity to 2.4% of GDP by 2027, will be challenging[122].

In terms of R&D investment in the UK, it currently remains concentrated in limited number of companies and territories. The South East, the East of England and London regions have taken majority of total UK research and innovation activity[123].

In view of the ongoing COVID-19 pandemic, many construction companies in the UK are being encouraged to apply for Credit for Increasing Research Activities (R&D tax credit) than ever before to realise significant savings in the innovation process. This may help them improve their liquidity through immediate cash savings.

The R&D tax credit is an incentive created to support firms to invest in developing new or improved processes, techniques and products[124].

According to HMRC statistics, 1,790 claims, amounting to GBP 90.0 million, for R&D tax credit have been made by the construction companies. This makes the construction sector one of the least involved in this initiative[125].

Eco-innovation and digitalisation

According to the 2018 Eco-Innovation Scoreboard (Eco-IS)[126], the UK stood at the 9th place with a score of 110, in comparison to the EU-28[127] average of 100.

In the **European Commission Digital Economy and Society Index (DESI) 2020**, the UK is ranked 8th out of EU-28 countries. With a 60.4 score, the UK stands above the EU-28 average score of 52.6[128].

The UK performs well in terms of 'Use of internet services' and 'Integration of digital technology', holding the 5th (score 73.3) and 8th (score 54.2) positions respectively. Nonetheless, it scores 70.8 in 'Digital public services', slightly below the EU-28 average of 72.0[129].

The Royal Institute of British Architects (RIBA), Chartered Institute of Building (CIOB) and Royal Institution of Chartered Surveyors (RICS) launched a free-to-download digital tool on 9 October 2018 – 'the Quality Tracker', to improve the quality of outcomes in the construction sector.

The Quality Tracker provides a constant reminder of quality targets throughout the construction project process. The Tracker sets up a formal 'chain of custody for quality' aligned to the RIBA Plan of Work. This enables project team members to better understand their risks. It improves collaboration, increases transparency, and averts disputes even when project teams grow and change. It facilitates clients to exhibit their commitment to quality and serves as market differentiator. The tracker, in the long run, would boost the broad construction sector's reputation by ensuring better quality buildings, improved human health, safety and well-being[130].

The government has defined a **Building Information Modelling (BIM) strategy** to develop digital techniques in construction and improve its transformative potential, particularly related to recycling infrastructure and CDW valorisation[131].

The UK BIM strategy, mentioned in the "Digital Built Britain 2011-2016" and "Digital Built Britain–Level 3 2016-2020" aim to foster the use of BIM in public construction, by requiring companies working on public sector projects to achieve BIM Level 2 in 2016 BIM Level 3 in 2020.

The **National Productivity Investment Fund** foresees investments of GBP 4.7 billion (EUR 5.2 billion) to enhance UK's position as a world leader in science and innovation across numerous areas, including robotics, artificial intelligence and industrial biotechnology[132]. In 2018, the government extended the NPIF until 2023-2024, raising funds to a total of GBP 37.0 billion to support investment in areas that are essential to boost productivity, such as transport, digital communication, research & development and housing[133].

The 2017 industrial strategy challenge fund (ICSF) launched by the Department for Business, Energy and Industrial Strategy (BEIS) was allocated GBP 1.7 billion of investment until 2018. This includes GBP 725 million (EUR 813 million) investment in a challenge fund to encourage innovation, and a series of announcements about infrastructure, skills and business environment developments over the next three years. An investment of GBP 170.0 million coupled with GBP 250.0 million of private sector investment (i.e. a total of GBP 420 million) is dedicated to improving the construction sector, trainings on upskilling the people of the sector and new construction products, technologies and techniques[134].

In July 2018, the government launched its **Construction Sector Deal**, which outlines the government's intended route for improving productivity in the construction sector[135]. It intends to raise total research and development (R&D) investment to 2.4% of GDP by 2027 and invest GBP 725 million in new Industrial Strategy Challenge Fund programmes to capture the value of innovation. In the Autumn Budget 2018, the government increased the rate of R&D tax credit to 12.0% with effect from January 2018.

Additionally, the sector is characterised by specialists in narrow fields, with limited business relationships with clients and fellow professionals in other related areas. This limited collaboration also stems from the nature of construction project management and procurement, based on breaking down projects into smaller packages and components to ensure low bidding prices and control suppliers, which is not conducive to innovation. This also negatively affects knowledge transfer.

6

National and regional regulatory framework

Policy schemes

The comprehensive policy strategy for the construction sector, the **Government Construction Strategy 2016-2020**, was introduced by the Infrastructure and Projects Authority in March 2016. The Strategy outlined the government's plan to increase productivity in government construction, ultimately achieving efficiency savings worth GBP 1.7 billion (EUR 2.0 billion) and provide support to 20,000 apprenticeships[136]. It covers a variety of areas in the construction sector, from skills to environmental protection. Its main objectives are:

- i) the improvement of the central government's capability as the largest single construction client;
- ii) integrating and increasing the use of digital construction processes (e.g. BIM);
- iii) fostering smarter procurement; promoting fair payment; and iv) reducing carbon emissions from construction, operation and maintenance of public sector buildings and infrastructure[137].

The government has proposed to create a UK Shared Prosperity Fund (UKSPF) to tackle inequalities between communities by raising productivity, with a greater focus on those regions, whose economies are furthest behind the rest of the country[138]. The UKSPF is considered as a replacement for the EU structural funding, which the UK received currently approximately EUR 2.4 billion every year. After Brexit, this fund would be used to boost businesses, employment and agriculture[139].

It declared that 400,000 affordable housing units would be delivered by 2020-21, including 8,000 accessible homes for the disabled and the elderly[140]. So far, 222,000 new homes have been delivered in 2017 and 2018. This has brought the total count of affordable homes delivered since 2010 to 1.3 million[141].

In 2018, the government added GBP 500.0 million (EUR 566.0 million) to the **Housing Infrastructure Fund,** which is now worth GBP 5.5 billion (EUR 6.2 billion), aiming to support the construction of 100,000 homes by 2021. The government also committed GBP 1.4 billion (EUR 1.6 billion) to help local authorities and housing associations build 40,000 affordable homes for purchase or rent[142]. Moreover, given the particularly acute shortage in Greater London, the government will allocate GBP 3.2 billion (EUR 3.5 billion) to the Greater London Authority for the construction of over 90,000 dwellings by 2021[143]. In addition to the Housing Infrastructure Fund, there is an additional support in the form of bank guarantees. The British Business Bank aims to provide guarantees supporting up to GBP 1.0 billion (EUR 1.1 billion) of lending to SME house builders through its new scheme[144].

Furthermore, in its Autumn Budget 2018, the government abolished the Housing Revenue Account borrowing caps. This would allow local authorities to borrow freely to build more homes in their area, in line with the Prudential 15 Code. This has enabled councils to deliver a new generation of council housing – up to an estimated 10,000 homes a year[145].

The **Help to Buy: Isa (Individual Savings Account)** scheme**,** launched at the end of 2015 and subsequently extended till March 2023, is an affordable home-ownership initiative for first-time buyers and it offers a tax-free savings account and government bonus. The ISA can be opened till November 2019 and contributions to such account can be made until November 2029. The bonuses would have to be claimed till December 2030. Through the **Help to Buy: Equity Loan**, the Government lends up to 20% of the cost of the newly built property to be purchased (the maximum purchase price being set at GBP 600,000), requiring the beneficiary to provide a 5% cash deposit and a 75% mortgage to make up the rest.

Finally, the **Help to Buy: Shared Ownership** scheme allows buyers to purchase a 25-75% share of a newly built home or an existing one and pay rent on the remaining share, provided their annual salary does not exceed GBP 80,000 (GBP 90,000 in London)[146]. 135,000 new shared ownership homes will be built up until 2021. Following this, the UK government decided to extend the Help to Buy equity loan would be extended by two years, to 2023, in a constrained format, only available for first-time buyers and with caps on the maximum house price that differ by region[147].

In 2018, the government announced a major **overhaul to the National Planning Policy Framework** to meet the housing demand. The approach is focused on providing a comprehensive approach for planners, developers and councils to build more homes, more quickly and in the diverse areas with the greatest housing need[148].

In May 2018, the UK Government launched the Buildings Mission under the Clean Growth Grand Challenge with the aim to reduce the energy consumption of new buildings by at least 50.0% by 2030. It also aimed to reduce the cost of retrofitting efficiency measures in existing buildings and ensure buildings are heated by clean energy sources.

It is expected that over GBP 400.0 million (EUR 442.1 million) will be invested in new construction products, technologies and techniques over the lifetime of this project[149].

In order to increase the supply of housing stock in the country, the UK government started implementing initiatives outlined in the February 2017 Housing White Paper along with necessary adjustment and reforms. Cumulatively, these steps would provide more than GBP 44.0 billion (EUR 48.6 billion) in financial support till 2022-2023 and would further streamline planning rules. The government has already committed more than GBP 29.0 billion (EUR 32.1 billion) funding under its Help to Buy Equity Loan scheme from April2013 to March 2023 with the aim to support up to 470,000 households into home ownerships[150].

In its March 2020 budget, the UK government announced a number of initiatives and funding programmes to help the construction sector and provide affordable housing options to its citizens in the midst of the COVID-19 pandemic. These include[151]:

- extension of the Affordable Homes Programme to March 2022 including a new, multi-year settlement of GBP 12.0 billion (EUR 13.3 billion). This is expected to bring in an additional GBP 38.0 billion (EUR 42.0 billion) in public and private investment
- allocation of more than GBP 1.0 billion (EUR 1.1 billion) from the Housing Infrastructure Fund to build about 70,000 new homes in high-demand areas across the UK
- allocation of GBP 650.0 million (EUR 442.1 million) to help rough sleepers avail permanent accommodation
- allocation of GBP 400.0 million (EUR 718.4 million) to help rough sleepers avail permanent accommodation
- reforming the New Homes Bonus (NHB) to incentivise greater delivery and higher access to funding
- additional investment of GBP 1.1 billion (EUR 1.2 billion) in local infrastructure to fund key schemes including supplying 70,000 new homes
- establishment of a new GBP 10.0 billion (EUR 11.1 billion) Single Housing Infrastructure Fund
- cutting the cost of new homes through the new First Homes scheme. It is estimated that this will lower the cost by an average of GBP 70,000 for eligible first-time buyers

By March 2020, almost GBP 4.0 billion (EUR 4.4 billion) has been allocated by the UK government, through the Housing Infrastructure Fund (HIF), to support construction of up to 340,000 new homes[152].

Additionally, the Scotland government has announced an investment of GBP 3.3 billion (EUR 3.6 billion) in affordable housing to deliver its targeted 50,000 affordable homes inclusive of 35,000 homes for social rent by 2021. With regards to Wales, a second phase of the Help to Buy – Wales scheme is still underway and is aimed at supporting the construction of over 6,000 additional new homes. It is expected to attract an investment of GBP 290.0 million (EUR 320.5 million) until 2021[153].

Further, the UK government has also announced a GBP 3.2 million (EUR 3.5 million) in emergency funding for local authorities to support rough sleepers and other vulnerable homeless people during the COVID-19 pandemic[154].

Building regulations

As per the National Federation of Builders (NFB), most of the revision of building regulations had been completed in 2010 and thus there are no changes since then.

Due to its administrative organisation, there are three different building regulatory regimes in the UK: England and Wales, Scotland and Northern Ireland. In England and Wales, the departments for communities and local government are responsible for building regulations, while planning and building control are the responsibility of local authorities. In terms of building enforcement, the regime in England and Wales has four main stages of approval. Approvals are carried out either by local authority inspectors or by approved inspectors.

The Building Regulations include detailed provisions on aspects such as control of building works; notices, plans and certificates; energy efficiency requirements; and water efficiency, among others[155]. Moreover, the Building Regulations are supported by a series of **Approved Documents**, which cover technical topics such as fire safety; site preparation and resistance to contaminates and moisture; ventilation; sanitation, hot water safety and water efficiency; and protection from falling, collision and impact, among others[156]. However, in the wake of the Grenfell Tower fire accident in 2017, the independent report revealed that the whole system of Building Regulation in the UK is "not fit for purpose", contains confusing rules and a lack of enforcement, which means construction companies are able to abuse the system[157]. Consequently, the independent **Review of Building Regulations and Fire Safety** examined the building and fire safety regulatory system with the key focus on residential buildings. The recommendations of the review set out a new regulatory framework to create a more simple and effective mechanism for driving building safety, to give more robust oversight of duty holders with incentives for the right behaviours, and effective sanctions for poor performance and to reassert the role of residents[158].

The **Construction Design and Management Regulations 2015** helps to improve health and safety in the construction sector. The CDM Regulations require sensible planning of the work so that the risks involved in construction are managed from end to end. The regulation details the cooperation and coordination of work with others, effective communication of information to those who need to know, have the right information about the risks and how they are being managed. It requires employers to consult and engage with their workers about the risks they face and how they are being managed[159].

On 7 February 2020, the Ministry of Housing, Communities and Local Government (MHCLG)'s consultation on its proposals for a new Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings closed. The Standard objectives include improving energy efficiency in dwellings in England by 2025 by requiring new-build homes to be future-proofed with low carbon heating and high levels of energy. In this regard, the MHCLG has also published a 'National Design Guide' which outlines its expectation from new developments[160].

Some of the initiatives announced in March 2020 Budget relating to housing regulations include[161]:

- reviewing the formula for calculating Local Housing Need (LHN) to encourage greater building within and near to urban areas
- introduction of new permitted development rights for building upwards on existing buildings by summer 2020 and to deliver new and bigger homes
- requirements for all local planning authorities to have up-to-date local plans by December 2023
- introducing a new Future Homes Standard (FHS) from 2025, requiring up to 80% lower carbon emissions for all new homes

Insurance and liability-related regulations

In England and Wales, all contractors are required to take out **Employer's Liability Insurance (EL)**, covering loss, damage, injury or disease caused to an employee of the company. The policy must cover the employer for at least GBP 5.0 million and come from an authorised insurer. Failure to do so is a criminal offence and an employer can be fined up to GBP 2,500 per day in the case of not properly insuring employees or fined up to GBP 1,000 if they fail to display the EL certificate or refuse to make it available to inspectors when asked[162]. Contractors must also take out public liability insurance if external parties (e.g. general public or customers) visit the construction site, so as to be covered in the case of injury to person or damage to property. Professional indemnity insurance (PI) covering negligence is also often taken out by contractors performing design works, although it is not compulsory. Similarly, all professional consultants who design and/or give professional advice are often required to have PI insurance as stipulated in building contracts. Additional insurances, such as contractor's all risk cover (CAR) and product liability insurance that covers risks caused by products like bricks, are also common among contractors[163]. The time limits regarding legal action in relation to construction defects are mainly defined by the Limitation Act 1980. Limitation periods can amount to six or 12 years[164]. Moreover, **contractors' all-risk insurance** (sometimes referred to as "contract works insurance") is a policy that covers all risks usually associated with a construction project, i.e. the cost of unforeseen lost or damage to building works. Such insurance is issued under the joint names of a contractor and a principal client and protects against machinery movement, public liability, business interruption, equipment erection mentioned to a few[165]. Similarly, a **collateral warranty** is a legally binding agreement which is ancillary to a separate contractual agreement between two parties and which forces an extended duty of care and a broader liability on those parties. Such a warranty effectively accommodates a duty of care to be extended by a contracting party to a third party that is not party to the original contract[166].

In order to improve the distribution of risks along the construction supply chain and therefore protect smaller contractors, the **Integrated Project Insurance – IPI** has been introduced, bringing about collective responsibility of all the actors involved in the construction process[167]. Thus, firms participating in a construction project sign up to a new alliancing contract, under which they are jointly liable.

The terrorism insurance remains a 'stand-alone' insurance obtained in addition to a conventional buildings or commercial combined policy. It covers material damage caused by an act of terrorism and is particularly relevant for building projects located in high-risk terrorist areas such as the City of London[168].

7

Current status and national strategies to meet Construction 2020 objectives

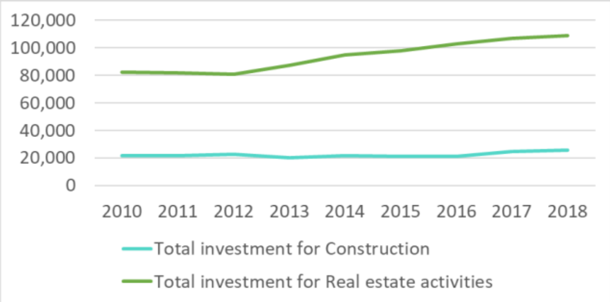
TO 1 – Investment conditions and volumes

Total **investment by the broad construction sector**[169] has generally been fluctuating over the past years (Figure 10). Investment by the real estate activities sub-sector increased by 32.2% between 2010 and 2018[170], reaching its peak value in 2018. Investment by the narrow construction sub-sector[171] has been fluctuating over 2010-2018, totalling EUR 25.4 billion in 2018, an increase of 18.1% compared to 2010. In terms of investment in intangible assets (including intellectual properties), the narrow construction sub-sector invested EUR 1.1 billion in intellectual property products in 2018, whereas the real estate activities sub-sector invested EUR 652.2 million, the highest since 2000.

Investment by the real estate activities sub-sector between 2010 and 2018 ↑ **32.2%**

Investment by the narrow construction sub-sector between 2010 and 2018 ↑ **18.1%**

Figure 10: Investments by the UK broad construction industry between 2010 and 2018 (EUR million)



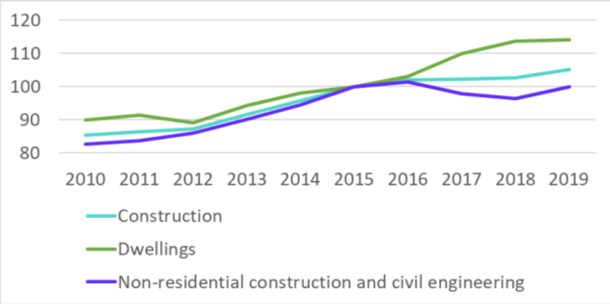
Source: Eurostat, 2020.

Total **investment in broad construction sector**[172] has been experiencing a recovering trend since 2010, reaching a growth rate of 23.1% for the 2010-2019 period (Figure 11). Nonetheless, the UK's exit from the EU Single Market coupled with the impact of COVID-19 on the country, is likely to result in a negative impact on the broad construction sector prospects in the short to medium term.

Investment in dwellings by the whole economy in 2019 exceeding the 2010 level by 26.7%. Similarly, investment in non-residential construction and civil engineering went up by 20.9% in 2019. In absolute terms, investment in dwellings and in non-residential and civil engineering by the whole economy in 2018 amounted to EUR 92.7 billion and EUR 134.3 billion respectively[173].

Total investment in the broad construction sector between 2010 and 2019 ↑ **23.1%**

Figure 11: Investment index in the UK construction sector between 2010 and 2019 (2010=100)



Source: AMECO, 2020.

The total inland infrastructure[174] investment, as a share of GDP, remained relatively stable and stood at 1.0% in 2017[175].

However, investment in rail infrastructure in the UK increased by 114.7% between 2010 and 2018, from EUR 6.4 billion to EUR 13.7 billion[176]. Likewise, investment in rail maintenance increased by 209.8% over 2010-2018[177]. Similarly, the country saw a 34.2% growth in its road infrastructure investment over 2010-2018, from EUR 6.5 billion to EUR 8.7 billion[178]. In contrast, investment in road maintenance decreased considerably by 39.8% over 2010-2018, from EUR 3.9 billion to EUR 2.4 billion[179].

Total **household renovation spending** stood at EUR 3.5 billion in 2018[180] in absolute terms, and at 0.2% of total household disposable income. Since 2010, renovation spending as a share of household disposable income has remained constant.

The government in its autumn 2018 budget announced extension of the **National Productivity Investment Fund (NPIF)** until 2024 and expanded it to a total of GBP 37.0 billion (EUR 40.9 billion). This fund includes infrastructure investments of over GBP 5.9 billion (EUR 6.5 billion) to improve transport networks and address congestion, GBP 740 million (EUR 817.9 million) to support the roll-out of full-fibre connections and future 5G communications, and GBP 5.5 billion (EUR 6.1 billion) to support the construction of new homes[181].

A complete response in the form of a National Infrastructure Strategy has been delayed by the UK government and is expected to be published alongside the 2020 Budget[182].

The **Housing Infrastructure Fund (HIF)**, which is part of the NPIF has a budget of GBP 5.5 billion (EUR 6.1 billion) to fund vital physical infrastructure projects, including the building of roads, bridges, energy networks and other utilities, new schools, healthcare centres and digital infrastructure to accommodate growing communities and alleviate pressure on public services[183].

In 2018, the **National Infrastructure and Construction Pipeline (NICP)**[184] commenced GBP 600.0 billion (EUR 651.5 billion) of public and private investment projects planned across the UK over the next decade. The government also announced its plan to not enter into any new Private Finance Initiative (PFI) contracts for the delivery or maintenance of infrastructure and public services on the grounds that the PFI model is inflexible and too complex. To ensure that the government meets market needs, it would review its support for infrastructure finance[185]. Around GBP 225.0 billion (EUR 248.9 billion) of currently planned investment in the pipeline will be delivered after 2020-2021. It comprises major ongoing investment projects that will be delivered over a number of years, such as Thames Tideway Tunnel, Hinkley Point C and the A14 Cambridge to Huntingdon improvement scheme as well as investment programmes in electricity generation and rail infrastructure.

Furthermore, 13 projects in the housing and regeneration sector (GBP 14.5 billion, i.e. EUR 16.0 billion) and 21 in science and research (GBP 4.9 billion, i.e. EUR 5.4 billion) are also planned by the government. Within the transport sector, GBP 50.3 billion (EUR 55.6 billion) will be specifically invested in the development of the High-Speed Rail, GBP 38.8 billion (EUR 42.9 billion) in other rail projects and GBP 8.2 billion (EUR 9.1 billion) in roads[186]. About 40.0% of the NICP projects will be delivered owing to government investment, with the rest relying on private investment. To this end, the government also published a funding and finance supplement to help attract further private sector investment into some of the NICP's most important infrastructure projects[187].

With regard to transport, the performance of UK's rail system improved in 2019 after some issues in 2018 due to train operating companies experiencing extensive delays and cancellations. Some of the major rail schemes and projects have over budgeted and fallen behind schedule. The new 'Crossrail' underground link connecting east and west London with its surrounding area, has been further delayed in 2019 and is not expected to become operational before 2021. Additionally, its actual cost is expected to be about GBP 18.3 billion (EUR 20.2 billion), an increase of more than GBP 2.0 billion (EUR 2.2 billion) above the original budget. Further, after a series of cost increases and contracting problems, the UK government finally gave a go-ahead with construction of the new 'High Speed 2' rail service in February 2020. But it is also expected that the cost of the whole project would cross its current estimate of GBP 88.0 billion (EUR 97.3 billion)[188].

To facilitate infrastructure financing and delivery, the **UK Guarantees Scheme**, which issues Treasury-backed infrastructure bonds, was extended to at least 2026, to boost investor confidence[189]. The government is also consulting with the construction sector to envisage the option of construction-only guarantees[190]. As part of infrastructure investment, the national government launched a new programme called "**Maritime 2050**" with the aim to invest in ports in order to maintain the country's continued prominence in the global shipping trade. Although a long-term plan is still in a rudimentary stage, estimated GBP 1.7 billion is dedicated to port infrastructure investment between 2018 and 2020[191].

The UK government has put on hold its investment in building new nuclear capacity. Given that almost 50.0% of the UK's current nuclear generating capacity is expected to shut down by 2025, the government has continued with construction on the 3.2 gigawatt electrical (GWe) Hinkley Point project. With respect to the 3.2 GWe Sizewell C project or the 1.0 GWe Bradwell project, the final investment decision is yet to be undertaken by the government[192].

The UK is committed to delivering up to 40GW of offshore wind capacity by 2030. After the third round of Contracts for Difference auctions in September 2019, the offshore deployment costs for 12 projects have further reduced[193].

Under the EU State aid rules, the European Commission has already reapproved the capacity market scheme in October 2019. Initially introduced in 2014, the scheme seeks to ensure security of electricity supplies taking into account the expected increase in its demand and upcoming closure of generation capacity. Accordingly, three auctions have been scheduled during early 2020 to aid UK to meet its capacity needs till 2023-2024[194].

Since 1973, the EIB Group has been active in the UK and till date, it has financed 1,007 projects, amounting to EUR 119.0 billion[195].

In 2019, the EIB Group invested EUR 243.0 million in infrastructure, EUR 385.0 million in SMEs financing, EUR 150.0 million in environment development and EUR 6.0 million in innovation investment. In parallel, the UK has also been a notable beneficiary from the European Fund for Strategic Investments (EFSI). As of June 2020, the financing under EFSI amounted to EUR 2.2 billion and is set to trigger additional investments of EUR 19.4 billion. Under the Infrastructure and Innovation Window, 22 projects have already approved, amounting to EUR 1.6 billion and are set to trigger EUR 15.5 billion in total investments. Under the SMEs Window, 18 agreements have been approved, involving a total financing of EUR 674.0 million, and are set to trigger investments of up to EUR 3.9 billion[196].

However, with its withdrawal from EU, the UK will not benefit from any new programme under EFSI and other EU led initiatives such as the Recovery Fund[197].

TO 2 – Skills

Recently there has been an uptick in the adoption of **Vocational Education and Training** (VET) in the UK. For instance, in 2017 almost 1.3 million new students formally enrolled in the VET programmes, representing an increase of 8.0% compared to 2016. The enrolment rate in upper secondary VET stood at 46.6%, slightly below the EU-28 average of 47.8%. The employment rates of recent VET graduates also increased to 84.2% in 2017, marginally better than 82.0% in 2016 and well above the EU-28 average of 79.5% in 2018[198].

Since 2018, there has been a rise in the investment in the **further education sector**. A funding scheme, the Strategic college improvement fund, was also launched in 2018. With an allocation of GBP 15 million (EUR 17.0 million), the fund is launched for a period of two years and aims at financing partnerships between colleges to share best practices and raise working standards[199].

As a part of 2016 Post-16 skills plan and in continuation of reforms of the upper secondary VET qualifications, the UK will be introducing a new technical qualification called T level in September 2020 in specific sectors including the construction sector. This new qualification will be for leaners after completing their general certificate of secondary education (GCSE) examinations[200].

The government is taking actions to increase the transparency and tackle the complexity of technical and professional routes, streamlining the VET system and qualifications, and creating 15 routes across technical education. To fund this, the **Apprenticeship Levy** was introduced in 2017, which replaced all taxpayer funding of apprenticeships for companies of all sizes[201]. It is expected to boost productivity by investing in human capital, develop vocational skills and increase the quantity and quality of apprenticeships[202]. In Scotland, a national apprenticeship network was launched in 2018, targeting former and current apprentices to share their experiences with the objective to inspire others to enrol in apprenticeships. In Wales, a new campaign 'The answer is apprenticeship' was also launched in summer 2018, aimed at youth (including NEETs) and their parents to publicise the benefits of apprenticeships for gaining skills and qualifications necessary to start a career[203].

In the UK, adults are more likely to frequently update their knowledge and skillset. In 2018, almost 14.6% of adults within the 25-64 age group are likely to have a learning experience in the past four months compared to the EU-28 average of 11.1%[204].

On average, adults in the UK are better educated than their EU counterparts – about 80.4% adults acquired at least an upper secondary qualification as compared to EU-28 average of 78.1%. Nonetheless, the distribution of low-qualified employed adults is also high at 65.7% compared to the EU-28 average of 56.8%[205].

The skill gap and labour shortage in the UK construction sector constitute a serious threat to its growth prospects. This is recognised in the **Government Construction Strategy 2016-2020**, which aims to strengthen the skill base in the sector, particularly with regard to digital skills, and support 20,000 apprenticeships until 2020[206]. Similarly, the **Construction 2025 Industrial Strategy** aims to improve the attractiveness of the industry as a whole, by engaging with young people and increasing occupational safety, health and diversity[207]. Several initiatives have been introduced to this end.

The **Construction Industry Training Board (CITB)** supports development of a skilled construction workforce. It provides a comprehensive range of services to companies and their employees. In 2018, CITB provided assistance to over 1,400 small and micro employers to access GBP 6.0 million (EUR 6.6 million). It also plans to extend the Skills and Training Fund to help SMEs with up to 250 employees, and continue to invest in small and micro employers by growing the fund to GBP 8 million (EUR 8.8 million) reaching 1,900 firms[208]. CITB**'s Grants Scheme** provides funding for CITB-registered employers to train, upskill and qualify their staff. Through its National Construction College, it offers training courses on health and safety, supervision, plant, machinery and other crafts, as well as apprenticeships, awards and accreditation. The CITB also leads the **National Skills Academy for Construction**, a project-based and demand-led training concept, where the client and contractor determine the required skills based on a practical live project[209]. Another CITB-funded project includes the **GO Construct** website, an industry-wide initiative that aims to attract, inform and retain a talented workforce for the construction and built environment sector, by providing information on the opportunities available in the industry[210].

The CITB utilizes GBP 20.8 million, received under National Retraining Scheme, to train 13,000 workers to make them employable in the construction sector[211].

In order to increase the attractiveness of the construction sector, the UK government launched a new construction skills fund in 2018 with a budget allocation of GBP 22.0 million (EUR 25.0 million). The UK Department for Digital, Culture, Media and

Sport also announced a digital skills partnership in 2018, supporting implementation of the UK digital strategy across the country[212].

Budding Builders is a free course providing 14-30-year-olds with entry-level construction training, employability and soft skill support and progression routes into the construction sector. Due to the programme's strong links with the industry, participants can progress with apprenticeships or full employment upon completion of the course[213]. Similarly, **Budding Brunels** is a 3-day course aimed at final year high school students, giving them the chance to find out more about various professional roles in construction, such as project manager and surveyor[214].

Another initiative **SOAR Build** is a joint venture partnership between the public and private sectors specialising in community regeneration. The initiative is aimed at supporting the construction sector though local employment while raising the youth's aspirations to engage in community affairs[215].

The **Chartered Institute of Building (CIOB)** attracts younger generation of construction professionals. Its **Craft Your Future** initiative comprises a construction game targeting 12-14-year-olds based on the popular Minecraft Education Platform. The game aims to introduce to its young players the possibilities of a career in construction and impart to them the methods and skills required to become a construction manager, confronting them with issues and challenges commonly faced by the industry[216].

The **Construction Skills Certificate Scheme (CSCS)** was created by industry partners as a means of certifying the skills of construction professionals. The scheme issues CSCS cards to provide proof that all workers on construction sites have the required training and qualifications for the type of work they perform. There are numerous types of CSCS cards, depending on the specific occupation of the applicant. One such card, the Construction Related Occupation (CRO), was introduced for those occupations for which there are no nationally recognised qualifications[217]. Because no formal qualifications are required to obtain it, the CRO was being utilised by workers as a way to enter the construction site without the need and commitment to be correctly trained and qualified[218]. For this reason, the card is being withdrawn, so as to push more workers to register for nationally recognised qualifications and obtain a Skilled CSCS Card instead. Ultimately, this action aims to raise the overall level of qualification and skills of the construction workforce and improve standards and safety on UK construction sites.

In order to tackle mismatch and labour shortage in construction, through recently signed **Sector Deal** the construction sector will be working with the government to produce a **Construction Skills Strategy** aimed at retaining and retraining a workforce fit for the future and able to deliver on the government's infrastructure and housing ambitions. It will focus on upskilling and retraining workers in new valuable skills, thereby matching worker's skillset with employer's needs[219].

TO 3 – Resource efficiency / Sustainable construction

Currently, the UK is on track to achieve its required end-use energy savings obligation for the first obligation period 2014 – 2020 under its Europe 2020 renewables target. It is also in the process of achieving its national 2020 energy efficiency targets for primary energy consumption. Notwithstanding, it still needs to increase its efforts to reduce final energy consumption since it is increasing faster than the EU average[220].

In 2017, the top three sources of energy-related emissions included the transport sector (34.0%) followed by power and heat generation (25.0%) and the residential sector (18.0%). Indeed, the UK building sector is considered as a key sector to focus on to meet future energy efficiency targets. The housing sector needs to become more energy efficient with traditional fossil fuel systems being replaced by modern cleaner alternatives[221].

> **In this regard, the UK government has recently published a new 'Future Homes Standard' requiring new homes to have reduced energy consumption and to be fitted with clean heating technologies (e.g. air source heat pumps) rather than fossil fuel heating systems from 2025. The standard is aimed at reducing carbon emissions by up to 80% from new homes[222].**

Nonetheless, reducing the energy requirement for home heating is quite difficult. The UK is currently facing an ageing housing stock with almost 21.0%

of the total stock being over hundred years old while only 17.0% being built after 1990. With most of the housing stock expected to last till 2050 already been built, retrofitting them with cleaner fuel technologies constitute a great challenge for the country[223].

To promote energy efficiency in UK homes, the **Energy Company Obligation (ECO)** programme was launched in January 2013. It requires energy suppliers to deliver carbon and notional bill savings by promoting and installing energy efficiency measures in residential properties, in case of more than 250,000 domestic customer accounts and supply more than certain specified amounts of electricity or gas. This threshold will decrease to 200,000 and 150,000 customer accounts in April 2019 and 2020 respectively. So far, there have been two phases of ECO completed – Jan 2013 to Mar 2015 ('ECO1'), and April 2015 to September 2018 ('ECO2'). The new fuel poverty-focused scheme, ECO3, was started in December 2018 and will run until March 2022[224, 225]. The target for ECO3 is set in notional bill savings only. The objective is to reduce carbon emissions and improve the ability of low income and vulnerable consumers to heat their homes to comfortable levels. ECO creates a legal obligation on energy suppliers to improve the energy efficiency of households by setting three specific targets[226]:

- the **Carbon Emissions Reduction Obligation (CERO)** focuses on homes requiring more complex interventions, such as solid wall insulation, cavity wall insulation and connections to district heating;
- the **Carbon Saving Community Obligation (CSCO)** focuses on the provision of insulation measures and connections to district heating systems to low income households including in rural areas;
- the **Home Heating Cost Reduction Obligation (HHCRO)**, also known as Affordable Warmth, provides measures to support low income and vulnerable households to heat their homes. These include installation of a new energy-efficient boiler, loft insulation and cavity wall insulation.

In 2017, the **Sustainable Development Commission (SDC)** launched a free online tool for evaluating the sustainability of a proposed development of a construction project, which has to be in the line of the guidelines of sustainability under **National Planning Policy Framework (NPPF)**. This tool has been very accessible and transparent about sustainability objectives that is used by developers and community groups alike[227].

BREEAM, a voluntary certification scheme for environmental assessment and rating system for buildings, is a successful instance of a UK initiative that contributes to the improvement and development of sustainable and energy efficient construction. Schemes, such as BREEAM New Construction, can influence decisions made at the design and procurement stage, ultimately making an impact on the comfort and health and safety of building occupants[228]. BREEAM is developed and managed by the Building Research Establishment (BRE), jointly owned by industry bodies and is being successfully adopted worldwide, with over 556,600 BREEAM-certified developments globally, and almost 2,260,100 buildings registered for assessment since its launch in 1990[229].

Lastly, "**A Green Future: Our 25 Year Environment Plan**" announced in 2018, gives the first overarching policy overview of the coherent environmental vision that has been set up by the national government. It includes an action plan on housing and green infrastructure. An important part of the Plan is its promise to put the natural environment 'at the heart' of housing and infrastructure development proposals. Environment Plan alongside the "**Clean Growth Strategy**" and "**Industrial Strategy**" will put pressure on developers, house builders and multi-tenure landlords to upgrade properties to deal with future climate requirements and in this way achieve the new sustainability vision[230].

TO 4 – Single Market

Overall, the UK performed adequately with respect to the metrics of the 2020 EU Single Market Scoreboard[231], especially in terms of Transposition of law, EU Pilot and Your Europe[232].

The UK's conduct improved in various areas including transposition of law, EU pilot response time and Your Europe – EU's single digital gateway aimed at providing access to information, procedures, assistance and problem-solving services. In case of transposition, performance improved across all metrices as compared to last report. With regard to EU Pilot, the UK's average response time complied with the set 70-day time[233]. With regard to internal market information system, the UK complied relatively well with only five indicators recording a performance decline compared to the last report. In terms of infringements, UK's performance was well below the EU-28 average, particularly with pending cases and average case duration being worse than the last report. Additionally, satisfaction rates among counterparts also declined significantly. With regard to public procurement, the UK's performance in 2019 was satisfactory. In terms of trade of goods and services, the UK reported the lowest trade integration in the single market in goods and the third lowest trade integration for services[234].

With the UK leaving the EU Single Market, it is expected that skill shortage will worsen for the construction sector. The restrictions regarding the free movement of labourers from the EU may lead to a further decline in the number of skilled labourers in construction and architectural activities. This would, in turn, result in higher wage cost, thereby raising the overall construction project costs. This is a significant issue for the sector, since about 13.0% of the total construction workforce is foreign-born, mainly coming from Eastern Europe. This issue is particularly felt in London that has 56.3% of the total non-UK construction workforce, followed by South East region (22.7%), East of England (17.8%) and South West (10.5%). Yorkshire and Humber have the lowest proportion of total non-UK construction workforce at 1.8%[235]. In addition, official surveys tend to underestimate migrant labour on-site, as migrants often prefer not to be in official surveys, for legitimate as well as illegitimate reasons. Anecdotally, house builders state that around 60-70% of employment on-site in construction in London is from abroad[236]. Moreover, projects may be delayed and overrun due to the lack of skilled labour on site, particularly large-scale infrastructure projects[237].

The UK's access to the **EU Digital Single Market (DSM)** has been affected by post-Brexit and there is still a lack of clarity about how specific issues will be impinged according to the European Scrutiny Committee[238]. Moreover, although EU legislation may no longer apply in the UK following the exit, UK construction companies would still be required to comply with key EU construction law, such as the **Construction Products Regulation 2011** governing the marketing of construction products in the EU, in order for them to be able to export to the EU[239]. Likewise, there is uncertainty as to whether UK construction firms would still be allowed to compete in EU tenders for public contracts after the UK leaves the EU[240]. To mitigate negative consequences of Brexit, the Ministry of Trade and Exports issued a final call in December 2017 for business to provide inputs for the Export Strategy. The strategy is based on combination of Industrial Strategy and Trade policy aiming to leverage their advantage of opportunities in overseas markets[241].

Regarding the implementation of **Eurocodes**, all EN Eurocode parts have been published as National Standards, with National Annexes being published on all Parts except EN 1993-1-6, EN 1993-1-7, EN 1993-3-2, EN 1993-4-1, EN 1993-4-2, EN 1993-4-3, and EN 1998-3. Although they are not compulsory and no regulatory framework enforces their use in public procurement, Eurocodes are the only means of structural design in the UK. No other national standards are used in parallel with them[242].

TO 5 – International competitiveness

According to the 2019 Global Competitiveness Index, the UK ranks 9th out of 141 economies in terms of its performance, representing a decline from its 2018 rank of 8th among 140 economies[243].

In terms of the **internationalisation of UK construction SMEs**, the export value of all construction-related projects in UK stood at EUR 1.1 billion in 2018, representing a decline of 6.6% compared to its value of EUR 1.1 billion in 2010. UK's share of exports of all construction-related products in 2018 stood at 5.0% of the total production value. This is well below the EU-27 average of 11.4% for the same period.

Exports value of all construction-related products between 2010 and 2018 ↓ **6.6%**

As per the 2019 Global Competitiveness Index in terms of **trade openness**, out of 141 economies the UK ranks 7th with regard to trade tariff percentage, 11th with respect to border clearance efficiency and 27th in relation to prevalence of non-tariff barriers, while 113th when it comes to complexity of tariffs[244]. In the context of **inward FATS (Foreign affiliates statistics)**[245]**,** value added at factor cost in the narrow construction sub-sector increased by 40.9% between 2010 and 2017[246]. Similarly, turnover in the narrow construction sub-sector grew by 27.0% during the 2010-2017 period respectively. In similar lines, turnover in the narrow construction sub-sector, in terms of **outward FATS**[247] grew by 27.9% between 2010 and 2017.

Some uncertainties exist about UK's future trading agreements with the EU Single Market. These need to be addressed on a priority basis to enable SMEs to plan and mitigate their exposures and business risks[248].

The **Construction 2025 Industrial Strategy** aims to foster the internationalisation of the UK construction sector through the cooperation between industry and the government. In particular, it seeks to achieve a 50% reduction in the trade gap between total exports and total imports for construction products and materials. Thus, the focus is placed on the identification of global trade opportunities for UK professional services, contracting and product manufacturing[249]. As part of the Industrial Strategy, funding of GBP 12.5 million (EUR 13.8 million) is available between 2018 and 2020 for innovative projects aiming to transform the UK construction sector, called **Innovate UK**. The priority is given to those projects, which demonstrate cross-sector collaboration and scalable solutions[250].

Launched by UK Government in 2015, the **Exporting is Great** website serves as a reliable platform for centralised information and guidance for new, occasional and frequent exporters, and allows companies to showcase their products to overseas clients and identify the best online marketplaces[251]. The programme is set to run for five years, aiming to get 100,000 additional companies exporting by 2020[252]. Furthermore, **UK Export Finance (UKEF)**, the UK's export credit agency, plays an important role in supporting UK firms to export and invest overseas, through the provision of guarantees, insurance and reinsurance against loss. For instance, the **Export Insurance Policy** insures exporters against the risk of non-payment from foreign clients or of being unable to recover the costs incurred during the project. Such risks include insolvency of the client, as well as political, economic or administrative events outside the UK that prevent payments from the buyer or that affect the performance of the export contract[253].

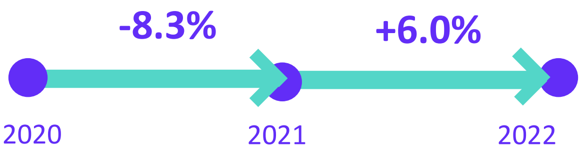
Moreover, the **Department for International Trade (DIT)** assists UK companies in selling their products and services to the overseas construction sector by organising workshops, seminars, etc. and taking part in international trade fairs and trade missions. It also provides free international export sale leads from its worldwide network[254]. Additional resources will be provided to strengthen trade policy capability in the DIT, amounting to GBP 26.0 million (EUR 28.7 million) a year by 2019-2020[255]. Additionally, the Department for International Trade of UK government launched a new industry partnership in July 2017 to boost construction exports and help UK companies to secure major international contracts. **Infrastructure Exports: UK (IE:UK)** will gather companies of all sizes to bid for infrastructure contracts abroad as a single 'Team UK' consortia, to deliver complex projects by combining their expertise[256].

8

Outlook

Since 2010, the UK economy has been steadily growing. But with the UK's exit from the EU and to due to the impact of COVID-19, its **GDP** is expected to decline by 8.3% in 2020. The decline is also partly related to the slump in private consumption as well as stagnation in labour productivity. Nonetheless, current forecast predicts that after a brief period of economic adjustment, the UK GDP will rise by 6.0% in 2021.

Expected GDP growth between 2020 and-2022



Likewise, the outlook for the broad construction sector is also dynamic. The **volume index of production** of the narrow construction sub-sector is estimated to decline by 13.5%. In parallel, the construction of buildings and civil engineering are expected to record declines of 14.9% and 12.5% respectively in 2020. Notwithstanding, the volume index of production of the narrow construction, construction of buildings (11.6%) and civil engineering (8.9%) sub-sectors are expected to increase by 10.0%, 11.6% and 8.9% respectively in 2021 – thus indicating that the growth in the sector will primarily pick up in 2021.

The **total value added of the broad construction sector** to the economy is expected to decrease by 24.6% in 2020 and increase by 6.6% in 2021 respectively. Furthermore, the **turnover** of the broad construction sector is projected to decline by 25.5% in 2020, compared to 2019. Thereafter, it is expected to increase slightly by 5.7% in 2021.

With changes in the macroeconomic context, the **number of persons employed** in the broad construction sector is also expected to reach 2,043,771 in 2020 (-25.6% Year over Year - YOY) and 2,163,290 in 2021 (5.8% YoY). The majority of this growth in employment is forecasted to come from two sub-sectors: the architectural and engineering activities and real estate activities.

Number of persons to be employed in the broad construction sector over 2019-2021 period

21.3%

Similarly, the number of **enterprises** in the broad construction sector is expected to fall by 25.5% in 2020 and then increase by 6.1% in 2021, reaching 438,311.

Number of enterprises forecast to operate in the broad construction sector between 2019 and 2021

21.0%

UK's exit from the EU, along with the ongoing COVID-19 pandemic situation, has adversely impacted the construction sector, resulted in reduced construction activities, increased prices for building materials and lack of availability of skilled labour. A loss of nearly 215,000 workers from housebuilding and construction has been predicted by 2020, should the point-based system in place for non-EU migrants be extended to EU workers[257]. House prices and rents continue to remain high, especially in areas of high demand. However, the UK government seeks to raise annual housing supply to 300,000 units by the mid-2020s to address this pressing issue[258].

The growth of **non-residential construction** has been limited owing to Brexit. In fact, office construction could be significantly slowed down, with up to half of planned developments in central London at the risk of being postponed or cancelled. However, the CITB forecasts a 3% growth in the construction output in 2020, followed by 1% growth in 2021 and 2022, before slowing down to zero growth in 2023.

The civil engineering and infrastructure sector is forecast to have a positive outlook because of the proposed pipeline of infrastructure projects and investments in infrastructure, housing and R&D over 2017-2022. The infrastructure sector is expected to witness a strong growth in 2020 and 2021, despite the government's inability to deliver on major infrastructure projects such as Crossrail and HS2. Another forecast specific to the infrastructure segment, projects growth in infrastructure output of 9% in 2019, 4% in 2020, followed by no growth in 2021 and 2022 and a decline of 3% in growth by 2023[259].

The UK broad construction sector has a mixed outlook. Activities related to major infrastructure projects, ports, warehouses, roads, etc. are expected to witness strong performance compared to commercial construction. However, uncertainties around the prospects of the sector are great, with the relatively unpredictable short and mid-term impact of the COVID-19 and Brexit.

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10 No data available for subsequent years.

11 Please note that data is not available for the manufacturing and architectural and engineering activities.

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