



European Construction Sector Observatory

Country profile **Luxembourg**

November 2021



In a nutshell

Over the 2010-2020 period, Luxembourg GDP increased from EUR 45.2 billion in 2010 to EUR 57.7 billion in 2020, recording a 27.7% growth. However, the GDP declined by 1.3% in 2020.

In line with the overall economy, the **number of enterprises** in the broad construction sector increased by 35.9% over the 2010-2020 period, totalling 9,852 in 2020. With regards to sub-sectors, the largest increment was reported by the real estate activities (+43.0%) sub-sector, followed by the narrow construction (+35.4%) and the architectural and engineering activities (+24.8%) sub-sectors over the same reference period, respectively.

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

↑ 35.4%

The **volume index of production** in the broad construction sector increased by 1.2% over the 2015-2020 period and **total turnover** reached EUR 12.7 billion in 2020, representing an increment of 65.7% since 2010. This increase was driven by three sub-sectors, namely the real estate activities (+79.6%), the narrow construction (+69.2%) and the architectural and engineering activities (+55.1%) sub-sectors over the 2010-2020 period.

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

↑ 69.2%

The **gross operating surplus** of the broad construction sector recorded a significant increase of 61.6% between 2010 and 2018, reaching EUR 1.9 billion. The majority of this increase was driven by growth in the narrow construction sub-sector (+134.5%), followed by the real estate activities (+39.2%) and the architectural and engineering activities (+7.6%) sub-sectors over the 2010-2018 period. The **gross operating rate** of the broad construction sector, an indicator of the sector's profitability, marginally increased from 15.1% in 2010 to 15.7% in 2018. This is lower than the EU-27 average of 16.7%. The real estate activities sub-sector remained the most profitable (47.9%), followed by the architectural and engineering activities sub-sector (12.1%).

Several schemes have been initiated by the Luxembourgish government to develop and promote the **housing market**. Under its 2018-2023 Coalition Agreement Programme, the Luxembourgish government plans to completely overhaul the existing housing assistance law and subsidies system to boost the supply of low-cost rental housing.

Under its EUR 93.4 million 2021-2026 Recovery and Resilience Plan (RRP), Luxembourg plans to recast its housing policy at the municipal level (Housing Pact 2.0). The country has also allocated EUR 24.0 million of the RRP budget to increasing the supply of affordable and sustainable public housing in the country¹.

The recasting of the Housing Pact will allow municipalities to better distribute existing governmental support to create affordable housing. The government has also allocated EUR 30.5 million of its RRP budget towards the decarbonisation of the transport sector, and EUR 13.0 million towards developing and promoting public digital services. Luxembourg has also directed EUR 6.5 million towards the skilling, reskilling and upskilling of its workforce. Out of this, EUR 5.0 million is allocated to training part time workers while EUR 1.5 million targets training jobseekers.

With regard to the **civil engineering market**, the government has announced investments of up to EUR 2.2 billion in the country's rail network over the 2018-2023 period. Additional investments amounting to EUR 390.0 million have also been planned for the tram system over the same reference period. Other key projects include the modernisation of the Brussels-Luxembourg-Strasbourg railway link by 2022, the upcoming rail link between the capital Luxembourg-City and *Esch-Belval* by 2030, and the installation of a European Train Control System on the entire railway network.

Construction is a strategically important sector of the economy and for achieving the EU climate

targets in parallel, given the sector's significant environmental impact, as well as its ability to stimulate the overall economic recovery process. As such, it is set to benefit greatly from the unprecedented investments allocated from the country's RRP.

In spite of several policy initiatives supporting the development of the construction sector, it continues to face some important issues. The shortage of skilled workers continues to be a major concern and investment in dwellings has remained constrained primarily due to the lack of available land, as well as the absence of sufficient incentives for landowners to build. The regulatory burden is also relatively high for SMEs in Luxembourg and the fear of failure prevalent in the country prevents potential entrepreneurs from starting a business.

The Luxembourg construction sector has a positive outlook overall. The housing and the civil engineering markets are expected to be the primary growth drivers of the private sector. As for the public sector, infrastructure projects and digitalisation, as well as the shift towards a circular and green economy backed by EU funding, are expected to drive the growth.

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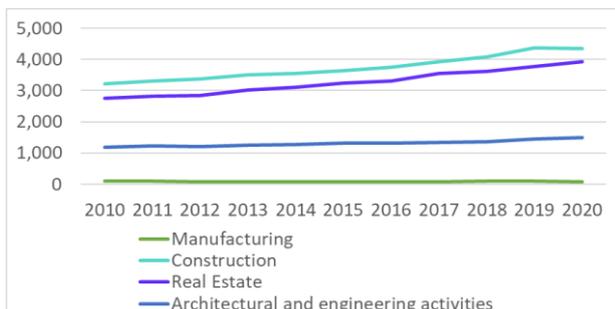
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Key figures

Construction market

In 2020², the **number of enterprises** in the broad construction sector in Luxembourg totalled 9,852 (Figure 1). In terms of sub-sectors, the narrow construction sub-sector accounted for 44.2% of the total number of firms, followed by the real estate activities (39.9%) and the architectural and engineering (15.1%) activities sub-sectors. Overall, the number of enterprises in the broad construction sector increased by 35.9% over the 2010-2020 period.

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



Source: Eurostat, 2021.

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

↑ 35.9%

This increase was mostly driven by growth in the number of companies in the real estate activities (+43.0%) sub-sector, followed by the narrow construction (+35.4%), and the architectural and engineering activities (+24.8%) sub sectors. Conversely, the number of enterprises in the manufacturing sub-sector decreased by 11.7% over the 2010-2020 period.

The **volume index of production** in the broad construction sector³ increased by 9.9% between 2015 and 2019. However, it declined by 7.9% in 2020, most probably explained as the impact of COVID-19 pandemic on the sector. (Figure 2).

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

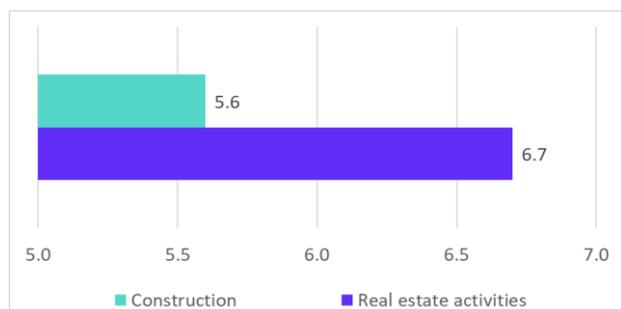


Source: Eurostat, 2021.

The **total value added at factor cost**⁴ of the broad construction sector amounted to EUR 5.1 billion in 2020⁵, experiencing a 60.9% growth compared to the 2010 level of EUR 3.2 billion. The narrow construction sub-sector accounted for 61.9% of the total⁶ (EUR 3.2 billion), followed by the real estate activities (+23.8%) and the architectural and engineering activities (+12.3%) sub-sectors. The manufacturing sub-sector reported a decline of 24.2% between 2010 and 2020.

The **share of gross value added** of the real estate activities sub-sector in the GDP reached 6.7% in 2020⁷, slightly below its 2010 level of 7.4% and the EU-27 average of 10.3% in 2020. The narrow construction sub-sector accounted for 5.6% of gross value added in the GDP in 2020, slightly above its 2010 level of 4.8% as well as EU-27 average of 5.1% for 2020 (Figure 3).

Figure 3: Gross value added as a share of GDP⁸ in the Luxembourgish broad construction sector in 2020 (%)



Source: Eurostat, 2021.

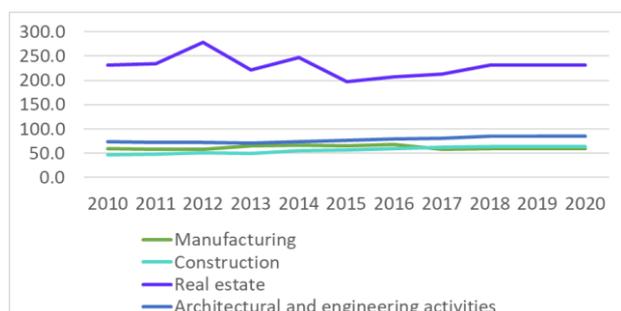
Productivity

Over the 2010-2018 period, **apparent labour productivity**⁹ in the broad construction sector increased by 26.0%, from EUR 62,739 in 2010 to EUR 79,072 in 2018. As such, it remains well above the EU-27 average of EUR 51,960.

With regard to the sub-sectors, the narrow construction sub-sector reported the highest increase of 33.9%, growing from EUR 47,300 in 2010 to EUR 63,356 in 2020, followed by the architectural and engineering activities sub-sector (+15.5%) increasing from EUR 73,800 to EUR 85,226 over the 2010-2020 period. In contrast, the real estate activities sub-sector reported a marginal decrease of 0.1% over the same period, totalling EUR 231,585 in 2020¹⁰. Similarly, the manufacturing sub-sector witnessed a decrease of 0.6%, from EUR 59,488 in 2010 to EUR 59,124 in 2020¹¹.

Labour productivity of the narrow construction sub-sector between 2010 and 2020 **↑ 33.9%**

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



Source: Eurostat, 2021.

Turnover and profitability

The total **turnover** of the broad construction sector amounted to EUR 12.0 billion in 2018, an increase of 55.8% compared to the 2010 levels (EUR 7.7 billion). It further increased to EUR 12.7 billion in 2020, registering a total growth of 65.7% over the 2010-2020 period. This increase in turnover was primarily driven by three sub-sectors – the real estate activities (+79.6%), the narrow construction (+69.2%) and the architectural and engineering activities (+55.1%) sub-sectors over the 2010-2020 period. In contrast, the manufacturing sub-sector recorded a decline of 9.2% over the same reference period.

Turnover of the narrow construction sub-sector between 2010 and 2020 **↑ 69.2%**

The **gross operating surplus** of the broad construction sector amounted to EUR 1.9 billion in 2018¹², registering a growth of 61.6% compared to the 2010 level of EUR 1.2 billion. In terms of sub-sectors, the largest increase was reported by the narrow construction sub-sector (+134.5%), followed by the real estate activities (+39.2%) and the architectural and engineering activities (+7.6%) sub-sectors over the 2010-2018 period. In contrast, the manufacturing sub-sector recorded a decline of 55.1% over the same reference period.

Gross operating surplus of the narrow construction sub-sector between 2010 and 2018 **↑ 134.5%**

The **gross operating rate** of the broad construction sector¹³, which gives an indication of the sector's profitability, marginally increased from 15.1% in 2010 to 15.7% in 2018¹⁴. This is slightly below the EU-27 average of 16.7% in 2018. As for the sub-sectors, the real estate activities sub-sector enjoyed the largest profit margin on sales in 2017 (47.9%), followed by the architectural and engineering services (12.1%), the narrow construction (9.4%) and the manufacturing (3.7%) sub-sectors, respectively.

The **construction cost**¹⁵ index increased by 7.9% between 2015 and 2019¹⁶. In addition to material and labour costs, the price of land is one of the key issues in Luxembourg. Due of the limited supply of

land (which belongs largely to private owners), it is very expensive.

Figure 5: Construction cost index¹⁷ between 2010 and 2019 (2015=100)

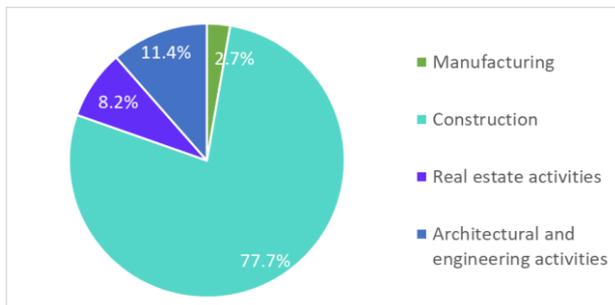


Source: Eurostat, 2021.

Employment

In 2020¹⁸, there were 64,583 **persons employed** in the broad construction sector, representing a 27.0% increase compared to 2010 (50,865 people). The narrow construction sub-sector employed 77.7% of the total workforce in 2020, representing 50,171 persons. This was followed by the architectural and engineering activities (11.4%, 7,380 persons), the real estate activities (8.2%, 5,275 persons), and the manufacturing (2.7%, 1,758 persons) sub-sectors (Figure 6.)

Figure 6: Percentage of people employed per construction sub-sector in Luxembourg in 2020



Source: Eurostat, 2021.

Except for the manufacturing sub-sector, all other construction sub-sectors experienced an increase in terms of persons employed over the 2010-2020 period, starting from the real estate activities (+57.6%), the architectural and engineering activities (+38.7) and the narrow construction (+25.8%) sub-sectors. The manufacturing

sub-sector declined by 23.7% over the same reference period.

Number of persons employed in the narrow construction sub-sector between 2010 and 2020 **↑ 25.8%**

In terms of **specific occupations**, the largest increment in the narrow construction sub-sector was registered for professionals (+83.3%), followed by technical and associate professionals (+61.5%) between 2010 and 2020. In contrast, plant and machine operators and assemblers, clerical support workers and elementary occupations witnessed a decline of 11.8%, 8.3% and 6.7% over the same reference period, respectively. In the case of the real estate activities sub-sector, technicians and associate professionals accounted for the largest increase of 150.0%. Lastly, in terms of the manufacturing sub-sector, professionals reported the largest increment (+52.9%), while the biggest decline was recorded for clerical support workers (-46.7%) over the same reference period.

The **number of self-employed workers** in the narrow construction sub-sector increased by 25.0% between 2010 and 2020, representing 4.4% of all self-employed persons in the economy. However, this is considerably below the EU-27 average of 11.7%. The number of self-employed workers in the real estate activities sub-sector accounted for 4.4% of all self-employed workers in the general economy, compared to the EU-27 average of 1.6%.

Number of self-employed workers in the narrow construction sub-sector between 2010 and 2020 **↑ 25.0%**

Full-time employment in the narrow construction sub-sector increased by 9.0% between 2010 and 2020. In contrast, a decrease of 9.6% was recorded in the real estate activities sub-sector over the same reference period. **Part-time employment** in the narrow construction sub-sector significantly increased by 71.4% between 2010-2020, while a decline of 30.0% was reported in the real estate activities sub-sector over the same period.

2

Macroeconomic indicators

Economic development

Luxembourg GDP increased by 27.7% between 2010 and 2020, from EUR 45.2 billion to EUR 57.7 billion. However, due to the impact of COVID-19 pandemic, in 2020 the GDP declined by 1.3% compared to 2019.

This overall growth was primarily driven by strong domestic demand and active job creation, partially offsetting the weak export performance due to COVID-19 pandemic restrictions. The application of an automatic wage indexation mechanism since January 2020, together with a lower inflation rate and sustained private consumption, also supported Luxembourg's economic growth over the reference period¹⁹. The **potential GDP** amounted to EUR 60.6 billion in 2020, resulting in a negative output gap of 4.7%.

Demography and employment

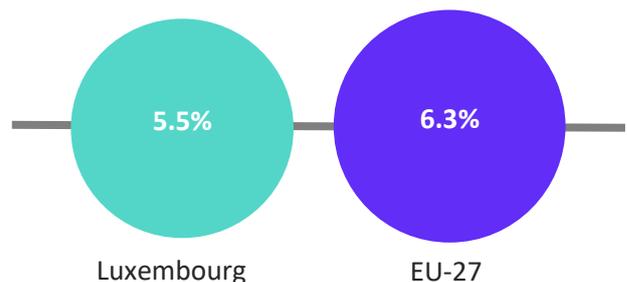
Luxembourg has one of the most dynamic labour markets among EU member states. In 2020, its **unemployment rate** stood at 5.5%, marginally below the EU-27 average of 6.3%, while slightly above its 2010 level of 3.8%. The **youth unemployment rate** (below the age of 25) stood at 23.2% in 2020, well above the EU-27 average of 16.8%, as well as its 2010 level of 14.2%.

Luxembourg's total population amounted to 626,108 in 2020, an increase of 24.7% compared to its 2010 level. It is expected to increase by 10.6% until 2030, and by 22.8% until 2050, reaching 769,048 inhabitants.

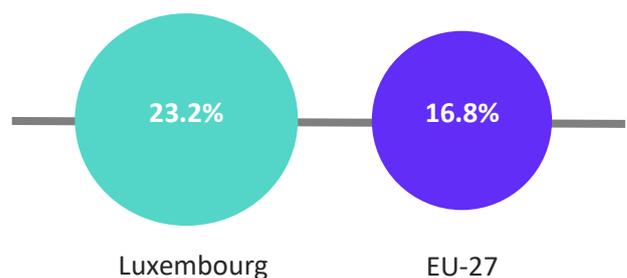
Immigration has stabilised at a high level, with a positive net **migration rate** of 6,772 in 2020, well below the previous year (10,267) and the 2010 level (7,660).

In 2020, the **working age population** made up 69.5% of the total population, slightly higher compared to the EU-27 average of 64.3%. By 2050, the share of working age population is expected to decrease to 61.1%. The proportion of people over 65 years old will increase from 14.5% to 25.5% over the 2020-2050 period, highlighting the country's ageing population. This may generate a growing need for adapted infrastructures responding to the needs of an elderly population.

Unemployment rate in 2020



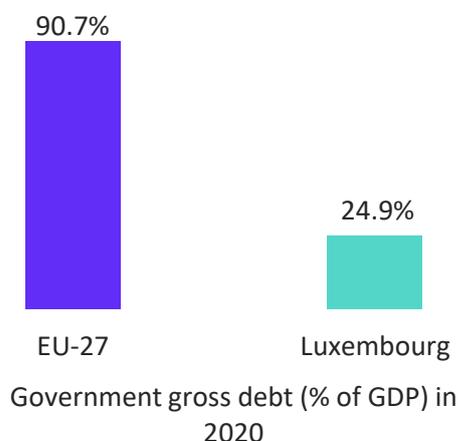
Youth unemployment rate in 2020



Public finance

In 2020, **general government expenditure** accounted for 47.8% of GDP, well below the EU-27 average of 53.4%. **General government deficit** stood at -4.1% of GDP in 2020, higher than the 2010 level of -0.3%, and lower than the EU-27 average of -6.9% in 2020. **General government gross debt**

accounted for 24.9% of the country's GDP in 2020, representing a modest increase compared to its 2010 level (20.2%), while being significantly below the EU-27 average of 90.7% in 2020.



Entrepreneurship and access to finance



As per World Bank Doing Business 2020 report, Luxembourg ranked 76th out of 190 countries in terms of ease of starting a business with a score of 88.8. This is well the previous year's rank of 66th 20,21,22.

As per the report, starting a business in Luxembourg requires five procedures, taking 16.5 days and costing 1.6% of per capita income. This is slightly above the OCED high-income average requiring 4.9 procedures and taking 9.2 days. The OCED high-income average costs 3.0% of per capita income, however. The paid-in minimum capital required (i.e., the amount that the entrepreneur needs to deposit in a bank or with a notary before registration and up to three months following incorporation) is 17.2% of per capita income, more than double the OECD high-income average (7.6% of income per capita)²³.

According to **Global Entrepreneurship Monitor 2020**, perceived opportunities (representing adult population aged 18 to 64 years), as well as entrepreneurial intentions (representing adult population not involved in entrepreneurial activities) for Luxembourg stood at 41.9% and 11.1%, respectively²⁴.

Luxembourg's loans to non-financial corporations increased by 112.6% over the 2010-2020 period, from EUR 13.3 trillion in 2010 to EUR 28.2 trillion in 2020.

Loans to non-financial corporations between 2010 and 2020  **112.6%**

According to the **Survey on the Access to Finance of Enterprises (SAFE) Report 2020**, 4.9% of SME respondents reported that **access to finance** is the most important problem they faced, well below the EU-27 average of 9.9%²⁵.

Similarly, Luxembourg performed better than the EU averages in terms of 'entrepreneurship'. In 2019, with regards to vocational, professional and continuing education systems preparing entrepreneurs for starting up and growing new firms, Luxembourg scored 3.3, slightly above the EU average of 2.8²⁶.

During the 2018-2019 period, various measures were implemented by the government to boost entrepreneurship within the country, including:

- the **InnovFin programme**, an initiative financed by the European Commission and managed by the EIB/EIF, implemented through state savings banks and aimed at providing guarantees and counter guarantees on debt financing to improve access to loans for innovative SMEs.
- tax relief of 1.0% by the Luxembourg government for SMEs to enable them to cope with the increased the minimum wage
- launch of the *Businesstransfer.lu* website, a platform matching individuals and businesses looking to buy or sell a company. It also helps SMEs in restarting or closing their businesses.

In 2019, the Luxembourg government centralised the administrative bodies involved in creating and developing businesses within the House of Entrepreneurship, thereby creating a single point of contact for all stakeholders engaged in starting an enterprise²⁷.

The House of Entrepreneurship represents 25 different partners including the Ministry of Economy, the Chamber of Trades and ADEM (*Agence pour le développement de l'emploi*). This

centralisation of all the administrative procedures applicable to entrepreneurship in a single place resulted in their simplification as well as the speeding up of the establishment and development of enterprises in Luxembourg²⁸.

Luxembourg has one of the highest levels of digital infrastructure and proportions of ICT, science and

technology staff in the workforce, among the EU member states. Despite this, the digital integration of the business sector remains well below the EU average. Additionally, the legal framework indirectly discourages entrepreneurship as business failures are heavily penalised by corporate insolvency regulations²⁹.

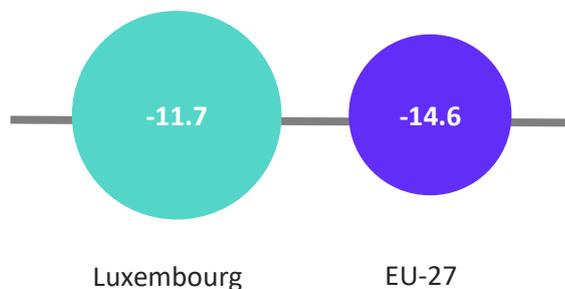
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Key economic drivers of the construction sector

Business confidence

Over the 2010-2020 period, business confidence indicators have been fluctuating significantly, particularly in relation to the construction sector. The **consumer confidence indicator** decreased from -7.5 in 2010 to -11.7 in 2020. This is well above the EU-27 average of -14.6. Similarly, the **construction confidence indicator** improved from -25.0 in 2010 to 8.7 in 2020, significantly above the EU-27 average of -9.3. In contrast, the **industry confidence indicator** deteriorated slightly from -18.5 in 2010 to -22.6 in 2020. This is also substantially below the EU-27 average of -14.4.

Consumer confidence indicator in 2020



The **investment ratio** marginally decreased to 16.2% in 2020 compared to 17.0% in 2010. This is well below the EU-27 average of 21.8% in 2020.

Investment per worker in the broad construction sector increased from EUR 42,869 in 2010 to EUR 54,124 in 2018³⁰. In terms of sub-sectors, investment per worker amounted to EUR 5,400 in the architectural and engineering activities (+671.4%), EUR 99,300 in the real estate activities (+528.5%), as well as EUR 6,400 in the narrow construction (+156.0%) sub-sectors in 2018³¹.

Investment per worker
in the narrow
construction sub-sector
between 2010 and 2018

↑ 156.0%

Domestic sales

Over the 2010-2020 period, the ranking of the top five most **domestically sold construction products** in Luxembourg has changed considerably. Since 2010, “Other worked ornamental, etc. (group 237012)”, “Tiles, flagstones, bricks, etc. (group 236111)” and “Mortars (group 236410)” has been replaced by “Other structures (group 251123)”, “Ceramic tiles and flags (group 233110)” and “Prefabricated structural components (group 236112)”. Additionally, compared to 2010, the total value of “Prefabricated structural components (group 236112)”, “Windows, French (group 162311)” and “Doors, windows and their frames (group 251210)” sold domestically has increased by 640.7%, 18.2% and 11.0% in 2020, respectively. The top five most domestically sold construction products, illustrated in Table 1, represented 45.8% of total domestic construction product sales in 2020.

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

	Luxembourg			EU-27
	Product	Value (EUR m)	Share in construction product domestic sales (%)	Product
1	Other structures (group 251123)	42.5	12.6	Other structures and parts of structures (group 251123)
2	Windows, French (group)	35.3	10.5	Ready-mixed concrete (group)

	Luxembourg			EU-27
	Product	Value (EUR m)	Share in construction product domestic sales (%)	Product
	162311)			236310)
3	Ceramic tiles and flags (group 233110)	29.0	8.6	Doors, windows and their frames (group 251210)
4	Doors, windows and their frames (group 251210)	25.6	7.6	N.A.
5	Prefabricated structural components (group 236112)	21.6	6.4	Prefabricated structural components (group 236112)

Source: PRODCOM, 2021.

Export of construction-related products and services

Over the 2010-2020 period, the ranking of the **most exported products** has noticeably changed. Since 2010, “Doors, windows and their frames (group 251210)”, “Prefabricated structural components (group 236112)” and “Other wooden containers, etc. (group 162413)” were replaced by “Oriented strand board (group 162113)”, “Fibreboard of wood, etc. (group 162115)” and “Other structures and parts of structures, etc. (group 251123)”. Additionally, compared to 2010, the total value of “Prefabricated buildings of metal (group 251110)” and “Portland cement, aluminous cement (group 235112)” exported has increased by 22.3% and 12.7% in 2020, respectively.

The **top five most exported** construction products from Luxembourg and the EU-27 are summarised in Table 2. Together, these made up 77.7% of all construction products exports in 2020.

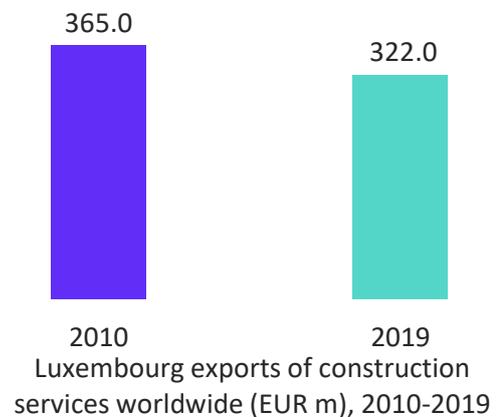
Table 2: Five most exported construction products in Luxembourg and in the EU in 2020

	Luxembourg			EU-27
	Product	Value (EUR m)	Share in construction products exports (%)	Product
1	Oriented strand board (group 162113)	93.5	30.6	Ceramic tiles and flags (group 233110)
2	Portland cement, aluminous cement (group 235112)	52.2	17.1	Other structures and parts of structures, etc. (group 251123)
3	Fibreboard of wood, etc. (group 162115)	42.9	14.0	Fibreboard of wood, etc. (group 162115)
4	Prefabricated buildings of metal (group 251110)	25.4	8.3	Doors, windows and their frames, etc. (group 251210)
5	Other structures and parts of structures, etc. (group 251123)	23.1	7.6	Builders joinery and carpentry, etc. (group 162319)

Source: PRODCOM, 2021.

With regard to the cross-border provision of construction services³², Luxembourg exported EUR 322.0 million worldwide in 2019, a decline of 11.8% compared to 2010 (EUR 365.0 million).

Of this total, EUR 218.0 million was exported to the EU-27 countries, i.e., 67.7% of the total. In parallel, Luxembourg **imported** a total of EUR 341.0 million in construction services in 2019, a decrease of 9.8% compared to 2010 (EUR 378.0 million), with 84.8% of import coming from the EU-27 countries in 2019. Luxembourg thus achieved a **trade deficit** of EUR 19.0 million.



Access to finance in the construction sector

According to the **2020 Survey on the Access to Finance of Enterprises (SAFE)** report, 22.0% of small and medium enterprises (SMEs) in Luxembourg reported grants or subsidised bank loans being relevant, well below the EU-27 average (44.4%). 13.9% of SMEs reported of using bank loans recently, lower than the EU-27 average (17.9%). During the same period, 22.7% of SMEs in Luxembourg applied for a bank loan, significantly below the EU-27 average of 34.6%, and 3.7% did not apply for bank loans fearing rejection, almost in line with the EU-27 average of 3.9%. 49.9% of SMEs did not apply for bank loans because of sufficient internal funds, well above the EU-27 average of 35.1%^{33, 34}.

According to the report, the availability of bank loans for SMEs has also changed. 6.5% of SMEs reported that the availability of bank loans has improved over the period, considerably lower than the EU-27 average (18.6%), while 5.1% found that it has deteriorated, well below the EU-27 average of 14.2%. Around 76.4% of SMEs disclosed that the availability of bank loans remains unchanged, well above the EU-27 average of 57.6%³⁵.



Credit extended to non-financial corporations in the general economy increased by 112.6%, from EUR 13.3 trillion in 2010 to EUR 28.2 trillion in 2020.

As per the **European Investment Bank (EIB) Investment Survey 2020**, 44.0% of Luxembourg construction firms consider the availability of finance as a long-term barrier for the sector. Leasing makes up the highest share of external finance (60.0%) in the Luxembourg construction sector, closely followed by bank loans (30.0%). 45.0% of Luxembourg construction firms rely on internal sources of finance for investment purposes, well below the EU-27 average of 62.0%. 55% reply on external sources. This is also driven by the fact that 85.0% of Luxembourg construction firms reported making a profit in 2020, slightly above the EU-27 average of 80.0%. Nonetheless, the share of 'financially constrained'³⁶ firms in the construction sector (6.0%) is higher than for firms operating in the service sector (3.0%) in Luxembourg³⁷.

The impact of COVID-19 on investment strategies been negative with almost 30.0% of Luxembourg construction firms investing less in 2020, well below the EU-27 average of 45.0%. However, almost 80.0% of construction firms believed their investment over the last three years was the right amount, in line with the EU-27³⁸.

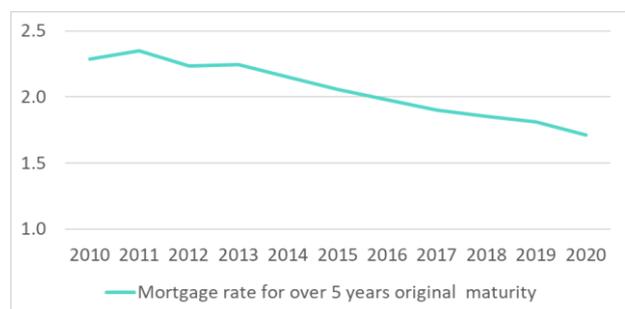
Access to housing

In Luxembourg, the **number of households** increased by 27.4%, from 204,900 in 2010 to 261,000 in 2020. The proportion of the **total population living in intermediate urbanised areas** increased from 33.4% in 2010 to 43.2% in 2019³⁹. In contrast, the share of the **total population living in densely populated areas** declined from 43.1% in 2010 to 19.6% in 2019 (reflecting housing affordability issues in urban areas – see more information below). The **mean equivalised net income** also increased by 17.6%, from EUR 36,410 in 2010 to EUR 42,818 in 2019⁴⁰. This is also well above the EU-27 average of EUR 19,567.

Housing loans to households picked up considerably, with total **outstanding residential loans** growing by 91.7%, from EUR 18.6 billion in 2010 to EUR 35.6 billion in 2019⁴¹. This is partly explained by declining **interest rates on mortgages**, standing at 1.7% in 2020 compared to 2.3% in 2010 (Figure 7).

Total outstanding residential loans between 2010 and 2019  **91.7%**

Figure 7: Mortgage rates for loans over 5 years original maturity (%) between 2010 and 2020



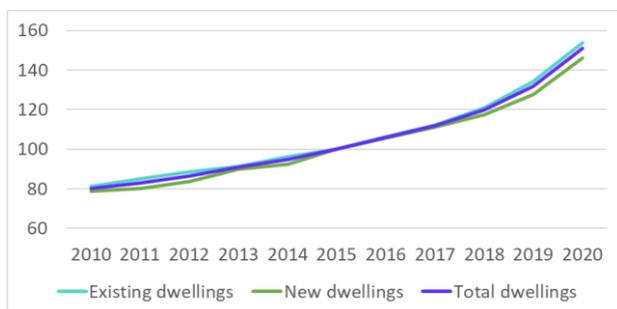
Source: European Central Bank, 2021.

Housing demand in Luxembourg is mostly driven by high population and employment growth. Additionally, the low interest rate environment has further improved financing conditions and supported housing demand in Luxembourg⁴².

According to a STATEC (*Institut national de la statistique et des études économiques*) forecast, Luxembourg needs to construct an additional 5,600 to 7,500 housing units every year until 2060 to keep pace with the increasing demand and population growth. Likewise, as per STATEC and Housing Observatory data, real estate market prices increased by 14.5% in 2020 compared to the previous year. Since 2010, on average 2,891 housing units have been constructed per year in Luxembourg. In 2018, 3,987 units were completed while there was an annual surplus demand for 5,390 dwellings⁴³. This leads to challenges with housing affordability.

House prices have continued to increase, mainly driven by the limited housing supply versus demand. These dynamics also contribute to the issue of affordability⁴⁴. The **house price index** for total dwellings increased by 51.1% over the 2015-2020 period, mostly driven by a 53.8% and 46.2% increase in existing dwellings and new dwellings over the same reference period, respectively (Figure 8).

Figure 8: House price index in Luxembourg between 2010 and 2020 (2015=100)



Source: Eurostat, 2021.

Rented housing in the country is mostly concentrated around Luxembourg City and it is becoming increasingly expensive, especially for lower income households. The limited supply of housing in main cities, particularly in the capital city of Luxembourg, is considered to be the main driver of the increase in rental costs⁴⁵. Housing supply has remained insufficient largely due to a lack of incentives for landowners to build new affordable housing. With land being a risk-free and low-taxed asset, landowners feel less incentivised to invest and extend build-up areas. The situation is further worsened by a limited supply of social housing stock⁴⁶. This leads to challenges in housing affordability.

According to the Luxembourg Institute of Socio-Economic Research (LISER), **COVID-19** has not had a major impact on housing prices and transactions. The number of transactions decreased slightly in Q2 2020, which is explained by a declining housing supply. Demand for housing (both from investors and homeowners) remains strong. Moving forward it is expected that housing construction will pick significantly in 2021. LISER reports that after an initial halt to the housing transactions due to the spread of COVID-19, the market revived very quickly, also thanks to the introduction of the possibility to virtually comply to the transactions' formalities, making it unnecessary to meet in person⁴⁷.

With regard to **building permits**, the total number of building permits granted for new construction increased by 34.2% over the 2010-2020 period, from 1,901 in 2010 to 2,552 in 2020. This was driven by a similar increment in the number of permits granted for both residential (+33.0%) as well as non-residential (+41.5%) buildings over the same reference period. In absolute terms, the number of building permits granted for residential and non-residential buildings stood at 1,626 and 275 in 2010 and 2,163 and 389 in 2020, respectively⁴⁸.

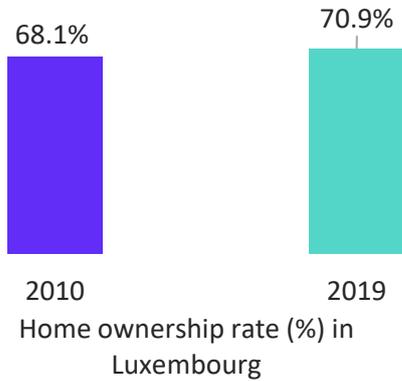
Building permits in residential dwellings between 2010 and 2020 ↑ **33.0%**

In relation to **dwellings**, the total number of permits granted for new construction increased by 31.3% over the 2010-2020 period, from 3,892 in 2010 to 5,112 in 2020. This was driven by a similar increment in the number of permits granted for residential (+42.2%) dwellings, offsetting the drop in the permits for non-residential (-82.1%) dwellings over the same reference period. In absolute terms, the number of permits granted for residential and non-residential dwellings stood at 3,552 and 340 in 2010 and 5,051 and 61 in 2020, respectively⁴⁹.

Dwelling permits in residential dwellings between 2010 and 2020 ↑ **42.2%**

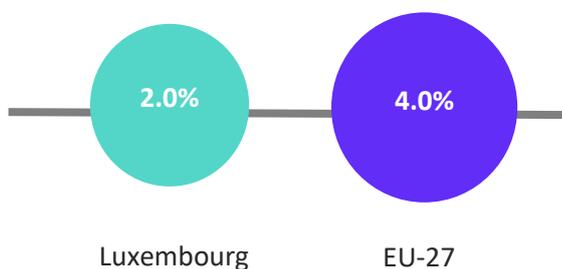
In parallel, **renovation spending** has constantly increased in Luxembourg, mostly driven by the booming property prices, from EUR 218.5 million in 2010 to EUR 315.8 million in 2019 (+44.5%). However, renovation spending as a percentage of gross household disposable income stood at 1.3% in

2018⁵⁰, the same as 2010 levels but slightly above the EU-27 average of 0.9%. This has been supported at the government level by the introduction of various policy measures to renovate the existing housing stock, adapting them to the special needs of their residents, as well as improving overall energy efficiency and noise insulation (see Policy Schemes).



Over the 2010-2019 period, the **home ownership** rate in Luxembourg increased slightly from 68.1% in 2010 to 70.9% in 2019. This rate further increased to 75.6% for the population earning **above 60.0% of the median equivalised income**⁵¹ whereas it declined to 48.9% for the population earning below 60.0% of the median equivalised income. The **overcrowding rate**⁵² stood at 7.1%⁵³ in 2019⁵⁴, well below the EU-27 average of 17.1%. The **severe housing deprivation rate**⁵⁵ stood at 2.0%⁵⁶, below the EU-27 average of 4.0%. In contrast, the **housing cost overburden rate**⁵⁷ stood at 10.1%⁵⁸ in 2019, marginally above the EU-27 average of 9.4%.

Severe housing deprivation rate in 2019



Infrastructure

As per the 2019 Global Competitiveness Report⁵⁹, Luxembourg ranked 17th and 20th out of 141 countries in terms of its overall infrastructure and transport infrastructure, respectively⁶⁰.

Luxembourg performed best in rail density (5th), followed by the efficiency of train services (14th), quality of road infrastructure (15th), and efficiency of air transport services (17th). With regard to road connectivity and airport connectivity, Luxembourg ranked 84th and 85th, respectively.

Since March 2020, the use of public transport (trains, trams and buses) has been free of charge across all the territories of Luxembourg. The government has also adopted the new sustainable mobility strategy, **Modu 2.0**, aiming at reducing the economic and environmental impact from peak-hour congestion by 2025 while transporting 20.0% more people than in 2017⁶¹. The strategy also involves making significant investments in the modernisation of the rail network, better cross-border connections and new multi-modal exchange hubs with three neighbouring countries⁶².

By 2023, the Luxembourgish government is planning to invest about EUR 2.2 billion into the rail network, with the rail operator CFL (*Société Nationale des Chemins de Fer Luxembourgeois*) spending EUR 400.0 million in the new rail rolling stock. Additionally, EUR 380.0 million will be invested in the tram network⁶³. The Luxembourgish government has planned significant investments in transport infrastructures in its RRP, as further explained in Chapter 7 – TO1 Investment conditions and volumes.

4

Key issues and barriers in the construction sector

Company failure

Overall, the broad construction sector registered a rising trends across all of its sub-sectors. In the narrow construction, the real estate activities and the architectural and engineering activities sub-sectors, company births increased by 40.3%, 30.1% and 4.7% over the 2010-2018⁶⁴ period, respectively.

Company births in the narrow construction sub-sector between 2010 and 2018

↑ 40.3%

Similarly, with regard to company deaths, the narrow construction, the real estate activities and the architectural and engineering activities sub-sectors reported increases of 26.5%, 14.0% and 8.3% over the 2010-2018 period, respectively.

Company deaths in the narrow construction sub-sector between 2010 and 2018

↑ 26.5%

According to Luxembourg Ministry of Justice and STATEC (*Institut national de la statistique et des études économiques*), the number of bankruptcies in the construction sector reached 113 in 2020, representing a decline of 25.1% compared to the 2019 level (151 companies)⁶⁵.

Trade credit



According to the 2020 SAFE (Survey on the Access to Finance for Enterprises) report, 11.5% of SMEs in Luxembourg reported trade credit to be relevant, well below the EU-27 average of 27.7%^{66, 67}.

As per the 2020 report (September October 2020), 1.4% of Luxembourg SMEs disclosed using trade credit in the past six months, considerably below the EU-27 average of 13.6%. However, 10.1% of the respondent SMEs did not use trade credit in the last six months, slightly below the EU-27 average of 13.8%⁶⁸.

Late payment

As per the Dun & Bradstreet Payment Study 2021, by Q4 2020, 58.0% of the Luxembourgish construction sector respondents made payments by due date, and only 1.1% made late payments over 90 days after the due date⁶⁹.

The **Late Payment Directive**, transposed by the law of 29 March 2013, stipulates that the payment period should not exceed 60 days unless the two parties agree otherwise. Payments by the public administration are to be settled within 30 days and any longer payment periods must be justified and cannot exceed 60 days.

While the Late Payment Directive appears to have been implemented to a satisfactory degree, data on the average payment duration collected by the European Payment Index is not available for Luxembourg and thus does not allow for an in-depth analysis of late payments as a constraint for businesses⁷⁰.

Time and cost of obtaining building permits and licenses



According to the World Bank Doing Business 2020 report, Luxembourg ranked 14th out of 190 economies with regards to “dealing with construction permits”⁷¹.

As per the report, 11 procedures are required to complete the formalities to build a warehouse⁷². This is slightly less than the OECD high-income average of 12.7 days. Additionally, completing construction formalities takes on average 155.0 days, slightly above the OECD high-income average of 152.3 days. As for the cost of completing the formalities to build a warehouse, in Luxembourg it is 0.7% of the value of the warehouse, against the OECD high-income average of 1.5%.

Table 3: Construction procedures timing and costs in the Luxembourg

Procedure	Time to complete	Associated costs
Obtain a recent copy of the cadastre plans from the Cadastre Administration	1 day	EUR 10
Obtain commodo/incommodo class 3 approval from the Ministry of Environment	120 days	No charge
Obtain construction permit from the Urban Department (<i>service de l'urbanisme</i>) of the Commune	90 days	EUR 960
Obtain approval in principle (<i>accord de principe</i>)	60 days	EUR 60
Obtain excavation permit from the Ministry of Public Works	60 days	EUR 10
Obtain feasibility study for the sewage (canalisation) connection	30 days	EUR 1,950
Hire independent surveillance company to carry out inspections of construction works	1 day	EUR 17,451
Request and receive inspection of completed works from the Urban Department	1 day	No charge

Request and receive sewage (canalisation) inspection	1 day	No charge
Obtain sewage (canalisation) connection	32 days	No charge
Obtain water connection	5 days	EUR 3,000

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

Skills shortage

The number of job vacancies in the narrow construction sub-sector experienced a significant increase of 289.5%, from 121 in 2010 to 471 in 2020⁷³. The number of job vacancies in the real estate activities sub-sector also increased by 84.3%, from 26 in 2010 to 47 in 2020. The increasing vacancy rate highlights the difficulties employers face in finding the right skills on the market.



Adult participation in education and training in the narrow construction sub-sector decreased from 8.2% in 2010 to 6.3% in 2020. The numbers of tertiary students in engineering, manufacturing and construction (in architecture and building) increased by 57.8%, from 45 graduates in 2011 to 71 graduates in 2019.

To improve the skills shortage in the construction sector, the government launched several initiatives, notably **LuxBuild2020 II**, as a part of the European BUILD UP Skills initiative. LuxBuild2020 II aimed to train and prepare both the blue-collar workers of the construction sector and the companies of the building sector over the period 2017 to 2020⁷⁴.

Since 2019, the Luxembourgish government has been developing a new national strategy for attracting, developing and retaining talent. The government plans to attract talent from abroad as well as accelerate expertise development at a national level⁷⁵. The European Centre for the Development of Vocational Training has compiled a list of occupations in shortage in Luxembourg, which includes engineers (specifically, logistic, civil and mechanical engineers)⁷⁶.

Sector and sub-sector specific issues

Material efficiency and waste management

Construction and demolition waste (CDW) accounts for almost 25.0-30.0% of all waste generated in the EU and consists of various materials, such as concrete, bricks, gypsum, wood, glass, metals, plastic, solvents, asbestos and excavated soil, etc.⁷⁷. In 2018, Luxembourg reported 7.3 million tonnes of waste, categorised as hazardous and non-hazardous, from construction activities. This is 17.4% and 3.9% lower compared to the waste generated in 2010 and 2016, respectively⁷⁸.

As a part of the Waste Prevention Program, the **National Waste and Resource Plan** (*Plan national de gestion des déchets et des ressources, PNGDR*) is currently applicable in Luxembourg. It is the third waste management plan, covering the 2016-2022 period. The sectors covered in the plan include agriculture, construction and infrastructure, manufacturing, transport, households, private service activities, public services, etc.⁷⁹. The program aims to:

- prevent the generation of waste from excavated soils,
- encourage backfilling with excavated soil,
- stabilise current recovery rates (90.0%),
- promote reuse of construction materials.

Climate and energy

Emissions of greenhouse gases (carbon monoxide and dioxide, methane and nitrous oxides) from activities related to the narrow construction and the

real estate activities sub-sectors in Luxembourg amounted to a total of 173,237 and 40,253 tonnes in 2019⁸⁰, respectively. Emissions in the narrow construction sub-sector decreased by 2.5% over the 2010-2019 period, whereas the real estate activities sub-sector reported a substantial increase of 382.1% over the same period.

Emissions of greenhouse gases from the real estate activities sub-sector between 2010 and 2019



↑ 382.1%

Despite being a relatively less carbon-intensive economy, Luxembourg has the highest greenhouse gases emissions per capita among the EU member states. The road transport sector is regarded as the primary source of emissions, contributing about 66.0% of the total CO₂ emissions (as per STATEC). Almost half of this is attributable to the cross-border commuting of workers and international freight traffic. This highlights the country's prominent position as a logistical hub and demonstrates the impact of its large commuting workforce on its environment⁸¹.

As a part of EU Green Deal, Luxembourg aims to achieve climate neutrality by 2050 but based on its existing policy initiatives and implementation levels, the current estimations say that the country will miss its 2030 targets of reducing emissions by 40.0% compared with the 2005 level. Measures such as the introduction of free public transport from 2020 and a carbon tax from 2021 may not achieve the desired effect in the absence of an efficient alternative to cars for transportation^{82,83}.

5

Innovation in the construction sector

Innovation performance

As per the European Innovation Scoreboard 2021, Luxembourg is classified as a strong innovator, a deterioration compared to last year when the country was classified as an innovation leader⁸⁴.

The top three indicators of the Luxembourgish innovation system include foreign doctorate students, trademark applications and international scientific co-publications. The country also demonstrated strong performance in attractive research systems, human resources and intellectual assets⁸⁵.

As per the scoreboard, Luxembourg's innovation performance declined in 2021 primarily due to a fall in employment in innovative enterprises. Nonetheless, the country displayed above average scores on the climate change related indicators⁸⁶.

In relation to the construction sector, the number of construction-related patent applications increased from one in 2010 to seven in 2020. Compared to 2019, the number of patent applications has increased by three⁸⁷.

Eco-innovation and digitalisation



According to the 2021 Eco-Innovation Scoreboard (Eco-IS), Luxembourg ranked 1st with the highest score of 171, substantially above the EU-27 average of 121⁸⁸.

As per the report, in 2019, Luxembourg performance improved in all five indicators and thus, exceeded the EU average. It performed considerably well in the socio-economic outcomes. The country also maintained high levels in other indicators such as resource efficiency outcomes, eco-innovation inputs and eco-innovation outputs. It performed just slightly better than the EU average in eco-innovation activities. Eco-innovation and

circular economy continue to be priority areas for the country with various related initiatives being continuously promoted and implemented by public authorities on a large scale⁸⁹. Luxembourg has already confirmed its commitment to transition into a lower carbon intensive economy by joining the **Leadership Group for Industry Transition**, a global initiative launched in September 2019. However, two major barriers that hinder Luxembourg's efforts are its small national market for eco-innovation, as well as resulting pressure on existing resources, and balancing the economic development needs with environmental protection responsibilities⁹⁰.

The Luxembourg Eco-Innovation Cluster plays an important role with respect to eco-innovation. It is a network that supports the various actors of the cleantech sector, with the goal of creating and developing new and sustainable business opportunities. The cluster's main objectives are to diversify the activities of Luxembourgish businesses, build public-private partnerships to develop new collaborative projects, promote networking between public and private actors at national and international level, and contribute to the development of new environmental solutions in the field of eco-technologies and sustainable construction⁹¹.

As per the **European Commission Digital Economy and Society Index (DESI) 2020**, Luxembourg ranked 10th out of the EU-28 member states with a 57.9 score, slightly above the EU-28 average score of 52.6⁹². According to DESI, in 2019, Luxembourg's performance improved in two dimensions – digital public services and connectivity, while it declined in the remaining three – human capital, use of internet services and integration of digital technology^{93,94}.

According to the **European Investment Bank (EIB) Investment Survey 2020**, the most frequent long-term impacts of COVID 19 on Luxembourgish construction firms were changes in the increased

use of digital technologies (50.0%) and permanent reduction in employment (22.0%), followed by changes in supply chain (21.0%) as well as changes in their services and products portfolio (15.0%). Nonetheless, more than 68.0% of Luxembourgish construction sector firms are expected to have implemented digital technologies within their business, either fully or partially by 2020. According to the report, the top digital technologies implemented by businesses in Luxembourg, either partially or fully, in the broad construction sector includes the internet of things (28.0%), drones (19.0%), 3-D printing (15.0%) and augmented or virtual reality (5.0%)⁹⁵.

Under its EUR 93.4 million Recovery and Resilience Plan (RRP), Luxembourg plans to contribute EUR 13.0 million towards developing and promoting digital services for the public. This includes creating new digital administrative services for firms and citizens⁹⁶.

By deploying digital technologies in the broad business sectors, Luxembourg aims to increase its productivity. Measures such as the development of e-Administration, including online public services, have a huge potential for the whole economy. The digitalisation of the public administration (*Modernise*), as well as the development of online administrative procedures, will reduce the overall cost of compliance and increase work efficiency of all the sectors within the economy including the construction sector⁹⁷.

Luxembourg has implemented various strategies to promote the uptake of strategic digital technologies by businesses including the **Data-driven Innovation strategy and the Artificial Intelligence (AI) strategy**. The country has also signed the **Declaration of European Blockchain Partnership and the Declaration on Cooperation on AI**. The country is also a member of the **BuildingSMART** global community

Among other sectors, the Luxembourgish government also wants to promote the adoption of

digital strategies in the construction sector⁹⁸. A prominent actor in the field of construction innovation and digitalisation is the **Luxembourg Institute of Science and Technology (LIST)**. Primarily focused on promoting Building Information Modelling (BIM) in Luxembourg, LIST undertakes various research and experimentation work related to the uses of BIM and virtual design/construction. It is involved in several research projects, such as **BIMetric**, a project in partnership with two French research institutions⁹⁹.

In September 2019, the Luxembourgish government established the Luxembourg Digital Innovation Hub (L-DIH). The L-DIH is an industry-led platform including on-demand solutions providers, which focuses on boosting the industrial digitalisation process for companies of any type and size based in the country. Furthermore, the fifth National Action Plan (which includes financial support measures for SMEs) is also under consultation by stakeholders and is currently pending approval. Such initiatives will directly and indirectly help construction sector firms to boost their digit capabilities¹⁰⁰.

Various programmes have also been developed by **Luxinnovation** including **Fit4Innovation**, **Fit4Start** and **Fit4Digital** to support innovation in SMEs while providing coaching and financing options for start-ups. Such programmes also help newer and smaller construction firms to remain competitive in the market¹⁰¹.

Other notable digital construction platforms include: (i) **Luxembourg for Business and Innovation (LfBI)** a networking platform for exporters; (ii) **Luxembourg Digital Innovation Hub** a platform supporting the development of the data-driven economy in Luxembourg, (iii) **BIMLUX 2021** a prominent event promoting digital transformation in the construction sector and (iv) **Digital Building Luxembourg** a platform focused on organising workshops around BIM, each related to a specific sector profession^{102,103}.

6

National and regional regulatory framework

Policy schemes

Despite numerous positive measures being undertaken by the Luxembourg government, house prices continue to rise steadily within the country. In order to promote low-cost public housing programmes, in particular rental housing, the government launched a concerted public action and private initiative under its 2018-2023 programme plans. The public actions are primarily focused on the following¹⁰⁴:

- the complete overhaul of housing assistance law and subsidies system for augmenting the supply of low-cost rental housing,
- promoting the creation of social housing and low-cost housing,
- making more building lots available,
- strengthening existing resources to increase the supply side, to include land use plans along with municipal development and environment preservation,
- developing a **new 2.0 State Municipalities Housing Pact**, providing better support to municipalities implementing a housing development strategy,
- improving the quality in construction and energy projects to provide better quality of life and social cohesion in neighborhoods
- prohibiting land speculation and improving rental market price transparency.

In addition to the two existing public players, the Housing Fund and the National Low-Cost Housing Company (SNHBM), the government expects municipalities to play a major role in reducing the housing shortage. The Ministry of Housing also focuses on establishing special units to advise and support municipalities in managing their own

projects including the acquisition and development of land, creation of housing, sale or rental of housing, management of rental assets, etc.¹⁰⁵.

In relation to land availability, the pre-emption right of the state, municipalities and public developers will be evaluated and modified, if required. The objective is to better identify factors involved in project development and improve the incentives for owners to sell¹⁰⁶.

Municipalities involved in the creation of social and low-cost housing will be acknowledged through additional financial incentives, mostly by linking the number of state subsidies to a system of graduated subsidies covering up to 100.0% of costs¹⁰⁷.

Luxembourg has already set up a separate unit, consisting of representatives of the Ministry of Housing and the Ministry of Finance, to evaluate land available for possible acquisition. The country acquired a few plots during 2019. In 2020, Luxembourg established a special fund to support housing development and pursue an active land acquisition policy. Additionally, in order to promote land acquisitions, any capital gains and profits on land sales were to be exempt from income tax¹⁰⁸.

The Luxembourgish government has adopted several measures to stimulate housing supply and home ownership. For instance, the "*Fonds de Logement*", a land management agency, has been empowered by law to support the supply of housing in the country. The government intends to shift its focus away from selling affordable housing towards increasing the supply of affordable rental housing. As such, regulations are also expected to be adapted in order to make local planning contracts more binding on landowners. The government is

also in the process of reviewing land and property taxes in order to increase the opportunity costs of holding vacant land¹⁰⁹.

Under its 2021-2026 Recovery and Resilience Plan (RRP), Luxembourg plans to recast its housing policy at municipal level (Housing Pact 2.0). Luxembourg has also committed to an investment of EUR 51.5 million (out of which EUR 24.0 million is to come from RRF funding) for increasing the supply of affordable housing and sustainable public housing in the country¹¹⁰.

This reform is focused on increasing the supply of sustainable public housing while streamlining the available financial incentives to create affordable housing stock. The reform plans to achieve this by mobilising available land plots for new construction and renovating the unused existing building stock. It would offer municipalities the required support and incentives to sign legally-binding implementation agreements with the central government, resulting in a joint obligation to develop land use plans thereby increasing the access to land and housing. Moreover, almost half of the accommodation planned under the project (*Neischmelz*) is for building affordable housing units¹¹¹.

This recasting of the Housing Pact will allow municipalities to better target the existing governmental support available to create affordable housing. Additionally, it will also help in making a more efficient use of the existing residential building units and plots potentially available for construction¹¹².

The Luxembourgish government has previously introduced additional fiscal measures to increase supply of both housing and land for construction purposes. These measures included a tax credit of up to EUR 20,000 to lower registration tax costs related to the purchase of a dwelling (***Bëllegen Akt***)¹¹³; a 'super-reduced' VAT rate of 3% rather than the standard rate of 17% on construction and renovation of dwellings, allowing a saving of up to EUR 50,000 per dwelling¹¹⁴; the reduction of capital gains taxes on sales of secondary residences, with first residences already exempted from capital gains taxes; and an increase of the accelerated amortisation rate on rented buildings from 4.0% to 6.0%¹¹⁵.

Under the 2021 Budget Law, Luxembourg has reduced the accelerated depreciation rate applicable to rented real estate from 6.0% to 4.0%. This will be applicable for real estate assets whose construction has been completed no longer than six years since the beginning of financial year (FY) 2021. This is also applicable for investment expenditures incurred on existing housing units to the extent: (i) it exceeds 20.0% of the unit's cost price and (ii) by FY 2021, the renovation work has been completed for less than five years. Nonetheless, the existing depreciation rate of 6.0% will continue to apply if existing legislative requirements are met and the housing stock has been constructed or acquired before FY 2021, or if the renovation of the existing dwelling has been completed before FY 2021¹¹⁶.

In 2016, a **rent subsidy** was introduced by the Ministry of Housing designed to support low-income households paying a monthly rent of over 33.0% of their disposable income. The monthly subsidy can reach up to EUR 300¹¹⁷. Since the launch of the subsidy, each beneficiary household has benefited from an average subsidy of EUR 126 per month¹¹⁸. In January 2018, the law related to rent subsidies was reformed to increase the number of households that can potentially benefit from grants¹¹⁹.

To foster housing supply and address the issue of the lack of available land for construction, the government also introduced a new type of contract called the *Baulandvertrag* in 2020, which allows authorities to require that landowners build on their land within a fixed period of time. If the land is not used, local authorities could impose penalties, such as reclassifying the land as unsuitable for building¹²⁰.

Building regulations

According to the **Law of 13 December 1989**, in Luxembourg, architects and engineers are required to take out compulsory third-party liability and professional indemnity insurance. These cover all professional liabilities. Additionally, the Order of Architects and Consulting Engineers (*Ordre des Architectes et des Ingénieurs-Conseils - OAI*) developed non-compulsory guidelines for third party liability insurance and professional indemnity insurance. Other types of insurance are also common, such as the Contractor's All Risk (CAR) and Decennial Liability insurance. The latter covers all

parties involved in the construction project who are likely to be subject to decennial liability under the acts 1792 and 2270 of the Civil Code. This type of insurance lasts for 10 years starting from the acceptance of works. In public procurement projects and private projects, the contract may require the parties involved to take out one or several of these insurances¹²¹.

In June 2021, the Le CRTI-B (*Centre de Ressources des Technologies et de l'Innovation pour le Bâtiment*) updated the general technical clauses relating to the work of heating installations and hot water preparation (CTG040), the work of the installation of sanitary facilities (CTG042), the works of sprinkler installations (CTG049) and the works of ventilation and air conditioning installations (CTG074)¹²².

The above mentioned four clauses have been rewritten to correspond and meet the expectations as well as the requirements of the Luxembourg market including its new standards and regulations¹²³.

Additionally, ILNAS (*Institut Luxembourgeois de la Normalisation, de l'Accréditation, de la Sécurité et qualité des produits et services*) is also in the process of revising the national standard **ILNAS 101: 2016** on living space. The standard defines how to measure and reflect the living area of a dwelling and is the first national standard developed in Luxembourg related to the field of construction¹²⁴.

Principles of liability in construction are mainly governed by the **Civil Code**. It lays out the regime of contractual liability, which has a different duration depending on whether damage occurs before or after handover. The liability limitation period for damages occurred before completion of the project is 30 years from the handover of the works. For damages occurring after completion, decennial liability applies when there has been damage affecting the solidity of the building shell (10-year limitation period). In the case of defects to minor works (decoration and maintenance works), bi-annual liability applies, whereby the construction parties are liable for five years¹²⁵.

Insurance and liability related regulations

In Luxembourg, areas are generally divided into different zone types (high density, low density, residential, industrial, etc.), with separate general rules applicable to each zone (e.g., safety requirements, characteristics of the building land, etc.). Furthermore, building regulations (*Règlement sur les bâtisses*) are specific to each municipality, and may therefore vary. The regulations also define the requirements for constructions (stability, safety, rules applicable to the building site, etc.)¹²⁶. The regulations also specify the procedure to be carried out to request a building permit, necessary for any new construction work, as well as enlargements, transformations, external modifications and demolitions of existing buildings¹²⁷.

Each municipality has a separate general development plan (*Plan d'aménagement général* – PAG) as well as a specific development plan (*Plan d'aménagement particulier* – PAP). The PAG consists of a set of graphical and written provisions, which cover: the rational utilisation of land, harmonious development of urban and rural structures, protection of the cultural heritage and natural environment, smart energy usage, and improving the quality of life of the population¹²⁸. The PAP implements and specifies each zoning area of the PAG of a municipality (with the exception of green areas, lands subject to a land use plan, among others)¹²⁹. Thus, the building regulations, the PAG and the PAP constitute the framework for the sustainable development of the territory of the municipalities.

In order to reduce the administrative burden linked to the issuance of building permits and therefore improve the supply of housing, the Omnibus law has been voted and is aimed to simplify the current process. The law shortens the length of the procedure to obtain a building permit, since it contains measures that reduce the time available to the administration to react. It also introduces the concept of 'tacit consent', meaning that no reaction from the administration can be considered as a positive answer¹³⁰.

Current status and national strategies to meet Construction 2020 objectives

TO 1 – Investment conditions and volumes

Total investment by the broad construction sector¹³¹ has been on an increasing trend since 2010. Investment by the narrow construction sub-sector increased by 61.0% between 2010 and 2019¹³², reaching EUR 235.0 million. This is mostly driven by a 238.8% and 205.7% increment in investments in machinery and in intellectual property, going from EUR 18.8 million and EUR 3.5 million in 2010 to EUR 63.7 million and EUR 10.7 million in 2019, respectively. Investment in the real estate activities sub-sector increased by 55.4%, from EUR 1.6 billion in 2010 to EUR 2.5 billion in 2019. Investments in intellectual property and in machinery for the real estate activities sub-sector follow a trend similar to the narrow construction sub-sector, reporting an increase of 185.5% and 145.4%, respectively, over the 2010-2019 period.

Investment by the narrow construction sub-sector between 2010 and 2019 **↑ 61.0%**

Figure 9: Investment by the Luxembourgish broad construction sector between 2010 and 2020 (EUR million)



Source: Eurostat, 2021.

The **total investment index in the broad construction sub-sector**¹³³ increased by 10.3% over the 2015-2020 period. Investment in non-residential construction and civil engineering followed a similar trend, rising by 17.2% in comparison to the 2015 value. In contrast, investment in dwellings by the whole economy marginally increased by 0.2% over the 2015-2020 period. In absolute terms, investment in the construction sector totalled EUR 6.0 billion in 2018¹³⁴ with EUR 2.3 billion invested in dwellings and EUR 3.7 billion in non-residential and civil engineering¹³⁵ (Figure 10).

Total investment in non-residential construction and civil engineering between 2015 and 2020 **↑ 17.2%**

Figure 10: Investment index in the Luxembourgish construction sector between 2010 and 2020 (2015=100)



Source: AMECO, 2021.

The share of **total inland**¹³⁶ **infrastructure investment** in the GDP amounted to 0.7% in 2018¹³⁷ compared to the 0.8% in 2010. Investment in air transport infrastructure and rail infrastructure increased by 84.3% and 68.6% over the 2010-2018 period, totalling EUR 12.4 million and EUR 263.9

million, respectively. In contrast, investment in inland waterways and road infrastructure decreased by 87.4% and 1.2% over the 2010-2018 period, amounting to EUR 128,264 and EUR 180.4 million in 2018, respectively.

Rail infrastructure investment between 2010 and 2018  **68.6%**

Investments in infrastructure maintenance have increased for all transport infrastructures except inland waterways. Investments in the maintenance of road, air transport and rail infrastructure increased by 98.5%, 58.5% and 31.9%, respectively, over the 2010-2018 period. In contrast, investment in inland waterways maintenance declined by 30.5% over the same reference period.

Road infrastructure maintenance between 2010 and 2018  **98.5%**

Luxembourg continues to actively support EU rail interoperability. Indeed, the entire rail network is already equipped with the European signalling system ERTMS (European Rail Traffic Management System)¹³⁸. In July 2018, CFL (*Société Nationale des Chemins de Fer Luxembourgeois*), the state-owned railway network operator in Luxembourg, announced its plans to invest EUR 4.0 billion in the development of rail infrastructure over the 2018-2028 period¹³⁹. The Luxembourgish government has already announced investments up to EUR 2.2 billion in its rail network over the 2018-2023 period. Additionally, investments amounting to EUR 390.0 million have been planned for the tram system over the same reference period¹⁴⁰.

In May 2018, the Luxembourgish government adopted its new sustainable mobility strategy (**Modu 2.0**), with an objective to reduce peak-hour congestion by 2025 while transporting 20.0% more population than in 2017. The strategy includes detailed research in developing smart and sustainable multimodal mobility-on-demand transit solutions¹⁴¹. The strategy also saw the elimination all fares for trains, trams and buses in Q1 2020¹⁴², providing free transport throughout the country¹⁴³.

Under its EUR 93.4 million Recovery and Resilience Plan (RRP), Luxembourg has allocated EUR 30.5 million (32.6% of the total allocation) towards the decarbonisation of its transport sector¹⁴⁴.

Some important projects include the modernisation of the Brussels-Luxembourg-Strasbourg railway link by 2022, the upcoming rail line between the southern area of the capital and *Esch-Belval* by 2030, a new rail line between Luxembourg and Bettembourg, as well as the installation of European Train Control System on the entire railway network¹⁴⁵.

Luxembourg has also benefitted from investments from the **European Fund for Strategic Investments** (EFSI). As of January 2021, financing under EFSI amounted to EUR 181.0 million and is set to trigger additional investments of EUR 893.0 million. Under the infrastructure and innovation window, ten projects have been approved, amounting to EUR 67.0 million and are set to trigger EUR 488.0 million in total investments. Under the SMEs window, seven agreements have been approved, involving a total financing of EUR 114.0 million, and are set to trigger investments of up to EUR 406.0 million benefitting almost 1,570 SMEs and mid-cap companies from improved access to finance¹⁴⁶.

TO 2 – Skills

The vocational education and training (VET) system in Luxembourg has a high employment rate for recent graduates (100.0% in 2019), considerably above the EU average of 79.1%¹⁴⁷. However, labour shortages and skills mismatches continue to be major threats to all key sectors. Since 2017, many changes have been introduced to correct this situation including the amendment of VET Reform Act, a bilateral agreement with the German *Lander of Rhineland-Palatinate*, and the implementation of European Social Fund Projects (July 2017 to December 2019)¹⁴⁸.

The 2008 VET Reform Act was amended in June 2019 to: (1) extend the training period to improve completion rates, (2) introduce specialised training for employed people and (3) integrate the apprenticeships and work placements contracts in the Labour Law to improve legal certainty.

Likewise, the bilateral agreement with Germany focused on strengthening the labour market in the *Grande Region* (Luxembourg and the bordering regions of Belgium, France and Germany) promoting cross-border mobility in VET¹⁴⁹.

In 2019, the Luxembourgish government reformed vocational training through the implementation of the Labour Code and the 2008 Act. The reforms introduced technical modifications allowing students an extension of their apprenticeship phase by up to two years. Additionally, 'on-the-job' vocational training was also introduced, allowing employees without certifications in their respective work fields to complete training in parallel with their job¹⁵⁰.

With regards to participation in adult learning, Luxembourg's participation rate remains high at 19.1% in 2019 compared to the EU average of 10.8%. However, this rate declined to 6.8% for low-skilled workers. The employment rate for older workers also remained at 43.1% in 2019, lower than the EU average of 59.1%¹⁵¹.

With respect to the construction sector, a number of initiatives have been launched aimed at strengthening skills in construction. Notably, the Luxembourg Chamber of Crafts together with the Construction Sector Training Institute (IFSB) and with MYENERGY, the public agency dedicated to sustainable energy, joined the initiative **LuxBuild 2020**. This is part of the EU-wide BUILD UP Skills scheme and aims at facilitating training in the fields of energy performance of buildings, renovation, and utilisation of renewables in buildings.

In addition to LuxBuild 2020, a number of training courses and certifications are available on the market, offered by the public sector or trades associations. For example, the Building Generation Project is a comprehensive initiative to inform young people about the different occupations, technological developments and job prospects in the construction sector, using different events, games and competitions. In addition, the Professional Association of Architects and Consulting Engineers (OAI) organises advanced training in construction and energy. The Luxembourg Chamber of Crafts is also active in delivering training on energy renovation, passive houses, ventilation systems etc.

In parallel, the Luxembourgish government is planning to implement a skills strategy to align training with the actual market skills requirements in the various economic sectors. It plans to create an accreditation agency to promote continuing vocational training and to ensure transparency in the continuing education market¹⁵².

Under its EUR 93.4 million Recovery and Resilience Plan (RRP), Luxembourg has allocated EUR 6.5 million (7.0% of the total allocation) towards the skilling, reskilling and upskilling of its workforce¹⁵³.

About EUR 5.0 million is allocated towards training part-time workers. This includes setting up online digital training courses and offering a one-off digital training voucher of up to EUR 500 to every part-time employee. Additionally, EUR 1.5 million is allocated towards training jobseekers. This involves activities such as organising various training courses (at least 30.0% of which will be for jobseekers over 45 years old) and developing digital as well as managerial skills¹⁵⁴.

TO 3 – Resource efficiency / Sustainable construction

In 2020, Luxembourg announced various initiatives towards achieving climate neutrality by 2050. In particular, in May 2020, the country adopted an ambitious National Energy and Climate Plan, followed by a Climate Protection Law in December 2020, thereby increasing its 2030 targets to reduce GHG (greenhouse gas) emissions by 55.0% compared to its 2005 levels. In order to reach its targets, significant investment needs to be made to increase the energy efficiency for both households and business units. Specifically, Luxembourg needs to prioritise investment in energy efficient construction, production and business models, as well as the renovation of residential buildings, in line with the recently updated EU industrial strategy¹⁵⁵.

The energy renovation of buildings and the Renovate flagship are not present prominently in any investment measures in the RRP. They are only mentioned as secondary objectives in the Housing Pact 2.0 reform. This reform is aimed at supporting municipalities' efforts to make affordable housing more accessible, either by building new housing

units or renovating the existing building stock to bring them up to the required standards¹⁵⁶.

Since January 2017, all new residential construction requires compliance with the AA energy class standard (i.e., nearly-zero energy use building standard - **NZEB**), in terms of both thermal insulation and energy performance, corresponding to a passive house. This makes Luxembourg the first EU member state to require such a strict level of energy performance. This measure is expected to result in final energy savings of 355 GWh¹⁵⁷.

In April 2019, an amendment to the Grand Ducal Regulation was enforced. Additionally, a new working draft is also under way to modify the calculation methodology for energy efficiency. Through this draft, the government plans to incorporate new technical developments while reinforcing the requirements of NZEB for new administrative buildings¹⁵⁸.

From November 2021 onwards, the Luxembourgish Chamber of Trades (*Chambre des Métiers*) have decided to offer three new training courses dealing with sustainable construction, namely: (i) Healthy materials in interior construction, (ii) Sustainable materials in construction and shells and (iii) Smart energy systems in buildings¹⁵⁹.

The Ministry of Housing also provides support for energy efficient renovation. The renovation grant (**Prime d'amélioration**) is allocated not only for interventions that improve the health and safety of residential dwellings, but also for the enlargement of existing rooms and construction of new ones. The grant amounts to 30.0% of the costs of the works, up to a maximum of EUR 10,000 per beneficiary¹⁶⁰. Moreover, the Ministry offers **guarantees** to eligible individuals wishing to take out loans for the renovation of their dwelling¹⁶¹.

The government continues to pursue its long-term strategy of renovation of the national stock of residential and commercial buildings under Directive 2012/27/EC. In fact, the National Council for Sustainable Construction (CNCD) has already implemented almost 35 initiatives aimed at reducing legal and financial obstacles related to building renovations. The government intends to yearly revise the renovation rates upwards by three

percent so as to achieve the target of all existing homes meeting zero net emissions by 2050¹⁶².

TO 4 – Single Market

As per the 2020 EU Single Market Scoreboard, Luxembourg performed well above the EU-28 average. In particular, it performed better in metrics such as transposition, EU Pilot, e-Curtis, Your Europe (EU's single digital gateway) and SOLVIT¹⁶³.

With regards to the 2020 EU Single Market Scoreboard metrics, Luxembourg's performance was average in terms of metrics such as Infringements and Internal Market Information Systems (IMI). In parallel, Luxembourg performed below average in terms of European Employment Services (EURES) metrics. Luxembourg's performance in relation to public procurement in 2019 was average, with five indicators out of 12 scoring "unsatisfactory" while the rest as "average" or "satisfactory"¹⁶⁴.

According to GAN Integrity, Luxembourg's land administration has a low risk of corruption with only one percent of businesses reporting being asked for a bribe while applying for building permits. Additionally, the number of days and steps involved in obtaining construction permits is in line with the OECD average. Corruption is also not extensively prevalent in the country's public services sector. However, almost 40.0% of businesses consider using connections and bribery as the easiest approach to obtain certain public services¹⁶⁵.

Luxembourg also reported regulatory barriers in the services sectors, particularly in the business services sector, well above the EU average for various essential professions. This resulted in less competition and in lower market entry rates compared to the EU average^{166,167}. As per a 2019 survey conducted by the Luxembourgish Chamber of Commerce, about 41.0% of business leaders affirmed that administrative procedures had increased in complexity, partly due to stricter international and European regulations¹⁶⁸.

Over the 2018-2019 period, the Luxembourg government launched an assistance scheme under the fourth SME action plan adopted in October 2018. Under the scheme, the government offered financial assistance to SMEs participating for the first time in a national trade fair by covering their

rent, set-up and stand management costs, thereby encouraging SMEs to actively take part in national trade fairs¹⁶⁹.

Nonetheless, as per the Global Entrepreneurship Monitor 2019, the fear of failure continues to be higher in Luxembourg compared to the EU average, acting as a deterrent for upcoming entrepreneurs. The government's inability to reform its bankruptcy law is also a pressing issue for the country¹⁷⁰.

With respect to the implementation of Eurocodes, Luxembourg published all EN Parts as National Standards in English, French and German, except for EN 1990-A1. National Annexes are published to all Eurocode parts, except for EN 1990-A1. The use of Eurocodes is not compulsory in Luxembourg, and National Regulations on structural design may be used in parallel with Eurocodes¹⁷¹.

TO 5 – International competitiveness

As per World Bank Doing Business 2020 report, Luxembourg ranked 1st out of 190 economies in the ease of trading across border, achieving a full score of 100 in trading across border dimension¹⁷².

As per the report, in Luxembourg, it takes only one hour to be documentary compliant and a few minutes to be border compliant. In terms of costs, businesses do not need to spend any money to be documentary and border compliant¹⁷³.

With regards to the **internationalisation of construction SMEs**, the export value of all construction-related projects in Luxembourg stood at EUR 305.5 million in 2020, representing a slight decline of 5.6% compared to its 2010 level of EUR 323.5 million.

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

 **5.6%**

In the context of **inward FATS (Foreign affiliates statistics)**¹⁷⁴, value added at factor cost and turnover in the narrow construction sub-sector increased by 54.0% and 75.3% over the

2010-2018¹⁷⁵ period, respectively. Similarly, value added at factor cost and turnover in the real estate activities sub-sector also increased by 63.8% and 101.9% between 2011¹⁷⁶ and 2018, respectively.

With regards to Foreign Direct Investment (FDI), Luxembourg's direct investment abroad (DIA) in the EU-27 for the manufacturing sub-sector stood at EUR 62.1 billion in 2018¹⁷⁷, the largest amount compared to other sub-sectors. It was followed by the real estate activities sub-sector with investment reaching EUR 7.1 billion for the same period. DIA for the narrow construction sub-sector was the lowest, standing at EUR 2.6 billion in 2018.

Notable initiatives include the **Europe Enterprise Network** which functions as an umbrella organisation with regard to the internationalisation of SMEs, the **Luxembourg Export Credit Agency (the Office du Ducroire, ODL)**, and **Luxinnovation**, the institutional framework promoting international trade in Luxembourg. The Luxembourg Export Credit Agency supports the internationalisation and export activities of SMEs. It provides a variety of financial instruments, such as export credit insurance, especially relevant for construction companies. The ODL can cover buyer credits financed by banks, so as to enable foreign buyers to fund export transactions of contracting equipment, services or construction works¹⁷⁸. Likewise, Luxinnovation is a national agency involved in innovation and research in Luxembourg. It encourages and supports SMEs to innovate and grow, while facilitating their collaboration with public research players.

Furthermore, the **Committee for the Promotion of Luxembourg Exports (Comité pour la Promotion des Exportations Luxembourgeoises - COPEL)** was founded by a cooperation agreement between the ODL and Luxembourg government to promote export of goods and services from Luxembourg-based firms¹⁷⁹. COPEL contributes to promotional material expenses (e.g., translations for presentations), provides support for participation in trade fairs, and contributes to advertising costs and provides export training and other consultancy services.¹⁸⁰

8

Outlook

Over the 2020-2022 period, GDP in Luxembourg is expected to increase by 7.9%, primarily driven by investments in public healthcare and infrastructure, digitalisation and green economy, backed by EU funding.

Luxembourg's GDP is forecasted to annually increase by 4.5% in 2021 and by 3.3% in 2022, totalling EUR 62.3 billion in 2022. Similarly, the **volume index of production** in the broad construction sector is also estimated to increase by 13.0% between 2020 and 2022.

Volume index of production in the broad construction sector between 2020 and 2022

↑ 13.0%

Turnover in the broad construction sector is estimated to annually increase by 5.0% in 2021. Likewise, the **number of persons employed** in the broad construction sector is also expected to increase by 4.9% to 67,724 persons in 2021. The majority of this increment is anticipated to come from two sub-sectors: the architectural and engineering activities (+8.3%) and the real estate activities (+6.9%) sub-sectors.

The housing supply in Luxembourg is limited, creating issues relating to housing affordability. To address this, the government is already working to completely overhaul the existing housing assistance law and subsidies system to boost the supply of low-cost rental housing. It is also developing the new 2.0 State Municipalities Housing Pact, aimed at providing better support to municipalities in implementing housing development strategy. In terms of transport infrastructures, the government announced

investments up to EUR 2.2 billion in its rail network over the 2018-2023 period. Additional investments amounting to EUR 390.0 million have also been planned for the tram system over the same reference period. Other notable projects include modernisation of the Brussels-Luxembourg-Strasbourg railway link by 2022, the upcoming rail line between the southern area of the capital and *Esch-Belval* by 2030 and the installation of European Train Control System on the entire railway network.

Under the EUR 93.4 million Recovery and Resilience Plan (RRP), Luxembourg has allocated EUR 30.5 million (32.6% of the total allocation) towards the decarbonisation of its transport sector¹⁸¹.

The country also plans to recast its housing policy at the municipal level (Housing Pact 2.0). Luxembourg has also committed to an investment of EUR 51.5 million (out of which EUR 24.0 million to come from RRF funding) for increasing the supply of affordable housing and sustainable public housing in the country. Additionally, the country has also allocated EUR 6.5 million (7.0% of the total allocation) towards the skilling, reskilling and upskilling of its workforce, and EUR 13.0 million towards developing and promoting digital services for public.

Overall, the Luxembourg construction sector is expected to recover from 2021 onwards, driven by large-scale digitalisation and infrastructural projects backed by EU funding. Output in civil engineering is expected to be primarily driven by investment in railways and road infrastructure.

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