



European Construction Sector Observatory

Country profile **Luxembourg**

November 2020



In a nutshell

Over the 2010-2019 period, Luxembourg GDP increased by 29.4%, from EUR 45.2 billion in 2010 to EUR 58.5 billion in 2019, primarily driven by strong domestic demand and active job creation.

Additionally, the application of an automatic wage indexation mechanism (since January 2020), together with a lower inflation rate and sustained private consumption, enabled the country's economy to perform well amid weak.

Reflecting this broader trend, the **number of enterprises** in the broad construction sector increased by 20.8% over the 2010-2019 period, totalling 8,755 in 2019. With regards to sub-sectors, the largest increment was reported by the real estate activities (+23.5%) sub-sector, followed by the narrow construction (+19.8%) and the architectural and engineering activities (+19.4%) sub-sectors over the same reference period, respectively.

Number of enterprises in the real estate activities sub-sector between 2010 and 2019

↑ 23.5%

In parallel, the **volume index of production** in the broad construction sector increased by 9.9% over the 2015-2019 period.

The **total turnover** in the broad construction sector increased to EUR 11.4 billion in 2019, representing an increment of 48.3% since 2010. This overall increase was driven by three sub-sectors, namely the narrow construction (+52.2%), the real estate activities (+46.9%) and the architectural and engineering activities (+41.8%) sub-sectors over the 2010-2019 period.

Turnover of the narrow construction sub-sector between 2010 and 2019

↑ 52.2%

Similarly, the **gross operating rate** of the broad construction sector, which is an indicator of the sector's profitability, marginally increased from 15.1% in 2010 to 15.2% in 2017. This is still lower than the EU-27 average of 16.6%. With regards to sub-sectors, the real estate activities sub-sector remained the most profitable (48.8%), followed by the architectural and engineering activities (10.4%), the narrow construction (9.3%) and the manufacturing (4.4%) sub-sectors in 2017, respectively.

In relation to employment, there were 60,253 **persons employed** in the broad construction sector in 2019, representing an increase of 18.5% since 2010. This was primarily driven by the real estate activities (+33.0%), the architectural and engineering activities (+28.4%) and the narrow construction (+17.6%) sub-sectors over the 2010-2019 period.

Number of persons employed in the real estate activities sub-sector between 2010 and 2019

↑ 33.0%

The Luxembourgish government has initiated various schemes to develop and promote the housing market. Under its 2018-2023 programme plans, the government plans to completely overhaul the existing housing assistance law and subsidies system to boost the supply of low-cost rental housing. It is also in the process of developing a new 2.0 "State Municipalities" Housing Pact to provide better support to municipalities implementing a housing

development strategy. Municipalities involved in the creation of low-cost housing will be assisted through additional financial incentives. Moreover, any capital gains and profits on land sales will be exempt from income tax to further promote the housing market supply side.

With regards to infrastructures, the Luxembourgish government has announced investments of 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. Furthermore, CFL, the state-owned railway network operator in Luxembourg, has announced investment of up to EUR 4.0 billion in the development of rail infrastructure over the 2018-2028 period.

In spite of several policy initiatives supporting the development of the construction sector, the latter continues to face two major issues. Firstly, the construction sector suffers from insufficient housing supply and inadequate transport infrastructures. 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. Secondly, the ongoing skills gap in the existing workforce and the shortage of skilled workers continues to be a major concern for the sector.

Despite the onset of the COVID-19 pandemic, the Luxembourg construction sector has a positive outlook in the medium and long term. Existing construction projects have also resumed activities and the sector is forecasted to see major improvements following the economic recovery, which is expected to be felt from 2021 onwards.

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1

Key figures

Construction market

In 2019¹, the **number of enterprises** in the broad construction sector in Luxembourg totalled 8,755 (Figure 1). In terms of sub-sectors, the narrow construction sub-sector accounted for 44.1% of total number of firms in the sector, followed by the real estate activities (38.8%) and architectural and engineering (16.2%) activities sub-sectors. Overall, the number of enterprises in the broad construction sector increased by 20.8% over the 2010-2019 period.

Number of enterprises
in the broad
construction sector
between 2010 and 2019

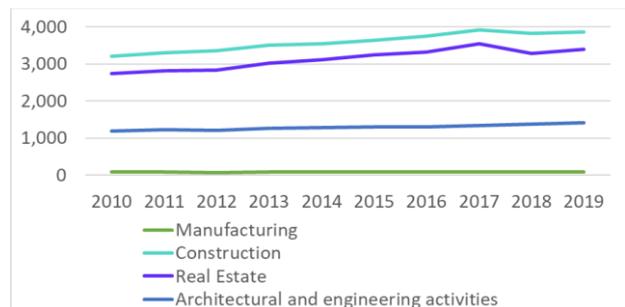
↑ 20.8%

This increase was mostly driven by growth in the number of companies in the real estate activities (+23.5%) sub-sector, followed by the narrow construction (+19.8%), and the architectural and engineering activities (+19.4%) sub-sectors.

On the other hand, the number of enterprises in the manufacturing sub-sector decreased by 8.2%, from 90 companies in 2010 to 83 companies in 2019.

Further, the **volume index of production** in the broad construction sector² increased by 9.9% between 2015 and 2019 (Figure 2).

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



Source: Eurostat, 2020.

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

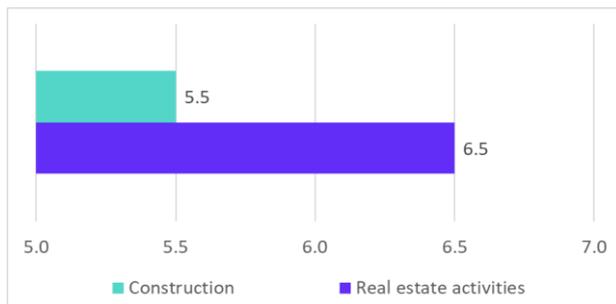


Source: Eurostat, 2020.

The **total value added at factor cost**³ of the broad construction sector amounted to EUR 4.5 billion in 2019⁴, experiencing a 39.7% growth compared to the 2010 level of EUR 3.2 billion. The narrow construction sub-sector accounted for 61.8% of the total⁵ (EUR 2.8 billion), followed by the real estate activities (+23.3% of the total), the architectural and engineering activities (+12.4%) and the manufacturing (+2.5%) sub-sectors.

The **share of gross value added** of the real estate activities sub-sector in the GDP reached 6.5% in 2019⁶, slightly below its 2010 level of 7.4% and the EU-27 average of 9.7% in 2019. Conversely, the narrow construction sub-sector accounted for 5.5% of gross value added in the GDP in 2019, slightly above its 2010 level of 4.8% as well as EU-27 average of 5.0% for 2019 (Figure 3).

Figure 3: Gross value added as a share of GDP⁷ in the Luxembourgish broad construction sector in 2019 (%)



Source: Eurostat, 2020.

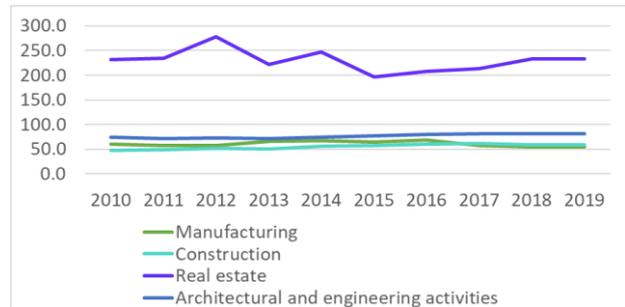
Productivity

Over the 2010-2017 period, the **apparent labour productivity**⁸ in the broad construction sector increased by 21.0%, from EUR 62,739 in 2010 to EUR 75,885 in 2019 (Figure 4). As such, it remains above the EU-27 average of EUR 50,079.

In the case of sub-sectors, the narrow construction sub-sector reported the highest increase of 24.2%, growing from EUR 47,300 in 2010 to EUR 58,734 in 2019, followed by the architectural and engineering activities sub-sector (+10.0%) increasing from EUR 73,800 to EUR 81,157 over the 2010-2019 period. The real estate activities sub-sector, exhibiting the highest labour productivity, reported a marginal increase of 0.5% over the same period, totalling EUR 233,010 in 2019⁹. In contrast, the manufacturing sub-sector witnessed a decrease of 8.2%, from EUR 59,488 in 2010 to EUR 54,583 in 2019¹⁰.

Labour productivity of the narrow construction sub-sector between 2010 and 2019 **↑ 24.2%**

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



Source: Eurostat, 2020.

Turnover and profitability

The total **turnover** of the broad construction sector amounted to EUR 10.9 billion in 2017, reporting an increase of 42.4% as compared to the 2010 levels (EUR 7.7 billion). Additionally, it further increased to EUR 11.4 billion in 2019, registering a total growth of 48.3% over the 2010-2019 period. The overall increment in turnover was primarily driven by three sub-sectors – the narrow construction (+52.2%), the real estate activities (+46.9%) and the architectural and engineering activities (+41.8%) sub-sectors over the 2010-2019 period. In parallel, the manufacturing sub-sector recorded a minor increase of 7.8% over the same reference period.

Total turnover of the narrow construction sub-sector between 2010 and 2019 **↑ 52.2%**

The **gross operating surplus** of the broad construction sector amounted to EUR 1.7 billion in 2017¹¹, registering a growth of 42.9% compared to the 2010 level of EUR 1.2 billion. In terms of its sub-sectors, the largest increase was reported by the narrow construction sub-sector (+113.3%), followed by the real estate activities (+20.6%) sub-sector over the 2010-2017 period. In contrast, the manufacturing and the architectural and engineering activities sub-sectors recorded a decline of 47.6% and 11.7% over the same reference period, respectively.

Gross operating surplus of the narrow construction sub-sector between 2010 and 2017 **↑ 113.3%**

In parallel, the **gross operating rate** of the broad construction sector¹², which gives an indication of the sector’s profitability, marginally increased from 15.1% in 2010 to 15.2% in 2017¹³. This is slightly below the EU-27 average of 16.6% in 2017. As for sub-sectors, the real estate activities sub-sector enjoyed the largest profit margin on sales in 2017 (48.8%), followed by the architectural and engineering services (10.4%), the narrow construction (9.3%) and the manufacturing (4.4%) sub-sectors, respectively.

Additionally, the **construction costs**¹⁴ index increased by 7.9% between 2015 and 2019. Beyond the material and labour costs, the price of land is one of the key issues in Luxembourg. Because of the limited land supply (which belongs largely to private owners), land costs are highly expensive

Figure 5: Construction cost index¹⁵ between 2010 and 2019 (2015=100)



Source: Eurostat, 2020.

Employment

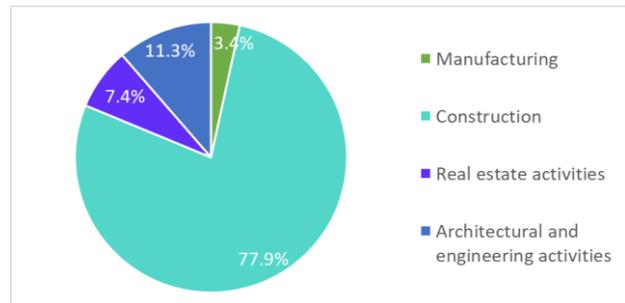
In 2019¹⁶, there were 60,253 **persons employed** in the broad construction sector, representing an 18.5% increase compared to 2010 figures (50,865 people). The narrow construction sub-sector employed 77.9% of the total workforce in 2019, representing 46,916 persons. This was followed by the architectural and engineering activities (+11.3%, 6,833 persons), the real estate activities (+7.4%, 4,452 persons), and the manufacturing (+3.4%, 2,051 persons) sub-sectors, as represented in the Figure 6.

Except for the manufacturing sub-sector, all other construction sub-sectors experienced an increase in terms of persons employed over the 2010-2019 period, starting from the real estate activities (+33.0%), the architectural and engineering activities (+28.4) and the narrow construction (+17.6%) sub-sectors. The manufacturing

sub-sector declined by 10.9% over the same reference period.



Figure 6: Percentage of people employed per construction sub-sector in Luxembourg in 2019



Source: Eurostat, 2020.

In terms of **specific occupations**, the largest increment in the narrow construction sub-sector was registered for technical and associate professionals (+76.9%), followed by managers (+28.6%) and clerical support workers (+25.0%) between 2010 and 2019, respectively. In contrast, only plant and machine operators and assemblers witnessed a decline of 5.9% over the same reference period. In the case of the real estate activities sub-sector, technicians and associate professionals accounted for the largest increase of 116.7%. Lastly, in terms of the manufacturing sub-sector, professionals reported the largest increment (+47.1%) while the biggest decline was recorded for clerical support workers (-40.0%) over the same reference period.

In addition, the **number of self-employed workers** working in the narrow construction sub-sector increased by 50.0% between 2010 and 2019, representing 5.6% of all self-employed persons in the economy. However, this is considerably below the EU-27 average of 11.9%. Similarly, the number of self-employed workers increased by 40.0% between 2010 and 2019 in the real estate activities sub-sector, accounting for 3.3% of all self-employed workers in the general economy. This is slightly higher compared to the EU-27 average of 1.4%.

Number of self-employed workers in the narrow construction sub-sector between 2010 and 2019

 **50.0%**

In parallel, **full-time employment** in the narrow construction sub-sector increased by 14.3% between 2010 and 2019. In contrast, a decrease of 13.2% was recorded in the real estate activities

sub-sector over the same reference period. Conversely, **part-time employment** in the narrow construction sub-sector significantly increased by 71.4%, over the 2010-2019 period. In comparison, a decline of 10.0% was reported in the real estate activities sub-sector in 2019 as compared to 2010 levels.

2

Macroeconomic indicators

Economic development

Over the 2010-2019 period, Luxembourg GDP increased by 29.4%, from EUR 45.2 billion in 2010 to EUR 58.5 billion in 2019. This also represented an increase of 2.3% compared to 2018.

This growth was primarily driven by strong domestic demand and active job creation, partially offsetting weak external performance due to COVID-19 pandemic restrictions. Furthermore, the application of an automatic wage indexation mechanism (since January 2020), together with a lower inflation rate and sustained private consumption, also supported the Luxembourg's economic growth¹⁷.

Potential GDP amounted to EUR 57.2 billion in 2019, resulting in a positive output gap of 2.2%. Last, the **inflation rate** in Luxembourg is relatively moderate, standing at 5.9% in 2019 as compared to 2015 its base year.

Demography and employment

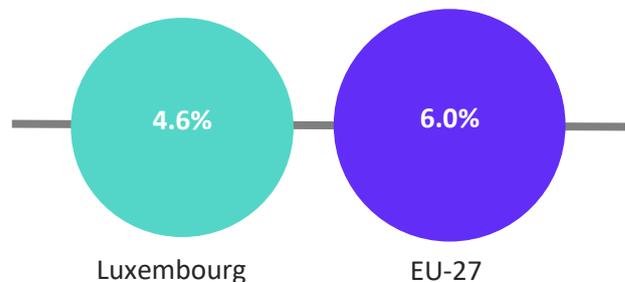
Luxembourg has one of the most dynamic labour markets among the EU Member States. In 2019, its **unemployment rate** stood at 4.6%, slightly below the EU-27 average of 6.0% while marginally above its 2010 level of 3.8%. In parallel, the **youth unemployment rate** (below the age of 25) stood at 17.0% in 2019, slightly higher than the EU-27 average of 15.1% and its 2010 level of 14.2%.

Luxembourg's total population amounted to 613,894 in 2019, an increase of 22.3% compared to its 2010 level. It is further expected to increase by 12.0% until 2030, and by 25.3% until 2050 reaching 769,048 inhabitants.

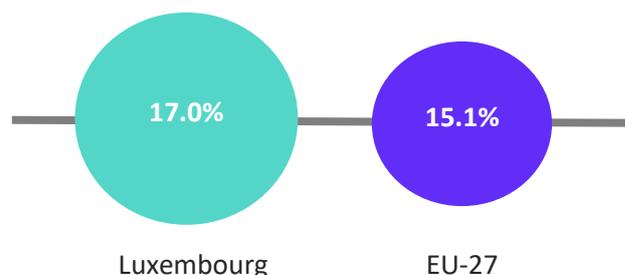
In parallel, immigration has stabilised at a high level, with a positive net **migration rate** of 10,267 in 2019, above the previous year (9,933) and the 2010 level (7,660). In turn, the positive net migration is likely to contribute to the increase of the housing demand.

In 2019, the **working age population** made up 69.5% of the total Luxembourgish population, slightly higher as compared to the EU-27 average of 64.6%. By 2050, the share of working age population is expected to decrease to 61.1%. In parallel, the proportion of people over 65 years old will increase from 20.3% to 25.5% over the 2019-2050 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 2019

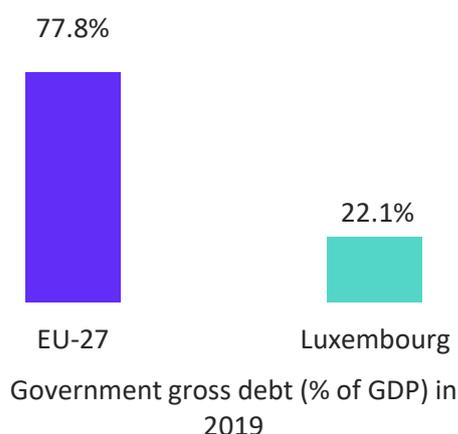


Youth unemployment rate in 2019



Public finance

In 2019, the **general government expenditure** accounted for 42.6% of GDP, marginally below the EU-27 average of 46.7%. The **general government deficit** stood at -2.2% of GDP in 2019, well above the 2010 level of -0.4%, as well as the EU-27 average of -0.6% in 2019. The **general government gross debt** accounted for 22.1% of the country's GDP, representing a modest increase compared to its 2010 level (+20.2%) while being significantly below the EU-27 average of 77.8% in 2019.



Entrepreneurship and access to finance



As per the 2019 Global Competitiveness Report by the World Economic Forum, Luxembourg ranked 15th out of 141 economies in terms of financing of SMEs¹⁸.

The Report also ranked Luxembourg 11th with regards to venture capital availability, 16th in terms of market capitalization as a percentage of GDP and 27th as to domestic credit to the private sector¹⁹.

As per the 2019 Small Business Act (SBA) Fact Sheet, Luxembourg's overall performance in

relation to 'Access to finance' was broadly in line with that of the EU-28²⁰ average with three indicators well above and four indicators notably below the EU-28 average²¹.

Similarly, Luxembourg also continued to perform in line with the EU-28²² average in terms of 'entrepreneurship', with seven out of twelve indicators scoring well above the EU-28 average²³. Some of the indicators in which Luxembourg scored higher than EU-28 average included 'early stage entrepreneurship activity', 'early stage entrepreneurship activity for female population', 'entrepreneurial intentions' and 'entrepreneurship education at post-secondary levels'. Nonetheless, there were also indicators where Luxembourg could further improve, including 'established business ownership rate', 'entrepreneurship as a desired career choice', 'media attention given to entrepreneurship' and 'high job creation expectation rate'²⁴.

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

- the **Innovfin programme** implemented through state savings banks and aimed at providing guarantees and counter guarantees on debt financing to improve access to loan financing for innovative SMEs.
- tax relief of 1.0% by the Luxembourg government for SMEs to enable them cope with the increased the minimum wage.
- launch of the '**Businessstransfer.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.

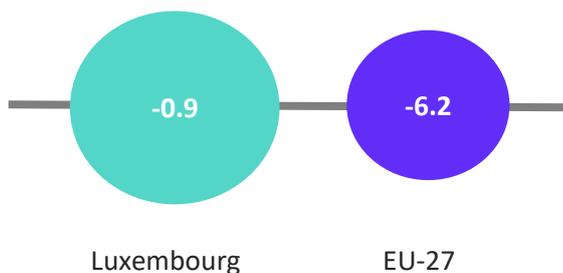
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Key economic drivers of the construction sector

Business confidence

Over the 2010-2019 period, business confidence indicators have been fluctuating significantly, particularly in relation to the construction sector. The **consumer confidence indicator** increased from -7.5 in 2010 to -0.9 in 2019, well above the -6.2 EU-27 average in 2019. Similarly, the **construction confidence indicator** improved from -25.0 in 2010 to 13.1 in 2019, significantly above the EU-27 average of 5.1. In contrast, the **industry confidence indicator** remained almost stable, improving slightly from -18.5 in 2010 to -17.8 in 2019. This is also substantially below the -4.8 EU-27 average.

Consumer confidence indicator in 2019



The **investment ratio** improved marginally to 17.5% in 2019 as compared to 17.0% in 2010. This is well below the EU-27 average of 21.7% in 2019.

Similarly, **investment per worker** in the broad construction sector increased from EUR 42,869 in 2010 to EUR 64,951 in 2017²⁵. In terms of sub-sectors, investment per worker in both the narrow construction, as well as the real estate activities sub-sectors registered an increase (+148.0% and +584.8%) from EUR 2,500 and

EUR 15,800 in 2010 to EUR 6,200 and EUR 108,200 in 2017²⁶, respectively.

Investment per worker in the real estate activities sub-sector between 2010 and 2017  **584.8%**

Domestic sales

The ranking of the top five most **domestically sold construction products** in Luxembourg has remained constant since 2010, with the exception of “Tiles, flagstones, bricks and similar articles (group 236111)” being replaced with “Other worked ornamental (group 237012)”. The top five most domestically sold construction products, illustrated in Table 1, represented 46.1% of total domestic construction product sales in 2019.

Table 1: Five most domestically sold construction products in Luxembourg and in the EU in 2019

	Luxembourg			EU-27
	Product	Value (EUR m)	Share in construction product domestic sales (%)	Product
1	Other structures (group 251123)	44.5	13.3	Other structures and parts of structures (group 251123)
2	Windows, French (group 162311)	37.3	11.1	Doors, windows and their frames (group 251210)
3	Doors, windows and their frames (group 251210)	27.3	8.2	Ready-mixed concrete (group 236310)
4	Ceramic tiles and flags (group)	26.4	7.9	N.A.

	Luxembourg			EU-27
	Product	Value (EUR m)	Share in construction product domestic sales (%)	Product
	233110)			
5	Other worked ornamental (237012)	18.8	5.6	Prefabricated structural components (group 236112)

Source: PRODCOM, 2020.

Export of construction-related products and services

The ranking of the **most exported products** has remained relatively stable since 2010. The **top five most exported** construction products from Luxembourg and the EU-27 are summarised in Table 2. Together, these made up 73.6% of all construction products exports in 2019.

Table 2: Five most exported construction products in Luxembourg and in the EU in 2019

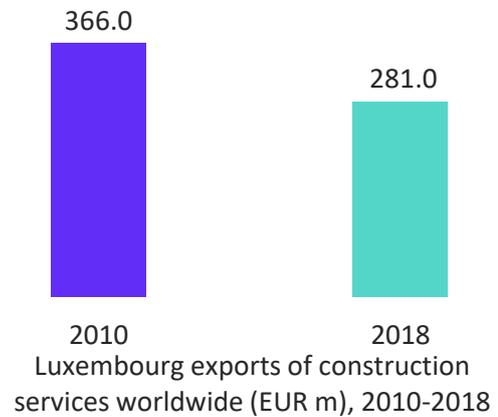
	Luxembourg			EU-27
	Product	Value (EUR m)	Share in construction products exports (%)	Product
1	Oriented strand board (group 162113)	52.3	17.4	Ceramic tiles and flags (group 233110)
2	Portland cement, aluminous cement (group 235112)	51.8	17.2	Other structures and parts of structures, etc. (group 251123)
3	Prefabricated buildings of metal (group 251110)	47.6	15.8	Fibreboard of wood, etc. (group 162115)
4	Fibreboard of wood, etc. (group 162115)	46.6	15.5	Doors, windows and their frames, etc. (group 251210)
5	Other structures and parts of structures, etc. (group 251123)	23.1	7.7	Marble, travertine, alabaster, etc. (group 237011)

Source: PRODCOM, 2020.

With regards to the cross-border provision of construction services²⁷, Luxembourg exported EUR 281.0 million worldwide in 2018, representing a decline of 23.2% compared to EUR 366.0 million in 2010.

Of this total, EUR 184.0 million was exported to the EU-27 countries, i.e. 65.5% of the total. In parallel,

it **imported** a total of EUR 275.0 million in construction services in 2018, a decrease of 27.6% compared to EUR 380.0 million in 2010, with 83.3% (i.e. EUR 229.0 million) coming from the EU-27 countries in 2018. Luxembourg thus achieved a **trade surplus** of EUR 6.0 million.



Access to finance in the construction sector

According to the Survey on the Access to Finance of Enterprises (SAFE) 2019, on average, only 4.0% of the Luxembourg respondent SMEs considered 'access to finance' as an important issue, slightly below than the EU-28 average of 7.2%²⁸.

However, this picture is slightly different when put in the context of the construction sector. As per the EIB Investment Survey 2019, 23.0% of the firms in the construction sector considered 'availability of finance' as a long-term barrier. According to the survey, almost 31.0% of the firms in the Luxembourg construction sector reported investing too little compared to their requirements, well above the EU average of 15.0%. Furthermore, about 64.0% of construction firms' investment needs were met through internal financing while the remaining 36.0% were covered through external financing sources. Additionally, over half of the external financing in the construction sector is done through leasing, followed by bank loans²⁹.

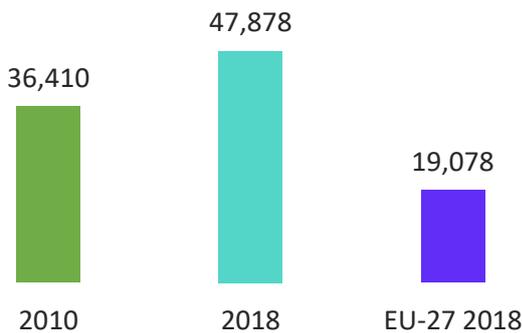
To address the issue of access to finance in the construction sector, some financial instruments were put in place. Namely, syndicated loans (*Crédit syndiqué pour projets d'une certaine envergure*), provide finance to companies for large-scale projects, such as the acquisition of land and buildings, mergers and acquisitions, as well as

business modernisation. In order to support the construction of research infrastructures, the Luxembourgish government also offers to cover up to 50.0% of eligible costs³⁰.

Access to housing

In Luxembourg, the **number of households** increased by 24.8%, from 204,900 in 2010 to 255,700 in 2019. The majority of this increase is driven by the arrival of new residents coming from abroad³¹. In addition, the proportion of the **total population living in intermediate urbanised areas** increased from 33.4% in 2010 to 43.7% in 2018³². In contrast, the share of the **total population living in densely populated areas** declined from 43.1% in 2010 to 15.1% in 2018 (reflecting housing affordability issues in urban areas – see more information below).

The **mean equivalised net income** increased by 31.5%, from EUR 36,410 in 2010 to EUR 47,878 in 2018³³. This is also well above the EU-27 average of EUR 19,078.

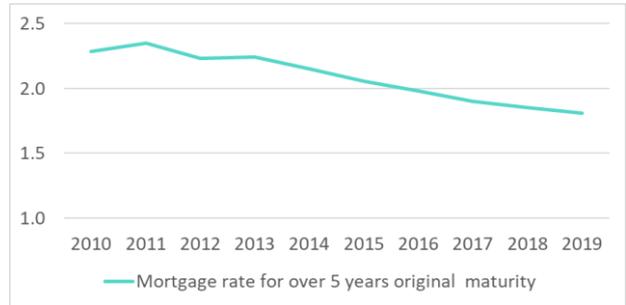


Mean equivalised net income in EUR

Moreover, housing loans to households picked up considerably, with total **outstanding residential loans** growing by 77.8%, from EUR 18.6 billion in 2010 to EUR 33.1 billion in 2018³⁴. This increase in residential loans is partly explained by the declining **interest rates on mortgages**, currently standing at 1.8% in 2019 as compared to 2.3% in 2010 (Figure 7).

Total outstanding residential loans between 2010 and 2018  **77.8%**

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

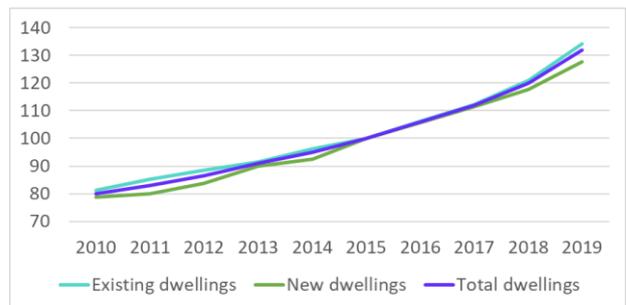


Source: European Central Bank, 2020.

Housing demand in Luxembourg is mostly driven by high population and employment growth, coupled with a large cross-border workforce with inadequate transport infrastructure. Additionally, the low interest rate environment has further improved the financing conditions and supported housing demand in Luxembourg³⁵. According to a STATEC forecast, Luxembourg needs to construct an additional 5,600 to 7,500 housing units every year until 2060 to keep a pace with the increasing demand and population growth. Since 2010, on average 2,891 housing units have been constructed per year in Luxembourg, as compared with an annual surplus of 5,390 households in demand of dwellings³⁶. This leads to challenges in housing affordability.

House prices have continued to increase, mainly driven by the limited housing supply (in comparison to the demand’s needs). These dynamics also contribute to the issue of affordability³⁷. The **house price index** for total dwellings increased by 32.0% over the 2015-2019 period, mostly driven by a 34.1% and 27.7% 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 2019 (2015=100)



Source: Eurostat, 2020.

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 costs³⁸. 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 stock³⁹. This leads to challenges in housing affordability. Indeed, Luxembourg City and its surroundings are by far the most expensive areas to live in Luxembourg. Regarding rental prices, the average rent increased by 4.7% between 2015 and 2019.

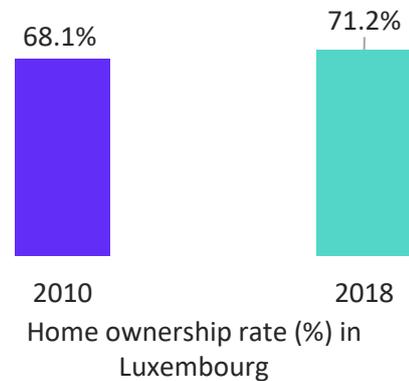
According to the Luxembourg Institute of Socio-Economic Research (LISER), **COVID-19** has not had a major impact on housing prices and transactions. The number of transactions slightly decreased in Q2 in 2020, which is rather explained by a declining housing supply. In fact, the demand for housing (both from investors and homeowners) remains strong. Moving forward it is expected that housing construction will pick significantly in 2021.

Regarding **building permits**, the number of building permits granted increased by 28.3% over the 2010-2019 period, from 1,901 in 2010 to 2,439 in 2019. This was partially driven by a similar increment in the number of permits granted for both residential (+25.0%) as well as non-residential (+47.6%) 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 2,033 and 406 in 2019, respectively⁴⁰.

Building permits in residential dwellings between 2010 and 2019  **25.0%**

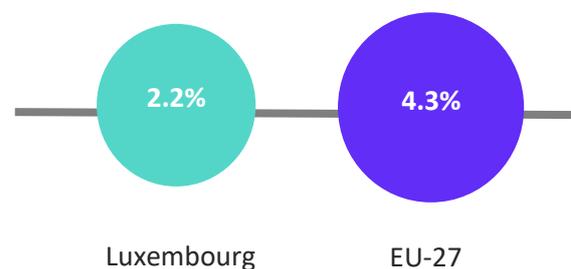
In parallel, **renovation spending** has constantly increased in Luxembourg, mostly driven by the booming property prices, from EUR 218.5 million in 2010 to EUR 299.6 million in 2019 (+37.1%). However, renovation spending as a percentage of gross household disposable income stood at 1.3% in 2018, the same as 2010 levels but slightly above

the EU-27 average of 0.9% in 2018. 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 2010-2018 period, the **home ownership** rate in Luxembourg has slightly increased from 68.1% in 2010 to 71.2% in 2018. This rate further increased to 77.0% for the population earning **above 60.0% of the median equivalised income**,⁴¹ whereas it declined to 45.2% (compared to EU-27 average of 49.8%) for the population earning below 60.0% of the median equivalised income. The **overcrowding rate**⁴² stood at 8.4%⁴³ in 2018⁴⁴, well below the EU-27 average of 17.1%. The **severe housing deprivation rate**⁴⁵ stood at 2.2%⁴⁶, still below the EU-27 average of 4.3%. In contrast, the **housing cost overburden rate**⁴⁷ stood at 9.6%⁴⁸ in line with the EU-27 average of 9.6%.

Severe housing deprivation rate in 2018



Infrastructure

According to the 2019 Global Competitiveness Report⁴⁹, Luxembourg ranked 17th and 20th out of 141 countries in terms of its overall infrastructure and transport infrastructure, respectively.

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

From March 2020, the use of public transport (trains, trams and buses) has been free of charge across all the territory of Luxembourg. Furthermore, the government 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 2017⁵⁰. 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 countries⁵¹.

By 2023, the Luxembourgish government is expected to invest about EUR 2.2 billion into the rail network, with the rail operator CFL spending EUR 400.0 million in the new rail rolling stock. Additionally, EUR 380.0 million will be invested in the tram network⁵².

4

Key issues and barriers in the construction sector

Company failure

Overall, the **business demography**⁵³ in the sub-sectors of the broad construction sector is showing diverging trends. In the narrow construction and the real estate activities sub-sectors, company births increased by 35.4% and 40.5% over the 2010-2017⁵⁴ period, respectively. At the same time, the architectural and engineering activities sub-sector experienced a reverse trend (-17.0%) during the same time frame.

Company births in the narrow construction sub-sector between 2010 and 2017

↑ 35.4%

With regards to company deaths, the construction sub-sectors displayed similar trends. In the narrow construction, the architectural and engineering activities and the real estate activities sub-sectors, company deaths increased by 34.3%, 15.3% and 5.9% over the same 2010-2017 period, respectively.

Company deaths in the narrow construction sub-sector between 2010 and 2017

↑ 34.3%

According to Creditreform, a German credit ratings and debt collection agency, the number of bankruptcies in Luxembourg reached at an all-time high level in 2019. In 2019, 1,336 companies declared bankruptcies, representing an increase of 11.8% as compared to 2018 (1,195 companies)⁵⁵. This further highlights the urgent need for passing Luxembourg's bankruptcy law reform (**Bill 6539**)

which approval is ending in Parliament for more than two years⁵⁶.

Trade credit



As per the 2019 SAFE report, 20.6% of the Luxembourgish SME respondents consider trade credit as a relevant source of finance, well below the EU-28 average of 31.0%⁵⁷.

Around 22.8% of Luxembourgish SMEs applied for trade credit in the last six months in 2019, well below the EU-28 average of 31.7%. Additionally, only 2.0% of the respondent SMEs applied for trade credit from their business partners in the last six months, compared to 16.7% in the EU-28, while 75.3% of the respondents did not consider it relevant for their enterprise, compared to the EU-28 average of 66.6%. According to the survey, 67.0% of Luxembourgish respondent firms believed that the availability of trade credit will remain unchanged in the future, slightly above the EU-28 average of 64.7%⁵⁸.

Late payment

According to the D&B Payment Study 2020, 54.1% of the Luxembourgish construction sector respondents make payments by due date whereas about 0.9% of the respondents make late payments over 90 days after the due date⁵⁹.

The **Late Payment Directive**, transposed by the law of 29 March 2013, defined the payment period to not exceed 60 days unless the two parties agree otherwise. Payments by the public administration, however, are to be settled within 30 days. Longer

payment periods by the public administration must be justified and cannot exceed 60 days⁶⁰. 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 businesses⁶¹.

Time and cost of obtaining building permits and licenses



As per the World Bank Doing Business 2020 report, Luxembourg ranked 14th out of 190 economies with regards to “dealing with construction permits”⁶².

As per the report, 11 procedures are required to complete the required formalities to build a warehouse⁶³. This is slightly less than the OECD high-income average of 12.7 days. Additionally, completing construction formalities take on average 155.0 days, slightly above the OECD high-income average of 152.3 days. In terms of the cost of completing the formalities to build a warehouse, this is considerably cheaper in Luxembourg, as it represents 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 (service de l'urbanisme) of the Commune	90 days	EUR 960
Obtain approval in principle (accord de principe)	60 days	EUR 60
Obtain excavation permit from the Ministry of Public Works	60 days	EUR 10
Obtain feasibility study for the sewage (canalization) 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 (canalization) inspection	1 day	No charge
Obtain sewage (canalization) 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 275.2%, from 121 in 2010 to 454 in 2019⁶⁴. Similarly, the number of job vacancies in the real estate activities sub-sector also increased by 77.7%, from 26 in 2010 to 46 in 2019. The increasing vacancies highlight the employers' difficulties in finding the right skills on the market.

Number of job vacancies in narrow construction sub-sector between 2010 and 2019

↑ 275.2%

In parallel, **adult participation in education and training** in the narrow construction sub-sector slightly increased from 8.2% in 2010 to 8.7% in 2019. Similarly, the numbers of **tertiary students** in engineering, manufacturing and construction (in architecture and building) slightly increased by 6.7%, from 45 graduates in 2011 to 48 graduates in 2018.

To improve the skills shortage situation 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 for the period 2017 to 2020⁶⁵.

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 level⁶⁶.

The European Centre for the Development of Vocational Training has compiled a list of shortage occupations in Luxembourg, which includes engineers (specifically, logistic, civil and mechanical engineers)⁶⁷.

Sector and sub-sector specific issues

Material efficiency and waste management

Construction and demolition waste (CDW) constitute as one of the heaviest and most voluminous waste streams in the EU region. CDW accounts for almost 25% - 30% of all waste generated in the EU and mainly consists of various materials, such as concrete, bricks, gypsum, wood, glass, metals, plastic, solvents, asbestos and excavated soil, etc.⁶⁸. In 2018, Luxembourg reported 7.3 million tonnes of waste, categorized as hazardous and non-hazardous, from construction activities. This is 17.4% and 3.9% lower as compared to the waste generated in 2010 and 2016, respectively. This is also substantially below the EU-27 average of 834.8 million tonnes in 2018⁶⁹. This difference is partly explained by the relatively small size of the country and amount of waste generating activities.

As a part of the Waste Prevention Program, currently **National Waste and Resource Plan** (*Plan nationale de gestion des déchets et des ressources, PNGDR*) is applicable in Luxembourg. It is the third waste management plan, covering the period of 2016-2022. The sectors covered in the plan include agriculture; construction and infrastructure; manufacturing; transport; households; private service activities, public services, etc.⁷⁰. The program aims to:

- prevent the generation of waste from excavated soils,
- encourage backfilling with excavated soil,

- stabilise current recovery rates (90 %),
- 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 162,626 and 31,080 tonnes in 2018⁷¹, respectively. Emissions in the narrow construction sub-sector decreased by 13.8% over the 2010-2018 period, whereas the real estate activities sub-sector reported an increase of 272.5% over the same period. However, it is to be noted that Luxembourg's real estate sector is relatively small in comparison other EU Member States. As such, any increase in the sector's activity easily translates into a significant increase in emissions of greenhouse gases.

Despite being a relatively less carbon-intensive economy, Luxembourg has the highest greenhouse gases emissions per capita among the EU Member States. The transport sector is regarded as the primary source of emissions (47.0% of the total), highlighting the country's prominent position as a logistical hub, as well as demonstrating the impact of its large commuting workforce on its environment⁷².

Luxembourg aims to achieve climate neutrality by 2050 but based on its existing policy initiatives and implementation levels, the country will miss its set 2030 targets of reducing emissions by 40% compared with 2005)⁷³.

Emissions of greenhouse gases from the real estate activities sub-sector between 2010 and 2018

 **272.5%**

5

Innovation in the construction sector

Innovation performance

As per the European Innovation Scoreboard 2020, Luxembourg is classified as an Innovation Leader, an improvement compared to last year when the country was classified as Strong Innovator⁷⁴.

The majority of this improvement is attributable to better performance of doctorate graduates and broadband penetration dimensions. The strongest innovation dimensions of the Luxembourgish system include attractive research systems, employment impacts and human resources. The country also demonstrated strong performance in foreign doctorate students, international scientific co-publications, trademark applications, and employment in knowledge-intensive activities⁷⁵.

Conversely, innovation dimensions in which Luxembourg achievements were relatively weak include firm investments, sales impacts and linkages. The country also scored low on indicators such as sales of new-to-market or new-to-firm innovations, non-R&D innovation expenditure, private co-funding of public R&D expenditure and R&D expenditure in the business sector⁷⁶.

As per the 2019 SBA Fact Sheet, Luxembourg's overall score on 'Skill and Innovation' is above the EU-28⁷⁷ average, with nine out of 13 indicators above the EU-28 average. In particular, the country scored considerably well above the EU-28 average in terms of innovation rate, national R&D available to SMEs, percentage of SMEs introducing marketing or organisational innovations and percentage of SMEs purchasing online. In contrast, Luxembourg can further improve its performance in terms of sales of new-to-market and new-to-firm innovations as well as turnover from e-commerce⁷⁸.

In the construction sector, the number of construction-related patent applications increased from one in 2010 to nine in 2018. During 2019, the

number of construction-related patent applications declined to four⁷⁹.

Eco-innovation and digitalisation



As per the 2018 Eco-Innovation Scoreboard (Eco-IS), Luxembourg ranked 1st with the highest score of 138, substantially above the EU-28 average of 100⁸⁰.

Eco-innovation and circular economy continue to be priority focus areas for the country. It has also 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 still hindering 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 responsibilities⁸¹.

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. This is mainly achieved through collaborative R&D and innovation projects. 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 construction⁸².

As per the European Commission Digital Economy and Society Index (DESI) 2020, Luxembourg ranked 10th out of EU-28 Member States with a 57.9 score, slightly above the EU-28 average score

of 52.6⁸³. 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 technology⁸⁴.

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. Among other sectors, the Luxembourgish government also wants to promote the adoption of digital strategies in the construction sector⁸⁵.

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 institutions⁸⁶. Another project aims at using BIM together with 4D technology. The concept is aimed at helping decision making in the pre-construction phase, as well as the monitoring of construction activities⁸⁷.

Progress in the definition and implementation of a national **BIM strategy** in Luxembourg is also being achieved by the **Resource Centre for Technologies and Innovation in Construction (Centre de Ressources des Technologies et de l'Innovation pour le Bâtiment – CRTI-B)**. This platform gathers all the main players in the sector (developers, contractors, etc.)⁸⁸. Several working groups have been created within CRTI-B, with the goal of developing a BIM guide⁸⁹.

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 capabilities⁹⁰.

Furthermore, various programmes have been developed by **Luxinnovation** including **Fit4Innovation** and **Fit4Start** 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 market⁹¹.

Another private sector initiative, **NEOBUILD**, was formed by the **Council for Economic Development and Construction (CDEC)** in 2011 to promote R&D and innovation in the sustainable construction sector. Supported by the Ministry of Economy and Foreign Trade, NEOBUILD is involved in fostering the emergence of innovative sustainable construction technologies for SMEs. It also contributes to managing their development and supports their implementation in Luxembourg⁹². Its competence areas include technology transfer, support with expertise, its network and dissemination of innovative projects. Furthermore, it introduced the **NEOBUILD Innovation Living Lab**, integrating over 100 different materials in a zero-energy building and functions as laboratory to test innovative solutions⁹³.

With regards to sustainable building, the government has reformed **CNCD (Conseil national pour la construction durable)**, a national green building council with the objective to prepare the construction sector for future opportunities and evolution in a streamlined manner⁹⁴.

6

National and regional regulatory framework

Policy schemes

Despite numerous positive measures being undertaken by the Luxembourgish 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 plans to launch a concerted public action and private initiative under its 2018-2023 programme plans. The public action will be primarily focused on the following⁹⁵:

- 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.

The government intends for municipalities to play a major role in reducing the housing shortage in addition to the two existing public players, the Housing Fund and the National Low-Cost Housing Company (SNHBM). The Ministry of Housing plans to establish 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.⁹⁶.

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 sell. Furthermore, municipalities involved in the creation of social and low-cost housing will be acknowledged through additional financial incentives, probably by linking the number of state subsidies to a system of graduated subsidies covering up to 100.0% of costs⁹⁷.

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 has already acquired a few plots during 2019. In 2020, Luxembourg will additionally establish 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 will be exempt from income tax⁹⁸.

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 land⁹⁹.

The Luxembourgish government has previously introduced additional fiscal measures to increase supply of both housing and land for construction purposes. These measures include a tax credit of up to EUR 20,000 to lower registration tax costs related to the purchase of a dwelling (**Bëllegen Akt**)¹⁰⁰; 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 dwelling¹⁰¹; the reduction of capital gain taxes on sales of secondary residences, with first residences being already exempted from the capital gains taxes; and an increase of the accelerated amortisation rate on rented buildings from 4% to 6%. These housing-related tax advantages have the effect of lowering the marginal cost¹⁰² of owner-occupied housing, thus favouring ownership¹⁰³.

Likewise, the government introduced the "Klimabank" policy in order to foster investment in the renovation of housing older than 10 years. In partnerships with banks, this allowed homeowners to avail interest free loans, for a borrowed capital of up to EUR 100,000 over up to 15 years, depending on the socio-economic conditions of the household. Alongside the Klimabank, the government has also introduced a system of financial aid for the establishment of a durability certification for new housing (LENOZ)¹⁰⁴.

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% of their disposable income. The monthly subsidy can reach up to EUR 300¹⁰⁵. Since the launch of the subsidy, each beneficiary household has benefited from an average subsidy of EUR 126 per month¹⁰⁶. In January 2018, the law related to rent subsidies was reformed to increase the

number of households that can potentially benefit from grants¹⁰⁷.

To foster housing supply and address the issue of the lack of available land for construction, the government introduced a new type of contract called the *Baulandvertrag*. It allowed 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 building.¹⁰⁸

Finally, given the wide-ranging nature of all state aid for housing in Luxembourg, a **Single point of contact** (including PRIME House aid, KlimaBank and LENOZ - *Lëtzebuenger Nohaltegkeets-Zertifizéierung*) was set up 2017 to answer citizens' concerns and questions, and provide information on aids given by both the Ministry of the Environment and the Ministry of Housing¹⁰⁹.

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. As for public procurement projects or private projects, the contract may require the parties involved to take out one or several of these insurances¹¹⁰.

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 a 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 5 years¹¹¹.

Insurance and liability related regulations

Generally in Luxembourg, areas are 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.)¹¹². Moreover, 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 buildings¹¹³.

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 population¹¹⁴. 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)¹¹⁵. 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 shortened the length of the procedure to obtain a building permit, since it contains measures that reduce the time available to the administration to react. Moreover, it introduced the concept of 'tacit consent', meaning that no reaction from the administration can be considered as a positive answer¹¹⁶.

Current status and national strategies to meet Construction 2020 objectives

TO 1 – Investment conditions and volumes

Total investment by the broad construction sector¹¹⁷ has been on an increasing trend since 2010. Investment by the narrow construction sub-sector increased by 54.5% between 2010 and 2018¹¹⁸, reaching EUR 225.6 million. This is mostly driven by a 248.6% and 199.5% increment in investments in intellectual property and in machinery, going from EUR 3.5 million and EUR 18.8 in 2010 to EUR 12.2 million and EUR 56.3 million in 2019, respectively. Investment in the real estate activities sub-sector increased by 51.0%, from EUR 1.6 billion in 2010 to EUR 2.5 billion in 2018. 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 229.0% and 117.4% over the 2010-2018 period.

Investment by the narrow construction sub-sector between 2010 and 2018 **↑ 54.5%**

Figure 9: Investment by the Luxembourgish broad construction sector between 2010 and 2019 (EUR million)

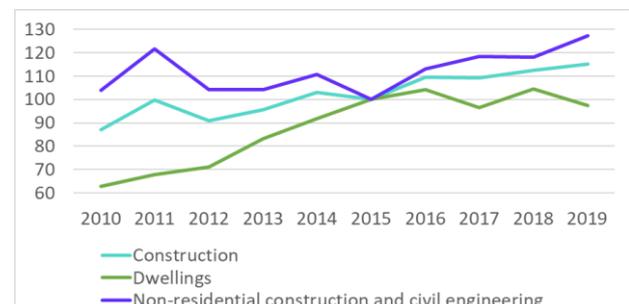


Source: Eurostat, 2020.

The total investment index in the broad construction sub-sector¹¹⁹ increased by 15.1% over the 2015-2019 period. Investment in non-residential construction and civil engineering followed a similar trend, rising by 27.2% in comparison to the 2015 value. In contrast, investment in dwellings by the whole economy slightly decreased by 2.5% over the 2015-2019 period. In absolute terms, investment in the construction sector totalled EUR 6.0 billion in 2018¹²⁰ with EUR 2.3 billion invested in dwellings and EUR 3.7 billion in non-residential and civil engineering¹²¹ (Figure 10).

Total investment in non-residential construction and civil engineering between 2015 and 2019 **↑ 27.2%**

Figure 10: Investment index in the Luxembourgish construction sector between 2010 and 2019 (2015=100)



Source: AMECO, 2020.

The share of **total inland**¹²² **infrastructure investment** in the GDP amounted to 0.7% in 2018¹²³ as compared to the 0.8% in 2010. Investment in air 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.

Air infrastructure investment between 2010 and 2018



Conversely, **investments in infrastructure maintenance** have increased for all transport infrastructures except inland waterways. Investments in the maintenance of road, air 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



Luxembourg continues to actively support EU rail interoperability. Indeed, the entire rail network is already equipped with the European signalling system ERTMS¹²⁴. 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 period¹²⁵.

The Luxembourgish government has 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 also been planned for the tram system over the same reference period¹²⁶.

In May 2018, the Luxembourgish government adopted its new Sustainable Mobility Strategy (**MoDu 2.0**), with an objective to reduce the peak-hour congestion by 2025 while transporting 20.0% more population than in 2017. The strategy included detailed research in developing smart and sustainable multimodal mobility-on-demand transit solutions¹²⁷. The agreement planned to eliminate all fares for trains, trams and buses by the Q1 2020¹²⁸. As such, free mobility has already been implemented since February-end 2020 under which the government provides free mobility through national trains, trams and buses¹²⁹.

Financial support for infrastructure investment also comes from the EU. In 2019, EIB invested EUR 44.0 million in the growth and development of regional SMEs¹³⁰.

Under the current Multiannual Financial Framework, Luxembourg has been allocated EUR 88.2 million from the EU Cohesion Policy funds. The country also received financial assistance from other EU programmes such as the Connecting Europe Facility and Horizon 2020 allocating EUR 29.0 million and EUR 125.0 million, respectively¹³¹.

Luxembourg has also benefitted from investments from the **European Fund for Strategic Investments** (EFSI). As of July 2020, financing under EFSI amounted to EUR 159.0 million and is set to trigger additional investments of EUR 729.0 million. Under the infrastructure and innovation window, seven projects have been approved, amounting to EUR 46.0 million and are set to trigger EUR 312.0 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 407.0 million¹³².

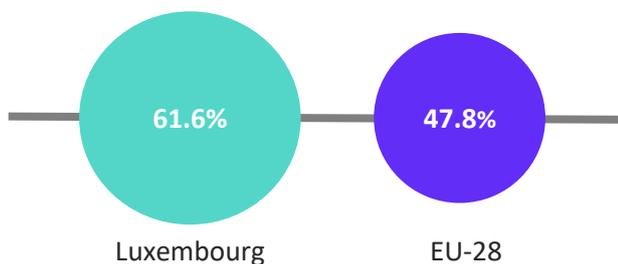
TO 2 – Skills

The vocational education and training (VET) system in Luxembourg showed high rates of participation with 61.6% of secondary level students enrolled in upper secondary VET programmes in 2017¹³³, as compared to the EU average of 47.8%¹³⁴. The country also has a high employment rate for recent VET graduates at 95.4% in 2017, considerably above the EU average of 79.5%. However, grade repetition continued to be a major threat to technical secondary education. To respond to this issue, many changes were introduced including the amendment of VET Reform Act, a bilateral agreement with the German (*Land of Rhineland-Palatinate*) and the implementation of European Social Fund Projects (July 2017 to December 2019)¹³⁵.

The 2008 VET Reform Act was amended in June 2019 to: (1) extend the training period length 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 VET¹³⁶. In September 2018, about 150 VET students were enrolled in apprenticeship mobility across the *Grande Region*¹³⁷. Similarly, the European project, with a budget of EUR 860,200, intended to create a coherent and efficient system to analyse and revise VET programmes while adapting almost 120 curricula to the new legislative and regulatory framework¹³⁸.

Rate of participation of secondary level students enrolled in VET in 2017



Participation in adult learning for Luxembourg remained high at 18.0% in 2018, as compared to the EU-28 average of 11.1%. However, this rate declined to 7.3% for low-skilled workers¹³⁹.

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. Furthermore, the project supports the development of a national roadmap for qualifications in the construction sector¹⁴⁰. Additionally, the programme '**Fit4 green jobs**' was launched in 2017 to train people under 30 in new skills leading to jobs and techniques of the future in the construction sector¹⁴¹.

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 market¹⁴².

In addition to 'LuxBuild 2020', a number of trainings and certifications are available on the market, offered by the public sector or trades associations. This includes the Level up – build up your life, to familiarise 16-to-29 year-old NEETs (not in education, employment, or training) with the construction sector and related career opportunities. In addition to this initiative, the Building Generation Project is another comprehensive initiative to inform young people about the different occupations, technological developments and job prospects in the construction sector, using different events, games, competitions. Furthermore, 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 house, ventilation systems etc. Finally, specific skills related to energy efficiency in construction are also taught at an academic level. For instance, the University of Luxembourg offers an application oriented engineering degree 'Energy and the Environment', covering energy and environmental technology in construction¹⁴³.

TO 3 – Resource efficiency / Sustainable construction

Under the fourth National Energy Efficiency action plan (**NEEAP IV**) published in 2017, Luxembourg announced its national energy targets for 2020, set at 49,292 GWh along with an energy savings target of 5,993 GWh to be achieved by year-end. The government intends to achieve these targets through a mechanism of energy efficiency obligations established in 2015 and is determined to optimise its obligation mechanism for the period 2021-2030. Further discussions related to such changes for the 2021-2030 period are still under way and are expected to be completed by end-2020¹⁴⁴.

Energy efficiency measures in buildings (both residential and non-residential) are expected to

account for over half of the final energy savings by 2020, estimated at 2,783 GWh¹⁴⁵. With respect to residential buildings, an ambitious timetable has been prepared for the progressive **intensification of energy efficiency requirements** on new residential buildings.

Since January 2017, all new residential construction requires to comply 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 GWh¹⁴⁶.

The NZEB legislation was implemented into the Grand-Ducal Regulation dated July 2016, concerning energy performance in residential buildings. However, an amendment to the Grand-Ducal Regulation was enforced in April 2019 and a new working draft is still 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 buildings¹⁴⁷.

Conversely, the Luxembourgish government also introduced the intensification of the energy efficiency requirements on new non-residential buildings, making it compulsory for them to meet the energy efficiency class D. Compared to buildings before the introduction of this regulation, final energy savings of around 30% are expected owing to this measure, i.e. 112 GWh¹⁴⁸. Similar measures (mainly subsidies) for residential and non-residential buildings are in place when it comes to their energy renovation. Additionally, the Luxembourg Sustainability Certificate of Residential Buildings, or **LENOZ**, was introduced in 2017. This is a voluntary certification for new buildings based on ecological, economic and social criteria.

The Ministry of Housing also provides support for energy efficient renovation. The Renovation Grant (**Prime d'amélioration**) is granted 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% of the costs of the works, up to a maximum of EUR 10,000 per beneficiary¹⁴⁹. Moreover, the Ministry offers **guarantees** to eligible individuals wishing to take out loans for the renovation of their dwelling. The amount of the guarantee cannot exceed EUR 131,630¹⁵⁰.

With the cost of energy renovations being high, the Luxembourgish government established a '**climate bank**' in 2017, aimed at promoting sustainable energy-efficient renovation and refurbishment projects at a reduced or zero interest rate for low-income families.

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. Overall, 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 2050¹⁵¹.

New financing methods for the renovation of commercial buildings are also being considered, and the government has already established an inventory of central government buildings that are heated and/or cooled with total useful surface area in excess of 500 m². The inventory is the basis for a strategy for increasing energy performance in government buildings through the annual renovation of 3.0% of the total surface area of these buildings¹⁵².

Finally, the government has already launched the '**Guichet unique**', a new information and advisory network within the framework of the legislation on the Climate Bank. This central administrative body receives interested individuals on site and manages all submitted applications for financial support relating to energy renovations or new ecological construction.

TO 4 – Single Market

According to 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 SOLVIT¹⁵³.

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 System (IMI). In parallel, Luxembourg performed below average in terms of EURES metrics¹⁵⁴.

As per the 2019 SBA Fact Sheet, Luxembourg performed considerably above the EU average in terms of seven out of nine indicators including public contracts secured abroad by SMEs, market access to new and growing firms without being unfairly blocked by established firms, number of pending infringement proceedings, SMEs with intra-EU exports as well as imports of goods, etc. In contrast, the country can further improve its operations under a number of single market directives not yet transposed and intra-EU online exporters¹⁵⁵.



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"¹⁵⁶.

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 services¹⁵⁷.

Luxembourg also reported regulatory barriers in the services sectors, particularly in the business services sector, being well above the EU average for various essential professions. This resulted in

lower competition and in lower market entry rates as compared to the EU average^{158,159}.

Over the 2018-2019 period, the Luxembourgish 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 fairs¹⁶⁰.

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 Eurocodes¹⁶¹.

TO 5 – International competitiveness

According to the 2019 Global Competitiveness Index, Luxembourg ranked 18th out of 141 economies in terms of its performance¹⁶².

In terms of **trade openness**, out of 141 economies, Luxembourg ranked 5th in relation to the prevalence of non-tariff barriers, 7th with regards to trade tariff percentage, 20th with respect to border clearance efficiency while 113th when it comes to the complexity of tariffs¹⁶³.

With regards to the **internationalisation of construction SMEs**, the export value of all construction-related projects in Luxembourg stood at EUR 300.7 million in 2019, representing a slight decline of 7.0% as compared to its 2010 level of EUR 323.5 million.

Export value of all construction-related products between 2010 and 2018  7.0%

In the context of **inward FATS (Foreign affiliates statistics)**¹⁶⁴, value added at factor cost and turnover in the narrow construction sub-sector increased by 44.8% and 61.2% over the 2010-2017¹⁶⁵ period, respectively. Similarly, value added at factor cost and turnover in the real estate

activities sub-sector also increased by 29.2% and 56.4% between 2011¹⁶⁶ and 2017, respectively.

Conversely, Luxembourg's performed well below the EU average in relation to **internationalisation**. As per the 2019 SBA Fact Sheet, Luxembourg has performed better than the EU average in only three

indicators – involvement of trade community, SMEs with extra-EU exports, as well as imports of goods. With regards to the rest of the six indicators, the country performed significantly below the EU average, especially in terms of advance rulings, formalities – procedure and automation, border agency co-operation - as well as extra-EU online exporters¹⁶⁷.

Over the 2018-2019 period, the Luxembourgish government implemented a part of the 4th SME Action Plan aimed at supporting the internationalisation of its SMEs. The scheme involved providing financial support to SMEs in relation to the costs incurred by them while participating in cooperation projects on a European scale¹⁶⁸.

Other initiatives include the **Europe Enterprise Network** which functions as an umbrella organisation in regards to internationalisation of SMEs, the **Luxembourg Export Credit Agency** (*the Office du Dueroire, 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 works. It can also cover supplier credits, which the exporter may arrange for its foreign buyer¹⁶⁹. 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. It supports firms regardless of their activities or size¹⁷⁰.

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 Luxembourgish government to promote exports of goods and services from Luxembourg-based firms¹⁷¹. 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. The amount of financial aid that COPEL can offer amounts to up to 50% of the expenses incurred, with a ceiling of EUR 200,000 over a period of three years¹⁷².

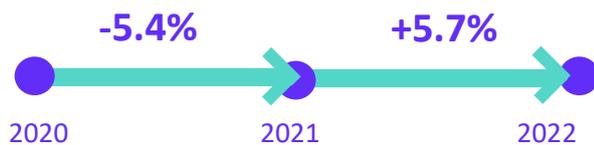
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Outlook

Over the 2020-2022 period, Luxembourg GDP is forecasted to remain at a similar level, primarily due to weak external performance and lower investment base, partially offset by sustained private consumption.

Luxembourg's **GDP** is forecast to annually decrease by 5.4% in 2020 and then increase by 5.7% in 2021, totalling EUR 58.5 billion (same as 2019 level) in 2021.

Expected GDP growth between 2020-2022



Subsequently, the **volume index of production** in the broad construction sector is estimated to decline by 11.9 index points (ip) in 2020 and then increase by 8.0 ip in 2021, respectively. This shows that the sector is expected to recover from 2021 onwards.

Likewise, the **turnover of the broad construction sector** is estimated to initially decline by 13.0% in 2020 and then increase by 7.4% in 2021, respectively.

Turnover of the broad construction sector between 2019 and 2021

↓ 6.5%

As such, the **number of persons employed** in the broad construction sector is also expected to decrease by 13.4% to 52,200 in 2020 and later increase by 5.9% to 55,301 in 2021, registering an

overall decline of 8.2% over the 2019-2021 period. The majority of this decline is anticipated to come from two sub-sectors: the manufacturing (-20.2%) and the narrow construction (-9.8%) sub-sectors.

Number of persons

employed in the broad construction sector

between 2019 and 2021

↓ 8.2%

The Luxembourgish construction sector suffers from insufficient housing stock along with overloaded transport infrastructures. 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.

Overall, the Luxembourg broad construction sector is forecasted to witness a sharp deceleration in 2020, followed by a slight growth and market correction from 2021 onwards. Despite the resumption of existing construction projects after the lockdown, the sector continues to face challenges in the existing economic environment.

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- 2 Data unavailable for the volume index of production for the construction of buildings and civil engineering.
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- 4 Please note that this 2019 data is a nowcast - please refer to the methodology notes for further details.
- 5 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.
- 6 Data for the manufacturing and architectural and engineering activities are unavailable for 2017 and 2018.
- 7 Data for the manufacturing and architectural and engineering activities are unavailable for 2017 and 2018.
- 8 Apparent labour productivity refers to the gross value added per person employed.
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