



European Construction Sector Observatory

Country profile **Germany**

January 2022



In a nutshell

Over the 2010-2020 period, Germany's GDP increased by 11.3%, reaching EUR 3.1 trillion in 2020. However, it declined by 4.6% in 2020 compared to the 2019 level. In 2021, Germany's GDP and inflation are expected to grow by 2.8% and 3.2%, respectively, compared to the 2020 level¹, though in the final quarter of 2021 the economy even contracted by 0.7%, as persisting supply shortages of key raw materials and components were delaying the recovery.

In line with the economy, the **number of enterprises** in the broad construction sector increased by 33.2%, from 536,874 in 2010 to 715,198 in 2020. This growth was largely driven by the narrow construction (+71.7%) sub-sector, followed by the architectural and engineering activities (+20.6%) sub-sector, partially offsetting the decline in the real estate activities (-6.4%) and the manufacturing (-4.9%) sub-sectors over the 2010-2020 period.

Number of enterprises
in the narrow
construction sub-sector
between 2010 and 2020

↑ 71.7%

Similarly, the **volume index of production** in the broad construction sector increased by 16.6% between 2015 and 2020, primarily driven by a 26.9% and 15.1% increase in the volume index of production in the construction of civil engineering and construction of buildings, respectively, over the same period.

Volume index of
production in the broad
construction sector
between 2015 and 2020

↑ 16.6%

Likewise, the **total turnover** of the broad construction sector reached EUR 618.6 billion in 2019, registering a 64.0% growth above the 2010 level (EUR 377.3 billion). It further increased to EUR 638.9 billion in 2020, representing an overall growth of 69.3% since 2010. With regard to sub-sectors, all registered growth – the narrow construction (+112.0%), the architectural and engineering activities (+71.6%), the real estate activities (+29.0%) as well as the manufacturing (+15.4%) over the 2010-2020 period.

Turnover in the narrow
construction sub-sector
between 2010 and
2020

↑ 112.0%

At the same time, the **gross operating rate** of the broad construction sector², an indicator of the sector's profitability, stood at 20.1% in 2019, 2.4 percentage points below the 2010 level (22.6%).

With regard to employment, in 2020, there were 4,511,733 **persons employed** in the broad construction sector in Germany. This represented a 53.6% rise in the number of persons employed from the 2010 level (2,938,001 persons). This was largely driven by increase in the number of persons employed in the narrow construction (+75.4%) sub-sector, followed by the architectural and engineering activities (+40.8%) over the 2010-2020 period. The real estate activities and the manufacturing sub-sectors also experienced an increase of 32.9% and 2.1%, respectively, over the same period.

The German government has initiated several measures aimed at the development of the country's **housing market**. It has also allocated

EUR 8.0 billion in housing subsidies, to be used over the 2018-2024 period. In 2020, a new tax incentive law for privately financed new rental apartments was also introduced along with other relevant measures such as the extension of the rental price brake by five years and increased incentives for switching to climate friendly heating systems.

Under its 2021-2026 National Recovery and Resilience Plan (NRRP), Germany has allocated EUR 2.5 billion for investment in energy-efficient buildings renovation. Through this broad renovation programme, Germany expects to deliver at least 30.0% energy savings.

As outlined in its 2021-2026 NRRP, Germany's residential programme intends to achieve deep renovation of 40,000 dwellings by 2026. This measure will be complemented by municipal living laboratories for the energy transition exploring innovative solutions for an efficient and sustainable energy supply in urban neighbourhoods through pilot projects. Additionally, under the buildings renovation initiative, the government has unveiled grants for financing the renovation of gas-fired boilers. The NRRP also discusses other incentives such as introduction of carbon pricing, using revenue from such pricing to promote climate protection measures, various tax concessions as well as a 'carbon dividend' to be paid to low-income households. Moreover, the NRRP measures are expected to be extended beyond 2026 with national funding.

With regards to **civil engineering**, the German government has already announced a EUR 86.0 billion investment plan in the national rail infrastructure, as part of the total funding of EUR 269.6 billion under the 2030 Federal Transport Infrastructure Plan. In January 2020, the German government finalised a 10-year EUR 86.0 billion LuFV III railway operating and financing agreement to modernise its rail infrastructure. The project includes the renewal of around 2,000 km of track

and 2,000 turnouts each year as well as the modernisation of 2,000 bridges. Similarly, the German Federal Ministry of Transport signed an agreement for the construction of the Dresden-Prague cross-border rail link. The project is expected to cost EUR 5.4 billion and involves the construction of a railway line from Dresden, Saxony in Germany, to Prague in Czech Republic, as well as a 25 km tunnel under the Erzgebirge Mountains. Additionally, from 2021, the German government plans to raise EUR 1.0 billion of federal funding per year to expand local public transport infrastructure. This is expected to increase to EUR 2.0 billion per year by 2025.

Presently, the German construction sector continues to face challenges on **one major issue**. Labour shortage is considered to be a major roadblock, in comparison with other business sectors. In order to tackle this, the German government implemented the 'Skilled Workers Strategy' (*Fachkräftestrategie*), which fosters skilled labour immigration from developing countries. The Skilled Labour Immigration Act, effective from 1st March 2020, also facilitates in non-EU immigration. In addition, the issue of late payments continues to hinder the development of the German construction sector. For instance, as per the Survey on the Access to Finance of Enterprises (SAFE) 2021 report, about 25.4% of enterprise respondents reported their payments to suppliers being affected due to late payments by customers. This was followed by 19.2% of respondents who stated that late payment affected production or operational activities.

Overall, the German broad construction sector has a positive outlook. Investment in public sector infrastructure, digitalisation, energy efficient housing renovations as well as a green circular economy, backed by EU funding, is expected to lead the future growth of the sector.

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Key figures

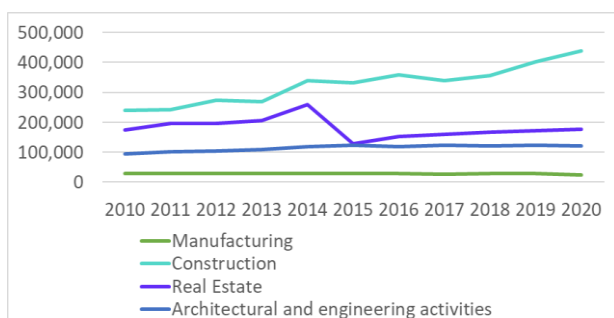
Construction market

The **number of enterprises** in the broad construction sector in Germany totalled 760,233 in 2020³ (Figure 1), representing a 41.6% increase compared to the 2010 level (536,874). This was mainly driven by the growth registered in the narrow construction (+83.2%), the architectural and engineering activities (+27.6%) and the real estate activities (+0.7%) sub-sectors between 2010 and 2020. Contrarily, the manufacturing sub-sector reported a decline of 11.2% during the same period. In 2020, the narrow construction sub-sector accounted for 57.6% of the total enterprises, followed by the real estate activities (23.1%), the architectural and engineering activities (16.0%) and the manufacturing (3.3%) sub-sectors.

Number of enterprises
in the broad
construction sector
between 2010 and 2020

↑ 41.6%

Figure 1: Number of enterprises in the broad construction sector in Germany between 2010 and 2020



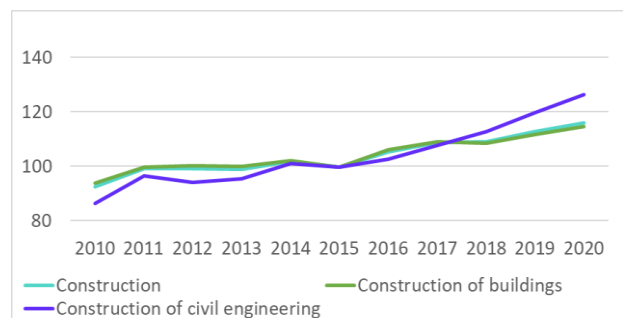
Source: Eurostat, 2021.

The **volume index of production** of the broad construction sector increased by 16.1% between 2015 and 2020 (Figure 2). Likewise, the volume index of production in the construction of buildings and the construction of civil engineering increased by 14.7% and 26.5%, respectively, over the same period.

Volume index of
production in the
construction of civil
engineering between
2015 and 2020

↑ 26.5%

Figure 2: Volume index of production in the German broad construction sector between 2010 and 2020 (2015=100)

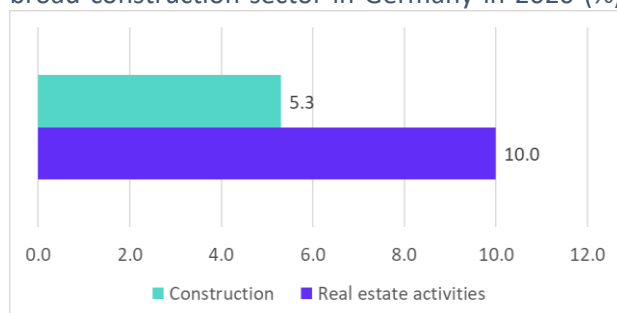


Source: Eurostat, 2021.

The **total value added at factor cost⁴** of the broad construction sector amounted to EUR 291.9 billion in 2020⁵, representing an increase of 69.5% since 2010 (EUR 172.2 billion). The narrow construction sub-sector accounted for 51.6% (EUR 150.8 billion) of the total value added in 2020, followed by the real estate activities (26.0%, i.e., EUR 75.9 billion), the architectural and engineering activities (14.7%, i.e. EUR 42.8 billion) and the manufacturing (7.7%, i.e. EUR 22.5 billion) sub-sectors.

The **share of the gross value added (GVA)** of the broad construction sector in the GDP stood at 16.2% in 2018, below the 2010 level (16.3%). In 2020, the share of GVA of the real estate activities sub-sector in the GDP stood at 10.0% (below the 2020 EU-27 average of 10.3%), followed by the narrow construction sub-sector, which stood at 5.3%, (above the 2020 EU-27 average of 5.1%) (Figure 3).

Figure 3: Gross value added as a share of GDP in the broad construction sector in Germany in 2020 (%)



Source: Eurostat, 2021.

Germany counts 38 NUTS-2 statistical regions. In 2019, *Berlin*, *Mittelfranken* and *Schleswig-Holstein* accounted for the largest shares of gross value added in the narrow construction sub-sector. These amounted to EUR 5.9 billion (3.6% of the total), EUR 3.5 billion (2.1% of the total) and EUR 5.7 billion (3.4% of the total), respectively. Similarly, in the real estate activities sub-sector, *Oberbayern*, *Düsseldorf* and *Darmstadt* are the top contributors in terms of share of gross value added, accounting for EUR 24.5 billion, EUR 20.2 billion and EUR 18.7 billion, respectively, in 2019.

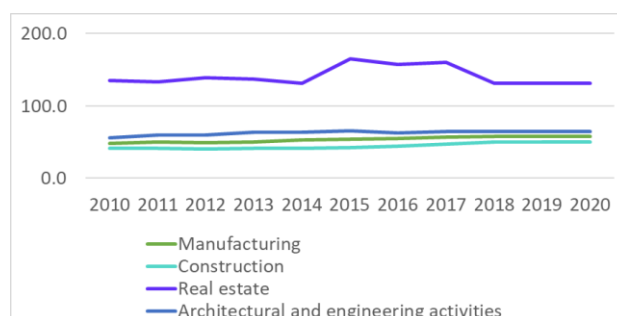
Productivity

Apparent labour productivity⁶ in the broad construction sector has been experiencing an increasing trend, from EUR 58,600 in 2010 to EUR 66,057.3 in 2017 (+12.7%), well above the EU-27 average of EUR 50,079 in the same year. In 2018, it decreased to EUR 63,801 representing an overall boost of 8.9% since 2010. Amongst the sub-sectors, apparent labour productivity in the narrow construction sub-sector experienced the strongest increase (+21.2%), going from EUR 41,100 in 2010 to EUR 49,800 in 2018. This was followed by the manufacturing sub-sector, which increased from EUR 48,227.1 in 2010 to EUR 57,533.0 in 2018 (+19.3%). The architectural and engineering activities sub-sector also increased from EUR 56,200 in 2010 to EUR 64,500 in 2018 (+14.8%). Lastly, the real estate activities sub-sector exhibited a decline from 135,500 in 2010 to 131,000 in 2018 (-3.3%).

In 2020, apparent labour productivity in all four sub-sectors declined marginally from the previous year, though having increased since 2010. In particular, apparent labour productivity in the narrow construction sub-sector reached EUR 49,777 in 2020, representing 21.1% increase

since 2010. The manufacturing sub-sector followed next, where labour productivity reached EUR 57,527 in 2020, exhibiting a 19.3% growth since 2010. The architectural and engineering activities sub-sector also increased by 14.7% since 2010, reaching EUR 64,475 in 2020. Contrarily, the real estate activities sub-sector declined by 3.3% since 2010, reaching EUR 130,980 in 2020 (Figure 4).

Figure 4: Labour productivity in the broad construction sector in Germany between 2010 and 2020 (EUR k)



Source: Eurostat, 2021.

Turnover and profitability

The **total turnover** of the broad construction sector amounted to EUR 579.7 billion in 2018, registering a 53.6% increase compared to 2010 levels (EUR 377.3 billion). It further increased to EUR 643.3 billion in 2020⁷, representing an increase of 70.5% since 2010. This growth was driven by increases in all the four sub-sectors – the narrow construction (+117.0%), the architectural and engineering activities (+71.6%), the real estate activities (+30.1%) and the manufacturing (+6.7%) sub-sectors over the same period. In 2020, the largest share of the turnover came from the narrow construction sub-sector, which accounted for 57.6% (i.e. EUR 370.7 billion) of the total. It was followed by the real estate activities (20.4%, i.e. EUR 131.5 billion), the architectural and engineering activities (11.8%, i.e. EUR 75.7 billion) and the manufacturing (10.2%, i.e. EUR 65.4 billion) sub-sectors.

Total turnover in the broad construction sector between 2010 and 2020

↑ 70.5%

In parallel, the **gross operating surplus** of the broad construction sector increased by 47.4% between 2010 and 2018⁸, from EUR 85.2 billion to

EUR 125.5 billion. This was largely driven by the increase in gross operating surplus of the narrow construction (+154.6%), the architectural and engineering activities (+48.2%), the manufacturing (+41.5%) and the real estate activities (+12.3%) sub-sectors over the same period.

At the same time, the **gross operating rate** of the broad construction sector⁹, which gives an indication of the sector's profitability, stood at 23.1% in 2017, well above the EU-27 average (16.6%). In 2018¹⁰ it decreased to 21.7%, below the 2010 level (22.6%). Amongst the sub-sectors, the real estate activities sub-sector was the most profitable, with the gross operating rate reaching 46.5% in 2018. This was followed by the architectural and engineering activities (21.4%), the narrow construction (14.4%) and the manufacturing (10.2%) sub-sectors.

Similarly, the **construction cost index** increased by 12.2% between 2015 and 2020. This was mainly due to a 17.4% increase in the index for labour cost in construction and 9.4% increase in the index for input prices for materials.


Labour cost index in construction between 2015 and 2020  **17.4%**

Figure 5: Construction cost index for residential buildings between 2010 and 2020 (2015=100)



Source: Eurostat, 2021.

Construction prices increased drastically in 2021. The Federal Statistical Office (Destatis) reports that, on an annual average in 2021, the producer price increase for individual building materials such as timber and steel was larger than ever since the survey was first conducted in 1949. Prices were up 77.3% for solid construction timber, 65.1% for roof battens and 61.4% for construction timber compared with the average of the previous year. Even the prices of chipboards, for which sawmill waste is generally used, rose by 23.0%. For comparison: The producer price index for industrial

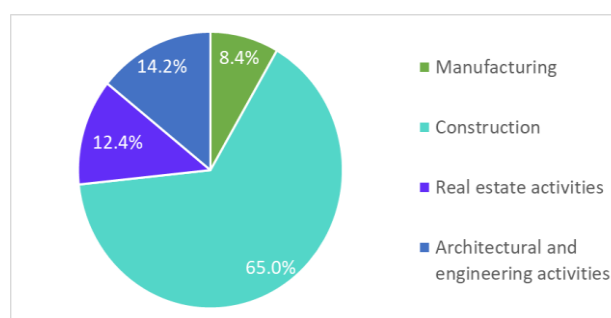
products (total) was up 10.5% on an annual average in 2021 compared with 2020¹¹.

Employment

In 2020¹², there were 4,662,042 **persons employed** in the German broad construction sector, 58.7% more than the 2010 level (2,938,001 persons). This was driven by a significant increase in the number of persons employed in the narrow construction sub-sector (84.8%), followed by the architectural and engineering activities (46.8%) and the real estate activities (31.5%) sub-sectors over the 2010-2020 period. Contrarily, the manufacturing sub-sector registered a decline of 3.9% over the same period. In 2020, the narrow construction sub-sector employed 65.0% of the total workforce in the broad construction sector (i.e. 3,028,566 persons), followed by the architectural and engineering activities (14.2%, i.e. 663,293 persons), the real estate activities (12.4%, i.e. 579,659 persons) and the manufacturing (8.4%, i.e. 390,524 persons) sub-sectors (Figure 6).

Number of persons employed in the broad construction sector between 2010 and 2020  **58.7%**

Figure 6: Percentage of people employed by construction sub-sectors in Germany in 2020



Source: Eurostat, 2021.

As for **employment by specific occupation**, the manufacturing sub-sector experienced the highest increase in demand for 'professionals' and 'technicians and associate professionals' by 47.7% and 29.1% respectively, over the 2010-2020 period. In contrast, the demand for 'managers' and 'service and sales workers' decreased by 27.3% and 18.1% over the same period, respectively. Furthermore, in the narrow construction sub-sector, demand for 'technicians and associate professionals' and

'managers' increased by 91.8% and 37.9%, over the 2010-2020 period respectively. Conversely, the demand for 'craft and related trades workers' decreased by 32.9%, over the same period. Lastly, in the real estate activities sub-sector, the highest increase in demand was for 'professionals' which increased by 126.0% over the 2010-2020 period. It was followed by demand for 'clerical support workers' and 'technicians and associate professionals' increased by 42.4% and 41.9% over the same period, respectively.

Number of technicians and associate professionals in the narrow construction sub-sector between 2010 and 2020

↑ 91.8%

Number of managers in the narrow construction sub-sector between 2010 and 2020

↑ 37.9%

The number of **self-employed workers** in the narrow construction sub-sector in Germany decreased by 33.6% over the 2010-2020 period. This also represented 9.6% of all the self-employed workers in the general economy in 2020 (1.8 percentage points (pp) below 2010). Similarly, the real estate activities sub-sector witnessed a 0.8% decline in the number of self-employed workers

over the 2010-2020 period. This represented 1.7% of the total self-employed workers in the general economy in 2020 (0.3 pp above 2010).

Over the 2010-2020 period, **full-time employment** in the real estate activities and manufacturing sub-sectors increased by 27.2% and 7.8% respectively. Whereas in the narrow construction sub-sector, it decreased by 9.3% over the same period. Similarly, **part-time employment** in the real estate activities sub-sector increased by 63.7% over the 2010-2020 period. It was followed by the manufacturing and the narrow construction sub-sectors which witnessed an increase of 20.1% and 3.2%, respectively, over the same period.

With regard to **employment per regions**, *Oberbayern* employed the largest share of persons in the narrow construction sub-sector amounting to 143,840 in 2018¹³, followed by *Düsseldorf* (131,890 persons) and *Stuttgart* (126,210 persons). These regions also reported a growth in the number of persons employed of 17.8%, 5.8% and 15.7% from 2010 levels, respectively. Similarly, the real estate activities sub-sector recorded the highest employment numbers in *Berlin* (43,800 persons), *Düsseldorf* (37,850 persons) and *Oberbayern* (31,740 persons) in 2018¹⁴. Among these regions, *Berlin* and *Düsseldorf* reported a growth in number of persons employed by 0.6% and 2.4% from 2010 levels, respectively. However, a decline of 2.2% in the number of persons employed was observed in *Oberbayern* over the 2010-2018 period.

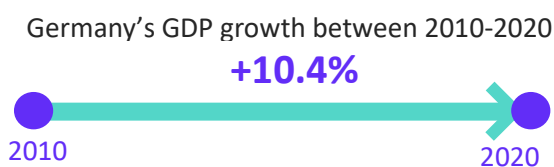
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Macroeconomic indicators

Economic development

In 2020, the German economy shrank, mainly because of the COVID-19 pandemic and the subsequent measures adopted by the government to contain the virus. The pandemic brought disruptions to the economy due to the fall in household spending and industrial production¹⁵.

Between 2010 and 2020, the country's GDP increased by 10.4%, from EUR 2.8 trillion in 2010 to EUR 3.4 trillion in 2020. However, it witnessed a decline of 4.9%, from 2019, which is lower than the growth registered in 2019 and 2018 (0.6% and 1.3%, respectively). The **potential GDP** in 2020 was EUR 3.2 trillion, resulting in a negative **output gap** of 4.8%, which indicates that the economic output is lower than the economy's full capacity for output. In 2021, German GDP is expected to grow by 2.8%, reaching EUR 3.6 trillion. The annual growth **inflation rate** reached 0.4% in 2020, from 1.4% in 2019. This is attributable to sales tax reduction and a strong decline in energy prices.



Demography and employment

In 2020, the **total population** in Germany stood at 83.2 million people. It is projected to increase to 83.5 million people by 2030 (+0.4%), and then decrease to 82.7 million people by 2050 (-0.9%). In parallel, the **net migration rate** increased from 130,166 in 2010 to 200,748 in 2020. The total number of immigrants also increased from 404,055 in 2010 to 886,341 in 2019 (+119.4%).

In 2020, the **working age population** accounted for 64.5% of the total population, and is expected to

decrease in coming years, reaching 60.3% in 2030 and 58.0% in 2050. The share of the **ageing population** (65+ years) stood at for 21.8% of the total population in 2020. It is expected to increase to 25.4% of the total population in 2030 and 28.0% of the total population in 2050. In turn, this may generate an increased demand for hospitals and elderly care infrastructure. This also puts further pressure on labour supply in the construction sector (see Chapter 4 on Skills Shortage).

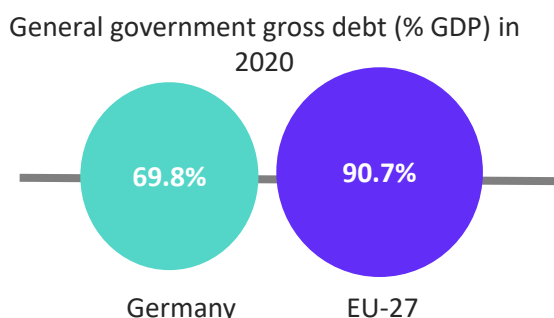
The **unemployment rate** (25-64 years) in Germany stood at 3.5% in 2020, well below the 2010 level (6.7%) and the EU-27 average (6.3%). Similarly, the **youth unemployment rate** (under 25 years old) stood at 7.0% in 2020, well below the 2010 level of 9.8% and the EU-27 average of 16.8%.

The decreasing trend of unemployment is expected to improve further, partly driven by government measures such as Participation Opportunities Act (*Teilhabechancengesetz*) and Qualifications Opportunities Act (*Qualifizierungschancengesetz*)¹⁶.

The Participation Opportunities Act was implemented in January 2019. As per the Act, when a long-term unemployed person is hired, the state pays 75.0% of their wage in the first year and 50% in the second year¹⁷. Moreover, the Qualification Opportunities Act (implemented since January 2019), aims to strengthen the further training of those already employed in order to make them fit for the new demands on the labour market¹⁸.

Public finance

In 2020, **general government expenditure** reached 51.1%, above the 2010 level (48.1%) and below the EU-27 average (53.4%). **General government deficit** in 2020 reached -4.2%, compared to the 2010 level (-4.4%) and the EU-27 average (-6.9%). Lastly, **general government gross debt** reached 69.8% in 2020, below than 2010 level (82.4%) and EU-27 average (90.7%).



Entrepreneurship and access to finance

According to the World Bank Doing Business 2020 report, Germany ranked 125th out of 190 countries in ease of starting a business in 2019. This is a decline in comparison with previous year's ranking (113th)^{19,20}.

As per the report, starting a business in Germany requires 9 procedures, taking 8 days and costing 6.5% of income per capita²¹. In terms of entrepreneurship, 36.0% of the German adult population perceive that there are good opportunities in starting a firm in the country, and 10.7% of the adult population, currently not involved in entrepreneurial activities, intended to start a business in the coming three years²².

In terms of the start-up environment, the low level of start-up activity in Germany remains a problem. In the first half of 2020, 117,800 new businesses were created, a drop of 15.5% compared to the same period last year. The government implemented measures to support start-up companies during the pandemic, including low interest loans for start-ups. The KfW Special Programme 2020, which was implemented in April 2020, expands the ERP Start-up Loan – Universal and helps companies overcome the COVID-19 crisis with low interest rates and high liability exemptions. The 'ERP Start-up Loan – Universal' supports business start-ups, business successors, the self-employed and freelancers. Funding is available to SMEs with fewer than 250 employees and an annual turnover of not more than EUR 50.0 million, and to large companies with no turnover limit²³.

In 2020, the COVID-19 pandemic had a major impact on German SMEs, reflected also in the 3.9% drop and 1.3% drop in SME value added and employment, respectively. However, with the government taking numerous policy measures to support the economy, these indicators are forecast to grow by 6.6% and 1.4%, respectively, in 2021²⁴.

However in the construction sector, there was an increase of 8.7% in SME value added and 1.9% in SME employment. In June 2020, the government introduced a stimulus package of EUR 130.0 billion, composed of 57 measures. Most of these measures aimed to optimise existing measures to make it easier for companies, in particular SMEs, to access finance until the end of 2020. One of the key support measures for SMEs is the short-time allowance (*Kurzarbeitergeld*), which allows them to keep their workforce without the need to pay them. Companies where at least 10.0% of the workforce is affected by a drop in demand can access the allowance, which will be paid until the end of 2021. During the first 3 months, employees affected receive 60.0% of their net income, with this amount increasing up to 80.0% after the 7th month²⁵.

Loans to non-financial corporations in the general economy in Germany increased by 26.3%, reaching EUR 994.7 billion in 2020 from EUR 787.4 billion in 2010. This reflects improving conditions of access to finance in the country.

As per the World Bank Doing Business 2020 report, in terms of access to finance Germany ranked 48th out of 190 countries for the ease of getting credit²⁶.

The German government has taken several measures to improve the conditions of access to finances for SMEs in the country, such as²⁷:

- KfW-Fast credit was introduced by the Federal ministry in 2020. A credit volume of up to EUR 500.0 million will be allocated for enterprises who have between 10 and 50 employees.
- An interim aid worth EUR 25.0 billion was adopted during 2020 to help SMEs with liquidity needs. It was applicable for SMEs who experienced a decrease in sales of at least 60.0% in the month of April and May 2020.

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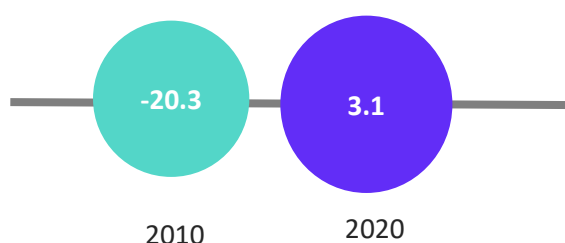
Key economic drivers of the construction sector

Business confidence

In 2020, all confidence indicators showed signs of deterioration with consumer confidence and industry confidence dropping sharply and continue to lie in the negative territory. However, construction confidence indicator has shown significant signs of improvement since 2010, although declining from 2019.

Over the 2010-2020 period, the **consumer confidence indicator** has been fluctuating, reaching -9.5 in 2020 in comparison to the 2010 level (-4.6). This is also higher than the EU-27 average (-14.6), however lower than the 2019 level (-2.1). The **industry confidence indicator** decreased from 0.4 in 2010 to -15.4 in 2020. This is lower than both the 2019 level (-8.8) and the EU-27 average (-14.4). Lastly, the **construction confidence indicator** experienced an increase over the 2010-2020 period, going from -20.3 to 3.1. This is also higher than EU-27 average of -9.3, but lower than the 2019 level (16.5).

Construction confidence indicator in Germany



In parallel, the **investment ratio** has generally increased since 2013, reaching 21.6% in 2020, compared to 19.6% in 2010. **Investment per worker**, on the other hand, decreased by 16.8%, from EUR 91,890 in 2010 to EUR 76,419 in 2018²⁸.

However, following the relaxation of economic restrictions, the confidence levels recovered in June 2020 reached 99.6^{29,30}. It kept increasing until September 2020, reaching 99.8. In October 2020, confidence among German consumers had again started declining as there were possibilities of a second lockdown and toughening of restrictions due to a rise in infection figures. It dropped to 99.6 in October 2020, and further to dropped to 99.3 in November 2020^{31,32}.

Consumer confidence further dropped to 98.9 in January 2021. It then slowly started recovering and reached its highest peak in September 2021 (101.3). It again started falling and reached 101.0 in November 2021³³.

Domestic sales

The ranking of the **five most domestically sold product groups in 2020** has changed significantly since 2010. 'Doors, windows and their frames' (group 251210), which ranked first in 2010, has been replaced by 'Other structures and parts of structures' (group 251123). 'Ready-mixed concrete' (group 236310), ranking second in 2010, has been replaced by 'Doors, windows and their frames' (group 251210). Similarly, 'Windows, French windows and their frames' (group 162311), ranking third in 2010, has been replaced by 'Prefabricated structural components for building or civil engineering' (group 236112). 'Portland cement, aluminous cement' (group 235112) which ranked fourth in 2010, has been replaced by 'Ready-mixed concrete' (group 236310). Lastly, 'Builders joinery and carpentry of wood' (group 162319) which ranked fifth in 2010, has been replaced by 'Prefabricated wooden buildings' (group 162320). Germany's **top five most domestically sold product**

groups in 2020 constituted 48.2% of all construction product domestic sales in 2020.

Table 1: Five most domestically sold construction products in Germany and in the EU in 2020

Germany				EU-27
	Product	Value (EUR m)	Share in construction product domestic sales (%)	Product
1	Other structures (group 251123)	6,194.0	15.0	Other structures (group 251123)
2	Doors, windows and their frames etc (group 251210)	3,803.4	9.2	Ready mixed concrete (group 236310)
3	Prefabricated structural components (group 236112)	3,610.9	8.7	Doors, windows and their frames (group 251210)
4	Ready-mixed concrete (group 236310)	3,323.7	8.0	Prefabricated buildings of metal (group 251110)
5	Prefabricated wooden buildings (group 162320)	3,016.1	7.3	Prefabricated structural components (group 236112)

Source: PRODCOM, 2021.

Export of construction-related products and services

The ranking of the **top five most exported construction** product groups has changed significantly between 2010 and 2020. 'Doors, windows and their frames' (group 251210) which ranked first in 2010, has been replaced by 'Other structures and parts of structures' (group 251123). Further, 'Portland cement, aluminous cement' (group 235112), which ranked second in 2010, has been replaced by 'Fibreboard of wood' (group 162115). Similarly, 'Builders' joinery and carpentry' (group 162319), ranking third in 2010, has been replaced by 'Doors, windows and their frames' (group 251210). The 2010 ranking (fourth) for 'Windows, French windows and their frames' (group 162311) remains unchanged in 2020. Lastly, 'Plaster products for construction purposes' (group 236210), which ranked fifth in 2010, has been replaced by 'Portland cement, aluminous cement' (group 235112). Germany's **top five most exported**

construction products groups in 2020 constituted 49.9% of the total exported construction products groups.

Table 2: Five most exported construction products in Germany and in the EU in 2020

Germany				EU-27
	Product	Value (EUR m)	Share in construction product export sales (%)	Product
1	Other structures (group 251123)	2,064.5	18.7	Ceramic tiles and flags (group 233110)
2	Fibreboard of wood (group 162115)	1,583.9	14.3	Other structures (group 251123)
3	Doors, windows, etc. (group 251210)	871.4	7.9	Fibreboard of wood or other ligneous materials (group 162115)
4	Windows, French windows and their frames (group 162311)	553.2	5.0	Doors, windows, etc. (group 251210)
5	Portland cement, aluminous cement, slag cement (group 235112)	448.4	4.1	Builders joinery and carpentry of wood, n.e.c. (group 162319)

Source: PRODCOM, 2021.

In terms of the **cross-border provision of construction services**³⁴, Germany **exported** EUR 1.8 billion worldwide in 2020, 12.5% below the 2014³⁵ level. Specifically, the exports made to the EU-27 member states and countries outside the EU-27 in 2020 amounted to EUR 1.1 billion and EUR 0.7 billion respectively. The share of exports of construction services in total exports in 2020 was 63.7%.

Germany **imported** EUR 1.6 billion worth of construction services in 2020 from foreign countries. This is 1.3% above the 2014³⁶ level. Specifically, the imports made from the EU-27 member states and countries outside the EU-27 in 2020 amounted to EUR 1.3 billion and EUR 0.3 billion respectively. The share of imports of construction services in total imports in 2020 was 81.3%.



Germany achieved a trade surplus of EUR 155.0 million in 2020, marking a decrease of 64.1% from 2014³⁷.

Access to finance in the construction sector

According to the 2021 Survey on the Access to Finance of Enterprises (SAFE) report, around 41.7% of SMEs in Germany reported of bank loans being relevant, below the EU-27 average (45.7%)³⁸.

As per the report, 11.9% of the SMEs reported using bank loans recently (between April 2021 and September 2021), below the EU-27 average (14.2%). During the same period, 18.6% of SMEs in Germany applied for a bank loan, below the EU-27 average of 21.3%. 2.7% of SMEs in Germany did not apply for bank loans fearing rejection, below the EU-27 average (4.7%). 56.4% of SMEs did not apply for bank loans because of sufficient internal funds, higher than the EU-27 average (47.7%)³⁹. Out of those who applied for a bank loan, 72.2% received everything they requested, which is slightly above the EU-27 average of 71.3%.

The availability of bank loans during April to September 2021 to SMEs in Germany has also changed. 15.2% of SMEs opined that the availability of bank loans improved over the period, slightly below the EU-27 average (15.6%). However, 9.8% of SMEs mentioned that it has deteriorated, slightly below the EU-27 average (10.1%). 67.1% of SMEs believed that the availability of bank loans remains unchanged, above the EU-27 average (64.0%)⁴⁰.

The requirement of bank loans between April and September 2021 increased for 13.4% of SMEs in Germany, below the EU-27 average (18.1%). Over the same period, the requirement of bank loans decreased for 23.1% of SMEs, above the EU-27 average (15.7%). 62.7% of SMEs also reported that their requirement for bank loans remained unchanged over the same period, below the EU-27 average (65.4%)⁴¹.



Credit extended to the German construction sector has been growing consistently since 2013. In 2020, it reached EUR 82.7 billion, representing a 34.0% increase since 2010 (EUR 61.7 billion).

As per the European Investment Bank (EIB) Investment Survey 2020, bank loans continue to make up the highest share (53.0%) of external finance in construction sector in Germany, followed by leasing. However, majority of the German firms in the construction sector rely on internal sources of finance for investment purposes, in comparison with external sources. A greater share of German firms operating in the construction sector preferred to rely exclusively on internal sources to finance investment, after the services sector. As such, the share of 'financially constrained'⁴² firms in the construction sector is lower than the firms operating in the services and manufacturing sector in Germany at about 5.0%⁴³.

The report also shows that most firms in Germany are satisfied with the type, amount, cost, and maturity of the funding received. 13.0% of firms in the construction sector are dissatisfied with the cost of finance, 9.0% for collateral requirements and 5.0% for type of finance received. Moreover, the availability of finance is considered a long-term barrier to investment by 33.0% firms in the construction sector⁴⁴.

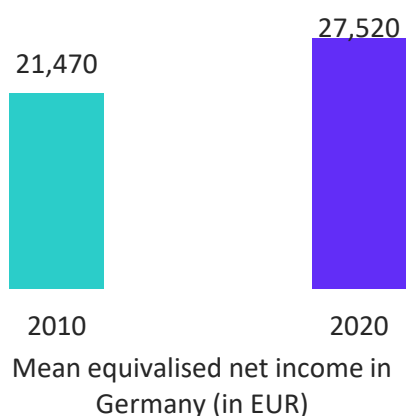
In October 2020, the EIB Group provided a guarantee of around EUR 125.0 million to Commerzbank AG. The guarantee will enable it to provide new lending of up to EUR 500.0 million under favourable terms to SMEs and mid-caps which are experiencing shortages in liquidity due to the COVID-19 pandemic in Germany⁴⁵.

In June 2021, the EIB Group provided a guarantee of EUR 95.0 million to Landesbank Baden Württemberg (LBBW). This guarantee will provide new lending of up to EUR 570.0 million to SMEs. The transaction is expected to support businesses in their recovery from liquidity shortages caused by the COVID-19 crisis⁴⁶.

Additionally, in December 2021, the EIB Group provided a guarantee of EUR 75.0 million to Deutsche Bank. The guarantee will provide new lending of EUR 300.0 million to SMEs and mid-caps facing liquidity shortages due to COVID-19 crisis⁴⁷.

Access to housing

The **number of households** in Germany has continuously increased since 2010, reaching 40.6 million units in 2020. This represents a 5.0% increase compared to the 2010 level of 38.6 million units. The share of population living in **intermediate urbanised areas** reached from 36.1% in 2010 to 41.4% in 2020, representing an increase of 5.3 pp. Since 2010, **mean equivalised net income** in Germany has also increased from EUR 21,470 to EUR 26,105 in 2019, being significantly higher than EU-27 average of EUR 19,567 in 2019. It further increased to EUR 27,520 in 2020, which represents 28.2% increase from 2010 levels.

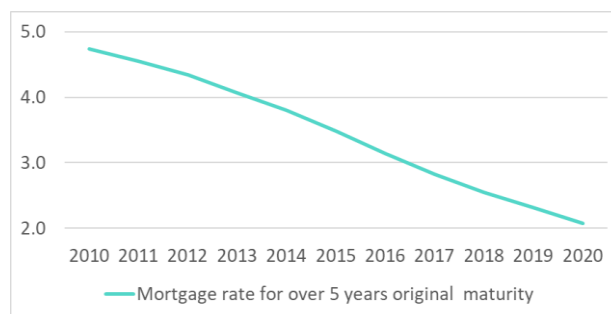


Lending to households for home purchases picked up, with **total outstanding residential loans** growing by 32.8%, from EUR 1.2 million in 2010 to EUR 1.5 million in 2019⁴⁸. This increase in residential loans is partly supported by the declining rates on mortgages. In fact, **interest rates on mortgages** (for over five years maturity) have been consistently declining from 4.7% in 2010 to 2.1% in 2020 (Figure 7).

Total outstanding
residential loans
between 2010 and 2019

↑ 32.8%

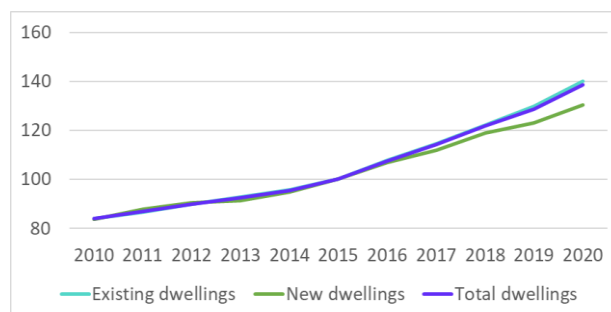
Figure 7: Mortgage rates for loans for over five years original maturity (%)



Source: ECB MFI Interest Rate Statistics, 2021.

The increasing population living in intermediate urbanised areas coupled with increasing mean equivalised net income has boosted demand for housing in Germany. These factors, together with decreasing mortgage rates in the country, have boosted the uptake of residential loans. As a result, housing prices have increased since 2015. In particular, the **house price index** for total dwellings has increased by 38.7% over the 2015-2020 period. This is driven by a 30.4% and 40.2% increase in the house price index for new dwellings and existing dwellings (Figure 8).

Figure 8: House prices index in Germany between 2010 and 2020 (2015=100)



Source: Eurostat, 2021.

House price index for
existing dwellings
between 2015 and 2020

↑ 40.2%

House prices in Germany continued to boom despite the recession caused by the COVID-19 pandemic. During 2020, they increased by 11.4% compared to 11.1% in 2019⁴⁹.

The housing market in Germany remains strong amidst improving economic conditions. However, high demand coupled with lower interest rates and high prices have continued showing an upward trend. This highlights the constrained supply of homes in the country. According to the Federal

Statistical Office (*Destatis*), house prices in Germany have continued to rise throughout the COVID-19 crisis, faster than expected – both in cities and rural areas. House prices rose 8.3% during the first three quarters of 2021 compared to the same period the previous year. Strong house price rises are expected to continue in 2021, supported by low interest rates, as well as the prevailing supply shortage in major cities⁵⁰.

The resilience of the German housing market amid the disruptions caused by the global COVID-19 pandemic, makes it the most preferred for foreign investments. Chinese property investors are looking at Germany as a destination to make "pandemic-proof" investments for the future. Chinese buyers are prioritising to invest in Germany due to its potential to offer high returns from commercial properties and buy to let properties⁵¹.

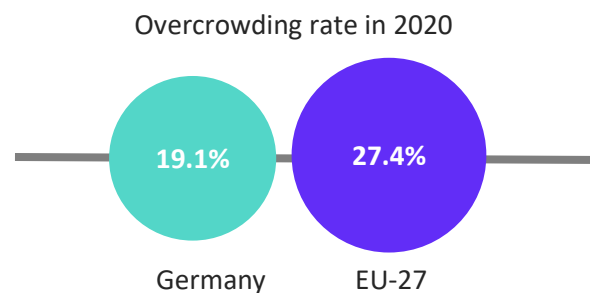
With regards to the **housing supply** in 2020, the total number of homes completed in Germany increased by 4.6% from 2019, reaching 306,376 units⁵². In 2021, the number of completed residential units is likely to rise only gradually and remain well under the official government target of building 375,000 new housing units per year⁵³. Moreover, the number of **building permits** in 2020 in the German housing market stood at 362,000, representing an increase of 0.4% from the number of permits issued in 2019 (360,578). Out of this, permits for single dwelling houses reached 117,000 in 2020, from 112,232 in 2019 (+4.2%) whereas permits for collective dwellings reached 185,000 in 2020, from 188,478 in 2019 (-1.8%)⁵⁴.

In 2021, residential construction activity continued to rise. According to the Federal Statistical Office (*Destatis*), in the first three quarters of 2021, dwelling permits rose by 4.8% from previous year to 282,420 units, following an annual growth of 2.2% in 2020⁵⁵.

The German housing market continues to be characterised by a low rate of **home ownership** and a preference for **rental housing**. In 2020, 50.4% of the building stock was held by **homeowners** (down from 53.2% in 2010 and 51.1% in 2019). On the other hand, **tenants** comprised of 49.6% in 2020 (up from 46.8% in 2010 and 48.9% in 2019). The indexed values of **actual rentals for housing** have also increased by 7.6% between 2015 and 2020. Only 32.1% of people earning **below 60.0% median equivalised income** own their home in 2020, while

this figure reaches 54.6% to for people earning **above 60.0% of the median equivalised income**. This shows that the level of income is a key determinant to home ownership.

Housing quality in Germany is relatively high. The **housing cost overburden rate**⁵⁶ in 2020 stood at 19.9%, higher than the EU-27 average (9.9%), and above the 2011⁵⁷ level (16.1%)⁵⁸. The **severe housing deprivation rate**⁵⁹ in 2019 stood at 2.1%, on par with the 2011 level. However, it is below the EU-27 average (4.0%)⁶⁰. It further decreased to 1.2% in 2020. Finally, the **overcrowding rate**⁶¹ in 2020 stood at 19.1%, above the 2010 level (14.3%). However, it lies below the EU-27 average (27.4%)⁶².



Infrastructure

As per the Global Competitiveness Report 2019, Germany ranked 8th in infrastructure, scoring higher than the average of advanced economies⁶³.

In terms of infrastructure, Germany ranked well in railroad density (7th), airport connectivity (7th), liner shipping connectivity (7th) and road connectivity (11th). It has also been ranked 16th under efficiency of train services and 18th under efficiency of seaport services. The quality of its road infrastructure ranked at the 22nd place, comparative to most economies worldwide. However, this is down from the 19th rank of the previous year. In the efficiency of air transport services, Germany ranked 28th out of 141 economies. The country's road density in 2019⁶⁴ remained the same as 2018 at 37.0km/km². It increased by 2.8% from 36.0 km/km² in 2010. Its railroad density increased by 1.9% over the same period, totalling 107.0 km/km² in 2019.

The COVID-19 pandemic negatively affected the German economy, which compelled government officials (and EU officials at a broader level) to propose a number of investment packages. Amongst them, on May 2020, the German government announced an economic stimulus

package – **Investment Future Mobility** - amounting to EUR 28.0 billion. The package aims at boosting investments in digital infrastructure and rail transport⁶⁵.

As part of the investment package, EUR 3.0 billion is planned to go to the Federal Digital Infrastructure Fund, while another EUR 5.0 billion will be invested to expand access to 5G networks. The package shall also support railway networks through investments totalling EUR 2.6 billion. The state-owned rail company, Deutsche Bahn, will also receive EUR 5.5 billion to increase equity capital over the next two years due to a loss of revenue during the health crisis. Furthermore, EUR 2.5 billion shall be set aside for road construction, EUR 1.9 billion for alternative and synthetic fuels, and EUR 170.0 million towards financial assistance for bus companies. An additional EUR 1.2 billion will be allocated for the improvement of waterways⁶⁶.

According to Globaldata's construction projects database, five big construction projects were initiated in Germany in the third quarter of 2021. These include the construction of the digital park Fechenheim; construction of Berlin Data Center Campus (BER1); development of Lorrach central

hospital campus; construction of shipbuilding facility in Kieler Forde; and the redevelopment of the Markisches Zentrum complex⁶⁷.

The German federation coalition government formed in November 2021 intends to focus on the transport infrastructure through a reform of subsidies for electric cars and building alternative transport modes. Charging infrastructure is to be improved and shared and autonomous public transport vehicles will be promoted. Public transport is to be invested in and cycling and pedestrian mobility to be supported. Renewable energy should make up 80.0% of the German grid energy mix by 2030⁶⁸.

The Recovery and Resilience Plan of Germany includes investment of EUR 700.0 million for the construction of charging infrastructure; EUR 1.1 billion for the purchase of buses with alternative propulsion; EUR 2.5 billion towards helping citizens shift to clean electric vehicles by giving financial support for more than 800,000 decarbonised vehicles. The plan also includes the extension of the initial registration period for granting the ten-year tax exemption for purely electric vehicles⁶⁹.

4

Key issues and barriers in the construction sector

Company failure

The number of **company births** in the narrow construction sub-sector reached 29,735 in 2019, representing a growth of 3.8% over the 2010-2019⁷⁰ period. Similarly, the real estate activities sub-sector witnessed a 6.1% growth in company births over the same period, with numbers reaching up to 23,209 in 2019. Conversely, the number of company births in the architectural and engineering activities sub-sector decreased by 22.9% since 2010, reaching 8,661 in 2019.

The number of **company deaths** in the narrow construction sub-sector reached 36,981 in 2019, increasing by 37.3% over the 2010-2019⁷¹ period. The architectural and engineering activities sub-sector witnessed a 24.4% growth in company deaths over the same period, with numbers reaching up to 15,312 in 2019. In contrast, the number of company deaths in the real estate activities sub-sector decreased to 14,192 in 2019, representing a decline of 35.6% since 2010.

Company deaths in the real estate activities sub-sector between 2010 and 2019

↓ 35.6%

The impact of COVID-19 pandemic was partly mitigated by government support measures, resulting in a limited number of insolvencies in Germany. In fact, around 15,841 business insolvencies (including small businesses) were recorded in Germany in 2020, representing a decrease of 15.5% compared to the 2019 level (18,749). This is partly due to a rule, suspending the mandatory filing of insolvency claims, designed to keep firms afloat during the pandemic. Specific to the broad construction sector in Germany, there

were 2,500 insolvencies in 2020 compared to 3044 in 2019 (-17.9%)⁷².

In March 2020, in order to combat the impact of the pandemic, the government helped financially troubled companies by allowing them to delay filing bankruptcy. This was later extended until April 2021⁷³. There were several other economic policy measures announced by the German government including a EUR 122.3 billion aid package, comprising of EUR 55.0 billion for directly combating the pandemic and EUR 50.0 billion in immediate assistance for supporting microenterprises. An immediate assistance worth EUR 50.0 billion was also announced for own-account workers and small companies. As per this measure, one-off payments of up to EUR 9,000 for companies with up to five employees (full-time equivalents) or EUR 15,000 for companies with up to ten employees (full-time equivalents) were made available⁷⁴.

Trade credit



According to the 2021 SAFE report, around 11.7% of SMEs in Germany reported trade credit to be relevant, well below the EU-27 average of 27.8%⁷⁵.

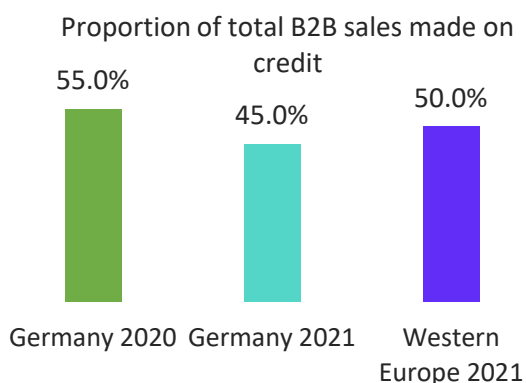
As per the report, 6.2% of the SMEs in Germany reported of using trade credit between April 2021 and September 2021, well below the EU-27 average of 13.7%. During the same period, 25.0% of SMEs in Germany applied for trade credit, lower than the EU-27 average of 29.6%. 4.3% of German SMEs did not apply due to the possibility of rejection and 39.2% of SMEs did not apply because of sufficient

internal funds, higher than the EU-27 average of 37.5%⁷⁶.

Amongst the firms which applied for trade credit in Germany, 79.8% received everything they applied for, above the EU-27 average of 71.6%. A smaller share of German SMEs (6.8%) received over 75.0% of what they applied for in trade credit, lower than the EU-27 average of 9.6%. 3.9% of SMEs in Germany received less than 75.0% of what they applied for, lower than the EU-27 average of 8.7%. No trade credit applications from German SMEs were rejected⁷⁷.

Regarding the availability of trade credit during April 2021 and September 2021, 14.5% of SMEs reported that the conditions had improved, slightly lower than the EU-27 average of 14.7%. However, 6.3% of German SMEs also reported that the availability of trade credit had deteriorated, lower than the EU-27 average of 8.2%. For 70.4% of German SMEs, the availability of trade credit remained unchanged during the same period, slightly higher than the EU-27 average of 69.7%⁷⁸.

According to the Atradius Payment Practices Barometer, in 2021, around 45.0% of sales were made on credit in the German economy (compared to an average of 50.0% in Western Europe⁷⁹). This represented a contraction compared to the 55.0% of credit sales recorded in Germany for 2020. As a result, companies took steps to mitigate credit risk which included offering discounts for early payment and overdue invoice payment reminders. In 2022, 54.0% of the respondents intend to offer trade credit more frequently as a way to provide short-term finance for their customers⁸⁰.



Late payment

According to the SAFE 2021 report, 6.5% of SMEs reported facing late payment issues on a regular basis, below the EU-27 average (11.8%)⁸¹.

As per the report, 25.4% of SMEs reported that their payments to suppliers have been affected as a result of late payments by customers. For 19.2% of SMEs, late payment affected production or operations, and for 22.3% it impacted investments or new hiring. 21.4% of SMEs also reported that their loan repayments have been delayed, or they have had to seek additional financing as a result of late payments⁸².

According to the Atradius Payment Practices Barometer 2021 report, in Germany 37.0% of the total value of business invoices were overdue in 2021, compared to 40.0% in 2020. 10.0% of the total value of sales were outstanding after 90 days in 2021, an increase from 8.0% previous year. Almost all outstanding sales after 90 days were written off. Additionally, 60.0% of businesses surveyed reported that they did not change their payment terms in 2021 and most believed that customer payment practices will improve in 2022⁸³.

According to the European Payments Report 2021, 44.0% of businesses in Germany have agreed to accept longer payment terms in order to avoid damaging client relationships⁸⁴.

As per the report, 43.0% German firms consider the widening gap between the payment terms and duration of pay is a real risk to the sustainable growth of the business. On average, business-to-business (B2B) customers in Germany are allowed 41 days to pay dues, on par with the EU-28⁸⁵ average of 41 days. However, in practice German B2B customers took an average of 53 days to pay dues in 2021, slightly higher than the EU-28⁸⁶ average of 52 days⁸⁷.

About 36.0% of German companies consider that late payments lead to loss of income and prohibit growth potential, with 37.0% of companies believing that the financial difficulties of debtors are the main cause of the problem⁸⁸.

With the ongoing COVID-19 pandemic, the situation has become more difficult. According to the European Payment Report 2021, 44.0% of respondents expect debtors to have liquidity

challenges due to the impact of COVID-19 and this will likely affect late payments. This is lower than the EU-28⁸⁹ average of 48.0%⁹⁰.

Additionally, 41.0% of respondents in Germany ranked "Risk of a pan-European recession" as one of the main challenges in terms of their customers paying on time and in full over the next 12 months⁹¹. This is slightly above the EU-28⁹² average of 40.0%. At the same time, 61.0% respondents are more concerned than ever before about debtors' ability to pay on time, below the EU-28 average of 62.0%. Lastly, 62.0% of respondents believe the risk of late/non-payments will increase during the next 12 months, less than the EU-28 average⁹³ of 66.0%⁹⁴.

Credit losses are problematic for half of the German firms. Amidst economic uncertainty, 55.0% reported that their routines and processes are not as strong as they need to be to ensure financial sustainability. 37.0% rely largely on credit checks and 27.0% on debt collection to protect against late payments⁹⁵.

Time and cost of obtaining building permits and licenses

As per the World Bank Doing Business 2020 report, Germany ranked 30th out of 190 economies, in 'Dealing with Construction Permits'⁹⁶. This is a decline from previous year's ranking (24th)⁹⁷.

Completing the formalities to build a warehouse⁹⁸ requires nine administrative procedures (Table 3), below the OECD high-income average of 12.7; and takes 126 days (below the 152.3 OECD high-income average). The estimated cost is approximately 1.1% of the warehouse value, lower than the OECD high-income average of 1.5%⁹⁹.

Table 3: Construction procedures timing and costs in Germany

Procedure	Time to complete	Associated costs
Obtain topographic survey of the land plot	30 days	EUR 2,175
Obtain building permit ¹⁰⁰	25 days	EUR 7,339
Apply for approval of static calculation	21 days	EUR 4,288
Receive fire safety inspection from District Chimney Sweeper	1 day	EUR 31
Receive inspection of the building shell	1 day	EUR 2,600
Receive inspection after completion of the building ("Foermliche"	1 days	no charge

Bauabnahme")		
Apply for water connection	1 day	EUR 7,500
Receive inspection by water company	1 day	no charge
Obtain water connection	45 days	no charge

Source: Doing Business overview for Germany, World Bank, 2020.

Skills shortage

The number of **job vacancies** in the narrow construction sub-sector increased by 156.9%, from 51,892 in 2010 to 133,332 in 2020. Similarly, job vacancies in the real estate activities sub-sector increased by 61.7% over the same period, reaching 8,435 in 2020, from 5,216 in 2010. These trends reveal large skills shortages in the narrow construction sub-sector, and to a lesser extent in the real estate activities sub-sector.

Job vacancies in the narrow construction sub-sector between 2010 and 2020

 **156.9%**

Moreover, **adult participation rate in education and training** in the narrow construction sub-sector decreased from 9.4% in 2010 to 9.0% in 2020. In the real estate activities sub-sector, adult participation in training also decreased from 11.0% in 2010 to 10.2% in 2020.

The number of **tertiary students in engineering, manufacturing and construction** has been increasing continuously since 2010. In 2019, it stood at 157,163, representing an increase of 111.3%, from the 2010 level (74,371). Out of these, the number of students in manufacturing and processing increased by 107.3%, going from 4,905 in 2010 to 10,166 in 2019. This was followed by the number of students in architecture and building, which grew from 16,301 in 2010 to 27,591 in 2019 (+69.3%). Similarly, the number of tertiary students in engineering and engineering trades increased by 23.8%, from 53,165 in 2010 to 65,813 in 2019.

Considerable **shortages of skilled labour** have been reported by many sectors in Germany, and this acts as an impediment to the growth of the country's economy¹⁰¹. As per the **EIB (European Investment Bank) Investment Survey 2021**, in comparison with other barriers, almost 96.0% of the business respondents concluded that **unavailability of skilled staff** is the biggest long-term barrier for the German broad construction sector¹⁰².

In order to address the challenges of skill shortages in Germany and the declining working-age population, the government is implementing a comprehensive **Skilled worker strategy** (*Fachkräftestrategie*). Sectorial associations are also investing in awareness raising campaigns to attract young people for apprenticeships in the construction sector^{103,104,105}.

Sector and sub-sector specific issues

Material efficiency and waste management

Construction and demolition waste (CDW) constitutes one of the heaviest and voluminous waste streams in the entire EU. CDW mainly consists of several materials, including concrete, bricks, gypsum, wood, glass, metals, plastic, solvents, asbestos and excavated soil, many of which can be recycled. In 2018¹⁰⁶, the CDW in Germany totalled 225.2 million tonnes. This represented a rise of 17.9% and 2.1% from 2010 (191.0 million tonnes) and 2016 (220.5 million tonnes) levels. Out of the total CDW generated in 2018, around 9.1 million tonnes of waste were classified as hazardous waste, comprising 4.0% of the total; and 216.1 million tonnes of waste was categorised under non-hazardous waste, making up 96.0% of the total¹⁰⁷.

Construction and
demolition waste
between 2010 and 2018

↑ 17.9%

As per the report published by **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety**, in July 2020, the waste management infrastructure in Germany is comprised of 15,500 facilities, all of which achieve high recycling rates. The highest recycling rate is for CDW (almost 90.0%), followed by production and commercial waste (around 70.0%) and municipal waste (67.0%)¹⁰⁸.

As required by the EU Waste Framework Directive, to promote its circular economy objectives, Germany has mandated that at least 70.0% of the non-hazardous construction and demolition waste (CDW) generated on the construction sites by weight during the renovation activities will be prepared for re-use, recycling, and other material recovery¹⁰⁹.

Climate and energy

As a part of the EU “Fit for 55” initiative, Germany aims to reduce **greenhouse gas emissions** by 55.0%, by 2030 (compared to 1990 levels). In order to achieve this target, the government agreed on a 2030 Climate Package that is composed of a proposal for a federal law on climate protection and a 2030 climate protection programme. This programme contains a list of sectoral policies aimed at achieving Germany’s 2030 greenhouse gas emission reduction target. The law apportions the overall emission reduction targets into sectoral emission budgets between key sectors of the economy, inclusive of the buildings sector. With regards to emissions from the **buildings sector**, Germany has increased tax support aimed at refitting heating systems since 2019. To smoothen the exchange of old heating oil burners, new heating systems will also get a subsidy of 40.0% of the cost. At the same time, after 2026 it will not be allowed to fit a new oil heating system (as long as an alternative exists)¹¹⁰.

Emissions of greenhouse gases (carbon dioxide, methane and nitrous oxides) from activities in the narrow construction and the real estate sub-sectors amounted to 9.8 million tonnes and 0.4 million tonnes in 2019¹¹¹, respectively. While the greenhouse gases emission from the narrow construction sub-sector remained almost the same in 2020, the real estate activities sub-sector reported a 62.0% decline in its emissions in 2020 as compared to the 2010 levels.

As of January 2021, Germany has started implementing its national law to introduce carbon pricing for CO₂ emissions from fossil fuel combustion outside the EU Emissions Trading System (ETS). The law covers key emitting sectors such as industrial and building, heating and transport¹¹².

The system started initially with a fixed price and will steadily increase until 2025 (from EUR 25 to

EUR 55/t CO₂). The emission cap for 2026 reflects the emission reduction trajectory of the Effort Sharing Regulation¹¹³ (ESR). From 2026 onwards, allowances will be tradeable. Similarly, Germany has a trajectory for emission reductions in the transport sector (125 Mt CO₂eq by 2030 compared to 161 Mt CO₂eq by 2021), responsible for more than a third of the effort sharing emissions¹¹⁴.

Germany's future "traffic light" coalition has adopted ambitious targets for the development of renewable energies in order to make progress on climate change. As such, an accelerated phase-out of coal-fired power generation is essential, "ideally already by 2030". As per set targets, by 2030, 80.0%

of electricity is expected to come from renewable sources as compared to its present rate of 50.0%. In order to reach the 80.0% target, Germany needs to strongly invest in the development of wind turbines and photovoltaics. However, the Greens' demand for photovoltaics for new buildings is not included in the agreed coalition agreement. Additionally, starting from 2023, the surcharge under the Renewable Energy Act (EEG) is to be financed entirely from the budget as compared to the current situation of funding it from electricity consumers¹¹⁵.

5

Innovation in the construction sector

Innovation performance

As per the 2021 European Innovation Scoreboard, Germany is classified as a Strong Innovator, same as the previous year¹¹⁶.

The top three indicators of the German innovation system included PCT (Patent Cooperation Treaty) patent applications, employment in innovative enterprises, and design applications. The country also demonstrated strong performance in intellectual assets and innovators as well as employment impacts¹¹⁷.

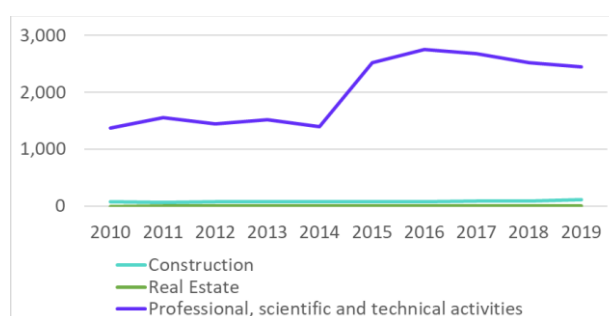
As per the scoreboard, German innovation performance slightly increased primarily driven by an improvement in the functioning of several indicators including indicators using innovation survey data, innovative SMEs collaborating with others, product innovators as well as business process innovators. The country also achieved above average scores on innovators that do not develop innovations themselves while almost average scores on the climate change related indicators¹¹⁸.

In 2019¹¹⁹, the **Business Enterprise R&D Expenditure (BERD)** in the German narrow construction sub-sector amounted to EUR 116.8 million, representing a 52.7% growth compared to EUR 76.5 million in 2010. In parallel, the BERD in the professional scientific and technical activities as well as the real estate activities sub-sectors increased by 79.0% and 600.0% over the 2010-2019 period, totalling EUR 2.4 billion and EUR 3.5 million in 2019, respectively.

Business enterprise R&D expenditure in the narrow construction sub-sector between 2010 and 2019

↑ 52.7%

Figure 9: Business enterprise R&D expenditure (BERD) per construction sub-sector in Germany between 2010 and 2019 (EUR m)



Source: Eurostat, 2021.

The total number of **R&D personnel** (full-time equivalents – FTE¹²⁰) has also increased across all sub-sectors. In the narrow construction sub-sector, total R&D personnel FTE amounted to 1,490 in 2019¹²¹, registering a 81.9% increase compared to the 2010 level. Similarly, the number of FTE in the professional and technical activities sub-sector has more than doubled over the 2010-2019 period, reaching 26,909 in 2019. This was a 125.2% increase compared to the 2010 level (11,950). Likewise, total R&D personnel in the real estate activities sub-sector amounted to 53 FTEs, a 381.8% jump as compared to 11 FTEs in 2010.

R&D personnel (FTE) in the real estate activities sub-sector between 2010 and 2019

↑ 381.8%

The number of **patent applications** in the German broad construction sector has declined by 5.1%, from 1,207 in 2010 to 1,146 in 2020, averaging at 1,156 patent applications over the 2010-2020 period.

As per the 2021 EU Industrial R&D Investment Scoreboard, seven German companies in the real estate investment & services, and five in the household goods & home construction sectors are

currently ranked among the top 1,000 in terms of R&D spending¹²².

According to the KfW SME Innovation Report 2020, the aggregate innovation expenditure by the construction sector stood at EUR 0.4 billion in 2019, almost in line with its 2018 level of EUR 0.3 billion¹²³.

As per the report, 6.0% of the enterprises in the broad construction sector increased their expenditure for development of innovation activities in 2020 compared to the previous year. Conversely, only 14.0% of the enterprises kept their innovation expenditure level the same while 13.0% of the enterprises reduced their expenditure on innovation activities in 2020 compared to the 2019 level. Additionally, only 4.0% of the SMEs in the broad construction sector can be considered innovative¹²⁴.

The German Parliament has introduced a new law with tax incentives for R&D effective from 2020 onwards, allowing businesses to claim a tax credit worth 25.0% of the eligible expenses (personnel costs of research staff or 60.0% of the fees for subcontracting). This incentive is available to all companies regardless of their size. However, the base is capped at EUR 2.0 million, translating into a maximum tax credit of EUR 500,000 per company per year, thus mostly beneficial for SMEs¹²⁵.

Eco-innovation and digitalisation



According to the 2021 Eco-Innovation Scoreboard (Eco-IS), Germany ranked 6th with a score of 133, well above the EU-27 average of 121¹²⁶.

As per the report, Germany's eco-innovation performance declined from 3rd rank in 2018 to 6th rank in 2019. This was primarily due to weaknesses in eco-innovation activities and environmental outcomes offsetting strong performance in eco-innovation inputs as well as socio-economic and eco-innovative outputs¹²⁷.

Germany is one of the leading EU member states in the field of eco-innovation including waste management, recycling and environmental technologies. Recently, the country has put an increased focus on digitalisation and a digital agenda. Germany's strong exporting environmental

technology sector, high numbers in patent development, high environmental and safety standards, skilled employees, efficient production chains and a strong industrial sector provide a good basis for driving a circular economy and eco-innovation in the country¹²⁸.

Nonetheless, there are still some barriers in the mobility sector, in addition to a reluctance for environmental regulation and economic instrumentation. Overcapacities in waste-to-energy facilities and inadequate incentives for waste prevention are also prevalent issues. Germany does not have a dedicated Eco-innovation Action Plan (Eco-AP), although it has an eco-innovation policy. The country has already launched a research and development programme to explore its circular economy potential – **Building and mineral cycles (ReMin) (2020-2024)**. Additionally, the Digital Agenda of the Federal Environment Ministry (2020) also addresses some of the digitalisation and environmental protection issues¹²⁹.

As per the European Commission Digital Economy and Society Index (DESI) 2021, Germany ranked 11th out of EU-27 Member States with a 54.1 score, slightly above the EU-27 average score of 50.7¹³⁰.

Germany performed comparatively well in broadband connectivity. The country is a leader in 5G readiness and is second in the EU-27 in overall fixed broadband take-up. In the case of human capital, Germany performed above average on almost all indicators except the share of female ICT specialists. Basic digital and software skills are widespread in the country. However, there is a general shortfall of ICT specialists. With regard to digital public services, Germany's performance has improved, but continuous efforts are necessary. In November 2018, the Federal government published its implementation strategy 'Shaping Digitalisation'. Additionally, in January 2021, the German Federal government adopted its first Data Strategy. Encompassing more than 240 measures, the Data Strategy is aimed at improving the innovative usage of data, data sharing and covers, data infrastructure, use of data and data competency for example¹³¹.

Through its 2021-2026 National Recovery and Resilience Plan (NRRP), Germany plans to invest significantly in digitalisation, decarbonisation and climate friendly mobility initiatives. The NRRP has allocated EUR 3.4 billion for the deployment of advanced technologies, research and development as well as EUR 1.2 billion for supporting digitalisation of businesses. The 20.0% digital target is clearly exceeded with at least 52.6% of the expected allocation supporting digital objectives^{132,133}.

The NRRP also involves two important multi-country projects on digitalisation: the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies amounting EUR 1.5 billion as well as the IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS) amounting EUR 750.0 million¹³⁴.

Additionally, the NRRP has allocated EUR 3.0 billion for the digitalisation of public services. This includes making more than 115 federal and 100 regional public services digitally available by end-2022. The plan has also allocated EUR 1.8 billion for investment in digital skills. This involves developing education platforms and competence centres, training networks as well as support for apprentices in relation to digital areas and use of digital technologies^{135,136}.

As per the 2020 SMB Digital Maturity Study, German SMEs are using the COVID-19 pandemic crisis as a chance to invest in digitalisation¹³⁷.

Likewise, the **digitalisation** of the construction sector stimulates innovation. The Federal Ministry of Transport and Digital Infrastructure (BMVI) supports the use and uptake of Building Information Management (BIM) for the whole supply chain of planning, constructions and operations. Besides sponsoring pilot-projects, a national step plan for the BIM implementation was presented in 2015, known as the **Road Map for Digital Design and Construction**¹³⁸, acting as a roadmap for leveraging BIM as a standard planning tool for all federal infrastructure projects and is scheduled to be adopted by end-2020. Additionally, an industrial alliance called "**planen und bauen 4.0 GmbH**" also supports the digitisation of the construction sector¹³⁹. According to the EIB Investment Survey 2021, almost 40.0% of the firms in the German construction sector were likely to/ had

implemented any digital technologies, either single or multiple, within their business. Additionally, almost 50.0% of the firms in the broad construction sector had implemented platforms, followed by 48.0% in the case of robotics, 25.0% in the case of drones, 22.0% in the case of 3-D printing technology and 20.0% in the case of Internet of Things and Big Data / Artificial Intelligence¹⁴⁰.

Since 2018, the German government has launched the following measures, that indirectly promote innovation and digitalisation within the construction sector¹⁴¹:

- Expansion of competence centres under the '**Mittelstand 4.0**' initiative, supporting the digitalisation of SMEs by providing information, knowledge and examples of best practices via its competence centres. Three new competence centres were established while seven existing centres' operations were extended by two years.
- Adoption of employment training programmes by BA and BMAS (82 SGB III *Förderung beschäftigter Arbeitnehmerinnen und Arbeitnehmer im Rahmen der Arbeitsförderung*) in January 2019, to help employers adapt to the structural changes due to the use of technology in the workplace and the digitalisation of labour. It offered full or partial financial support for employers undertaking professional training.

Another programme by the German government, the 'Go-Digital programme', promotes consulting and implementation services for SMEs in digitised business processes, digital market development and IT security¹⁴².

With regards to digitalisation, in January 2022, the new German coalition agreement suggested creation of "agile project teams and innovation units" equipped with "specific competences" between the ministries instead of a separate new Ministry. To achieve this, an additional "digital budget" will also be made available for funding.

In respect of new laws, a "digital check" will be introduced to ensure that all projects are digitally fit for purpose. Additionally, to boost innovation, the future "traffic light" coalition also wants to create a female start-up grant to increase the share of women in the digital sector. Further, a new Agency

for Transfer and Innovation (DATI) will also be established to promote innovation in universities in

association with start-ups as well as small and medium-sized enterprises¹⁴³.

6

National and regional regulatory framework

Policy schemes

The Ministry for Economic Affairs and Energy, the Federal Ministry for Environment, Nature Conservation Building and Nuclear Safety and the Federal Ministry of Transport and Digital Industry are the key national players shaping policies affecting the construction sector at the national level.

Germany has an ambitious goal of reducing its energy use by almost half by 2050. This includes the heating requirements of the building stock (see Section TO 3 – Resource efficiency/Sustainable construction). The federal government has dedicated EUR 17.0 billion over the 2015-2020 period to foster energy efficiency measures for the German economy¹⁴⁴. Investments in the energy sector are expected to reach about EUR 15.0 billion annually, including EUR 9.0-10.0 billion invested in new renewable energy capacity over the 2014-2024 period¹⁴⁵.

In terms of **housing policies**, the first stage of the 2006 German federal reforms (*Föderalismusreform I*), transferred the entire responsibility of implementation of the **social housing programmes** to the federal states, the *Länder*. Thus, policies vary considerably in focus and size across German federal states¹⁴⁶. Apart from this, the *Länder* also leads different local policy activities such as vocational training or regional financing schemes that have an impact on the construction sector. In 2019, the German government introduced Article 104d of the Basic Law (*Gesetz zur Änderung des Grundgesetzes*) allowing the federal government to provide direct, ring-fenced financial assistance to the *Länder* for the construction of social housing from 2020 onwards¹⁴⁷.

The German government has allocated EUR 1.0 billion of program funds under the Basic Law to be used over the 2020-2024 period to provide financial assistance for social housing¹⁴⁸. Additionally, the federal states have promised to strengthen their funding programs, especially programs for residential construction. With the German government, as well as the federal states and municipalities, funding a total of EUR 5.0 billion, almost 100,000 social housing units are expected to be created in the near future¹⁴⁹.

Starting from 2020, funding mechanisms such as increasing the *Länder's* share of VAT revenues and providing higher supplementary grants to financially strapped *Länder* are being employed by the federal government. A total of EUR 5.0 billion was made available by the federal government for the construction of social housing in the spring of 2020^{150,151}. The federal government has also implemented various measures aimed at alleviating housing affordability, supporting the housing supply. The German government is implementing the recommendations of the Building Land Commission (*Baulandkommission*) to mobilise more residential building land for the construction of affordable housing and creation of additional living space¹⁵².

In its NRRP, Germany indicated its plans to introduce administrative simplifications, which are expected to facilitate the construction and renovation of buildings and help keep housing affordable¹⁵³.

The German government has allocated EUR 8.0 billion to housing subsidies, to be used over the 2018-2024 period for the construction of social housing units¹⁵⁴. In 2019, it introduced a new tax incentive law for privately financed new rental

apartments, in addition to the regular straight-line depreciation. A special depreciation of five per cent per year for new rental apartments has been allowed, subject to a maximum eligible assessment base of EUR 2,000 per square meter of living space, in the year of acquisition or manufacture and in the following three years¹⁵⁵.

However, there are certain prerequisites. They are the upper construction cost limit of EUR 3,000 per square meter of living space, in addition to the building application made after 31st August 2018 but before 1st January 2022, and the beneficiary rental apartments in the year of acquisition or manufacture and in the following nine years must continue to serve the purpose of living outside the home. Moreover, the special depreciation can be availed of only until the assessment period 2026¹⁵⁶.

Similarly, the German government has taken various initiatives to promote and advance the construction of affordable social housing. These include:

- Extension of the rental price brake by five years along with a retroactive reclaim option in the event of a violation of rent brake for a period of 30 months
- Reduction of the ancillary acquisition costs by limiting the brokerage costs to a maximum of 50.0% of the commission
- Introduction of more attractive housing premium policies
- Re-activation of fallow lands to be used for the construction of new rental housing
- Increased incentives for switching to climate-friendly heating systems along with energy efficient building renovations.

As outlined in its 2021-2026 NRRP, Germany's residential programme intends to achieve deep renovation of 40,000 dwellings by 2026, corresponding to a renovated area of 3,676,000 m² ¹⁵⁷.

Under its Long-Term Renovation Strategy (LTRS), Germany has set the target of increasing its renovation rate from 1.3% to 2.0% for single and two-family houses, as well as from 1.5% to over 2.0% for apartment blocks by 2030. Milestones have been set for dwelling renovations that were carried out and projects approved by 2026. Despite holistic upgrades and application of the Energy Efficiency First Principle not being explicitly

mentioned, the residential sector projects are expected to deliver, a minimum of 45.0% of primary energy demand savings and almost 70.0% savings through bonuses for renewable energy and energy efficiency¹⁵⁸.

The NRRP also makes reference to carbon pricing's revenues to be channelled to promote climate protection measures, tax incentives as well as a 'carbon dividend' paid to low-income households. Moreover, the NRRP measures are expected to be extended beyond 2026 with national funding¹⁵⁹. In fact, as of January 2021, Germany has already started implementing its national law to introduce carbon pricing for CO₂ emissions from fossil fuel combustion outside the EU Emissions Trading System (ETS). Starting with a fixed price, the system is expected to steadily increase until 2025 (from EUR 25/t to EUR 55/t CO₂). From 2026 onwards, allowances will become tradeable¹⁶⁰.

With regard to heating and cooling of buildings, the targeted share of renewables from 14.6% in 2019 to 27% by 2030 will require additional measures. Some of the key measures could involve financial incentives like setting a CO₂ price, providing financial and advisory support for households and buildings to replace oil boilers, support to build new heat networks and transform existing ones. To reach the target, further efforts may be needed, including increasing the number of buildings with heat pumps¹⁶¹.

Correspondingly, housing cooperatives play an important role in providing social housing and affordable rent. Such cooperatives are eligible for funding from the EUR 1.5 billion Federal Compensation Fund for Social Housing¹⁶². In 2018, the federal government gathered stakeholders for a **Housing Summit (Wohngipfel)**. The government announced a new package of measures to strengthen housing affordability, aimed at supporting the building of 1.5 million new dwelling units. The package includes provisions for securing land for building, lowering of construction costs and tackling skill shortages in the construction sector¹⁶³. The key measures were classified into three broad categories: stimulus for investment in building houses; affordable housing; and cutting costs and tackling skill shortage. Social housing is a key component of this programme with a total funding of EUR 5.0 billion over the 2018-2021 period. The

effort will enable an additional 100,000 units of social housing by 2021¹⁶⁴.

In September 2018, the German government introduced a new home ownership related to a child grant scheme (*Baukindergeld*), aimed at families with children and single parents. The scheme provides the single parent a total grant of EUR 12,000 per child in ten equal instalments of EUR 1,200 per year. In order to be eligible for the grant, the annual household income should not exceed EUR 90,000 for a family with one child. This annual income requirement increases by an additional EUR 15,000 per additional child. Moreover, the children must be under 18 years old, and the purchase contract must be dated on or after 1st January 2018¹⁶⁵. A sum of EUR 570.0 million was allocated for this in the 2019 federal budget, with an approximate provision of EUR 3.8 billion in the period up to 2023.

Under its federal budget, the German government has allocated EUR 9.9 billion for supporting families in the area of housing over the 2018-2020 period¹⁶⁶. Furthermore, a new **tenant protection law** (*Mieterschutzgesetz*) came into force in January 2019. It focuses on addressing the housing crisis in urban areas, where young families and single parent families face worsening affordability. The law provides more protection for tenants in rented housing and changes in the rental price brake (*Mietpreisbremse*). From January 2020 onwards, only 8.0% (instead of the previous 11.0%) of the modernisation costs can be allocated to the annual rent¹⁶⁷.

In December 2021, Germany's new government approved a EUR 60.0 billion supplementary budget for the climate and transformation fund. Under the supplementary budget, the country will channel EUR 60.0 billion of its unused debt in the 2021 federal budget into the government's climate and transformation fund for future spending¹⁶⁸.

The move is expected to promote more investments in the shift towards a green economy. Moreover, Germany will also finance EUR 18.0 billion of tax revenue, mostly from eco-taxes and the CO₂ emission trading scheme, into its climate and transformation fund in 2022¹⁶⁹.

As per the new German coalition agreement, both

housing and construction policies will be upgraded and relocated in a separate Ministry to be led by the Social Democratic Party of Germany (*Sozialdemokratische Partei Deutschlands*, **SPD**). The agreement does not mention anything related to a freeze on rent. However, the rent brake will be extended until 2029. The possibility of increasing rent will also be limited. Additionally, the agreement intends to examine ways to introduce a 'fair sharing' of the CO₂ price to be paid in addition to heating costs between landlords and tenants. This is in contrast to the present policy under which only tenants are required to bear additional costs. Furthermore, about 400,000 apartments will be constructed annually, out of which 100,000 apartments will be publicly funded. The German coalition intends to "make the construction and housing of the future affordable, climate-neutral, sustainable, low-barrier, innovative and lively public spaces"^{170,171}.

Under the new coalition agreement, the SPD, the Greens and the Free Democratic Party (**FDP**) proposes to launch a new housing charity with tax incentives and investment allowances, thereby creating a new dynamic for housing as well as achieving sustainable social security for affordable housing. This is also expected to complement the existing housing sector without putting it at a disadvantage¹⁷².

Building regulations

The responsibility for public construction law in Germany is also divided between the central government and the federal states. Zoning law (*Bauplanungsrecht*) falls under federal law. It determines the purpose for which a property may be used and whether a building project is appropriate for its surroundings. The federal states are responsible for building regulations (*Bauordnungsrecht*), which determine how buildings may be designed and constructed in order to meet planning law requirements¹⁷³.

Zoning regulations are governed by the relevant statutory laws at the federal (*Länder*) as well as the regional and local development plans (*Flächennutzungsplan*, *Bebauungsplan*). The applicable codes for zoning and strategic planning are— Federal Planning Act (*Raumordnungsgesetz*); zoning codes of the German states (*Landesplanungsgesetze*); Federal Building Code

(*Baugesetzbuch*); and the Federal Land Utilisation Ordinance (*Baunutzungsverordnung*)¹⁷⁴. The *Musterbauordnung* (Model Building Code), at the federal level, offers a prototype for each state to issue its own building regulation.

In order to obtain a building permit (*Baugenehmigung*), the project must comply with planning and building regulations¹⁷⁵, as well as with all other relevant regulations. For instance, the Energy Performance Certificate (*EnEV-Ausweis*) is mandatory to obtain a building permit, according to the *Energieeinspargesetz* and *Energieeinsparverordnung* (Energy Saving Act and Energy Saving Ordinance). Notably, EnEV was updated replaced in November 2020 by the GEG¹⁷⁶.

The legal framework can be complemented by federal contracting rules, such as the Standard Rules of Contracting and Execution of Construction Works (*Vergabe und Vertragsordnung für Bauleistungen*). These are compulsory for the procurement of public works but are also frequently used in private construction projects. Furthermore, contractual provisions also define the liability relationship between parties in a construction project.

The rights of consumers purchasing a property from a developer are protected by the *Makler-und Bautragerverordnung* (MaBV) law. It defines, the maximum proportion of the purchase price to be paid by the customer during the development stages of the property. If life is put in danger through failure to observe acknowledged rules during design, supervision or execution of works, the German Penal Code (*Strafgesetzbuch*, STGB) may apply.

Each state issues a list of acknowledged technical rules for works (*Liste der technische Baubestimmungen*). This list refers to the standards of the German Institute for Standardisation (*Deutsches Institut für Normung*, DIN) for the planning, design and building of construction works and their parts. DIBt (*Deutsches Institut für Bautechnik*) is responsible for the development of the list on behalf of the Länder¹⁷⁷. The German DIN standards have official status and are mandatory for building projects and to produce building products, building elements and construction systems.

Insurance and liability related regulations

The legal and regulatory rules are defined partly at the federal level and to a large degree by the individual Länder. The Civil Code (BGB – *Bürgerliches Gesetzbuch*) sets out the main provisions with regard to liability in tort (such as injuries inflicted to third parties, breach of statutory provisions and liability for damages caused by agents or sub-contractors) and liability of construction parties (such as architects, engineers, and building contractors) for construction defects¹⁷⁸.

The regular limitation period set in the Civil Code is three years, but a limitation period of two years is defined for construction related to manufacturing, maintenance or alteration of a moveable asset. Moreover, a limitation period of five years applies for construction related to works resulting in the manufacturing, maintenance or alteration of a building¹⁷⁹.

In 2018, the Construction Contract Law as part of the Civil Code came into effect. The new law includes significant changes improving the rights of building owners and developers. For example, by entitling them to a comprehensive description of the construction works to be undertaken prior to conclusion of the contract, as well as a fixed timeframe for completion of the works, which can become the basis for damage claims in case of delays¹⁸⁰.

The law also introduced a cancellation period of 14 days for contracts not validated by a notary, as well as termination provisions in the case of the bankruptcy of the contractor. Customers can also withhold 10.0% of the payments as a last instalment as guarantee for satisfactory completion of turnkey projects. The law also includes provisions advantageous to construction firms, such as the definition of an acceptance test, after which the customer cannot claim defects in the performed works. Additionally, construction sector chambers with experts specialising in construction law should also be available in future in order to decide on open questions quickly and competently¹⁸¹. The new law has been welcomed by industry associations¹⁸².

With regard to insurances, the contractor can obtain the liability insurance (*Haftpflicht-versicherung*), or the all-risks insurance (*Bauleistungs-versicherung*) for works-in-progress.

The risk insurance includes coverage for damage and theft. The advance building insurance (*Gebäudeversicherung*) also covers natural disasters¹⁸³.

Current status and national strategies to meet Construction 2020 objectives

TO 1 – Investment conditions and volumes

Total **investments by the broad construction sector**¹⁸⁴ increased substantially over the past few years (Figure 10). Notably, investments by the narrow construction and the real estate activities sub-sectors increased by 72.1% and 23.4% between 2010 and 2020, respectively. In absolute terms, investments by the real estate activities sub-sector stood at EUR 182.0 billion in 2020, while investments by the narrow construction sub-sector stood at EUR 8.0 billion. Likewise, **investments in intellectual property** by the narrow construction and the real estate activities sub-sectors also followed an upward trend, increasing by 9.3% and by 68.6% over the 2010-2020 period, respectively¹⁸⁵.

Investments by the narrow construction sub-sector between 2010 and 2020

↑ 72.1%

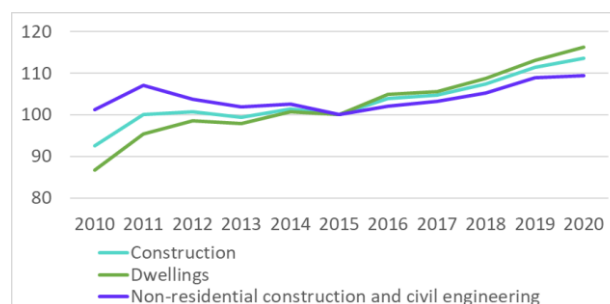
Figure 10: Investment by the German broad construction industry between 2010 and 2020 (EUR m)



Source: Eurostat, 2021.

Total **investments in the broad construction sector**¹⁸⁶ increased by 13.5% between 2015 and 2020 (Figure 11). In particular, investments in dwellings experienced a 16.3% growth over the 2015-2020 period. Similarly, investments in non-residential constructions and civil engineering also increased by 9.4% between 2015 and 2020. In absolute terms, investments in the broad construction sector totalled EUR 373.7 billion in 2019¹⁸⁷, out of which EUR 227.4 billion were invested in dwellings and EUR 146.3 billion were allocated to non-residential constructions and civil engineering¹⁸⁸.

Figure 11: Investment in the German broad construction sector between 2010 and 2020 (2015=100)



Source: AMECO, 2021.

The share of **total inland**¹⁸⁹ **infrastructure investment** in the GDP reached 0.7% in 2019¹⁹⁰, same as the 2010 level. Investment in rail and road infrastructure increased by 82.5% and 35.9% over the 2010-2019 period, totalling EUR 6.9 billion and EUR 16.7 billion in 2019, respectively. Similarly, investment in air transport and inland waterways increased by 27.0% and 0.9% between 2010 and 2019, amounting to EUR 1.9 billion and EUR 1.1 billion in 2019, respectively. In contrast, investment in sea infrastructure decreased by 47.2% over the

2010-2019 period, totalling EUR 510.0 million in 2019.

Rail and road
infrastructure
investment between
2010 and 2019

↑ 82.5%



As per the new LuFV¹⁹⁴ agreement, the German government will contribute EUR 62.0 billion while DB (*Deutsche Bahn*), the national operator, will invest EUR 24.0 billion with its entire income from the project to be reinvested back over the 2020-2029 period¹⁹⁵.

Regarding transport infrastructures, the **2030 Federal Transport Infrastructure Plan** (*Bundesverkehrswegeplan - BVWP*) sets the strategy for transport investments in Germany, highlighting the importance assigned by the federal government and the EU to mobility and infrastructural investments in Germany¹⁹¹. The key aspects of BVWP are structural maintenance of existing infrastructure networks and removal of bottlenecks at important transport hubs. A total funding of EUR 269.6 billion until 2030 has been planned, out of which EUR 141.6 billion will be invested in maintenance of existing infrastructure. Around EUR 98.3 billion has been earmarked for upgrading and new infrastructure construction. Of the total planned funding of EUR 269.6 billion, 49.0% or EUR 132.8 billion has been earmarked for investments in federal trunk roads, 42.0% (EUR 112.3 billion) for investment in railway network and the remaining 9.0% (EUR 24.5 billion) for improvements of waterways¹⁹².

With regard to railways, in January 2020, the German government finalised a 10-year EUR 86.0 billion LuFV III (*Leistungs- und Finanzierungsvereinbarung*) railway operating and financing agreement to modernise its rail infrastructure. The agreement provides for substantial and sustained spending on Germany's transport infrastructure with the aim to achieve a 54.0% increase on annual spending compared to the previous five-year financing period (LuFV II plan). The project includes the renewal of around 2,000 km of track and 2,000 turnouts each year as well as the modernisation of 2,000 bridges¹⁹³.

Similarly, in July 2020, the Bavarian Ministry of Housing, Construction and Transport agreed to invest EUR 436.0 million in the Bavarian rail network in Germany. The funding is expected to be used for various small regional rail projects, such as the construction of new stations at *Lindau*, *Würzburg*, *Regensburg* and *Brunnen* as well as improving accessibility along the *Senden-Marktoberdorf* route¹⁹⁶.

In August 2020, in association with DB (*Deutsche Bahn*), the Federal Ministry for Transport and Digital Infrastructure announced plans for the EUR 462.5 million digital rail-hub project in *Stuttgart*. The project includes the digitalisation of the railways in the city as well as the installation of digital signalling systems, controlling equipment and high-grade automatic train operation systems at stations. Scheduled to open in 2025, the project will be funded by the Federal Ministry of Finance, with full implementation to be completed by end-2030¹⁹⁷.

In association with the Ministry of Transport of the Czech Republic, the Free State of Saxony, DB (*Deutsche Bahn*) and Czech Republic-based railway firm *Správa železniční dopravní cesty*, the German Federal Ministry of Transport has signed an agreement for construction of the *Dresden-Prague* cross-border rail link. The project is expected to cost EUR 5.4 billion and involves the construction of a railway line from *Dresden*, Saxony in Germany, to *Prague* in the Czech Republic as well as a 25 km tunnel under the *Erzgebirge* Mountains. The first part of the project, the *Prague-Lovosice* line, is expected to be completed between 2030 and 2035, with the full line likely to be operational by end-2050¹⁹⁸.

In parallel, over the 2020-2031 period, German federal funding for local public transport is planned to be increased by an additional EUR 5.2 billion. The government will also provide an additional EUR 900.0 million between 2020 and 2023 for

expanding the cycling infrastructure within the country and financing additional pilot projects¹⁹⁹.

In recent years, Germany has announced various important construction and infrastructure projects. For instance, the construction of the *Fehmarn* belt underwater tunnel between Germany and Denmark, involving an investment of EUR 7.0 billion, is expected to boost the sector's growth in the coming years²⁰⁰. Additionally, as part of the Trans-European Road Network (TEN-T), Germany estimates an investment need of EUR 115.0 billion between 2021 and 2030 for the German sections of the TEN-T core and comprehensive network²⁰¹.

The new German coalition intends to invest massively in climate protection, digitalisation, infrastructure and transport. In fact, the SPD, Greens and FDP plan to invest 'more in rail than in road' so as to make it an attractive mode of transport. It even expects to "double" its share of passenger transport by 2030, in line with the past coalition estimates²⁰².

As such, the new German coalition expects Deutsche Bahn AG's infrastructure is to be operated 'in the public interest' in future. Moreover, profits are expected to remain in the network division and will not flow to the railway group. Additionally, all road construction projects planned until 2023 will be implemented while plans for 2030 will be reviewed again. The coalitionists expect 15.0 million electric cars to drive on the roads by 2030²⁰³.

The EIB has financed a number of infrastructure projects in Germany including the *Verkehrsbetriebe Hamburg-Holstein's* (VHH) Hamburg E-mobility Programme, launched in September 2019 under the Clean Urban Transport Programme Loan Germany. The project, amounting to EUR 142.0 million with a proposed EIB financing of EUR 60.0 million, aims at the electrification of Hamburg's fleet of public busses between 2019 and 2023²⁰⁴.

In 2020, the EIB Group invested almost EUR 1.5 billion in infrastructure in Germany²⁰⁵.

Likewise, Germany also benefitted from investments from the **European Fund for Strategic Investments** (EFSI). As of January 2021, the total financing under EFSI amounted to EUR 9.5 billion and is set to trigger additional investments of EUR 42.1 billion. Under the infrastructure and

innovation window, 109 projects have been approved, amounting to EUR 8.1 billion and are set to trigger EUR 34.2 billion in total investments. Under the SMEs window, 33 agreements have been approved, involving a total financing of EUR 1.4 billion, and are set to trigger investments of up to EUR 7.9 billion. Additionally, this is expected to benefit about 43,915 SMEs and mid-cap companies from improved access to finance²⁰⁶.

Renovation spending by households amounted to EUR 14.4 billion in 2020, representing a 41.7% increase compared to the 2010 level. Similarly, spending as a share of total household disposable income increased from 0.6% in 2010 to 0.7% in 2020.

Households' renovation spending between 2010 and 2020



41.7%

TO 2 – Skills

The German government has adopted several measures to promote the adoption of VET. In January 2020, Germany announced a new law to align dual VET with future requirements in five areas by introducing a minimum training wage for apprentices, emphasising equivalence to academic qualifications by introducing new terms for advanced vocational training programmes, expanding part-time vocational training to new target groups, facilitating recognition of prior VET learning and reducing administrative burdens²⁰⁷.

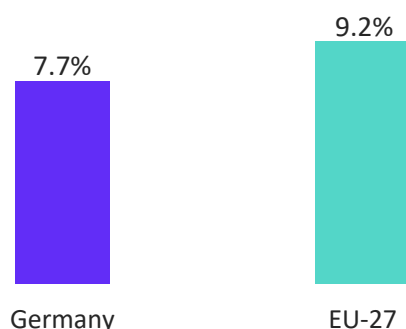
Similarly, in March 2020, the German government adopted the Skilled Immigration Act, granting applicants with a recognised full vocational or higher general education qualification the possibility to live and work in Germany. Furthermore, the new version of the law on advanced training programmes to become a master craftsman or technician was also approved²⁰⁸.

In response to the COVID-19 pandemic, in April 2020, the Federal Cabinet adopted the Law on the promotion of continuing vocational training during times of structural changes and further development of funding of vocational training assistance. Furthermore, the government has developed labour market support instruments such as facilitating access to short time work benefits and employee qualification²⁰⁹.

With regard to apprenticeships, in 2020, the number of new entrants decreased by 5.6% compared to its 2019 level. Similarly, the number of new apprenticeship contracts also declined by 11.0% in 2020 compared to the previous year²¹⁰.

There are several reasons behind this decline in apprenticeships including unattractive working conditions, lower pay and regional differences. To address these issues, the German government has announced various measures to secure apprenticeships as well as improve its training capacity. In June 2020, the German government announced 'Securing apprenticeship placements' funding programme, allocating EUR 500.0 million for 2021 and EUR 200.0 million for 2022. This is primarily aimed at supporting small businesses willing to keep or extend their training levels of apprentices²¹¹.

Correspondingly, Germany's overall **participation in adult learning** and education stood at 7.7% in 2020 (aged 25-64), below the EU-27 average of 9.2%²¹². Adult participation in education and training in the narrow construction sub-sector stood at 9.0% in 2020, slightly higher compared to the EU-27 average of 7.4%. In contrast, adult participation in education and training in real estate activities stood at 10.2% for 2020, below the EU-27 average of 13.8%. The share of unemployed adults participating in adult learning slightly increased from 8.2% in 2019 to 12.1% in 2020²¹³.



Participation in Adult Learning in 2020

Adopted in 2019, the national skills strategy (*Nationale Weiterbildungsstrategie*) combined federal and regional programmes and is expected to improve transparency together with accessibility, with better recognition of informal skills and guidance to low-skilled workers to formal (as well as partial) qualifications. Other recent reform

initiatives include the 'Qualifications Opportunities Act' (*Qualifizierungschancengesetz*), providing improved access to and financial support for further education of employees whose jobs are at risk of being replaced by new technologies²¹⁴.

In April 2021, the Federal Ministry of Education and Research decided to increase its support to adult learning centres. This included increasing the number of educational staff to strengthen the digital learning portal, thereby responding to the sudden increase in demand for online adult education²¹⁵.

Adult education in Germany continues to focus on input and teacher-oriented education. As a result, other important aspects such as developing new innovative approaches to cater to individual learning interests are slightly lagging behind²¹⁶.

Skills shortage is one of the biggest problems for the German construction sector. To tackle this, the central government, in partnership with regions (*Länders*), has launched the second phase of the Quality Initiative 2019-2023. This includes 48 different projects in 59 establishments. The key focus of the initiative will be in the fields of machine technology and electrical engineering, among others.

As per its National Resilience and Recovery Plan (NRRP), Germany has allocated EUR 1.4 billion for the digitalisation of education²¹⁷.

Under the NRRP, the German government has announced various initiatives to promote the digitalisation and education of its workforce. The government plans to promote digital skills by supporting continuing education and training networks as well as supporting companies offering apprenticeships. A one-stop web portal will make educational content more accessible to learners. Further, the creation of continuing education and training networks is also expected to help companies provide their staff with relevant training. Moreover, to support the apprenticeship system, enterprises will receive financial incentives to hire and retain apprentices, which in turn will contribute towards fulfilling the Youth Guarantee²¹⁸.

In parallel, in order to modernise the VET curriculum to current labour market requirements, the Federal Ministry of Education and Research (BMBF) had already launched the **Vocational Training Pact** in 2018. With a focus on digitalisation,

automation and advanced technology learning, the Federal Cabinet, in 2019, updated the Vocational Training Act (*Berufsbildungsgesetz*). The update introduced three continuing vocational education and training (C-VET) levels with harmonised terms of C-VET occupations²¹⁹.

Similarly, in June 2019, the German parliament passed the Skilled Labour Immigration Act, effective from 1st March 2020. The new rule permits qualified workers from non-EU countries to work in Germany and is expected to bring an additional 25,000 skilled workers each year. The rules also allow the candidates to take up further training and education in Germany, in cases where the professional qualifications are partially recognised. Furthermore, the immigration law does not restrict entry of skilled workers to any pre-defined list of “shortage occupations”. As such, certain occupations suffering from labour shortages, including craftsmen and other skilled workers in the construction sector, electrical and other engineers, also benefit from this Act²²⁰.

TO 3 – Resource efficiency / Sustainable construction

Under the **National Energy Efficiency Action Plan (NEEAP)**, in case of primary energy consumption, Germany has an indicative national reduction target of 20.0% by 2020, 30.0% by 2030 and 50.0% by 2050, in comparison to 2008. The government recently adopted the Climate Package (including the Climate Protection Program 2030 and the Federal Climate Protection Act of 2019). The country achieved its emissions reduction targets for 2020, which is partly explained by the impact of the COVID-19 crisis, and the decline in economic activities²²¹.

Under the new Climate Law, the climate targets will require almost tripling the current pace of emission reduction by 2030. Despite emissions having on average decreased by 15.0 million tonnes per year over the last decade, they will have to significantly decrease further by 36.0 million to 41.0 million tonnes per year until 2030²²².

So far, climate action is insufficient in all sectors. As per estimates, the buildings sector is expected to fall short of its sector target in 2021. Without any

fast supplementary climate action, the 2030 targets will be significantly missed in the sectors.

Since the political push to decarbonise the economy (*Energiewende*), Germany has made substantial efforts to make its building stock more energy efficient. Given that buildings make up about 35.0% of total energy consumption, they have important energy savings potential²²³. Through the “**2050 Energy Concept**”, the federal government has paved the way to the transformation of the country’s energy supply and utilisation. The concept foresees, among other targets, the reduction of the primary energy demand of buildings by 80.0% by 2050, compared to 2008²²⁴.

In December 2019, the German government launched the ‘Energy Efficiency Strategy 2050’ initiative aimed at achieving its 2030 targets through fostering energy efficiency investments across different sectors²²⁵. The legal requirements for energy conservation in Germany are laid out in the Energy Conservation law. The most important standards governing energy efficiency in buildings are set out in the Energy Conservation Act (EnEG), the Energy Conservation Ordinance (EnEV), now replaced by the GEG in November 2020, and the Renewable Energies Heat Act (EEWärmeG). Additionally, the Heating Cost Ordinance governs the allocation of costs for heating and hot water production in centrally supplied buildings with two or more units²²⁶.

In October 2019, the German government passed a draft of the new Building Energy Act (*Gebäudeenergiegesetz* - GEG) merging and simplifying the Energy Saving Act, Energy Saving Ordinance and Renewable Energies Heat Act. Under the GEG, the European requirements for the total energy efficiency of buildings have been implemented. Additionally, the regulations of the lowest energy building have also been integrated into a unified energy saving law. Nonetheless, the current energy requirements for new buildings and renovations continue to apply and will not be tightened. In fact, the ‘neighbourhood approach’ is introduced under the Act²²⁷.

The German Federal Minister for Economic Affairs and Climate Action has already presented his “opening balance on climate protection” as well as announced a number of “immediate measures” that the ministry intends to present in the coming months. Through these measures, Germany plans

to reach its objective of 80.0% renewable energy by 2030, including the acceleration of deployment of solar and wind energy, renovation of buildings, supporting the transformation of industry, particularly via “carbon contracts for difference” and an updated National Hydrogen Strategy with a doubling of the planned production for green hydrogen. The first Climate Protection Package is expected by end-April 2022 with the second one during the summer²²⁸.

Under its 2021-2026 NRRP, Germany has allocated EUR 2.5 billion for investment in the energy-efficient buildings renovation. Through this broad renovation programme, Germany expects to deliver at least 30.0% of energy savings. This will be complemented by municipal living laboratories for the energy transition exploring innovative solutions for an efficient and sustainable energy supply in urban neighbourhoods through pilot projects²²⁹.

With the renovation of existing housing stock, the country intends to reduce its energy consumption and make housing more affordable while promoting the green transition. The NRRP includes additional reforms to remove investment barriers and strengthen the capacities for construction works. This is also expected to increase the stock of social housing and improve transport options from areas with affordable housing²³⁰.

Additionally, the buildings renovation initiative also provides assistance in financing the gas-fired boilers for renovating buildings. However, this is limited to replacing coal and oil-based heating systems. As per the DNSH (Do No Significant Harm) assessment, this investment is expected to significantly reduce air emissions and improve public health in areas where the EU air quality standards laid down in Directive 2008/50/EU are or could be exceeded. The investment in gas condensing boilers is part of a broader measure aimed at improving the energy efficiency of buildings and bringing them in line with the long-term renovation strategies under the Energy Performance of Buildings Directive. Further, photovoltaic modules are also planned to be installed together with the gas boilers during these renovations²³¹.

The building renovation measure will step up emission savings, driven by increased support for renewable energy heating systems, smart home solutions, renovations to very high efficiency classes

and the abolition of support for lower classes of energy performance. Furthermore, municipal living labs for the energy transition is also expected to contribute to these targets by supporting energy-optimised urban district projects as blueprints for the roll-out of efficient and integrated energy solutions. Finally, the greenhouse gases (GHG) emission reduction potential of these measures is expected to be reinforced by Germany’s carbon pricing policy.

According to estimates, following an average 2.6% annual renovation rate at optimal cost levels, the primary energy saving potential in Germany, by 2050, is 352TWh. This is expected to generate more than 12.8 million full time equivalent jobs over the 2021-2050 period. Moreover, carbon pricing policies could create additional incentives for energy efficiency measures²³².

In parallel, the German government also offered additional incentives to promote building renovations. For instance, the German government has created an exchange bonus scheme wherein it covers 40.0% (in case of installation of a gas hybrid heater) to 45.0% (in case of installation of a regenerative heat generator) of renovations cost of a new, efficient heating system. Moreover, no new oil heating system will be allowed to be fitted in buildings after 2026 under the 2030 Climate Package (as long as an alternative exists)²³³.

Another example, if owners install new windows and / or insulate the roofs and outer walls of an owner-occupied residential property, they will be eligible to claim a tax incentive of 20.0% of the investment costs up to a maximum deductible amount of EUR 40,000 per beneficiary property. This tax incentive will be spread over three years, resulting in reduced tax liability for a large number of building owners²³⁴.

In September 2018, the Ministry for Economic Affairs (BMWi) adopted the 7th Energy Research Programme defining the energy research policies until 2022, at a total budget of EUR 6.4 billion²³⁵. The programme, part of the Ministry’s “Research network – Energy in Buildings and Districts” programme, aims at streamlining the research efforts in the energy optimised building domain. There are four key research focus areas of the 7th Energy Research Programme: (i) energy efficiency in buildings, industry and commerce as well as in

transport sector; (ii) alternative energy sources exploring various sources, such as wind, geothermal, solar, biofuel, hydro, marine as well as conventional thermal plants; (iii) integration of energy systems, such as power grids, storages, sector coupling, and hydrogen technologies and (iv) energy transition research, such as CO₂ circular economy, digitalisation, and resource efficiency so as to optimise the energy usage²³⁶. The programme focuses on applying energy efficiency and use renewable sources in industry and commerce, buildings and neighbourhoods, and in the transport sector²³⁷.

Likewise, the Market Incentive Programme (MAP) with a yearly budget of EUR 300 million, offers grants and low-interest loans to private individuals, companies and municipalities to invest in sustainable heating and cooling technologies powered by renewable energy. The grants can be provided in the form of subsidies of up to 30.0% of total investment costs for a solar collector system. For heat pumps and biomass plants, the grant funding can range between EUR 50,000 to EUR 100,000 depending on the level of innovation of the system²³⁸.

Furthermore, there has been continued support from the EIB for development of energy efficient buildings in Germany. For example, in January 2020, the state housing company, *Gewobag*, received a EUR 240.0 million loan from the EIB to build 2,000 new residential units in Berlin by 2023. The units will be compliant with existing energy efficiency standards, and hence contribute towards the dual goal of mitigating Berlin's housing shortage as well as contribute towards the organisation's climate change objectives²³⁹.

TO 4 – Single Market

According to the 2021 EU Single Market Scoreboard, in some areas, Germany performed below the EU-27 average and, in others, better than EU-27 average. The country had a score equal to that of the EU-27 average in four out of the total ten criterion²⁴⁰.

In relation to the EU Single Market Scoreboard 2021 metrics, Germany's performance was below average in infringements and SOLVIT (staffing). The country performed above average in terms of transposition of law, e-Certis, professional

qualifications and Your Europe metrics – the EU's single digital gateway aimed at providing access to information, procedures, assistance and problem-solving services. Lastly, Germany scored average in terms of IMI (Internal Market Information System), EURES (European Employment Services), public procurement as well as trade in goods and services²⁴¹.

During 2020, the German government introduced several financial support measures to protect and support SMEs through the COVID-19 pandemic period. This included providing loans, subsidies, equity and security benefits to tax deferrals, protection for vocational training places as well as legal provisions such as temporary suspension of the obligation to file for insolvency.

In June 2020, the German government introduced a stimulus package worth EUR 130.0 billion. This package consisted of 57 support measures including the reduction in VAT from 19.0% to 16.0% until the end of 2020. The majority of these provisions were aimed at optimising existing measures, thereby making it simpler for enterprises, in particular SMEs, to access finance until the end of 2020²⁴².

A notable support measure for SMEs was the short-time allowance (*Kurzarbeitergeld*), which allowed them to employ workforce without paying them. Only those companies where at least 10.0% of total workforce was affected by a drop in demand could avail the allowance and this will be paid until the end of 2021. For the first three months, affected workers would receive 60.0% of their net income, with this amount increasing up to 80.0% after the seventh month²⁴³.

Despite having a strong institutional and legal anti-corruption framework, Germany carries a moderate level of **fraud and corruption risk** in the construction and public procurement sectors. Specifically, in terms of land administration, corruption is reportedly prevalent in large-scale construction projects owing to close ties between local authorities and large companies. Around a third of Germans considered corruption to be prevalent in issuing building permits²⁴⁴.

With respect to the use of **Eurocodes**, Germany has published all Eurocode Parts as National Standards with the exception of EN 1990-A1 (Annex 2). The Regulation MLTB 03/2014 mandates 39 Eurocodes

Parts for structural design. Other National Standards are used in parallel with EN 1991-4 (DIN FB 140), EN 1995-1-1 (DIN 1052-10), and with EN 1997-1 (DIN 1054). The National Standards complement the Eurocodes Parts. Some Eurocode Parts are restricted according to the Regulation MLTB 03/2014. There is no obligation to make use of Eurocodes in public procurement²⁴⁵.

TO 5 – International competitiveness

As per World Bank Doing Business 2020 report, Germany was ranked 42nd out of 190 economies in the ease of trading across border, achieving score of 91.8²⁴⁶.

As per the report, with regards to exports, it takes only one hour to be documentary compliant and 36 hours to be border compliant in Germany as compared to OECD high income average of 2.3 hours and 12.7 hours, respectively. In terms of costs, it costs USD 45 (EUR 40) and USD 345 (EUR 305) to become documentary compliant and border compliant in Germany as compared to the OECD high income average of USD 33 (EUR 29) and USD 137 (EUR 121), respectively²⁴⁷.

With regards to the **internationalisation of construction SMEs**, the export value of all construction-related projects in Germany stood at EUR 11.1 billion in 2020, representing a 0.9% increase as compared to the 2010 level. Germany's share of exports of all construction-related products in 2020 stood at 26.0% of the total production value, slightly lower as compared to the 33.4% in 2019 as well as the EU-27 average of 11.3% in 2019.

Export value of all construction-related products between 2010 and 2020

 **0.9%**

In the context of **inward FATS (Foreign Affiliates Statistics)**²⁴⁸, value added at factor cost in the narrow construction sub-sector increased by 26.6% between 2010 and 2018²⁴⁹. Similarly, turnover in the narrow construction sub-sector increased by 78.3% over the 2010-2018 period. In contrast, turnover in the real estate activities sub-sector increased by only 0.3% between 2010 and 2018. In contrast, value added at factor cost in the real estate activities sub-sector decreased by 56.0%

over the 2010-2018 period. Likewise, in the context of **outward FATS**²⁵⁰, turnover in the narrow construction sub-sector, decreased by 75.5% over the 2010-2018²⁵¹ period. Conversely, turnover in the real estate activities sub-sector increased by 13.5% over the same reference period.

Contrary to the large size of the German construction sector and the overall competitiveness of German engineering, only one company ranked within the top 100 Global construction firms in 2020 by sales. This was comparable to other European countries including Belgium, Switzerland, Italy, Finland, Norway, etc. but well behind countries such as the Austria, Spain, Sweden, France, Greece and Netherlands. The latter countries had 2, 7, 4, 3, 3 and 3 companies, respectively, within the 2020 ranking. Given its renowned engineering expertise, the German construction sector has been increasingly successful in securing international contracts, particularly related to infrastructure and civil engineering projects. On the other hand, several issues have reportedly been limiting opportunities for German construction businesses wishing to operate across the EU, particularly linked to public procurement²⁵².

The German government has initiated several measures to promote and strengthen public procurement processes including better use of e-procurement, a dedicated web portal for sustainable public procurement as well as a lifecycle costing calculation tool from the German Environment Agency²⁵³. Since October 2018, the use of e-procurement has also been made mandatory for all public procurement procedures over the EU threshold. Nonetheless, a more coordinated and strategic approach is required.

Since 2018, the country has introduced the following measures to promote internationalisation of German businesses^{254,255}:

- Implementation of the New German Accelerator in Singapore (GASEA) by the Federal Ministry for Economic Affairs and Energy in 2018. GASEA offers customised mentoring and extensive networking opportunities, strategic advice, free office space and tactical support to 20 German start-ups each year to enable them to scale up in ASEAN and southeast Asia.
- Improved conditions for the granting of export credit guarantees

(*Exportkreditgarantien — ‘Hermes cover’*) by the Federal Inter-ministerial Committee on Export Credit Guarantees in July 2018 and February 2019.

- Expansion of the market entry programme (*Markterschließungsprogramm*) by the Federal Ministry for Economic Affairs and Energy in 2019, aimed at supporting SMEs entering or positioning themselves in new foreign markets.

- Introduction of ‘Skilled Labour Immigration Act’ in 2020, aimed at making it easier for companies to attract and recruit workers
- Issuing export guarantees during the COVID-19 pandemic to protect German enterprises in case of non-payment by foreign debtors. This is particularly important for SMEs being export oriented in their business activities.

All the above-mentioned initiatives are expected to indirectly boost the internationalisation of German construction companies in new foreign markets.

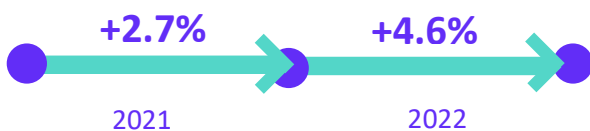
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Outlook

Over the 2020-2022 period, the German GDP is forecast to increase by 7.5%, primarily driven by economic recovery from the COVID-19 pandemic as well as significant developments in private consumption and EU backed investments.

The German **GDP** is forecast to increase by 2.8% in 2021 and by 3.6% in 2022, totalling EUR 3.6 trillion and EUR 3.7 trillion in 2021 and 2022, respectively.

Expected GDP growth in 2021 and 2022



In parallel, over the 2020-2022 period, the **volume index of production** in the broad construction sector is expected to increase by 3.8%, mainly driven by 4.3% and 2.9% increases in the construction of buildings and civil engineering, respectively.

Similarly, **turnover** in the broad construction sector is forecast to grow by 6.9% in 2021, amounting to EUR 683.0 billion. The **total value added** of the broad construction sector is also expected to increase by 6.8% in 2021, reaching EUR 307.5 billion.

Likewise, the **number of persons employed** in the broad construction sector is also expected to increase by 7.1% to 4,832,702 in 2021. The majority of this growth is anticipated to come from the narrow construction (+7.8%) sub-sector, followed by the architectural and engineering activities (+6.8%) and the real estate activities (+5.6%) sub-sectors.

The German government is already undertaking several initiatives to promote its **housing market**. It has allocated a EUR 8.0 billion housing subsidy to be used over the 2018-2024 period. Additionally, a new tax incentive law for privately financed new

rental apartments was introduced, in addition to the regular straight-line depreciation. Noteworthy measures include the extension of the rental price brake by five years and increased incentives for switching to climate friendly heating systems. As mentioned in its NRRP, Germany's residential programme intends to achieve deep renovation of 40,000 dwellings by 2026. The NRRP also makes reference to carbon pricing and revenue to be channelled back to promote climate protection measures, tax incentives, as well as a 'carbon dividend' paid to low-income households. Moreover, the NRRP measures are expected to be extended beyond 2026 with national funding.

With regard to **civil engineering**, from 2021, the German government plans to raise EUR 1.0 billion of federal funding per year for expanding track-based local public transport infrastructure. This is expected to increase to EUR 2.0 billion per year by 2025. With regard to railways, in January 2020, the German government finalised a 10-year EUR 86.0 billion LuFV III railway operating and financing agreement to modernise its rail infrastructure. In July 2020, the Bavarian Ministry of Housing, Construction and Transport agreed to invest EUR 436.0 million in the Bavarian rail network in Germany. In August 2020, in association with DB (*Deutsche Bahn*), the Federal Ministry for Transport and Digital Infrastructure announced plans for the EUR 462.5 million digital rail hub project in Stuttgart. Moreover, the German Federal Ministry of Transport has signed a EUR 5.4 billion agreement for construction of the Dresden-Prague cross-border rail link.

Overall, the growth in German broad construction sector is expected to be driven by large scale digitalisation, energy renovations, infrastructural and circular economy projects backed by EU funding. Output in civil engineering will be the leading investment driver for the economy.

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- 3 Please note that this 2020 data is a nowcast - please refer to the methodology notes for further details.
- 4 Please note that the share of each sub-sector in the value added of the broad construction sector should not be compared to the shares of the Gross Value Added in the GDP, since the GDP also includes taxes and excludes subsidies.
- 5 Please note that this 2020 data is a nowcast - please refer to the methodology notes for further details.
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