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2025 Country Report - Luxembourg

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Recommendation for a COUNCIL RECOMMENDATION

on the economic, social, employment, structural and budgetary policies of Luxembourg

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European Commission

Luxembourg

2025 Country Report

ECONOMIC DEVELOPMENTS AND KEY POLICY CHALLENGES

Luxembourg's economy shows signs of a mild recovery

Positive developments in financial markets supported a mild recovery for Luxembourg's open economy. While the geopolitical situation remains uncertain, the easing of monetary policy and stabilisation of financial markets supported the recovery in 2024. Real gross domestic product increased by 1.0%, following a decline of 0.7% in 2023, mainly driven by the financial sector. In January 2025, after a gradual recovery, assets under management by the fund industry hit EUR 5.9 trillion, a new all-time high since the previous peak in 2021. However, this record was exclusively due to market valuations, as net investments remained below the 2021 records. Gross fixed capital formation continued to fall in 2024 and was 25% lower than in 2021. In the same period, real GDP has decreased by 0.8%.

Rising tariffs have added to the uncertainty surrounding the external environment to which the economy is highly sensitive. Luxembourg's exposure in terms of goods exported to the United States (US) is relatively low. However, the deterioration in the international economic climate might affect exports via indirect channels such as a reduction of demand from its European trade partners. Also, while a financial services recovery started in 2024 thanks to a pick-up in investment fund revenues, uncertainty surrounding global trade is set to weaken the prospects of the sector and weigh on the contribution from net exports throughout 2025.

Real GDP is expected to grow by 1.7% in 2025 mainly supported by domestic demand and 2.0% in 2026 as the contribution from net exports is due to turn positive. The consumer confidence indicator points towards a mild recovery in private consumption supported by an expansionary fiscal stance and falling interest rates, which underpin investment. A wage indexation that occurred in May 2025 should further support private demand, while the recent increase in the number of transactions in both new and existing construction and in mortgage demand indicate a recovery in investment in dwellings which is set to further accelerate in 2026. That year, domestic demand is expected to continue to support the economy, while a stabilising international trade situation should support exports.

Policy measures kept inflation slightly below the euro area average with wage increases slowing down. The softening of energy and food prices has further eased inflation. In 2024, a more pronounced slowdown was prevented by stronger wage growth in the first half of the year. Between 2020 and 2024, nominal unit labour costs increased by 19.1%, compared with 14.7% in the euro area. Headline inflation forecasts for Luxembourg stand at 2.1% for 2025, further declining to 1.8% in 2026.

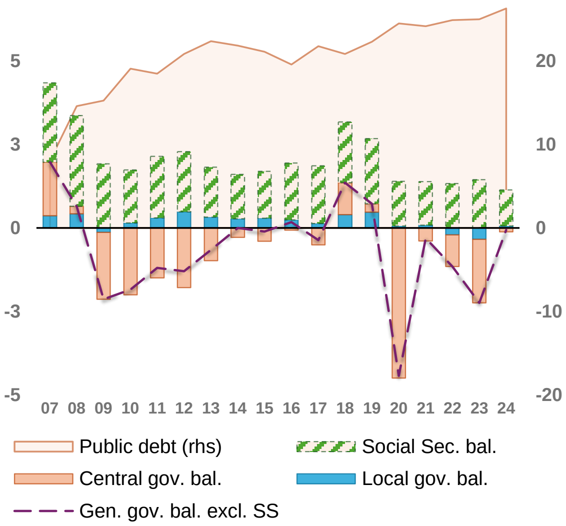
The government is phasing out its broad energy price support measures while focusing on vulnerable groups. Broad measures to counteract energy prices were not fully phased out at end of 2024. The support measures that remained in force did not all appear to be fully targeted at protecting vulnerable households and firms and preserving incentives for energy savings ([1]). But the government has adopted a new

([1]) Commission opinion of 26 November 2024 on the Draft Budgetary Plan of Luxembourg.

package of measures for 2025 aimed at supporting the purchasing power of low-income households. Structural measures to decrease energy consumption and invest in energy efficiency measures ((EU) 2023/2407) would help address the root causes of energy poverty.

Luxembourg's public debt remains comparatively low, though it has increased substantially since the global financial crisis. Luxembourg public finances remain sound overall. The government registered a surplus of 1.0% of GDP in 2024, which is mostly explained by windfall revenues from taxes on income and wealth revenues from and a slow down in expenditure growth on the back of a less inflationary environment and of the implementation of the provisional so-called twelfths' system in the first part of the year. In 2025 and 2026, the general government balance is expected to turn to a deficit of 0.4 and 0.5 % of GDP, respectively on the back of an expansionary fiscal stance and of lower windfall revenues. Despite the recurrent surpluses recorded over most of the period between 2008 and 2024, general government debt has gradually increased, from 14.6% of GDP in 2008 to 26.3% of GDP in 2024 (Figure Graph 1.1). This is due to the non-appropriation of social security schemes, which are booked as reserves in the social security agencies, except for the pension scheme, transferred into an investment fund to support the sustainability of the pension system in the long term (see below). As a result, central government deficits need to be financed with debt issuance.

Graph 1.1: **Government balances and debt (2007-2024) percentage of GDP**



Source: DG ECFIN, Eurostat

In the short term, public finances are projected to remain sound, despite of sustained expenditure growth. In 2024, net expenditure ([2]) in Luxembourg grew by 6.2% (see Annex 1). This increase is mainly driven by expenditure related to compensation of employees and social transfers. Moreover, this takes into account the impact of discretionary revenue measures as the indexation of tax brackets, which has been estimated to shave off revenues. In 2025, net expenditure is forecast by the Commission to grow by 6.8%, which is above the maximum growth rate recommended by the Council([3]). This increase is mainly driven by expenditure related to compensation of employees, social payments and gross fixed capital investment. The cumulative growth rate of net expenditure in 2024 and 2025 taken together is projected at

([2]) Net expenditure is defined in Article 2(2) of Regulation (EU) 2024/1263 as government expenditure net of (i) interest expenditure, (ii) discretionary revenue measures, (iii) expenditure on programmes of the Union fully matched by revenue from Union funds, (iv) national expenditure on co-financing of programmes funded by the Union, (v) cyclical elements of unemployment benefit expenditure, and (vi) one-off and other temporary measures.

([3]) Council Recommendation of 21 January 2025 endorsing the national medium-term fiscal-structural plan of Luxembourg (OJ C, C/2025/650, 10.2.2025, ELI: http://data.europa.eu/eli/C/2025/650/oj).

13.5%, which is below the maximum rate recommended by the Council.

The main challenge for Luxembourg's public finances is to ensure long-term sustainability despite an ageing population. This is due to escalating pension costs (projected to increase by 8.1 pps from 9.4% of GDP in 2024, to reach 17.5% of GDP by 2070 ([4])) which are expected to exert substantial upward pressure on government spending in the decades to come ([5]).

Continuing diversification of the financial sector

Luxembourg's international financial sector remains a key pillar of the national economy, but its competitive edge is being tested by evolving market dynamics, technological advancements and global regulatory changes. The sector real gross value added (GVA), which had dropped by 5.0% in 2022 (after an exceptional performance in the previous year: +14.3%), decreased further in 2023 (-6.9%) and in 2024 (-0.7%). From the peak reached in Q4-2021 to the upturn in Q4-2023, the shift in real GVA was -18.6%. The sector's productivity declined by 17.4% in 2021-2024. Meanwhile, banking profits almost doubled (to reach 11.5% of GDP), revealing a disconnect between profitability and economic growth ([6]), amid growing volatility, and a 30% increase in output prices over that period. The continued decline in the financial sector's productivity and its eroding competitiveness, suggest structural weaknesses, calling for further diversification strategies.

Luxembourg has struggled to keep pace with leading financial hubs in integrating emerging technologies and leveraging international regulations. Luxembourg features one of the most competitive environments for FinTech providers in the EU ([7]). However, the adoption of advanced technologies such as cloud services (32.6%) and big data analytics (32.4%) remains below EU averages and drags the financial centre ratings in the main aggregate indexes ([8]). Luxembourg ranks 27th in the Smart Centres Index 2024 ([9]). The Deloitte Digital Banking Maturity (DBM) ([10]) indicates that Luxembourg has been downgraded to the lowest group, "Digital latecomers", and ranks 30th out of 44 countries, with a DBM Index of 34% - significantly below the worldwide average (41%). Regulatory caution, a fragmented digital finance strategy and the transition from legacy systems have limited large-scale technology-driven adoption, such as artificial intelligence, in the low-R&D-intensity activities of banking and asset management ([11]). Furthermore, developments, including the US Tax Cuts and Jobs Act of 2017 and the OECD's Base Erosion and Profit Shifting initiative have tightened regulations, potentially reducing part of Luxembourg's historical competitive advantage in corporate taxation. In 2024, financial assets stocked in the country (total international investment position) remained high, amounting to EUR 12.8 trillion. However, these stocks have been declining in GDP terms over the period 2016-2024 (-24.4% in 2016-2024) and in two out of three instances real GDP showed the same pattern (see Graph 1.2). The strong relationship between real GDP growth and the growth of Luxembourg's international investment position to its GDP (IIP/GDP) suggests that the country's economic performance is closely tied to its ability to attract and retain foreign investment. This investment has been shrinking in terms of GDP, compared to the rather stable

([4]) European Commission, 2024, *2024 Ageing Report. Economic and Budgetary Projections for the EU Member States (2022-2070)*

([5]) European Commission, 2024, *2024 Country Report - Luxembourg*

([6]) The financial sector gross value added is compiled in accordance with ESA 2010. Output excludes interest margins on inter-bank and central-bank positions, which are treated as property income rather than production.

([7]) GFCI 37 – FinTech Ratings

([8]) DESI, 2024

([9]) The Smart Centres Index 10, 2024

([10]) DBM, 2024

([11]) Conseil national de la productivité, 2023, contribution of the sector to GDP (Annex 2). Furthermore, most investment is in financial entities within the same group and in real estate, with small or negative consequences for the real economy.

Graph 1.2: **International Investment position (assets to current GDP) and real GDP (2017-Q1, 2024-Q4). Year-on-year percentage changes**

Source: DG ECFIN, Eurostat

Luxembourg has developed a resilient and stable regulatory environment allowing the impressive expansion of its global financial hub. The reduction in the corporate tax rate in 2025, the creation of a secondary market for non-performing loans, and increased supervision of financial institutions reflect a cautious, stability-focused approach. The government has also introduced targeted policy measures, including regulatory sandboxes for fintech. While these measures preserve Luxembourg's AAA credit rating and maintain investor confidence, which are among the country's main strategic priorities, they do not necessarily address the need for broader financial sector transformation.

Diversification within the financial sector could reduce overreliance on the funds industry. Sustainable finance and innovation are among the areas where Luxembourg has strong potential for financial diversification ([12]). The country has already positioned itself as a leader in green investment funds and financial products compliant with environmental, social and governance standards ('ESG-compliant'). These are areas that are expected to grow significantly in the coming years. Further supporting innovative structuring of blended climate-finance and cooperative ventures, and enforceable ways to achieve transparency and accountability, will be key to maintaining Luxembourg's competitiveness in the global financial landscape and ensuring sustainable economic growth.

Prioritising housing affordability essential

Luxembourg is facing a severe housing challenge, with affordability deteriorating significantly over the past decade due to soaring property prices. Between 2018 and 2022, housing prices rose by nearly 60%, making Luxembourg one of the most expensive housing markets in Europe. However, the market has recently undergone a correction, with prices falling by 9.1% in 2023 – –one of the sharpest contractions in the EU (-1.2% in the euro area) – and by 5.4% in 2024. In real terms ([13]), house prices have decreased to their 2020 levels. However, housing affordability remains an issue for a growing proportion of the population and prompts newly arrived workers to commute and seek accommodation in neighbouring France, Belgium and Germany, where housing prices are lower. This has created regional housing inflation pressures in border towns ([14]) and exacerbated cross-border commuting challenges ([15]).

([12]) OPC LUX: Climate Policy Observatory, Luxembourg, Annual Report 2023.

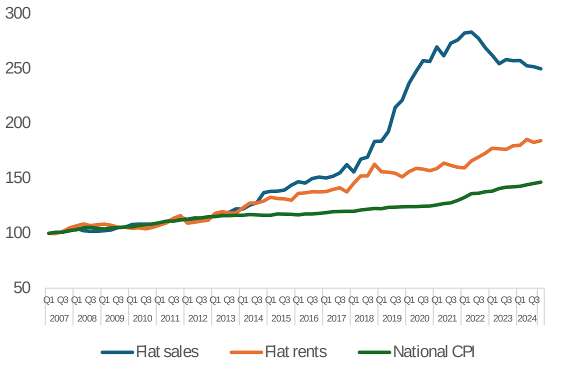
([13]) As calculated by the Luxembourg *Observatoire de l'Habitat* based on the national CPI.

([14]) Coût du logement: Une comparaison du Luxembourg avec la France, la Belgique et l'Allemagne, Note 40, Observatoire de l'habitat (2024).

([15]) Les Cahiers de la Grande Région, 8. LISER , 2024.

The market dynamics was affected by interest rate increases, leading to a drop in property demand and a sharp slowdown in construction. The price surge in 2018-2022 was mainly explained by the long-standing mismatch of high demand and insufficient supply of housing, amplified by speculative investment as substantial property price increases attracted investors. In 2023, the housing market declined sharply due to the lagged effects of higher energy prices and monetary policy tightening, weakening consumer confidence and slowing demand.

Graph 1.3: **Advertised prices of flats for sale and to let (Current EUR) (Base 100 1st quarter 2005)**



Source: Observatoire de l'habitat, Luxembourg

Bankruptcies and job losses mounted in real estate and construction, requiring government intervention. Between 2022 and 2024, bankruptcies in real estate rose by 110% and by 71% in construction. To stabilise the market, the government has taken decisive measures to encourage housing demand and support construction firms. For example, it has raised interest mortgage deductibility and purchased unsold housing units in the presales market segment. Such emergency policies may have succeeded in containing permanent damage to Luxembourg's economy. However, these and previous housing policies have largely failed to address structural issues. The introduction of a secondary market for non-performing loans in July 2024 has helped to improve banks' liquidity, yet it has not significantly revived mortgage lending due to still comparatively high interest rates.

In this context, the government has stepped up investment, but more determined reforms and a holistic approach are needed to ensure housing affordability and stability in prices. Lack of recurrent taxation favours the practice of hoarding land and property, while the registration tax, levied on transactions, lowers the amount being placed on the market. The taxationh reform package (including an effective tax on property ownership, and two new taxes on the unused land and unoccupied dwellings), aims to increase the supply of housing and usage of constructible land and unoccupied dwellings. However, the package has been pending parliamentary approval since 2022 and will only be implemented over several years. The government has also launched new public housing projects on public land. However, these take time to be implemented and are burdened with delays, while public-private partnerships for affordable housing development remain underutilised. The lack of coordinated housing policies with neighbouring regions has further complicated efforts to stabilise housing costs, as price increases in border towns continue to push workers further away.

Household debt remains high but is decreasing. The sharp decline in house prices in 2022-2024 has been less pronounced than the contraction in borrowing capacity. Household debt for house purchase has been on a downward trajectory since 2021 and it decreased by 0.5% in 2024. While mortgage debt is low in terms of GDP, at 52% in 2024, it remains high in terms of disposable income, at 123%), compared with 34.7% in the euro area. However, it was around 5% lower than pre-pandemic levels. The median debt service-to-income ratio is relatively low at 16%. At 35% for those in the lowest income quintile, it remains below the 40% threshold indicating financial overburden.

Interlinked housing and transportation challenges

Luxembourg's transportation infrastructure is struggling to accommodate the massive influx of daily

Box 1: **Barriers to private and public investment in Luxembourg**

Luxembourg's business environment remains attractive and public investment is among the highest in the EU at 4-5% of GDP, though capacity constraints cause some delays. Structural barriers continue to limit private investment, particularly in innovation-driven and high-growth sectors.

- **Shortage of skilled workers in technology, and engineering.** The most pressing long-term barrier for businesses is the lack of skilled workers, especially for small and medium-sized enterprises (SMEs) that compete with large firms.
- **High energy costs and market uncertainty**. As public support is phased out, energy prices have become a significant barrier for investment decisions. Currently, uncertainty about the future is making firms increasingly reluctant to commit to large capital expenditures.
- **Regulatory and administrative complexity.** Luxembourg's regulatory burden is a challenge for SMEs, which creates additional costs and slows business operations.
- **Limited access to risk capital for scale-ups and SMEs.** Despite its strong financial sector, venture capital and private equity participation is limited.

The implementation of Luxembourg's RRP is well underway. At present, Luxembourg has fulfilled 42% of the milestones and targets in its RRP. Efforts are needed to ensure completion of all RRP measures by 31 August 2026.

It remains important to accelerate the implementation of cohesion policy programmes. The mid-term review offers opportunities to speed up progress and better address EU strategic priorities related to competitiveness, defence, housing, water resilience and the energy transition.

Luxembourg has not yet taken advantage of the opportunities provided by the Strategic Technologies for Europe Platform under Cohesion Policy and the Recovery and Resilience Facility to reallocate resources towards this priority. However, Luxembourg can still seize these opportunities to support the development or manufacturing of critical technologies in the areas of digital and deep tech, clean and resource efficient technologies, and biotechnologies.

commuters from neighbouring countries. Nearly 220 000 cross-border workers commute daily from France, Belgium and Germany, making up close to 43% of total employment in Luxembourg and this share continues to increase strongly. Despite major investments in public transport, traffic congestion on major highways remains a problem, weighing on productivity, environmental sustainability and work-life balance for thousands of workers. Luxembourg's car ownership is high at approximately 678 vehicles per 1 000 inhabitants. This reflects a deeply ingrained car culture exacerbated by high housing costs, pushing many workers to reside further away from their workplace and also in neighbouring countries and rely on cars. This high figure could also, at least partly, be explained by a very high number of non-resident cross border workers and their associated company cars.

Luxembourg's transport system faces significant challenges as it seeks to accommodate a projected 40% increase in travel demand by 2035 compared to 2017. An estimated 89% increase in the demand for public transport is expected by 2035. The National Mobility Plan 2035 outlines substantial infrastructure investment, with up to EUR 3 billion to expand and modernise the rail network. Key initiatives include new rail lines like the Luxembourg-Bettembourg line, expected to reduce network delays by 55% ([16]), and additional high capacity trains to increase service frequencies and overall train capacity.

Luxembourg's economic sustainability will depend on its ability to reform both housing and transportation policies in a coordinated manner. The government aims to prioritise housing affordability over housing as an investment asset. The size of the challenge calls for a set of reforms in various areas such as taxation, land use planning and the mortgage market, including macroprudential policy aimed at disincentivising speculative housing demand ([17]), while supporting first-time homebuyers. Unlocking more land for development, developing large district projects on public land, implementing the Housing Pact 2.0, and adopting the housing tax reform remain priorities for inclusion in this enhanced policy mix. Stronger cross-border urban planning cooperation with France, Belgium and Germany is needed to ensure that housing supply is expanded in a sustainable and coordinated way. On transportation, investing in cross-border rail infrastructure, integrating ticketing systems, and improving last-mile transport connections should be prioritised to reduce reliance on cars. Effective monitoring of housing market reforms and alignment with employment projections will be needed to curb the rapid rise in living costs and address growing risks, such as the recent housing market instability. Addressing these issues will be crucial to ensure that Luxembourg remains an attractive and competitive place, both for entrepreneurship and technological advancement, as well as for its high standards of living. Without these structural reforms, Luxembourg risks worsening its housing affordability crisis, exacerbating transport issues and further eroding productivity due to inefficient transport systems (see Section 3).

([16]) Plan national de mobilité, Ministère de la Mobilité et des Travaux publics

([17]) Institutional investors and house prices. *European Central Bank, 2025*

The sustainability of the pension system is at risk in the medium- and long-term

Luxembourg's pension system faces medium- and long-term risks as expenditures are set to start outpacing contributions from the second half of the current decade. The 2024 Ageing Report projects a steady rise in pension-related spending, reaching 17.5% of GDP by 2070 – a rise of 8.1 pps from 2024 (see Annex 1). The sizeable reserves saved by the system, the largest in the EU (at 34.5% of GDP in 2023) may temporarily offset that impact, but the system is expected to run growing deficits as from 2033 ([18]), depleting the reserve by 2047 ([19]). Demographic shifts are behind this trend, with the ratio of contributors over pensioners falling below one in 2067 (from 2.28 in 2024), driven by an ageing population and by the projected decrease in net-migration.

Older workers in Luxembourg are more likely to stop working earlier than in other Member States. Only 51.0% of people aged 55-64 in Luxembourg were active in 2024, the lowest rate in the EU (68.2% ([20])). The average age at which people in Luxembourg start drawing a pension is also one of the lowest in the EU, at 59.9 in 2023 ([21]). Although the statutory retirement age is 65, early retirement is possible from 57, while generous entitlements provide large financial incentives to stop working early, with the average pension being 78% of the last wage ([22]). Participation rates and exit ages are projected to rise only modestly (+4.9 pps and +0.8 years) between 2022 and 2070, less than the respective EU averages (+10.1 pps and +2.1 years) according to the 2024 Ageing Report. Current sustainability measures

([18]) Cahier statistique no 18 – IGSS, 2024.

([19]) Ibid.

([20]) Statistics | Eurostat

([21]) Statistics | Eurostat

([22]) Statistics | Eurostat

Box 2: **UN Sustainable Development Goals (SDGs)**

Luxembourg performs well on several SDGs related to macroeconomic stability and productivity (SDGs 4, 9, 17) and fairness (SDGs 1, 4, 5) but challenges remain for some SDGs related to environmental sustainability (SDGs 7, 12, 13).

Although it shows signs of catching up, Luxembourg is below the EU average on climate action (SDG 13) due to the high net greenhouse gas emissions per capita – partly influenced by the 220 000 cross-border commuters – and a relatively low share of renewable energy in gross final energy consumption (see Annex 17).

comprise a partial revalorisation adjustment of the pension for inflation and a compulsory reform whenever reserves fall below 1.5 times annual benefits. Reforms need to start ahead of that time limit to allow a gradual implementation, as the reserve would be depleted within five to six years after reaching the legal threshold.

In 2024, the government launched a public consultation on the possible shape of a future pension reform. The first phase of consultations took place between October and December 2024 and gathered the opinions of the public, experts and stakeholders on the future of the pension system. A second phase of the consultation was launched in February 2025 and will focus on the three themes (adaptability, sustainability and equity of the pension system) identified during the first phase ([23]). The results of the consultations will be discussed within expert groups, which are expected to come forward with concrete proposals in a summary report, on the reforms needed to ensure the financial sustainability of the system and its ability to deliver on intergenerational fairness and stability.

Tackling aggressive tax planning

Aggressive tax planning continues to be a challenge in Luxembourg. Tackling it is essential, since it distorts fair competition and constitutes an obstacle to a fair tax environment in the EU, with an impact on taxpayers and government finances. Luxembourg has taken limited steps to address the ATP CSR, and its tax system continues to present certain risks that can facilitate aggressive tax planning practices, such as the narrow scope of the non-deductibility of interest and royalty payments. Besides the implementation of Directives, Luxembourg has adopted limited measures to address this issue. The scope of the non-deductibility of interest payments, and royalty payments from Luxembourg-based companies to non-EU jurisdictions, is limited to those included in the agreed EU list of non-cooperative jurisdictions for tax purposes and does not cover all jurisdictions with zero and low tax rate. This could still lead to little or no taxation, as this list is non-exhaustive. Currently, Luxembourg has not taken sufficient measures to address the risks of aggressive tax planning on outbound payments.

([23]) More details at: https://pensioun.schwätzmat.lu/

INNOVATION, BUSINESS ENVIRONMENT AND PRODUCTIVITY

Improving productivity growth through investment and innovation remains a key challenge. Luxembourg's labour productivity is much higher than the EU average. However, its productivity growth is on a declining path, below the EU average.

Limited access to finance for scaling-up and R&D investment

Luxembourg's start-up ecosystem has improved over the years, but venture capital for high-tech investments remains limited and businesses struggle to secure the investment they need to grow beyond their early stages. Government programmes such as *Fit4Start*, *Luxembourg Future Fund* and *Digital Tech Fund* provide financial support, helping businesses launch and survive their first years. In 2024, start-ups in Luxembourg secured over EUR 600 million, up 25% on the previous year. Green tech led the field, raising EUR 150 million. However, start-ups face difficulties when trying to expand, as there is a significant drop in investment after the initial funding stage. While 60% of start-up funding goes to businesses in their earliest stages, only 20% receive additional investment ([24]).

A key reason for this investment gap is Luxembourg's lack of alternative sources of financing. Investors rely mostly on bank financing, which favours lower-risk financial options, such as real estate and wealth management, over long-term R&D projects and start-up investments. Luxembourg lacks a strong financial culture for private investment in start-ups. Only 25% of early-stage funding in Luxembourg comes from angel investors([24]). This means that businesses find it harder to secure private investment, including small and medium-sized enterprises (SMEs) and start-ups that require substantial R&D investment. This makes them more reliant on government programmes, which do not always provide enough for scaling-up. Stronger tax incentives would encourage investment in R&D by individual domestic firms with high growth potential, ensuring that these businesses have better access to funding for innovation.

The government has launched an action plan to help foster and scale up start-ups. On 24 March 2025, Luxembourg announced the '10 Points of Action for Start-ups' plan. It focuses first on fostering start-ups by introducing tax credits for investment in young innovative companies and financial aid for spin-offs starting May 2025, with up to EUR 200 000 in cofinancing. Second, for scale-ups, Luxembourg will launch a dedicated support programme by the end of 2025, proposing advantageous tax regimes for employee stock options to aid growth. Lastly, Luxembourg intends to set up an AI Experience to enhance the overall innovation ecosystem and reinforce its international position as an innovation hub supported by EUR 300 million from Luxembourg's *Société Nationale de Crédit et d'Investissement.*

Low uptake of public funding for R&D and business innovation

Luxembourg offers public funding for research and innovation, but SMEs do not take full advantage of these programmes. The government provides grants and financing through institutions like *Luxinnovation* and the *Ministry of the*

([24]) Luxembourg Startup Ecosystem Assessment and Benchmarking Ministère de l'Economie, 2023

Economy, but many businesses struggle with the complexity of applications and delays in receiving funds. As a result, fewer businesses engage in R&D, and Luxembourg's total investment in innovation remains below that of other leading European economies. While partly explained by Luxembourg's services-based economy, business R&D spending is substantially lower than in top-performing countries across a broad range of sectors (OECD, 2025). Business R&D intensity has been on a downward trend, and fell to 0.48% of GDP in 2023, far below the EU average of 1.47% (Annex 12). A bill of law introducing a new tax credit for direct investment by individuals in young innovative companies has been presented to the Luxembourg parliament on 4 April 2025.

Collaboration between business and research communities is still underdeveloped, limiting opportunities for innovation. Luxembourg's economy is dominated by financial services, which are not R&D-intensive compared to industries like manufacturing or technology. In leading innovation hubs, universities play a key role in developing new technologies and supporting start-ups, but Luxembourg has relatively few university spin-offs and a low rate of collaboration between businesses and research institutions. The recently announced spin-off aid of up to EUR 200 000 aims at facilitating the creation and the funding of spin-offs. Expanding partnerships between universities and businesses could help develop industry-specific training programmes and strengthen the country's talent pipeline.

SMEs struggle to hire skilled workers

Luxembourg's labour market is highly dynamic, benefiting from a strong international workforce and high wages. Luxembourg experiences a 'brain gain' effect, attracting workers from abroad, including skilled workers, due to its strong economy and competitive salaries. Nearly half of the population is non-native and cross-border workers make up 43% of Luxembourg's employed labour force in 2024, of which around 53% are from France, 24% from Germany and 23% from Belgium.

Despite these strengths, start-ups and small businesses face challenges in attracting and retaining skilled employees. This is particularly the case when competing with large corporations and financial institutions. The strong presence of multinational companies and Luxembourg's dominant financial sector push up salary expectations, making it difficult for SMEs or start-ups to afford the best talent. Many start-ups report that they struggle to hire software engineers, artificial intelligence specialists and experienced marketing professionals, as these workers are more likely to choose established firms that offer higher wages and greater job security.

Luxembourg's high cost of living and expensive housing market also limit its ability to attract skilled workers. The absence of a dedicated start-up visa programme further complicates relocation for non-EU entrepreneurs and skilled professionals. To counter these challenges, Luxembourg introduced a more favourable tax regime aimed at attracting highly skilled talent. Additionally, the country is initiating several strategies to enhance its international appeal, including a plan to launch a digital portal for international talent in the second half of 2025 to facilitate integration and provide resources.

The small size of Luxembourg's higher education system limits its role in talent development. The system's small size limits the number of graduates available for local businesses, and many young Luxembourgers study abroad, particularly in Belgium, France and Germany. While many of these graduates return, others choose to stay in larger economies where there are more career opportunities, creating a gap in certain technical fields.

DECARBONISATION, ENERGY AFFORDABILITY AND SUSTAINABILITY

Luxembourg is navigating complex challenges and opportunities in its net-zero transition. Currently dominated by fossil fuels, a shift to renewables in its energy mix is vital to meet climate targets. Although progress has been made, as illustrated by CO_2 tax increases and the setting of renovation goals, emissions from transport and buildings remain high. Public-private partnerships could spur innovation and growth in the clean energy sector. Yet, regulatory barriers and institutional structures need refining to increase non-fossil flexibility and consumer engagement.

Room for growth in renewable energy production in Luxembourg

Luxembourg's energy mix remains dominated by fossil fuels. In 2023, oil used in transportation accounted for 61.1% and natural gas 13.4% of gross inland consumption (Annex 8). To meet its climate targets, Luxembourg needs to increase deployment of renewables, especially solar and wind power, and exploit the potential of renewable hydrogen for long-term energy sector integration. According to Luxembourg's National Energy and Climate Plan, the country aims to increase the share of renewable energy in the energy mix to 37% by 2030([25]). This will require significant investment in renewable energy infrastructure and a coordinated effort from the public and private sectors.

([25]) Klima Agence: https://www.klima-agence.lu/en/luxembourgs-energy-and-climate-policy-integrated-national-energy-and-climate-plan-necp.

Significant reductions achieved in greenhouse gas emissions from transport, but need to keep momentum

Luxembourg has achieved a remarkable 43% reduction in greenhouse gas (GHG) emissions from road transport, but the target is still a long way off. Between 2005 and 2023, the country was the best performer in the EU in terms of reducing GHG emissions from road transport (Annex 7). Fleet electrification and initiatives like extending the tram line and offering free public transport have contributed to this. Despite this positive development, road transport still contributes 60% of GHG emissions in Luxembourg's Effort Sharing Regulation (ESR) sectors, namely domestic transport, buildings, agriculture, small industry and waste. This is due to the country's significant vehicle density, reliance on fossil fuels, and fuel sales to international carriers and individuals in transit from neighbouring regions, driven by lower indirect taxes compared to surrounding countries. In recent years, however, the price differential in favour of Luxembourg has narrowed, mainly as a result of the CO_2 tax. This has contributed to decreased road transport emissions ([26]). Achieving the 2030 target of 50% emissions reductions compared to 2005 levels, as set by the Effort Sharing Regulation, and further the national 2030 emission reduction target of 55% as set by the national Climate Law, depends crucially on further measures in the transport sector. Key strategies include the promotion of electric vehicles (EVs), expanding EV charging infrastructure, and further

([26]) Note de conjoncture, 2024

addressing fuel tourism to enhance decarbonisation.

The prevalent use of company cars and commuters' preferences result in private cars being the most favoured option. Company cars account for about 22% of Luxembourg's vehicle fleet. The widespread use of company cars and related allowances, with added benefits such as fuel allowances and mileage reimbursements, further amplifies car dependency, hindering the shift to sustainable transport options. These incentives reduce the cost of commuting by car, contributing to road congestion and environmental impacts. Currently, public transport accounts for about 17% of commuter journeys and only 5% of commuting is made by rail, leaving considerable room for increased usage. Yet, rural commuters face limited public transport options, while urban commuters face issues like overcrowding, with delays and limited capacity. Furthermore, insufficient park-and-ride facilities prevent commuters from easily transitioning from cars to trains, highlighting a gap in transport planning.

The government's response to transportation challenges has been significant but insufficient to shift commuting behaviour away from private car use. Measures such as free public transport have not significantly reduced car dependency, as this measure primarily benefits residents rather than cross-border workers, who still pay train fares. Addressing these disparities requires a tailored approach, improving public transport across regions and promoting sustainable commuting practices. Success will depend on efficient implementation of infrastructure projects, enhancing service reliability and fostering cross-border cooperation with Germany, France and Belgium.

More efforts needed to improve energy efficiency in buildings

Decarbonising existing buildings remains a key challenge. The residential sector saw a slight increase in energy consumption in 2023. However, in view of the climate targets, more building renovations and enhanced energy efficiency could still help reduce emissions in this sector. Luxembourg has made progress in this area, with a national renovation strategy aiming to reduce energy consumption in buildings by 34% by 2030 (Annex 8). Nevertheless, further progress in decarbonising road transport and buildings must be prioritised in order to meet the 2030 target of a 50% reduction in emissions compared to 2005 levels set by the ESR, and even more so the 55% reduction target set by the national Climate Law.

Luxembourg's energy poverty levels are among the lowest in Europe – yet the issue persists. It mainly affects lower-income households living in older rental homes that are poorly insulated and expensive to heat. These tenants often have little control over energy improvements yet bear the full cost of inefficient buildings. While the overall numbers are modest, this matters for the energy transition: the residential sector still relies heavily on fossil fuels, and reducing household energy use by nearly a third by 2030 will require action in precisely these harder-to-reach homes ([27]).

Policy efforts to date have combined emergency relief (e.g. price caps, subsidies) with long-term renovation incentives, yielding mixed results. While short-term measures succeeded in reducing energy poverty levels to 1.9% in 2023, (from 3.3% in 2022) structural programmes like the Energy Efficiency Obligation Scheme and *Klimabonus* have struggled to reach the most affected households. Obstacles include

([27]) Luxembourg NECP 2024: https://commission.europa.eu/publications/luxembourg-final-updated-necp-2021-2030-submitted-2024_en.

administrative complexity, lack of prefinancing and the absence of renovation obligations for private landlords. Critical oversight will be needed given that one third of households are renters and public funds that support renovations may end up increasing rents or excluding those who need them most.

Moving forward, the transition could be fostered by sharpening existing tools rather than expanding them. Introducing minimum standards for the worst-performing rentals, paired with tenant protection measures, would help unlock progress where it matters most. Simpler procedures, more direct technical assistance and better-targeted subsidies would make existing incentives more inclusive. Using granular indicators, like Luxembourg's energy poverty metric, to monitor progress could ensure the transition remains both fair and effective.

Leveraging policy and regulation key for the energy transition

Policy and regulation play a crucial role in driving the energy transition in Luxembourg. The country has already introduced various measures to promote renewable energy, energy efficiency and electric vehicles, including various investments under the country's recovery and resilience plan. However, more needs to be done to create a level playing field for renewable energy sources and to address the challenges posed by fossil fuels. This includes introducing policies to support the development of renewable energy as well as phasing out support measures that are not targeted, temporary and do not preserve price incentives to save energy.

Luxembourg does not participate in any projects of common interest under the Trans-European Networks for Energy (TEN-E) nor Trans-European Transport Network (TEN-T) Regulations. This is a significant obstacle to decarbonisation efforts. Clarifying the legal and institutional framework pertinent to these projects, and permitting in particular, would enable Luxembourg to leverage EU funding and expertise to support its energy transition.

The national carbon tax is a key tool in the energy transition. In 2025, the national CO_2 tax was increased from EUR 35 to EUR 40 per tonne of CO_2. Introduced in 2021 at EUR 20 per tonne of CO_2 and subsequently increased by EUR 5 each year, the tax applies to fuels (gasoline and diesel), heating oil, and gas. According to the national legislation, there will be a further EUR 5 increase in 2026, aligning with the anticipated price levels under the EU Emissions Trading System 2 (ETS-2) for specific sectors, including buildings and road transport. This progressive tax increase strategy reflects Luxembourg's commitment to meeting national and EU climate objectives, as outlined in the Climate Law. It is planned that the provisions relating to the evolution of the CO_2 tax for the period 2027-2030 will be reassessed in 2026, according to what is reported in the national energy and climate plan.

The CO_2 tax in Luxembourg is linked to the forthcoming introduction of the EU Emissions Trading System 2 (ETS-2) and the observed fuel price differential with neighbouring countries. As carbon pricing evolves, the fuel price differential between Luxembourg and its neighbouring countries is a critical factor in meeting the national climate target, particularly with the introduction of the ETS-2.

Improving water quality required

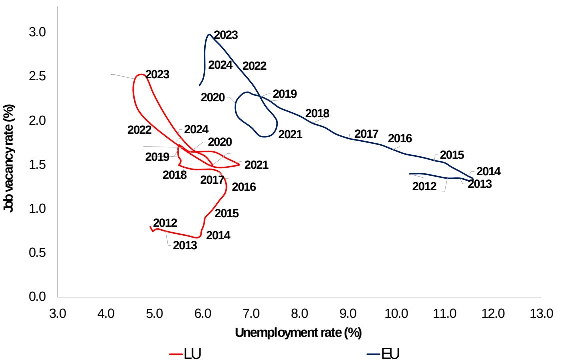
Luxembourg faces the most significant water quality challenges in the EU. All surface water bodies are affected by nutrient pollution and most groundwaters are affected by nitrates and pesticide pollution. Urban development disrupts river flow and water ecosystems, restricting the availability of water in the face of increasing demand. This poses risks to public health, the environment and the economy, particularly in agriculture, construction, water utilities and health services. Protecting and restoring water ecosystems would help mitigate both social and environmental costs while maintaining long-term competitiveness. Luxembourg should reduce pressures on water bodies' shape and course and further promote sustainable agriculture. Luxembourg has a substantial annual shortfall in funding for water protection and management of EUR 125 million, which could be filled through an extended application of the ‘polluter pays’ principle and economic incentives.

The low number of older workers in work remains a pressing challenge. The employment rate for older workers (55-64) is one of the lowest in the EU, with almost half in this age group being long-term unemployed, compared with 30% for the entire population (Annex 10). Their participation in adult learning is also behind the EU average. In response, Luxembourg has taken steps to address this and plans further measures. The government has launched a large-scale public consultation for a pension system reform, taking place in two phases in 2024 and 2025, focusing on adaptability, sustainability and equity ([28]). With support from the Recovery and Resilience Fund, the 'Future Skills' initiative targets participants aged 45 or over. Better integration of older workers in the labour market – by phasing out early retirement schemes, reducing financial incentives to leave the labour market early and introducing active ageing policies, for example – is important to enable Luxembourg to hit the 2030 national employment target, to strengthen the financial sustainability of the country's pension system and to ensure inclusive growth.

High skills shortages challenge competitiveness

Skilled labour shortages in sectors linked to the green and digital transitions may hinder competitiveness. Some 80% of small and medium-sized enterprises encounter difficulties in recruiting workers with the right skills, while shortages are reported in several occupations requiring specific skills related to the digital and green sectors (Annex 12). The vacancy rate fell to 1.4% in 2024. The decline in vacancies was particularly marked in business services, while employment growth has significantly slowed recently. Labour shortages reported by entrepreneurs in business and consumer surveys are down from the historical peak reached at the beginning of 2022. These shortages concern professional, scientific and technical activities (4.4%), which remain above the EU average (2.8%).

Graph 4.1: **Beveridge curve (2012-Q1 to 2024-Q4)**



Source: Eurostat

The persistence of skilled labour shortages could be partially explained by skills mismatches, which continue to be higher than the EU average. The match or mismatch between labour supply and demand can be gauged by the relationship between job vacancy rates and unemployment rates (Graph 4.1). In Luxembourg, both job vacancy and unemployment rates gradually increased in 2014-2015, indicating a growing structural mismatch. However, this trend reversed in 2016. In 2021 and 2022, an increase in the demand for labour concurred with a decline in unemployment, while in 2023-2024 these trends reversed. These developments could be explained by short-term factors, but the reported persistence of recruitment difficulties could also reflect a skills mismatch.

([28]) For more details, see the Luxembourg government's [Presentation of the second phase of the consultation on the pension system](#).

Luxembourg's employment agency has taken several measures to improve its matching ability, through skills forecasting. For example, it has set up a website that provides real-time data on job openings and labour market trends. The Recovery and Resilience Facility supports vocational training programmes to address skills mismatches in the job market. The *European Social Fund Plus* (ESF+) cofinances measures promoting lifelong learning in connection with skills needs both for jobseekers and employees. To address skills shortages and mismatches, it is important for Luxembourg to make progress in effectively implementing policy measures, such as the 'Skills Plang', which is still pending legislative approval.

The deterioration of digital skills levels points to the need to further strengthen reskilling and upskilling. Although above the EU average, the percentage of adults with at least basic digital skills fell from 63.8% in 2021 to 60.1% in 2023 (see Social Scoreboard in Annex 13). Similarly, the share of individuals with above basic digital skills dropped from 31.8% to 27.9%. An adequately skilled labour supply is crucial for maintaining the competitiveness of Luxembourg's growing information and communications technology sector (Annex 10). Under the recovery and resilience plan, the 'Skillsbridges' programme offers courses to facilitate career changes as part of the transition to a digital and greener economy. Overall, 36% of the European Social Fund Plus allocation (EUR 5.6 million) targets the development of digital jobs and skills. The Just Transition Fund also supports specific training measures, including reskilling and digital upskilling. The effective implementation of individual learning accounts could also contribute to reskilling and upskilling.

Low levels of basic skills pose a threat to labour productivity and competitiveness. The proportion of low achievers was higher than the EU average in all three areas tested in 2018, the last PISA survey Luxembourg participated in (Annex 12). Student performance also has an equity aspect: the score gap between advantaged and disadvantaged students was the widest in the EU. National data show that the performance deficit develops early, particularly among pupils from disadvantaged backgrounds and those who speak French or Portuguese at home. Similarly, while 8th graders' scores in digital skills improved between 2018 to 2023, pupils showed the largest performance gaps according to the level of their parents' occupations. To address performance gaps, a pilot initiative providing literacy education in French was launched in four primary schools in 2022/2023, to teach reading and writing to pupils who do not speak German or Luxembourgish at home. The primary education curriculum is currently being revised with more focus on developing basic skills (Annex 12).

Human capital formation is essential for economic growth

The absence of a unified school quality framework at national level prevents effective monitoring and may accentuate segmentation and inequalities. Luxembourg has neither a binding national reference framework for school quality nor an external school evaluation system([29]). Skills levels and standards are not sufficiently detailed in the curricula and there is no systemic standardised data collection in schools. The issue is reflected in the significant discrepancy between internal measurements (teachers' evaluations) and external standardised measurement of students' performance using ÉpStan([30]) a Luxembourgish school monitoring tool. In particular, the draft regulation implementing the school development plans in secondary school ([31]) has never been adopted. While autonomy for individual schools enables them

([29]) See Observatoire national de l'enfance, de la jeunesse et de la qualité scolaire (OEJQS), 2024, Topical report: Evidenzorientierte Qualitätsentwicklung im Gesamtsystem Schule (German)

([30]) "Épreuves Standardisées" (ÉpStan)

([31]) Draft Grand-Ducal regulation relating to the RGD (laying down the procedures for drawing up and implementing the school development plan in secondary schools).

to better adapt to the needs of rapidly changing and increasingly diverse communities, the level of autonomy under the current institutional framework may facilitate higher segmentation and inequality. Current policies emphasise curriculum reforms focusing on skills-based learning and digital skills but fail to address disparities across the school systems.

A focus on basic skills development from an early age is needed, with targeted and proactive support for disadvantaged pupils and schools. Luxembourg could benefit from more personalised and preventive support, accompanied by an expert evaluation to optimise its impact. At the same time, German-language activities in early childhood education and care could be introduced to better prepare children for instruction in German at school. Targeted support for disadvantaged pupils and schools could help reduce the performance gap between students from different socio-economic and linguistic backgrounds. This would improve the country's overall skills levels. The implementation of the new skills-oriented primary school curriculum does not address disparities. These could be addressed at national level by the adoption of a national quality framework in education providing for disparities in the curricula, as well as providing adequate methodological preparation for teachers. With these tools, schools could draw up their own quality policy and actions.

Reducing inequalities is also key

The risk of poverty or social exclusion (AROPE) has been increasing in recent years, reflecting systemic inequality issues. The total AROPE rate and the rate for children have been growing overall since 2015, contrary to the EU average which has fallen over the same period. This trend is mainly driven by income disparities, as measured by the at-risk-of-poverty component of AROPE: AROP rate has consistently been above the EU average since 2019.. By contrast, the rates (total rate and children's rate) for the other two underlying components of the AROPE, severe material and social deprivation, remain well below corresponding EU averages, despite recent rises (Annex 11). In-work poverty has consistently surpassed the EU average since 2010 and currently affects 1 in 7 employees. In terms of demographics, in-work poverty is particularly prevalent among those born outside the EU, the low-skilled (working in low-wage sectors), and single-parents especially those with dependent children. These factors contribute to inequality, including income inequality as measured by the income quintile share ratio. The impact of social transfers, excluding pensions, in reducing income inequality has been decreasing, reflecting insufficient social benefits as well as low take-up rates [32]. Low awareness about eligibility for support measures, complex administrative procedures and psychological costs are among the main reported reasons for this low uptake[33]. The inequality-reducing effect of taxes and transfers is also below the EU average, with limited progressivity of direct taxation when it comes to wages[34].

Reducing inequalities, is essential for fostering social cohesion and supporting Luxembourg's competitiveness. Several measures have been taken, including tax breaks and increases in minimum wages, pensions and other social benefits. The government announced a national action plan to prevent and combat poverty. The plan is to be drawn up with the social partners by the end of 2025. One of the key measures will include administrative simplification to increase social benefit take-up, in particular through the creation of a one-stop shop for social benefits. Moreover, 25% of the 2021-2027 (ESF+) allocation (EUR 3.8 million)

(32) Due to a break in series in 2020, 2021 and 2022 the evolution of this indicator should be interpreted with some caution. Nevertheless, the latest available data indicates that the performance of LU on this indicator has not improved and remains significantly below the EU average.

(33) Luxembourg Institute of Socio-economic Research (LISER), 2024, *Précarité et (non-)recours aux aides financières au Luxembourg – Une étude qualitative*

(34) Eurofound, 2024, *Promoting social cohesion and convergence – Developments in income inequality and the middle class in the EU*

supports the fight against poverty and social exclusion. A more effective tax-benefits system could also help alleviate high living costs, as could reskilling and upskilling and increasing the supply of social housing.

These findings are consistent with the second-stage analysis in line with the Social Convergence Framework. The analysis points to challenges related to the increasing percentage of people at risk of poverty or social exclusion, mainly driven by income disparities, but does not point to overall social convergence challenges for Luxembourg, even with the measures implemented or planned [35].

[35] European Commission, SWD (2025)95. The analysis relies on all the available quantitative and qualitative evidence and the policy response undertaken and planned.

KEY FINDINGS

To foster competitiveness, sustainability and social fairness, Luxembourg would benefit from:

- **implementing the RRP**, including the REPowerEU chapter; **swiftly implementing cohesion policy**, taking advantage of the opportunities under the mid-term review and making optimal use of EU instruments, including **InvestEU** and **STEP**, to improve competitiveness;

- **strengthening the sustainability of the pension system** – implementing reforms that ensure the financial sustainability of the pension system, increasing the effective retirement age and the employment rate of older workers;

- **taking stronger measures to tackle aggressive tax planning**, which would prevent distortion of competition between firms, treat EU taxpayers fairly and safeguard government finances;

- **addressing housing market issues** by reforming taxes and benefits, macroprudential policies, land use planning, mortgage market regulations, and by investing in public housing, strengthening coordination with cross-border public transport and urban planning;

- **enhancing sustainable and efficient transportation**, to achieve the necessary emissions reductions (towards the target of a 55% reduction), by decarbonising transport and by increasing the use of public transport -which would also tackle growing traffic congestion-, in particular by investing in public transport infrastructure, strengthening cross-border networks in collaboration with regional authorities in the 'Greater Region', and by improving last-mile connections, to create a more competitive and sustainable transportation system;

- **boosting competitiveness,** including by promoting diversification in the financial sector, supporting investment in high R&D intensive activities, fostering productive innovation and accelerating digitalisation in the business sector, in particular in the uptake of advanced digital technologies by SMEs and enabling business scale-up and productivity growth.

- **reducing reliance on fossil fuels and accelerating the green transition,** in particular by increasing energy efficiency in residential and commercial buildings and supporting municipalities in deploying renewable energy, and by stimulating skills development, particularly for those key skills that are necessary for the green and digital transition.

- **further supporting renewable energy deployment**, by Increasing and modernising the high-voltage grid capacity, improving interconnections with neighbouring countries, and easing permitting procedures.

- **to support upward social convergence, improving performance and ensuring equal opportunities in schools** – addressing the effects on students' performance of economic background, language differences and disparities among school systems, notably by implementing a unified national school quality framework with common objectives, qualification benchmarks and monitoring procedures. This would help develop human capital potential and innovation capacity, key factors for sustainably improving the country's competitiveness.

ANNEXES

LIST OF ANNEXES

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LIST OF GRAPHS

This Annex contains a series of tables relevant for the assessment of the fiscal situation in Luxembourg, including how Luxembourg is responding to Council recommendations issued under the reformed Economic Governance Framework.

The reformed framework, which entered into force on 30 April 2024([36]), aims to strengthen debt sustainability and promote sustainable and inclusive growth through growth-enhancing reforms and priority investments. The medium-term fiscal-structural plans (hereinafter, MTPs or plans) constitute the cornerstone of the framework, setting the budgetary commitment of Member States over the medium term. The latter is defined in terms of net expenditure growth, which is the single operational indicator for fiscal surveillance.

Luxembourg submitted its plan on 15 October 2025. The plan covers the period until 2029, presenting a fiscal adjustment over four years. On 21 January 2025, the Council adopted the Recommendation endorsing Luxembourg's plan.([37])

The assessment of the implementation of the Council Recommendation is carried out on the basis of outturn data from Eurostat and the Commission Spring 2025 Forecast, and taking into account the Annual Progress Report (APR), that Luxembourg submitted on 25 April 2025. Furthermore, in the context of the Commission Communication of 19 March 2025([38]), on accommodating defence expenditure within the Stability and Growth Pact, the Annex reports the projected increase in defence expenditure based on the Commission Spring 2025 Forecast.

The Annex is organised as follows. First, developments in **government deficit and debt** are presented based on the figures reported in Table A1.1. Then, the assessment of the **implementation of the Council Recommendation endorsing the plan** follows, based on the relevant figures presented in Tables A1.2 to A1.8, including data on defence expenditure.

The Annex also provides information on the **cost of ageing** and the **national fiscal framework**. Fiscal sustainability risks are discussed in the Debt Sustainability Monitor 2024.([39])

Developments in government deficit and debt

Luxembourg's government surplus amounted to 1.0% of GDP in 2024. Based on the Commission's Spring 2025 Forecast, it is projected to turn to a deficit of 0.4% of GDP in 2025. The government debt-to-GDP ratio amounted to 26.3% at the end of 2024 and, according to the Commission, is projected to decrease to 25.7% end-2025 due to the snow-ball effect as GDP growth is projected to be higher than interest payment.

([36]) Regulation (EU) 2024/1263 of the European Parliament and of the Council (EU) on the effective coordination of economic policies and on multilateral budgetary surveillance, together with the amended Regulation (EC) No 1467/97 on the implementation of the excessive deficit procedure, and the amended Council Directive 2011/85/EU on the budgetary frameworks of Member States are the core elements of the reformed EU economic governance framework.

([37]) OJ C, C/2025/650, 10.02.2025, ELI: https://eur-lex.europa.eu/eli/C/2025/650/oj/eng.

([38]) Communication from the Commission accommodating increased defence expenditure within the Stability and Growth Pact of 19 March 2025, C(2025) 2000 final.

([39]) European Commission (2025) 'Debt Sustainability Monitor 2024,' European Economy-Institutional Papers 306.

Table A1.1: **General government balance and debt**

	Variables		2024	2025		2026	
			Outturn	APR	COM	APR	COM
1	General government balance	% GDP	1.0	-0.6	-0.4	n.a.	-0.5
2	General government gross debt	% GDP	26.3	26.4	25.7	n.a.	26.2

Source: Commission Spring 2025 Forecast (COM), Annual Progress Report (APR)

Developments in net expenditure

The net expenditure([40]) growth of Luxembourg in 2025 is forecast by the Commission([41]) to be above the recommended maximum corresponding to a deviation of 0.5% of GDP. Considering 2024 and 2025 together, the cumulative growth rate of net expenditure is projected below the recommended maximum cumulative growth rate. The annual deviation in 2025 is above the 0.3% of GDP threshold.

Table A1.2: **Net expenditure**

	Annual			Cumulative*		
	REC	APR	COM	REC	APR	COM
	Growth rates					
2024	n.a.	6.7%	6.2%	n.a.	n.a.	n.a.
2025	5.8%	7.1%	6.8%	14.2%	14.3%	13.5%
2026	4.7%	n.a.	5.3%	19.6%	n.a.	19.5%

(1) The cumulative growth rates are calculated by reference to the base year of 2023.
Source: Council Recommendation endorsing the national medium-term fiscal-structural plan of Luxembourg (Rec.), Annual Progress Report (APR), and Commission Spring 2025 Forecast (COM).

General government defence expenditure in Luxembourg remained stable at 0.5% of GDP between 2021 and 2023([42]). According to the Commission 2025 Spring Forecast, expenditure on defence is projected at 0.6% of GDP in 2024 and 0.7% of GDP in 2025.

([40]) Net expenditure is defined in Article 2(2) of Regulation (EU) 2024/1263 as government expenditure net of (i) interest expenditure, (ii) discretionary revenue measures, (iii) expenditure on programmes of the Union fully matched by revenue from Union funds, (iv) national expenditure on co-financing of programmes funded by the Union, (v) cyclical elements of unemployment benefit expenditure, and (vi) one-off and other temporary measures.

([41]) Commission Spring 2025 Forecast, *European Economy-Institutional paper 318*, May 2025.

([42]) Eurostat, government expenditure by classification of functions of government (COFOG).

Table A1.3: **Net expenditure (outturn and forecasts), deviations vis-à-vis the recommendation**

	Variables		2023 Outturn	2024 Outturn	2025 COM	2026 COM
1	Total expenditure	bn NAC	38.1	40.4	43.0	45.3
2	Interest expenditure	bn NAC	0.2	0.3	0.3	0.3
3	Cyclical unemployment expenditure	bn NAC	-0.1	0.1	0.1	0.1
4	Expenditure funded by transfers from the EU	bn NAC	0.1	0.2	0.2	0.2
5	National co-financing of EU programmes	bn NAC	0.0	0.1	0.1	0.1
6	One-off expenditure (levels, excl. EU funded)	bn NAC	0.0	0.0	0.0	0.0
7=1-2-3-4-5-6	**Net nationally financed primary expenditure (before discretionary revenue measures, DRM)**	**bn NAC**	**37.8**	**39.8**	**42.4**	**44.6**
8	Change in net nationally financed primary expenditure (before DRM)	bn NAC		2.0	2.6	2.2
9	DRM (excl. one-off revenue, incremental impact)	bn NAC		-0.4	-0.1	0.0
10=8-9	**Change in net nationally financed primary expenditure (after DRM)**	**bn NAC**		**2.4**	**2.7**	**2.3**
11	Outturn / forecast net expenditure growth	% change		6.23%	6.8%	5.3%
12	Recommended net expenditure growth*	% change		8.0%	5.8%	4.7%
13=(11-12) x 7	Annual deviation	bn NAC		-0.7	0.4	0.3
14 (cumulated from 13)	Cumulated deviation	bn NAC		-0.7	-0.3	0.0
15=13/17	**Annual balance**	**% GDP**		**-0.8**	**0.5**	**0.3**
16=14/17	**Cumulated balance**	**% GDP**		**-0.8**	**-0.3**	**0.0**
17	p.m. Nominal GDP	bn NAC	81.0	86.1	89.8	94.1

* The growth rate for 2024 is not a recommendation but serves to anchor the base, as the latest year with outturn data when setting the net expenditure path is year 2023.
Source: Commission Spring 2025 Forecast and Commission's calculation.

Table A1.4: **Defence expenditure**

			2021	2022	2023	2024	2025	2026
1	Total defence expenditure	% GDP	0.5	0.5	0.5	0.6	0.7	0.6
2	*of which: gross fixed capital formation*	% GDP	0.1	0.1	0.0	0.1	0.4	0.2

Source: Eurostat (COFOG), Commission Spring 2025 Forecast

Table A1.5: **Macroeconomic developments and forecasts**

	Variables		2024	2025		2026	
			Outturn	APR	COM	APR	COM
1=7+8+9	**Real GDP**	**% change**	**1.0**	**2.5**	**1.7**	**n.a.**	**2.0**
2	Private consumption	% change	1.3	2.4	2.0	n.a.	2.4
3	Government consumption expenditure	% change	4.9	3.9	4.4	n.a.	2.6
4	Gross fixed capital formation	% change	-7.3	6.1	2.5	n.a.	3.9
5	Exports of goods and services	% change	0.3	3.2	3.1	n.a.	3.2
6	Imports of goods and services	% change	-0.3	3.8	3.8	n.a.	3.8
	Contributions to real GDP growth						
7	- Final domestic demand	pps	0.2	3.6	1.9	n.a.	1.9
8	- Change in inventories	pps	-0.3	-1.9	0.0	n.a.	0.0
9	- Net exports	pps	1.1	0.8	-0.2	n.a.	0.1
10	Output gap	% pot GDP	-3.6	-3.3	-3.1	n.a.	-2.5
11	Employment	% change	1.1	1.4	1.3	n.a.	1.7
12	Unemployment rate	%	6.4	5.9	6.6	n.a.	6.4
13	Labour productivity	% change	-0.1	1.1	0.4	n.a.	0.2
14	HICP	% change	2.3	2.0	2.1	n.a.	1.8
15	GDP deflator	% change	5.2	2.0	2.5	n.a.	2.8
16	Compensation of employees per head	% change	2.2	3.3	3.8	n.a.	3.3
17	Net lending/borrowing vis-à-vis the rest of the world	% GDP	1.6	n.a.	-0.2	n.a.	-0.6

Source: Commission Spring 2025 Forecast (COM), Annual Progress Report (APR)

Table A1.6: **General government budgetary position**

	Variables (% GDP)	2024	2025		2026	
		Outturn	APR	COM	APR	COM
1=2+3+4+5	**Revenue**	**47.9**	**47.3**	**47.5**	**n.a.**	**47.6**
	of which:					
2	- Taxes on production and imports	11.6	11.8	11.6	n.a.	11.5
3	- Current taxes on income, wealth, etc.	19.1	18.4	18.7	n.a.	18.9
4	- Social contributions	12.1	12.5	12.2	n.a.	12.2
5	- Other (residual)	5.1	4.6	5.1	n.a.	5.0
8=9+16	**Expenditure**	**46.9**	**48.0**	**48.0**	**n.a.**	**48.2**
	of which:					
9	- Primary expenditure	46.6	47.6	47.6	n.a.	47.8
	of which:					
10	- Compensation of employees	11.2	11.7	11.7	n.a.	11.8
11	- Intermediate consumption	4.6	4.7	4.6	n.a.	4.5
12	- Social payments	19.5	20.0	19.9	n.a.	20.1
13	- Subsidies	1.3	1.2	1.3	n.a.	1.2
14	- Gross fixed capital formation	4.5	4.6	4.7	n.a.	4.6
15	- Other	5.5	5.4	5.6	n.a.	5.6
16	- Interest expenditure	0.3	0.4	0.3	n.a.	0.3
18=1-8	**General government balance**	**1.0**	**-0.6**	**-0.4**	**n.a.**	**-0.5**
19=1-9	**Primary balance**	**1.3**	**-0.2**	**-0.1**	**n.a.**	**-0.2**
20	Cyclically adjusted balance	2.7	n.a.	1.0	n.a.	0.6
21	One-offs	0.0	0.0	0.0	n.a.	0.0
22=20-21	**Structural balance**	**2.7**	**0.9**	**1.0**	**n.a.**	**0.6**
23=22+16	Structural primary balance	3.0	1.3	1.3	n.a.	0.9

Source: Commission Spring 2025 Forecast (COM), Annual Progress Report (APR)

Table A1.7: **Debt developments**

	Variables	2024	2025		2026	
		Outturn	APR	COM	APR	COM
1	**Gross debt ratio* (% of GDP)**	**26.3**	**26.4**	**25.7**	**n.a.**	**26.2**
2=3+4+8	Change in the ratio (pps. of GDP)	1.3	0.1	-0.7	n.a.	0.5
	Contributions**					
3	**Primary balance**	**-1.3**	**0.2**	**0.1**	**n.a.**	**0.2**
4=5+6+7	**'Snow-ball' effect**	**-1.2**	**-0.8**	**-0.8**	**n.a.**	**-0.9**
	of which:					
5	- Interest expenditure	0.3	0.4	0.3	n.a.	0.3
6	- Real growth effect	-0.2	-0.6	-0.4	n.a.	-0.5
7	- Inflation effect	-1.2	-0.5	-0.6	n.a.	-0.7
8	**'Stock-flow' adjustment**	**3.8**	**0.6**	**0.0**	**n.a.**	**1.2**

* End of period.
** The 'snow-ball' effect captures the impact of interest expenditure on accumulated general government debt, as well as the impact of real GDP growth and inflation on the general government debt-to-GDP ratio (through the denominator). The stock-flow adjustment includes differences in cash and accrual accounting (including leads and lags in Recovery and Resilience Facility grant disbursements), accumulation of financial assets, and valuation and other residual effects.
Source: Commission Spring 2025 Forecast and Commission's calculation (COM), Annual Progress Report (APR)

Table A1.8: **RRF – Grants**

	Revenue from RRF grants (% of GDP)	2020	2021	2022	2023	2024	2025	2026
1	RRF grants as included in the revenue projections	n.a.	0.0	0.0	0.0	0.0	0.1	0.1
2	Cash disbursements of RRF grants from EU	n.a.	0.0	0.0	0.0	0.0	0.0	0.0

	Expenditure financed by RRF grants (% of GDP)	2020	2021	2022	2023	2024	2025	2026
3	Total current expenditure	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Gross fixed capital formation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Capital transfers	0.0	0.0	0.0	0.0	0.1	0.1	0.0
6=4+5	Total capital expenditure	0.0	0.0	0.0	0.0	0.1	0.1	0.0

	Other costs financed by RRF grants (% of GDP)	2020	2021	2022	2023	2024	2025	2026
7	Reduction in tax revenue	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Other costs with impact on revenue	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Financial transactions	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Annual Progress Report

Cost of Ageing

Total age-related spending in Luxembourg is projected to rise from about 17% of GDP in 2024 to about 20% in 2040 and 28% in 2070 (see Table A1.9). The overall increase of more than 10 pps is driven by the projected rise in pension spending and, to a lesser extent, long-term care and healthcare.

Public pension spending is projected to increase continuously over the next decades. The pension expenditure-to-GDP ratio would rise from about 9.5% of GDP in 2024 to 17.5% by 2070, the highest projected increase among EU Member States. By 2040, pension spending would rise by 1.8 pps of GDP.

Public healthcare expenditure is projected at 4.1% of GDP in 2024 (below the EU average of 6.6%) and is expected to increase by 0.4 pps by 2040 and by a further 0.7 pps by 2070 ([43]). Public expenditure on long-term care is projected at 1.1% of GDP in 2024 (below the EU average of 1.7%) and is expected to increase by 0.3 pps of GDP by 2040 and by a further 1.3 pps of GDP by 2070. These expenditure increases, due to an ageing population, pose a risk to fiscal sustainability in the long term.

Table A1.9: **Projected change in age-related expenditure in 2024-2040 and 2024-2070**

	age-related expenditure 2024 (% GDP)	change in 2024-2040 (pps GDP) due to: pensions	healthcare	long-term care	education	total	age-related expenditure 2040 (%GDP)	
LU	17.4	*1.8*	*0.3*	*0.3*	*-0.2*	***2.3***	19.8	**LU**
EU	24.3	*0.5*	*0.3*	*0.4*	*-0.3*	***0.9***	25.2	EU

	age-related expenditure 2024 (% GDP)	change in 2024-2070 (pps GDP) due to: pensions	healthcare	long-term care	education	total	age-related expenditure 2070 (%GDP)	
LU	17.4	*8.1*	*1.0*	*1.6*	*-0.3*	***10.5***	27.9	**LU**
EU	24.3	*0.2*	*0.6*	*0.8*	*-0.4*	***1.3***	25.6	EU

Source: 2024 Ageing Report (EC/EPC).

([43]) Key performance characteristics, recent reforms and investments of the Luxembourgish healthcare system are discussed in Annex 14 'Health and health systems'.

National fiscal framework

Luxembourg's framework for Independent Fiscal Institutions (IFIs) leaves room for improvement. The two IFIs are the National Council of Public Finance (CNFP), which focuses on monitoring the compliance with fiscal rules, and the National Institute of Statistics and Economic Studies of the Grand Duchy of Luxembourg (STATEC), which produces the macroeconomic forecast. The independence of the CNFP could be strengthened by giving it greater control over its budget and by emphasising the fiscal and economic expertise of members. Recruitment of staff is currently also limited to civil servants. In addition, its impact could be strengthened by developing an explicit communication strategy and by intensifying its outreach activities. Contrary to the CNFP, STATEC has been subject of external review and its forecasts are subject to ex post assessments by the CNFP. The government has a strong influence over the appointments to STATEC leadership and there are no formal expertise requirements.

Table A1.10:**Fiscal Governance Database Indicators**

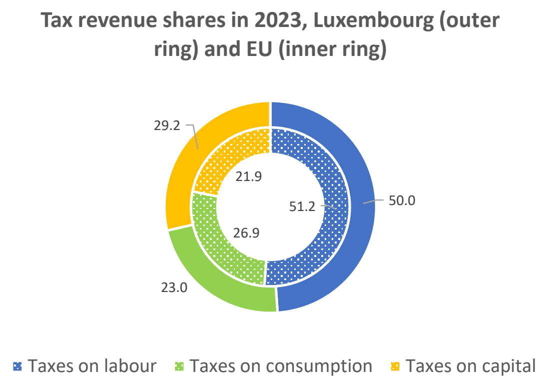
2023	Luxembourg	EU Average
Country Fiscal Rule Strength Index (C-FRSI)	10.91	14.52
Medium-Term Budgetary Framework Index (MTBFI)	0.78	0.73

The Country Fiscal Rule Strength Index (C-FRSI) shows the strength of national fiscal rules aggregated at the country level based on i) the legal base, ii) how binding the rule is, iii) monitoring bodies, iv) correction mechanisms, and v) resilience to shocks. The Medium-Term Budgetary Framework Index (MTBFI) shows the strength of the national MTBF based on i) coverage of the targets/ceilings included in the national medium-term fiscal plans; ii) connectedness between these targets/ceilings and the annual budgets; iii) involvement of the national parliament in the preparation of the plans; iv) involvement of independent fiscal institutions in their preparation; and v) their level of detail. A higher score is associated with higher rule and MTBF strength.
Source: Fiscal Governance Database

This annex provides an indicator-based overview of Luxembourg's tax system. It includes information on: (i) the tax mix; (ii) competitiveness and fairness aspects of the tax system; and (iii) tax collection and compliance. It also provides information on the risk of aggressive tax planning in Luxembourg.

Luxembourg's tax revenues in relation to its GDP are above the EU average. Table A2.1 shows that Luxembourg's tax revenues as a percentage of GDP (40.5%) were above the EU aggregate (39.0%) in 2023, a noticeable increase since 2022 (when they were equivalent to 39.3% of GDP, below the EU average of 39.7%). They further increased to 41.6% in 2024. Luxembourg's tax revenues from labour taxation in 2023 as a share of GDP were 20.2%, a substantial increase from 2022 (18.6%) and the first time that they were above the EU average for 2023 (20.0%). Luxembourg's revenues from consumption and environmental taxes as a share of GDP are among the lowest in the EU. Environmental taxation is limited and mostly consists of transport fuel taxes. This suggests there is scope to better incentivise environmentally friendly behaviour, including by developing pollution and resources taxes (which at present do not cover NOx emissions, waste landfilling and incineration, fertilisers, pesticides, or plastic products). Revenues from capital taxes as a share of GDP are the highest in the EU, and revenues from property taxes in general are relatively high. However, revenues from recurrent property taxes which are considered to be a particularly growth-friendly type of tax, are among the lowest in the EU.

Graph A2.1: **Tax revenue shares in 2023**



Source: Taxation Trends Data, DG TAXUD

Luxembourg's corporate-income-tax (CIT) rate is high and getting closer to the EU average. After three successive years of declines, Luxembourg's statutory corporate-tax rate was stable at 24.9% (which includes a 7% surcharge – added since 2013 to support a national

Table A2.1: **Taxation indicators**

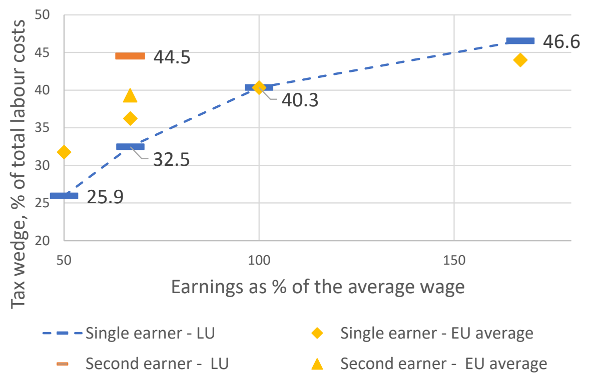
		Luxembourg					EU-27				
		2010	2021	2022	2023	2024	2010	2021	2022	2023	2024
Tax structure	Total taxes (including compulsory actual social contributions) (% of GDP)	35.7	38.4	39.3	40.5	41.6	37.8	40.2	39.7	39.0	
By tax base	Taxes on labour (% of GDP)	15.8	18.2	18.6	20.2		19.8	20.5	20.1	20.0	
	of which, social security contributions (SSC, % of GDP)	10.3	10.6	10.7	11.5		12.9	13.0	12.7	12.7	
	Taxes on consumption (% of GDP)	9.9	9.0	9.2	9.3		10.9	11.2	10.9	10.5	
	of which, value added taxes (VAT, % of GDP)	6.3	6.2	6.7	6.5		6.8	7.3	7.4	7.1	
	Taxes on capital (% of GDP)	10.0	11.6	11.1	11.8		7.1	8.5	8.7	8.5	
Some tax types	Personal income taxes (PIT, % of GDP)	7.4	10.1	10.4	11.6		8.6	9.6	9.4	9.3	
	Corporate income taxes (CIT, % of GDP)	5.4	4.5	4.4	5.0		2.2	2.9	3.2	3.2	
	Total property taxes (% of GDP)	1.0	2.6	2.6	2.4		1.9	2.2	2.1	1.9	
	Recurrent taxes on immovable property (% of GDP)	0.1	0.1	0.1	0.1		1.1	1.1	1.0	0.9	
	Environmental taxes (% of GDP)	2.3	1.5	1.2	1.3		2.5	2.4	2.1	2.0	
	Effective carbon rate in EUR per tonne of CO_2 equivalents	NA	112.4	NA	112.9		NA	86.0	NA	84.8	
Progressivity & fairness	Tax wedge at 50% of average wage (single person) (*)	25.3	26.1	26.0	26.2	25.9	33.9	31.8	31.5	31.5	31.8
	Tax wedge at 100% of average wage (single person) (*)	35.3	39.8	39.9	41.2	40.3	40.9	39.9	39.9	40.2	40.3
	Corporate income tax - effective average tax rates (1) (*)	27.7	24.6	24.6	24.6		21.3	19.3	19.1	18.9	
	Difference in Gini coefficient before and after taxes and cash social transfers (pensions excluded from social transfers) (2) (*)	9.7	5.3	5.3	5.9		8.6	8.2	7.9	7.7	
Tax administration & compliance	Outstanding tax arrears: total year-end tax debt (including debt considered not collectable) / total revenue (in %) (*)		9.9	9.8				35.5	32.6		
	VAT gap (% of VAT total tax liability, VTTL) (**)		7.4	3.7	6.7			6.6	7.0		

(1) Forward-looking effective tax rate (KPMG).
(2) A higher value indicates a stronger redistributive impact of taxation.
(*) EU-27 simple average.
(**) Forecast value for 2023. For more details on the VAT gap, see European Commission, Directorate-General for Taxation and Customs Union, VAT gap in the EU - 2024 report, https://data.europa.eu/doi/10.2778/2476549
For more data on tax revenues as well as the methodology applied, see the Data on Taxation webpage, https://ec.europa.eu/taxation_customs/taxation-1/economic-analysis-taxation/data-taxation_en.
Source: European Commission, OECD

employment fund) between 2019 and 2024, above the EU average of 21.2%. The country's aggregated statutory CIT rate was reduced to 23.9% in 2025 in an attempt by the government to bring it closer to the EU and OECD averages. Luxembourg's average effective corporate-tax rate stood at 24.6% in 2023, still above the EU average of 18.9%.

Luxembourg's tax framework provides for various incentives that effectively lower companies' tax burden and make it more attractive to companies. Since 2018, Luxembourg has offered an intellectual property (IP) regime where eligible net income from qualifying IP assets benefits from an 80% exemption from income tax – thus decreasing the overall tax rate (made up of CIT plus municipal business tax) to an effective rate on that income of 4.8% in 2025. Luxembourg also offers tax credits for investment, such as an 18% tax credit for investments and operating expenses that support the green and digital transformation (excluding: (i) assets that are depreciable over a period of less than three years; (ii) automotive vehicles and investments; and (iii) operating expenses to bring the company into compliance with obligations arising from environmental protection legislation and other legal and regulatory provisions applicable to the establishment and operation of industrial and commercial companies). There is also a 12% tax credit based on the acquisition price or production costs of new qualifying assets for overall investment applicable to: (i) depreciable intangible assets other than buildings, livestock and mineral and fossil deposits; (ii) sanitary and central heating installations incorporated into hotel buildings; (iii) certain buildings qualifying as social investment; (iv) fixed assets qualifying for special depreciation; and (v) acquisitions of software, insofar as they have not been acquired from a related company. Furthermore, Luxembourg entities subject to specific regulatory requirements can benefit from a full CIT exemption (such as investment funds) or a near-full tax exemption (such as private wealth-management companies, which need only pay a yearly subscription tax of 0.25% of income). Luxembourg has experienced the second highest growth rate in venture-capital financing since 2013 and its venture-capital vehicle (SICAR) is subject to income tax but benefits from exemptions (on income and gains from transferable securities qualifying as investment in risk capital and from net wealth tax).

Graph A2.2: **Tax wedge for single and second earners, % of total labour costs, 2024**



The tax wedge for second earners assumes a first earner at 100% of the average wage and no children. For the full methodology, see OECD, 2016, Taxing Wages 2014-2015.
Source: European Commission

Luxembourg's income-tax burden is relatively low across the income distribution. Luxembourg's tax wedge(44) in 2024 was lower than the EU average at lower income levels (i.e. for single earners at 50% and 67% of the average wage), while being equal to the EU average at 100% and higher than the EU average at 167% of the average wage. Furthermore, the tax wedge for second earners at 67% of the average wage was clearly higher than the EU average. In addition, the difference between the tax wedge for second earners and the tax wedge for single persons at 67% of the average wage was the largest among all EU Member States. While the difference between the tax wedge at 50% and at 167% of the average wage was higher than for the EU average, the tax-and-benefit system as a whole has a relatively small impact in reducing income inequality as measured by the difference in the Gini coefficient before and after taxes and social transfers.

Luxembourg scores well on indicators of the effectiveness and efficiency of its tax administration. Outstanding tax arrears were stable (down 0.1pp) between 2021 and 2022 at 9.9% of total net revenue, which is significantly below the EU-27 average of 32.6%. However, the VAT gap increased noticeably from 3.7% in 2022 to 6.7% in 2023 according to the fast estimates,

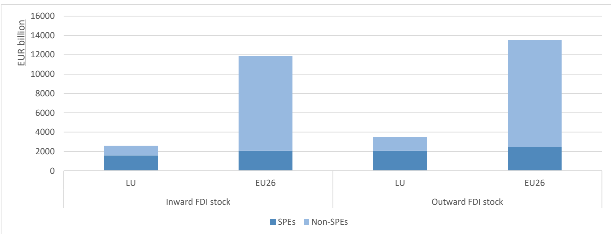
(44) The tax wedge is defined as the sum of personal income taxes and employee and employer social-security contributions net of family allowances, expressed as a percentage of total labour costs (the sum of the gross wage and social-security contributions paid by the employer).

while the EU-27 average stood at 7.0% in 2022 (data unavailable for 2023). This indicates a deteriorating level of VAT compliance. There is no indication that tax collection is inefficient in Luxembourg. The cost-of-collection ratio, which reflects annual total operating expenditure for the tax administration as a share of the annual net revenue collected, stood at 0.9% in 2021. The estimated, average, total tax-compliance costs for SMEs in Luxembourg are similar to the EU average. Only 15.9% of personal-income-taxation returns were filed electronically in 2021, the lowest share in the EU. However, the cost of compliance for taxpayers is set to improve with the generalisation of e-filing of personal-income taxes.

Luxembourg's legal tax provisions combined with the relevant economic indicators strongly suggest that the country is used as a conduit for aggressive tax planning. In 2023, Luxembourg's net inward stock of foreign direct investment (FDI) stood at EUR 2.593 billion, and its outward stock at EUR 3 513 billion, making it the second largest origin and destination country in absolute terms for FDI in the EU-27 after the Netherlands. The net inward FDI stock in Luxembourg was about 327 times larger than the size of its economy (equivalent to 3 296% of its GDP), and its net outward stock of investment about 443 times larger than its economy (equivalent to 4 429% of its GDP), making it by far the largest origin and destination country for FDI in the EU-27 relative to the size of its GDP. Around 60% of Luxembourg's inward and outward stock of FDI is held through special purpose entities (SPEs). Luxembourg is also a major conduit for dividend and interest flows (see Graph XXX). It is the destination of 13% of all dividends and 21% of all interest received in the EU and the origin of 13% of all dividends and 16% of all interest paid from the EU.

Luxembourg is a major financial hub in the EU and globally, even if but the scale of these figures suggests a risk of aggressive tax planning in Luxembourg, especially when compared with other Member States, Luxembourg is a major financial hub in the EU and globally, but even if the scale of these figures suggests that there is might be a high risk of aggressive tax planning. As part of its recovery and resilience plan, Luxembourg introduced a conditional measure of non-deductibility of interest and royalty payments in 2021. However, the scope of this measure is limited to the EU list of non-cooperative jurisdictions, which are not Luxembourg's main economic partners, and the measure does not specifically target low- or zero-tax jurisdictions, so the expected economic impact of the measure is small. Moreover, as most Member States have introduced – or are in the process of introducing – defensive measures targeting interest and royalty payments made to zero- and low-tax jurisdictions. This increases the risk that Luxembourg be as a conduit country. Luxembourg's other measures have been limited to implementing EU legislation and Council conclusions. The Pillar 2 Directive has been in force in the EU since 1 January 2024, and Luxembourg has notified the Commission of its transposition into national law. However, it is expected to have a limited impact on the outbound-payment issue in Luxembourg because its scope is limited to the largest multinationals (revenue threshold of EUR 750 million), and there are some sectoral exemptions. .

Graph A2.3: **Use of SPEs for FDI in Luxembourg and in the rest of the EU, 2023**



Source: European Commission

Luxembourg has a solid science base, but business innovation remains limited, hampering productivity growth and the diversification of the economy. The 2024 European Innovation Scoreboard (EIS) ranks Luxembourg as a strong innovator; at 112.1% its performance is above the EU average but decreasing (by six percentage points between 2017 and 2024 ([45])). Luxembourg has been unable to raise its R&D intensity, which has been on a downward trend over the past two decades (dropping to 1.01% of GDP in 2023 compared to 1.57% in 2007), mainly due to declining business R&D investments. To foster competitiveness and the emergence of a more diversified economic base, it would be beneficial to promote disruptive innovation in key sectors and better exploit Luxembourg's scientific excellence. This could be done by fostering a stronger connection between Luxembourg's science base and the business ecosystem and stimulating stronger business R&D investments through enhanced public support schemes.

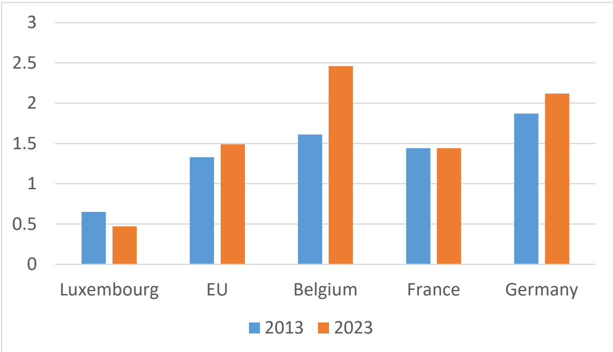
Science for innovative ecosystems

Luxembourg's solid and internationally well-connected science base is a key asset, but low and stagnant public R&D investments risk undermining its scientific excellence. The quality of Luxembourg research outputs, as measured by the share of scientific publications as a percentage of its total publications within the top 10% most cited scientific publications worldwide, is above the EU average (10.7% vs 9.6% in 2021). Luxembourg's researchers are very well connected internationally, as evidenced by the high share of international co-publications among the country's scientific publications (78.3% in 2023 vs the EU average of 55.9% ([46]), the highest rate in the EU. The robustness of the Luxembourg research system and its integration in international research networks makes Luxembourg an attractive hub for foreign students and researchers. In particular, Luxembourg performs very well when it comes to attracting foreign doctorate students, as shown in the 2024 edition of the EIS. More generally, Luxembourg ranked particularly high (11th out of 134) in the 2023 Global Talent Competitiveness Index ([47]). However, public R&D investment has remained stagnant over the last years, at a level well below the EU average (0.55% of GDP in 2023 compared to the EU average of 0.72%). In a context of fierce international competition and very rapid research and innovation developments, these low and stagnating levels of public R&D investment could ultimately weaken Luxembourg's scientific position worldwide and its attractiveness for foreign talent.

Business innovation

Business R&D intensity has been on a declining trend over the last two decades and is among the lowest in the EU. Over the last two decades, business R&D intensity has been on a downward trend, and fell to 0.47% of GDP in 2023, far below the EU average of 1.49%. This is in stark contrast to the investment levels and trends observed in neighbouring countries which are also classified as strong R&I performers or innovation leaders according to the EIS (Graph A3.1).

Graph A3.1: **Business R&D investment as % of GDP, 2013-2023**



Source: Eurostat

The low business R&D intensity, which is partly due to the country's economic structure and

([45]) European Innovation Scoreboard 2024: The EIS provides a comparative analysis of innovation performance in EU countries, including the relative strengths and weaknesses of their national innovation systems (also compared to the EU average).

([46]) Indicators table.

([47]) Global talent competitive index 2023.

specialisation in services (as opposed to manufacturing, which is generally more R&D-intensive), hampers productivity growth. Low private R&D investments also weigh on Luxembourg's innovation output, as measured by patents. Patent applications filed under the Patent Cooperation Treaty per billion GDP (in PPS €), which stands at 1.6 PPS €, is well below the EU average of 2.8.

Public support for business innovation remains critically low. Over the last few years, Luxembourg has progressively developed and expanded its policy mix aimed at fostering business innovation, through small-scale schemes such as the 'Fit 4' performance programmes, which targeted 86 small and medium-sized enterprises in 2023 and to which new components such as *Sustainability* [48] and *Innovation Healthtech Market* [49] have recently been added. Three companies joined the Fit 4 Innovation-Healthtech Market programme that opened for applications in March 2023, and 23 companies joined 'Fit 4 sustainability' that year. However, public support for business innovation is still marginal (0.037% of GDP in 2019, compared to an EU average of 0.100%). Unlike most EU countries, Luxembourg does not provide indirect support to R&D in the form of tax credits, only 'direct' support, i.e. in the form of grants or procurements. Going forward, assessing the efficiency and impact of the 'Fit4 programmes', while further fine-tuning and expanding the policy mix aimed at stimulating business R&D and innovation, will be key.

Despite the high quality of Luxembourg's public research system, linkages with the business sector remain underexploited ([50]). Science-business linkages remain weak, as evidenced by the low share of public expenditure on R&D financed by businesses (0.013.% in 2022, compared to an EU average of 0.050%). To tackle this challenge, Luxembourg has put in place several schemes over the last years to encourage public-private cooperation, many of which are managed by the Luxembourg National Research Fund (FNR). For example, since 2021 the FNR and relevant ministries have jointly issued calls under the BRIDGES programme aimed at strengthening public-private partnerships in priority areas (such as Health tech, high-performance computing, defence, space and lightweight materials). Furthermore, the innovation fund provides specific incentives for private-sector companies entering public-private research and innovation partnerships. While these schemes are expected to reinforce science-business ties, there has been little assessment of their efficiency and impact so far. To take full advantage of Luxembourg's scientific excellence as a key driver of innovation and economic diversification, it will be key to further strengthen links between science and business in key strategic sectors and in a sustainable manner.

Luxembourg is lagging behind on the digitalisation of SMEs and the take-up of advanced technologies by businesses in general but shows clear potential. In 2024, the country performed below the EU average (70.27% vs 72.91%) in its level of basic digital intensity for SMEs. Although the proportion of businesses adopting AI has risen by almost 10 percentage points, from 14.45% in 2023 to 23.73% in 2024 (compared with the EU average of 13.48%), the adoption of data analytics and advanced cloud services is far below the Digital Decade EU-level target of 75% adoption by 2030. To promote further adoption and development of digital technologies, Luxembourg makes use of national measures ([51]) and investment under its recovery and resilience plan ([52]).

([48]) Fit 4 sustainability: This is a support and co-financing programme that offers businesses the possibility of having an environmental impact assessment carried out on their activities, followed by various recommendations for reducing the environmental impact. Topics include lower energy consumption, a reduced carbon footprint and reduction of waste. The programme was launched in 2022 and is open to all Luxembourg companies, regardless of their size or sector of activity.

([49]) https://luxinnovation.lu/resources/annual-report-2023.

([50]) Through the national PEARL programme, EUR 4 million was allocated in 2023 to develop quantum computing, while through the national BRIDGE programme, Luxembourg launched specific calls for industry partnerships between public research institutions and national or international companies as well as thematic calls with Luxembourg ministries in the fields of agriculture, health tech, high performance computing, defence and development aid.

([51]) Luxembourg is developing interoperable and accessible European data processing technologies via major approved integrated projects of common European interest (IPCEI) on next generation cloud infrastructure and services.

([52]) The first payment request was made by the Luxembourg Quantum Communication Infrastructure Laboratory (LuxQCI) in June 2023 for EUR 20.2 million, and included digital milestones for advanced digital technologies.

Financing innovation

Luxembourg is taking concrete steps to consolidate its start-up ecosystem and to facilitate access to finance for innovative firms. In June 2023 Luxembourg adopted a roadmap entitled 'from seed to scale' and in March 2025 the government presented the "10 Points of Action for Start-ups" plan to strengthen its start-up ecosystem. The roadmap and the Action Plan encompass both existing and new measures to help start-ups on their development journey. One of the existing schemes is the 'Fit 4 Start' programme ([53]), in place since 2015, which provides coaching and funding for start-ups at an early stage of their development. Considering the large financing needs of start-ups and scale-ups, the growing availability of venture capital in Luxembourg over the last decade is a very positive development (venture capital investment as a percentage of GDP increased eight-fold between 2012 and 2023). Luxembourg has been active in supporting the growth of its venture capital market ([54]). For example, in March 2023, the Ministry of Finance, the Ministry of the Economy, the National Credit and Investment Company (SNCI) and the European Investment Fund (EIF) launched the Luxembourg Future Fund 2 (LFF 2), with a total capital of EUR 200 million, building on the experience of the first edition ([55]).

Innovative talent

Despite concrete steps to foster tertiary education, skills shortages are a key challenge for Luxembourg, whose research and innovation performance relies heavily on the country's ability to attract foreign talent. The shortage of skilled workers has worsened in recent years, accentuating the mismatch between available skills and the profiles sought on the market. Skills mismatches across all sectors have reached 23.8%, above the EU average of 20.2% (see Annex on education and skills). In 2022 Luxembourg had the lowest proportion in the EU (3.1 vs the EU average of 17.6) of new science and engineering graduates (per thousand population aged 25-34). In the field of computing specifically, Luxembourg has the second lowest proportion of graduates per thousand population aged 25-34, while the proportion of ICT graduates out of all graduates is remarkably higher (see Annex on education and skills). Luxembourg therefore relies extensively on foreign talent. The country has various schemes in place to attract outstanding researchers to Luxembourg ([56]) and is contemplating, as part of its 2023 'from seed to scale' strategy, the creation a talent desk, i.e. a single contact point for foreign talent wishing to join a Luxembourg start-up or scale-up.

Luxembourg has various promising initiatives and programmes to support entrepreneurship education but lacks a common policy framework and a national strategy. Entrepreneurship education is offered to students in upper secondary school as either a stand-alone subject or a component of other courses, while schools can also participate in national initiatives such as the 'sustainable entrepreneurial school' project. At higher-education level, the University of Luxembourg has set up an entrepreneurship programme which is open to all students and staff. While these initiatives exist, the absence of strategic planning and the lack of a common legal framework for entrepreneurship education may limit development in this area. Additionally, the absence of data and the fact that there is no evaluation of existing initiatives may pose barriers to policy development.

([53]) Scale-up support pilot programme, support programmes for innovation, digitisation and sustainability. Fit 4 innovation: fit 4 innovation - health tech market, fit 4 digital, fit 4 sustainability, SME package.

([54]) Active seed and venture capital funds: Société Nationale de Crédit et d'Investissement (SNCI), Eurefi, Digital Tech Fund, Luxembourg Future Fund (LFF), Luxembourg Future Fund 2 (LFF 2), Orbital Ventures Fund (space). Private funds: Mangrove Capital Partners, Expon Capital.

([55]) LFF 2 will fund investments that further stimulate the diversification and sustainable development of the Luxembourg economy. The scope of LFF 2 currently covers venture capital but will be extended to also include hybrid debt equity investments.

([56]) The FNR operates the ATTRACT, PEARL and CORE programmes to attract outstanding researchers to Luxembourg.

Table A3.1: **Key innovation indicators**

Luxembourg	2012	2017	2020	2021	2022	2023	2024	EU average (1)	USA
Headline indicator									
R&D intensity (gross domestic expenditure on R&D as % of GDP)	1.21	1.24	1.1	1.04	1.05	1.01	:	2.24	3.45
Science and innovative ecosystems									
Public expenditure on R&D as % of GDP	0.54	0.55	0.55	0.51	0.54	0.55	:	0.72	0.64
Scientific publications of the country within the top 10% most cited publications worldwide as % of total publications of the country	11.8	11.1	13.9	10.7	:	:	:	9.6	12.3
Researchers (FTEs) employed by public sector (Gov+HEI) per thousand active population	5.6	5.8	6.4	6.6	6.8	7	:	4.2	:
International co-publications as % of total number of publications	74.2	75.2	77.3	78.6	79.2	78.3	:	55.9	39.3
R&D investment & researchers employed in businesses									
Business enterprise expenditure on R&D (BERD) as % of GDP	0.67	0.69	0.55	0.53	0.51	0.47	:	1.49	2.7
Business enterprise expenditure on R&D (BERD) performed by SMEs as % of GDP	:	0.19	:	0.13	:	:	:	0.4	0.3
Researchers employed by business per thousand active population	3	4.5	3.6	3.2	3.7	3.3	:	5.7	:
Innovative outputs									
Patent applications filed under the Patent Cooperation Treaty per billion GDP (in PPS €)	1.6	1.7	2.2	1.6	1.6	:	:	2.8	:
Employment share of high-growth enterprises measured in employment (%)	9.02	11.64	11.9	:	:	:	:	12.51	:
Digitalisation of businesses									
SMEs with at least a basic level of digital intensity % SMEs (EU Digital Decade target by 2030: 90%)	:	:	:	:	66.25	:	70.27	72.91	:
Data analytics adoption % enterprises (EU Digital Decade target by 2030: 75%)	:	:	:	:	:	32.41	:	33.17	:
Cloud adoption % enterprises (EU Digital Decade target by 2030: 75%)	:	:	:	28.99	:	32.63	:	38.86	:
Artificial intelligence adoption % enterprises (EU Digital Decade target by 2030: 75%)	:	:	:	13	:	14.45	23.73	13.48	:
Academia-business collaboration									
Public-private scientific co-publications as % of total number of publications	8.6	9.9	11	13.5	13.4	13.4	:	7.7	8.9
Public expenditure on R&D financed by business enterprise (national) as % of GDP	0.017	0.009	0.012	0.013	0.013	:	:	0.05	0.02
Public support for business innovation									
Total public sector support for BERD as % of GDP	:	0.049	:	:	:	:	:	0.204	0.251
R&D tax incentives: foregone revenues as % of GDP	:	:	:	:	:	:	:	0.102	0.141
Business entreprise expenditure on R&D BERD financed by the public sector (national and abroad) as % of GDP	:	0.049	:	:	:	:	:	0.100	0.110
Financing innovation									
Venture capital (market statistics) as % of GDP, total (calculated as a 3-year moving average)	0.015	0.012	0.033	0.039	0.129	0.120	:	0.0780	:
Seed funding (market statistics) as % of GDP	9.6	0.7	16.3	2.8	2.6	3.1	:	7.3	:
Start-up and early-stage funding (market statistics) as % of GDP	55.1	93.9	82.1	95.4	92.8	82.0	:	44.0	:
Later stage and scale-up funding (market statistics) as % of GDP	35.3	5.4	1.6	1.8	4.6	14.9	:	48.7	:
Innovative talent									
New graduates in science and engineering per thousand population aged 25-34	2.5	2.5	2.5	2.7	3.1	:	:	17.5	:
Graduates in the field of computing per thousand population aged 25-34	0.7	0.9	1.2	1.6	1.8	:	:	3.6	:

(1) EU average for the last available year or the year with the largest number of country data
Source: Eurostat, DG JRC, OECD, Science-Metrix (Scopus database), Invest Europe, European Innovation Scoreboard

Luxembourg offers an attractive business environment, although firms' investment, innovative potential and entrepreneurship could benefit from further improvements. Its economy is well integrated into the EU and its administrative and regulatory hurdles are moderate overall. Luxembourg can rely on a digital infrastructure with very high level of VHCN (very high-capacity network) and 5G coverage, in line with the Digital Decade targets. However, several factors constrain business investment. One of them is the scarcity of skilled workers and their higher labour costs, while regulatory barriers for various professions and non-tariff trade barriers to services are higher in Luxembourg than in other Member States, potentially hindering market entry. Other obstacles to business investment are financial constraints and delayed payments, which are more prevalent here than in other EU countries. Finally, the economy's dynamism, entrepreneurship and innovative potential could also benefit from further enhancement.

Economic framework conditions

Business investment in Luxembourg is significantly low, harming innovation and productivity growth. In 2023, business investment stood at just 8% of the country's GDP, compared to 13% in the European Union ([57]), placing Luxembourg among the lowest in both the EU and the OECD ([58]). Investment in equipment increased by just 3.4% in 2023 and is projected to decrease by 5.5% in 2024, against the EU's respective growth of 3% and expected decline of 2.2% ([59]). Furthermore, business expenditure on research and development has been consistently decreasing and was as low as less than one third of the EU average in 2023 ([60]). A factor contributing to this low level of business investment, particularly in research and innovation, is Luxembourg's sectoral structure, which features a low proportion of industrial activity and a high proportion of financial services. Another factor is the low level of public support for business research and development, notwithstanding several initiatives to support business innovation ([61]) (see Annex 3). Other factors are lack of skills and financing constraints (see below and Annexes5 and 12).

Firms see the lack of skilled staff and the high labour cost as the main obstacles to their activity and investments. Despite the high number of cross-border workers (43% of the workforce), the availability of skilled staff is the obstacle to investment most cited by Luxembourgish firms (88% vs 77% in the EU), according to the EIB Investment Survey ([62]). Labour shortages are particularly high in the construction sector (see Annex 10). This constraint is however decreasing, as shown by the fall of the vacancy rate (from 3.2% in Q3 2022 to 1.8% in 2024) ([63]). The cost of labour is seen by Luxembourgish firms as the other main challenge for 2025 ([64]). In 2023, the hourly labour rate in Luxembourg was the highest in the EU (EUR 53.9 against EUR 31.8 in the EU) ([65]). An increase in the cost of labour could harm Luxembourgish firms' competitiveness if it is not matched by an increase in labour productivity.

A greater proportion of firms in Luxembourg finds they experience finance constraints and late payments than for the EU overall. In 2023, although access to loans was much easier than in other Member States (European Investment Fund access to finance index loans at 0.75 vs 0.38 in the EU), a greater proportion of firms in Luxembourg than in the EU as a whole said that they were facing financing constraints, mainly due to the borrowing costs ([66]) (Annex 5). In addition, the proportion of SMEs that experienced late payments was higher in Luxembourg than in other Member States. In 2024, 25.4% of Luxembourgish firms experienced late payments from public entities (against 16.6% in the EU) and 60.9% from private entities (against 47.9% in the

([57]) Eurostat, SDG_08_1.1

([58]) OECD Economic surveys: Luxembourg 2022, 17/11/2022.

([59]) European Commission, Autumn forecasts statistical annex, p. 187, 11/2024.

([60]) European Commission, Innovation scoreboard 2024, Luxembourg, 6/2024.

([61]) European Commission, Innovation scoreboard 2024, Luxembourg, 6/2024.

([62]) European Investment Bank, EIB Investment Survey 2024, p. 26.

([63]) Eurostat, Job vacancy statistics [jvs_q_nace2].

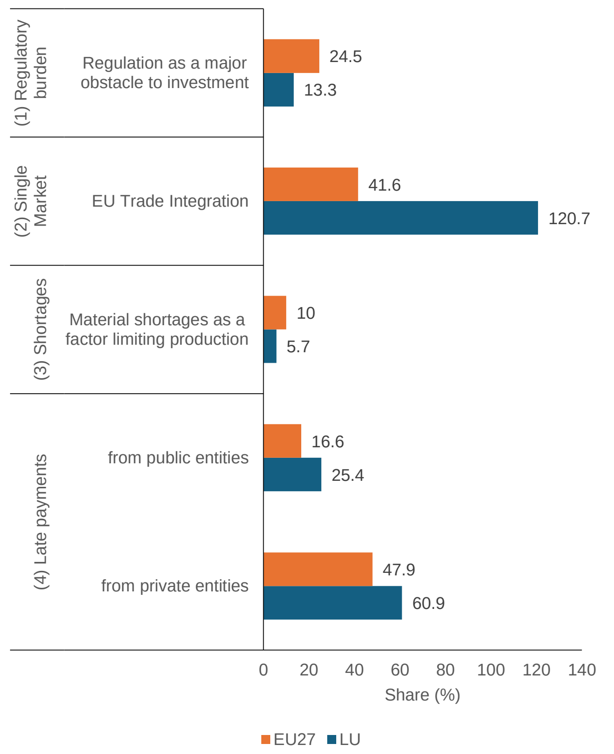
([64]) Luxembourgish Chamber of Commerce, baromètre de l'économie 2eme semestre 2024.

([65]) Eurostat.

([66]) EIB Investment survey 2024, 10/2024, p. 35.

EU) ([67]). Late payments disrupt cash flows and may increase finance constraints, which harms investment.

Graph A4.1: **Making Business Easier: selected indicators.**



Share of (1) enterprises, (2) average intra-EU exports and imports in GDP, (3) firms, (4) SMEs.
Sources: (1) EIB IS, (2) Eurostat, (3) ECFIN BCS, (4) SAFE survey.

For most Luxembourgish firms, digital and transport infrastructures are not an obstacle to investment. Only 29% of Luxembourgish firms found transport infrastructure to be an obstacle to investment, against 45% in the EU ([68]), with 5.8% reporting it as a major obstacle (EU 13.4%, see table A2.1). On digital infrastructure, 34% of Luxembourgish firms found it an obstacle to investment, against 45% in the EU. Luxembourg has made substantial progress, especially in the area of connectivity. Fibre to the premises (FTTP) coverage increased substantially, reaching 78.9% in 2023 (compared to 64% in the EU) ([69]). Coverage in rural areas also increased considerably, with FTTP coverage at 60% against an EU average of 53%. Luxembourg's VHCN coverage stands at 94.7% nationwide and 80.3% in rural areas, both surpassing the EU averages of 78.8% and 55.6%, respectively. For mobile connections, overall 5G coverage increased to 99.6% (above the EU average of 89.3%), and 5G coverage on the 3.4-3.8 GHz spectrum band ([70]) stands at 63% (above the EU average of 51%). Cybersecurity awareness in enterprises is increasing, which is improving the resilience of digital infrastructure. The number of enterprises that experienced ICT security incidents leading to unavailability of ICT services due to attack from outside decreased in Luxembourg, from 4.34% in 2022 to 3.34% in 2024, falling below the EU average (3.43%), while 86.80% of enterprises deployed some ICT security measures (slightly under the EU average of 92.76%) and only 54.12% of them made their employees aware of their obligations in ICT security related issues, below the EU average (59.97%).

Regulatory and administrative barriers

Regulatory and administrative obstacles to investment are moderate, but there is still room for improvement. Fewer firms in Luxembourg than in the EU overall find that business regulations constitute an obstacle to investment (52% vs 66%) ([71]), including deeming them a major obstacle (13.3% vs 24.5%, see graph A2.1). This also holds true for labour regulations, although the difference with the EU average is much smaller (60% vs 62%). However, compared to other OECD countries, the regulatory and administrative burden is slightly higher in Luxembourg than the OECD average (1.77 vs 1.68) ([72]). One reason for this is that Luxembourg scores badly on the impact evaluation of regulations (3.85 vs 1.84 on average in the OECD) ([73]). Another reason is that at the time of data collection, Luxembourg did not require public bodies to comply with the 'once-only principle' or

([67]) European Central Bank, 2024 SAFE survey,1/2025.

([68]) EIB Investment Survey 2024, p. 26.

([69]) Fibre networks have completely overbuilt the cable networks.

([70]) 3.4-3.8 GHz spectrum band is essential for enabling advanced applications requiring large spectrum bandwidth.

([71]) EIB Investment Survey 2024, p. 26.

([72]) OECD, Product Market Regulation indicators, Medium level indicator: administrative and regulatory burden.

([73]) OECD, Product Market Regulation indicators, Medium level indicator: Regulations Impact Evaluation.

regularly review whether permits and licences issued to businesses were still required or should be removed. Since then, reforms to reduce the administrative burden of enterprises have been announced ([74]). They include simplified procedures for applying for state aid, an online tool for sustainability reporting and for the implementation of the once-only principle. The Parliament has also been examining a bill that aims at optimising the use of personal data and provides for the exchange of data between administrations ([75]) (see Annex 6).

Tax compliance costs are in line with the EU average. According to an ECstudy ([76]), in 2019, the average total cost of tax compliance for a business represented a little less than 2% of its turnover, in line with the EU aggregate mean (see Annex 2). Business organisations however stated that streamlining tax law was a priority for reducing the administrative burden on businesses and fostering an environment more conducive to investment ([77]).

Luxembourg has modernised its insolvency arrangements. In 2022, Luxembourg had the second worst insolvency procedures in the EU according to the OECD ([78]). Since then, Luxembourg has improved how it handles insolvency. The 2023 law on the preservation of businesses and modernising bankruptcy law ([79]) has been assessed positively by business organisations. Authorities and business organisations are now discussing how to better accompany the firms in difficulty. Another topic which needs to be tackled is how to facilitate the handover of businesses, as many entrepreneurs will retire in the next coming years.

Entrepreneurship is insufficiently developed. Luxembourg ranks just 33rd out of 46 countries for total early-stage entrepreneurial activity ([80]). The enterprise birth rate was lower in Luxembourg than the EU average in 2021 (8.6% vs 10.8% in the EU in 2021) ([81]). Since then, the increase in business registrations has been lower in Luxembourg than in the EU overall ([82]). The gap between Luxembourg and the EU average has therefore increased. It may reflect the deterioration of the quality of Luxembourg's entrepreneurship environment. According to the Global Entrepreneurship Monitor ([83]), Luxembourg ranked 13th out of 46 economies for the quality of its overall entrepreneurial environment in 2019. By 2021, it had fallen to 20th, and by 2023 was down to 23rd.

Luxembourg has taken several measures to boost entrepreneurship. It has launched new entrepreneurship initiatives, particularly for those starting from unemployment, as well as for the young people ([84]). In addition, in 2023, to modernise the right of establishment and to stimulate entrepreneurship, Luxembourg amended the law governing access to occupations in craft trades, business and industry and to certain liberal professions ([85]). The law's provisions include digitalising some business start-up procedures, facilitating the right to start a second business after bankruptcy, simplifying the requirements on holding a business licence and business transfers, and facilitating access to several craft professions. However, this law also contains restrictions, as pointed out by the Chamber of Commerce ([86]).

While construction activity has declined since 2022 and there is a lack of housing, Luxembourg has adopted measures to speed up construction permits. Between 2022 and 2024, despite the housing shortage in

([74]) Luxembourg, press release, 21/3/2025.

([75]) Luxembourg, Projet de loi 8395

([76]) European Commission, Tax compliance costs for SMEs report, 1/2022, p. 39, p. 51, p. 106.

([77]) Meeting between European Commission's services and business organisations, 13/1/2025.

([78]) OECD, Enhancing insolvency frameworks to support economic renewal, 12/2022, p. 9.

([79]) Loi du 7 août 2023 relative à la préservation des entreprises et portant modernisation du droit de la faillite.

([80]) Global Entrepreneurship Monitor 2023/2024, 2/2024, pp. 142-143.

([81]) Eurostat, Birth rate, 2021.

([82]) Eurostat, business registrations (2021=100).

([83]) Global Entrepreneurship Monitor 2023/2024, 2/2024, pp. 142-143.

([84]) OECD, The missing entrepreneurs 2023, p. 289.

([85]) Loi du 26 juillet 2023 portant modification de la loi modifiée du 2 septembre 2011 réglementant l'accès aux professions d'artisan, de commerçant, d'industriel ainsi qu'à certaines professions libérales.

([86]) Réforme du droit d'établissement : la Chambre de Commerce juge les efforts de modernisation insuffisants, 13/7/2023.

Luxembourg, activity in the construction sector dropped sharply. To improve the situation, in June 2024, the government presented a set of administrative simplification measures, as well as a new public-private partnership (PPP) for the construction of affordable housing ([87]). In January 2025, Luxembourg adopted a package of 40 measures to speed up granting construction permits. It includes bringing in the principle of 'silence is equivalent to agreement' in two phases, simplified procedures for smaller works, a revision of urban planning rules for areas of economic activity and the harmonisation and simplification of environmental investigation procedures ([88]).

The single market

Luxembourg has the strongest EU trade integration of any Member State. The volume of its exports and imports of goods and services to/from other EU countries represented 120.7% of its GDP in 2024 (EU average 41.6%). This is mainly explained by Luxembourg's trade in services, especially financial services: in 2023, service exports and imports stood at 90.5% of GDP, far ahead of the EU average (15%). By contrast, exports and imports of goods only represented 25.9% of GDP, which was slightly below the EU average (28%) ([89]). According to the OECD, barriers to trade with EU and non-EU countries are lower in Luxembourg than in the OECD overll ([90]) and that includes for services ([91]).

Nonetheless, Luxembourg's non-tariff barriers to intra-European Economic Area (EEA) trade in services are the highest in the EU ([92]). They were the highest in the EU in 2024, as well as over the five last years, and increased in 2024 compared to 2023 (0.068 vs 0.060 – see the indicators in Table A2.1). Looking at specific sectors, Luxembourg had the highest non-tariff barriers to intra-EEA service trade among all EU Member States for three key sectors of the economy: construction, wholesale and retail trade, and accounting. The OECD ([93]) points out that certain rules regulating the entry of individuals seeking to provide services in Luxembourg remain more cumbersome than international best practice. In fact, Luxembourg applies labour market tests to individuals seeking to provide services in the country temporarily as contracted service suppliers or independent service suppliers. Employees transferred to Luxembourg within their own company are subject to the same tests.

For several regulated professions, regulatory barriers are more stringent in Luxembourg than in other Member States. Luxembourg has a slightly higher number of regulated professions than the EU average ([94]). According to the OECD ([95]) and the European Commission ([96]), regulatory restrictions remain particularly high for lawyers, notaries, architects, civil engineers, and accountants. For notaries, the restrictions are among the strictest in the EU. The regulation imposing the legal form of their business, and regulation of entry into the profession were highlighted as very strict. Entry regulations for lawyers are also particularly restrictive ([97]). The European Commission ([98]) has also found real estate agents to be stringently regulated ([99]).

In the retail sector, regulatory restrictions remain slightly higher than in peer countries,

([87]) Luxembourg, press release, 19/06/2024.

([88]) Luxembourg, press release, 10/01/2025.

([89]) Eurostat, bop_c6_a.

([90]) OECD, PMR indicators, barrier to trade facilitation, 2024 (0.53 in Luxembourg vs 0.71 in the OECD on average).

([91]) OECD, STRI – Luxembourg , 2023.

([92]) EC staff calculation based on the OECD, 2024 STRI database: the average (0.068) of Luxembourg's 2024 intra-EEA STRI values was the highest in the EU in 2024.

([93]) OECD, Luxembourg's country note, 2025.

([94]) EC, Regulated Professions Database.

([95]) OECD, Product Market Regulation indicators, 2024.

([96]) European Commission, Communication on updating the reform recommendations for regulation in professional services, COM(2021) 385, 9/7/2021.

([97]) OECD, Product Market Regulation indicators, 2024.

([98]) European Commission, Communication on updating the reform recommendations for regulation in professional services, COM(2021) 385, 9/7/2021.

([99]) For real estate agents, the OECD indicator provides a different assessment than the EC indicator. Despite methodological similarities between the EC and OECD indicators (de jure analysis of overall restrictiveness of regulation for entry and exercise of certain professions, scale 1 to 6), certain differences (e.g. weighting of restrictions, regulation at regional level), combined with different reference time points (OECD: 2023; EC: 2021), may lead to divergences between the results of the EC and OECD indicators. See EC, SWD (2021)185, p. 227.

although they have significantly decreased since 2018. According to the European Commission, the regulatory restrictions on both establishing and operating shops have significantly gone down since 2018 (100). This improvement is confirmed by the OECD (101), with Luxembourg's indicator for restrictions in retail going down from 1.73 to 1.31 from 2018 to 2023. But it is still higher than the EU average (1.31 vs 1.17). In addition, territorial supply constraints still affect consumer choice and prices. In 2023, the price level for food in Luxembourg was the highest in the EU (124.7 vs 100) (102).

Luxembourg performs very well on single market indicators, except on the transposition deficit. The share of single market directives not transposed by Luxembourg (the 'transposition deficit') is higher than for other Member States: in 2024, it was at 1.2% against 0.8% for the EU average. All other indicators show a very good performance. In 2024, Luxembourg transposed only 0.3% of the single market directives incorrectly (EU average: 0.9%) (103). It had only 11 open infringements, against an EU average of 24. Luxembourg ranked third among Member States for the shortest average duration to solve single market infringement proceedings at 31.1 months, well below the EU average at 45.8 months. In the SOLVIT service, set up to help businesses and citizens resolve breaches of EU law by public authorities in another EU country, Luxembourg solved 100% of the 34 cases it handled as lead centre (EU average of 84.9%).

Public procurement

The level of competition in public procurement procedures is satisfactory. The share of single bids was below the EU average between 2019 and 2023, which was positive, but this share increased in 2023 and came closer to the EU average (27% vs 28.8% in the EU on average in 2023) (see Table A2.1). Direct awards represented 4% of procurement procedures in 2024 (against 7% in the EU).

Luxembourg would benefit from further developing the strategic use of public procurement. Luxembourg reports that the implementation of green public procurement, socially responsible procurement and innovation procurement are in progress and that the objectives have been partially reached (104). Luxembourg could benefit from adopting a strategy or action plan to encourage those uses of public procurement.

(100) European Commission, 2022 update of the Retail Restrictiveness Indicator.

(101) OECD, Product Market Regulation indicators, 2024.

(102) Eurostat, Comparative price levels of consumer goods and services for 2023.

(103) European Commission, Single Market Scoreboard, 1/2025

(104) EC, Article 83- public procurement monitoring reporting, – 2021-2023, p. 33.

Table A4.1: **Making Business Easier: indicators.**

POLICY AREA	INDICATOR NAME		2020	2021	2022	2023	2024	EU-27 average
Luxembourg								
Investment climate								
Shortages	Material shortage, firms facing constraints, %[1]		4.6	18.3	14.2	10.7	5.7	10.0
	Labour shortage, firms facing constraints, %[1]		12.0	16.4	27.0	19.6	19.8	20.2
	Vacancy rate, vacant posts as a % of all available ones (vacant + occupied)[2]		1.8	2.3	3.1	2.3	1.7	2.3
Infrastructure	Transport infrastructure as an obstacle to investment, % of firms reporting it as a major obstacle[3]		12.8	18.7	17.6	12.0	5.8	13.4
	VHCN coverage, %[4]		-	92.6	93.3	94.7	-	78.8
	FTTP coverage, %[4]		-	75.2	76.2	78.9	-	64.0
	5G coverage, %[4]		-	12.7	93.2	99.6	-	89.3
Reduction of regulatory and administrative barriers								
Regulatory environment	Impact of regulation on long-term investment, % firms reporting business regulation as a major obstacle[3]		10.4	12.3	10.7	14.5	13.3	24.5
Late payments	Payment gap - corporates B2B, difference in days between offered and actual payment[5]		-	-	-	-	-	15.6
	Payment gap - public sector, difference in days between offered and actual payment[5]		-	-	-	-	-	15.1
	Share of SMEs experiencing late payments, %*[6]	from public or private entities in the last 6 months	39.1	68.7	53.2	69.6	-	-
		from private entities in the previous or current quarter	-	-	-	-	60.9	47.9
		from public entities in the previous or current quarter	-	-	-	-	25.4	16.6
Single Market								
Integration	EU trade integration, % (Average intra-EU imports + average intra EU exports)/GDP[2]		109.5	117.5	117.6	116.4	120.7	41.6
	EEA Services Trade Restrictiveness Index[7]		0.060	0.060	0.060	0.060	0.068	0.050
Compliance	Transposition deficit, % of all directives not transposed[8]		1.9	1.8	1.5	1.0	1.2	0.8
	Conformity deficit, % of all directives transposed incorrectly[8]		0.9	0.8	0.8	0.5	0.3	0.9
	SOLVIT, % resolution rate per country[8]		93.8	76.9	80.0	83.0	100	84.9
	Number of pending infringement proceedings[8]		18.0	13.0	12.0	10.0	11.0	24.4
Public procurement								
Competition and transparency in public procurement	Single bids, % of total contractors**[8]		20	18	23	27	-	-
	Direct awards, %**[8]		8	6	6	4	4	7.0

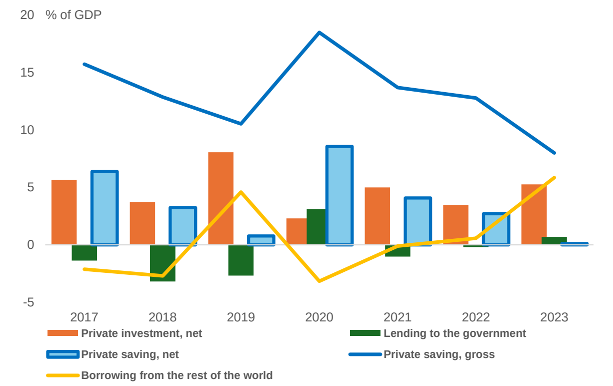
*Change in methodology in 2024: reporting late payments from public and private entities separately.
** No data on single bids available for 2024. Due to missing data, the EU average of direct awards data is calculated without Romania.
Sources: (1) ECFIN BCS, (2) Eurostat, (3) EIB IS, (4) Digital Decade Country reports, (5) Intrum Payment Report, (6) SAFE survey, (7) OECD, (8) up to 2023: Single Market and Competitiveness Scoreboard, 2024: Public procurement data space (PPDS).

Luxembourg is an important financial centre within the global financial system. Multinational companies use Luxembourg as a financial centre for their internal finances. Domestic firms seem to derive only limited benefits from Luxembourg's status as a financial centre, as access to external finance for companies, and small and medium-sized enterprises (SMEs) in particular, does not seem to be better than the EU average. Retail participation in capital markets is above the EU average and supported by high household wealth. Domestic institutional investors are conservative and invest only a small share in venture and growth capital. Luxembourg has attractive schemes for the scale-up of innovative start-ups, but, as is the case throughout the EU, more could be done to improve the availability of venture and growth capital.

Availability and use of domestic savings

Since 2020, Luxembourg's declining private savings and strong private investment have led to greater reliance on external financing, with the country shifting from a net lending to a net borrowing position. Since 2020, Luxembourg's private savings ratio (net of fixed capital consumption) has declined steadily from a peak of 8.6% of GDP to negative territory in 2024, reaching -0.4% of GDP (see Graph A5.1). In contrast, the net private investment ratio—measuring the net contribution of the private sector to capital accumulation—remained robust, averaging 4.2% of GDP over the past decade. Over the same period, the government maintained fiscal discipline, recording either general budget surpluses or relatively small deficits. On average, the general government balance posted a surplus of 0.9% of GDP over the past ten years. The shrinking role of domestic private savings in financing strong private investment levels has increased reliance on external funding. Luxembourg's external balance shifted from a net lending position of 3.2% of GDP in 2020 to a net borrowing position of 5.6% in 2024. This trend highlights a structural gap: net domestic savings—after accounting for the investment needed to preserve the existing capital stock—are insufficient to finance investment projects domestically. As a result, an increasing share of investment must be financed by international creditors.

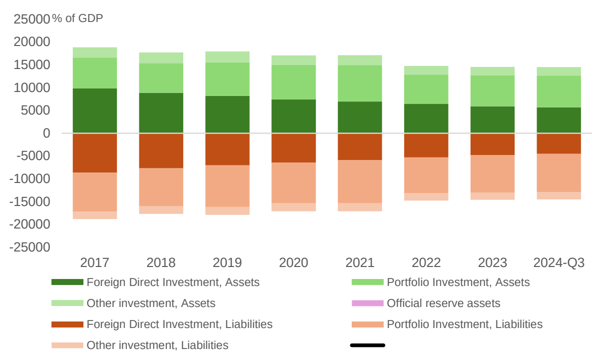
Graph A5.1: **Net savings-investment balance**



Source: AMECO

Luxembourg's international investment position is shaped by its large financial sector, with a significant net creditor position in direct investments and a substantial negative portfolio investment position due to investment fund shares held by non-residents. Luxembourg's international investment position is significantly influenced by the activities of multinational companies and the financial sector. The country maintains a very high net creditor position in direct investments, largely driven by special purpose vehicles. However, Luxembourg also exhibits a very large negative portfolio investment position, primarily due to a substantial stock of investment fund shares held by non-residents. In fact, Luxembourg is home to an internationally-oriented, market-based financial sector, which is several times the size of its domestic economy. The key institutions forming this sector include investment funds, money market funds, and special purpose entities. Luxembourg has positioned itself as the leading investment fund hub in the EU and the second largest globally, after the United States. Many of these institutions have limited or no exposure to Luxembourg's domestic economy; their assets and liabilities are located abroad, and they operate on a cross-border basis. This international orientation is reflected in the fact that Luxembourg's assets and liabilities to foreign entities stand at almost equal levels, multiple times the size of Luxembourg's GDP. As of Q3-2024, Luxembourg recorded assets of EUR 6 956 billion and liabilities of EUR 8 398 billion in portfolio investments, primarily raised through the issuance of investment fund shares. These assets and liabilities represented approximately 14 515% and 14 518% of GDP, respectively. Due to the dominance of the investment fund sector, Luxembourg was the largest net debtor in foreign portfolio investment assets among all EU countries in 2024, recording a net deficit of EUR 1 442 billion. The shrinking size of Luxembourg's international assets and liabilities as a percentage of GDP over the past decade can be partially attributed to revaluation corrections of financial assets in international markets.

Graph A5.2: **International investment position**

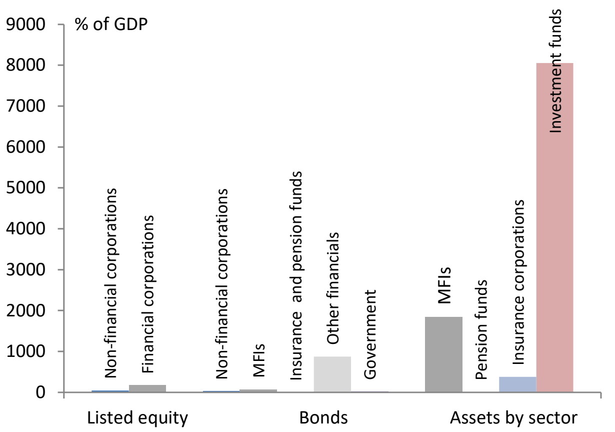


Source: ECB

Structure of the capital markets and size of the financial sector

Luxembourg is home to the largest investment fund sector in the EU, benefiting from its position as the leading European and an important global fund domicile. In 2023, investment funds domiciled in Luxembourg managed assets equivalent to 8 055% of Luxembourg's GDP. The second most significant sector in Luxembourg is the assets held by monetary financial institutions, with international banks playing a crucial role in supporting the leading European investment fund industry through services such as custody, fiduciary, and post-trading services. In addition to its dominance in the investment fund industry, Luxembourg has one of the largest secondary markets for bonds globally, positioning itself as the preferred listing destination for bonds issued by public international bodies, sovereigns, and public agencies. The volume of listed bonds in Luxembourg reached an amount equivalent to 988% of GDP in 2023. In contrast, Luxembourg's stock exchange for equities is relatively small by EU standards, with only 18 listed companies, ranking as the 8th largest in the EU by market capitalization and with total shares amounting to 215% of GDP by 2023.

Graph A5.3: **Capital markets and financial intermediaries**



Source: ECB, EIOPA, AMECO

Resilience of the banking sector

The Luxembourg banking sector remains resilient despite modest economic growth and rising credit risks. Weak economic environment remains the key challenge for Luxembourg domestic banks, following a GDP contraction in 2023 and modest real GDP growth in Luxembourg in 2024. Below-average growth, compounded by adverse financing conditions and geopolitical uncertainty triggers concerns despite high capital buffers. So far Luxembourg banks' solvency remains relatively robust, with the Common Equity Tier 1 (CET1) ratio, reflecting high-quality loss-absorbing capital, increasing to 18.4% in 2024, 1.8% higher than the EU average. However, total capital adequacy is slightly below the EU average, standing at 19.7% compared to 20.1% in the EU. According to the IMF's 2023 stress testing exercise conducted under the Financial Sector Assessment Program ([105]), Luxembourg's banking system would remain well-capitalised even under an adverse scenario, despite a significant decline in the system-wide capital ratio. The resilience largely reflects strong initial capital buffers, which provide a substantial cushion against shocks, notwithstanding the heterogeneity across banks. In the stress scenario, the capital of only four banks (representing less than 10% of total sector assets) would fall below

([105]) IMF "Luxembourg: Financial Sector Assessment Program—Technical Note on Stress Testing and Systemic Risk Analysis", June 24, 2024.

the CET1 hurdle rate of 8%, requiring moderate recapitalisation equivalent to 0.6% of GDP. According to the latest EBA MREL dashboard, Luxembourg banks' aggregate Minimum Requirement for Own Funds and Eligible Liabilities (MREL) stood at 36.8% of risk-weighted assets (RWA) in June 2024—2.3 percentage points above the EU average (34.5%) and significantly above the binding requirement of 25.8%. These high MREL levels reflect the sector's solid loss-absorbing and recapitalisation capacity. In parallel, the countercyclical capital buffer (CCyB) continues to be set at 0.5% to further strengthen resilience against emerging cyclical risks.

Despite signs of gradual deterioration, banks' asset quality remains relatively sound. Non-performing loans (NPLs) have gradually increased from 0.6% in 2021 to 0.9% in 2024, although they remain well below the EU average of 1.9%. The NPL ratio has been rising steadily over the past five years from the level of 0.6% in 2021, and pockets of vulnerability are emerging. Notably, NPLs on loans to non-financial corporations (NFCs) reached 3.3%, approaching the EU average of 3.5% while the five largest banks directly supervised under the Single Supervisory Mechanism reported an elevated overall NPL ratio of 3.1%, above the EU average for Significant Institutions (Sis) (2.3%). The upward pressure on NPLs could persist in the coming quarters, amid growing signs of stress in the corporate sector. In Q3-2024, the number of corporate bankruptcies surged by 71% year-on-year, reaching 273 cases, according to STATEC's "Bankruptcies and Liquidations" Dashboard" ([106]). Even when excluding holding companies and investment funds, bankruptcies rose by 60%, signalling mounting difficulties in the real economy. The construction sector was particularly affected, with 147 insolvencies (+24% year-on-year). If this trend continues, it could put additional pressure on banks' asset quality, particularly in sectors with high credit concentration such as construction.

Luxembourg banks maintain robust liquidity positions and exhibit a strong alignment between assets and liabilities. Both SIs and Less Significant Institutions (LSIs) in Luxembourg comfortably exceed the regulatory minimums for the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR), with no bank facing an individual shortfall. As of Q3-2024, the aggregate LCR for SIs stood at 178.2%, significantly above the EU average of 158.5%, and at 191.7% for LSIs, below the EU average of 216.8%. Although above the EU average of 89.6%, the loan-to-deposit ratio remains well within acceptable bounds at 98.3% for Q3-2024, and well below its peak of 129.6% in Q2-2018. Regarding the NSFR, which assesses whether banks' funding is sufficiently stable to cover its liquidity needs over a longer-term horizon, Luxembourg banks are also in a strong position. The aggregate NSFR stands at 128.1%, with 136.1% for SIs and 166.8% for LSIs, both comfortably above the EU average and the minimum legal requirements.

Resilience of the non-bank financial intermediaries

Risks stemming from Luxembourg's large and diverse investment fund sector primarily relate to liquidity mismatches and leverage, which can amplify market stress and lead to disorderly asset sales. The presence of open-ended funds offering daily redemptions, despite holding relatively illiquid assets, may lead to potential challenges during periods of market volatility. Moreover, given the sector's large size and strong interconnectedness with global financial markets, stress in Luxembourg funds could, if not mitigated, have significant spillover effects across the EU financial system. A mitigating factor is the broader availability and use of liquidity management tools (LMTs) for alternative investment funds (AIFs), including joint guidance issued by Ireland and the CSSF ([107]), which has proven effective in recent stress episodes—such as during the gilt market turmoil

Luxembourg's insurance sector remains solid and highly internationalised, with strong capital buffers. As of 2024, the country hosts 43 non-life insurers, 33 life insurers and 195 reinsurers, all supervised by the Commissariat aux Assurances. Both the life and non-life segments

([106])STATEC's "Bankruptcies and Liquidations" Dashboard, published on 10 Ocotber 2024.

([107])CSSF communication on Liability Driven Investment Funds, 3 April 2023 have seen some consolidation in recent years, with most insurers operating as subsidiaries of foreign groups. Many of them serve clients across the EU, and over 90% of gross premiums stem from foreign policyholders. The sector remains well capitalised. At end-2023, the median solvency capital requirement (SCR) coverage stood at 178% for life insurers and 199% for non-life insurers, although the latter has declined slightly since 2020. Reinsurers traditionally maintain even higher capital buffers, albeit with more heterogeneity across firms. The investment strategy of insurers reflects a prudent stance, especially among non-life companies, and is shaped by the strong presence of unit-linked life insurance products. In 2023, 46% of insurers' assets were held in UCITS, followed by corporate bonds (17%). In recent years, life insurers have gradually shifted their portfolios away from bonds towards investment funds. According to EIOPA's protection gap assessment against climate risks, Luxembourg faces medium to high risks of windstorms and flooding, but the insurance protection gap remains limited.

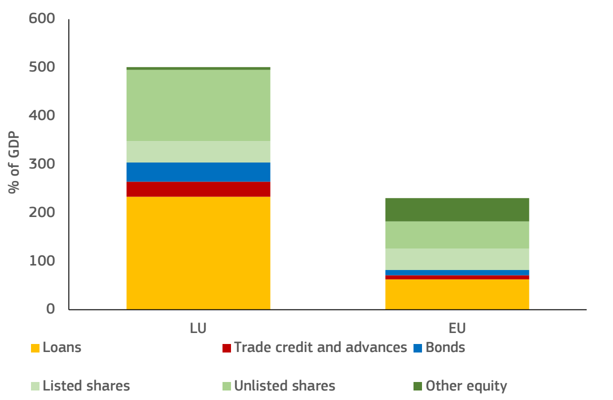
Sources of business funding and the role of banks

Luxembourg is an important financial centre with an internationally oriented banking sector and a large fund management industry. Luxembourg has long played a major role in international banking and finance. It has grown to the largest fund domicile in the EU and the second largest in the world. Luxembourg's economy is therefore dominated by its financial sector, which accounts for 23% of the country's gross value added.

Many multinational non-financial enterprises use Luxembourg as their corporate finance hub. Large non-financial companies (NFCs) make use of Luxembourg's financial centre by setting up a subsidiary that issues debt or takes out bank loans in Luxembourg for their global operations. This explains the large balance sheet of the NFC sector of five times GDP, and the larger share of bond financing of 7.9% of the aggregate balance sheet versus the EU average of 4.7%. Bank loans also play a significant role, with 46.6% of the balance sheet vs a 27.2% EU average. Listed shares represent only 8.9% of funding sources, compared to the EU average of 19.1% (see Graph A5.4)

Luxembourg's companies have good access to external finance but also rely on internal funding. According to the 2024 EIB Investment Survey, a large share of investments by companies, namely 87%, was financed internally or from intra-group sources, compared to an EU average of 75%. This is likely explained by the large number of multinational companies in Luxembourg. At the same time, 82% of Luxembourg's firms believed that their investment activities over the previous three years were about the right amount, slightly above the EU average of 80%. A share of 13% of firms said they invested too little, suggesting that there could be a financing gap relative to investment demand. According to the same survey, the share of finance-constrained firms is around 10% (above the EU average of around 7%). The most important reason cited by these firms is the high cost of bank credit. But, in point of fact, Luxembourg's interest rates are among the lowest in the EU. The interest rate for corporate loans of up to EUR 1 million stood at 4.28% in November 2024, which was the lowest in the euro area. In the last SAFE Access to Finance Survey ([108]), the share of SMEs reporting that access to finance was a constraint for them was 6%, which is in line with the EU average.

Graph A5.4: **Composition of NFC funding as % of GDP**



(1) The sum of NFC liabilities only reflects the total for the NFC liabilities considered. Reference period2023.
Source: Eurostat and FISMA E2 calculations

([108]) ECB SAFE Access to Finance Survey, Q4-2024.

Only a small number of Luxembourg's banks are involved in financing the domestic economy. Although there are 115 banks in Luxembourg, fewer than 10 of them are actually involved in financing the national economy. These are typically the domestic banks. The international banks cater to the needs of the Europe-leading investment fund industry by providing custody, fiduciary and post-trading services. This also explains to a large extent the fact that Luxembourg banks rely much more on fees and commissions than on net interest income, compared to their EU peers. Luxembourg has the second highest share of fee and commission income in the EU (after Lithuania), which accounts for 35% of banks' revenues, compared to the EU average of 27%. Overall, the banking sector remains resilient, with good liquidity and capital positions, but profitability has not been in the top tier (see Table A5.1).

Luxembourg's role as an international financial centre is reflected in the banks' lending portfolio. Most of Luxembourg's bank loans are extended to companies domiciled abroad. Of the total outstanding loans of EUR 773 bn in June 2024, only 34.4% was lent to domestic customers, while 45% was lent to other euro area countries and the balance was lent outside the euro area. Also, only a fraction was actually lent to the 'real' economy: most outstanding credit, about 76.5%, was to other banks and financial institutions. Just 13.6%, or EUR 104.7 bn, was lent to NFCs, domestic and abroad, and EUR 73.3 bn, or 9.5%, to households. Therefore only 9.4% of Luxembourg's bank lending is for the non-financial, domestic, private sector.

The rise in interest rates towards the end of 2022 led to a slowdown in lending and worsening of asset quality. On the whole, Luxembourg's banks have always had outstanding asset quality. The aggregate non-performing loan (NPL) ratio for the entire banking sector stood at 0.9% in June 2024 which is the second lowest in the EU. This is largely thanks to the international banks, which, by the nature of their business, have a very low NPL ratio. For the subgroup of domestic banks, which are more exposed to the local economy, the NPL ratio for loans to households stood at 2.5% and the NPL ratio for NFCs stood at 6.4% in June 2024, both above the EU average. This is after a significant deterioration towards the end of 2023, related partly to difficulties in the commercial real estate sector.

Lending to businesses slowed as interest rates started to rise but has since stabilised. Lending to NFCs slowed slightly in nominal terms at the end of 2022, as interest rates were rising at the same time. The outstanding amount of bank loans to domestic NFCs peaked at EUR 30.6 bn in September 2022 and then shrank to EUR 24.6 bn in November 2024. As these are nominal figures, and given elevated inflation during that time, it means that outstanding credit was declining in real terms, during the time when interest rates were rising and banks were tightening their credit standards. Lending to SMEs also slowed, with an outstanding amount of EUR 7.3 bn at the end of 2023. SMEs report that slowing economic growth and the uncertainty of the macro environment has made them more hesitant to invest.

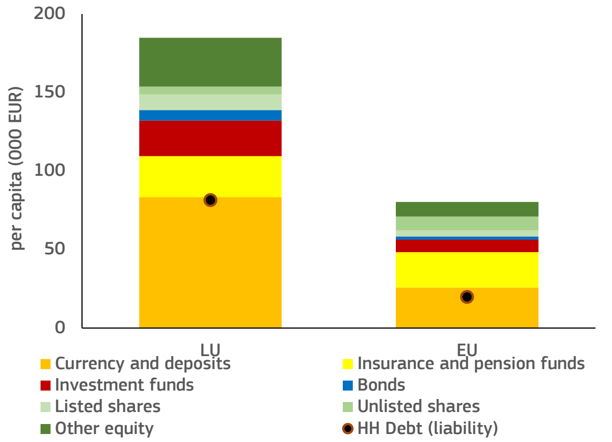
Lending to households has been driven by a buoyant housing market in recent years. House prices started to recede after peaking in the third quarter of 2023, as the housing market slowed down. Meanwhile, outstanding credit to domestic households remained stable. In this segment, NPLs are still very low. For households, the annual credit growth rate for adjusted loans gradually edged up from 4.1% in April 2024 to 5.1% in September 2024.

Capital markets and the participation of retail investors

Luxembourg's stock exchange is a leading marketplace for the listing of international debt securities. Since the introduction of Eurobonds in the 1960s, Luxembourg has grown to become an important trading place for international debt securities, in particular for bonds issued by public international bodies, sovereigns and public agencies. The exchange for equities is rather small, with a total number of 18 listed companies, making it the eighth largest by market capitalisation in the EU. The stock exchange's Euro MTF market is designed to be more accessible for SMEs, however only a few SMEs have used it to list their stocks. The Euro MTF is primarily used for debt securities. Still, the share of SMEs using equity as a financing tool is quite large, as 30% of SMEs indicated in the 2024 SAFE survey that equity was relevant for them, compared to an EU average of 12.0% (109), but this, of course, does not refer only to listed equities. There were 28 listed companies domiciled in Luxembourg in 2022 (110).

Luxembourg's households hold a substantial share of their financial wealth in marketable securities. Average financial household wealth in Luxembourg is estimated at EUR 185 800, which is the among highest in the EU. On the other hand, Luxembourg's households also have high debt levels, but these are matched by correspondingly larger cash holdings. In fact, most of their gross wealth (45%) is in deposits. Looking at net wealth only, after debt has been deducted, the share they hold in marketable securities (listed and unlisted shares, bonds and investment funds) stands at 42.8%, slightly above the EU average of 37.7%. They report less enthusiasm for insurance and pension funds, with 25.3% held in these asset classes, compared to an EU average of 36.9%. This indicates that households prefer direct participation in financial markets rather than relying on intermediaries like pension providers and insurance companies.

Graph A5.5: **Composition of household financial assets per capita and as % of GDP**



(1) The sum of household assets only reflects the total for the HH assets considered. Reference period 2023.
Source: Eurostat and FISMA E2 calculations

(109)Data and surveys - SAFE - European Commission, 2024, Results by country, T27.

(110)World Bank, Global Development Indicators.

The role of domestic institutional investors

Luxembourg is the largest domicile for investment funds in the EU. In December 2024 investment funds domiciled in Luxembourg held EUR 5.8 trillion of assets under management (AUM), which represents a steady growth from EUR 1.4 tn assets under management in 2008. Global asset management groups with fund ranges in Luxembourg make use of delegation arrangements as permitted under the relevant EU legal framework, where asset management functions are handled from the groups' main asset management centres, which may not be located in Luxembourg. Looking at the asset exposures for funds broken down by investment, the largest funds are equity funds, with EUR 1 858 bn, the second group are fixed income funds with EUR 1 293 bn, and the third are mixed funds with EUR 1 016 bn. Funds of funds hold EUR 364 bn in assets and real estate funds EUR 134 bn. This makes Luxembourg the second largest fund domicile for real estate funds in the EU, covering 4% of the EU's commercial real estate market.

Luxembourg is an important hub for international insurance businesses that invest their reserves globally. Most Luxembourg insurers are subsidiaries of foreign groups. Many of these insurers use Luxembourg as their base from where they cater to their clients across the EU. In fact, over 90% of gross premiums underwritten by Luxembourg insurers in 2024 stemmed from foreign policyholders. The sector is therefore large compared to the size of the country and its investments are equivalent to 240% of GDP vs 55.3% of GDP in the EU. Investment funds accounted for 43.3% of insurers' portfolio. Of these, 33.5% were equity funds and a notable 2.7% were private equity funds. The rest of the portfolio is split across government bonds (9.4% vs 19.0% in the EEA as a whole) and corporate bonds (19.7%), equities (11.5%), and 8.3% held in cash and deposits (111).

Luxembourg's public pension scheme works on a pay-as-you-go basis. At end-2023 it had reserves of EUR 26.2 billion. The assets of the scheme are managed by the Fonds de

(111)Source: EIOPA Insurance Statistics.

Compensation. This fund was created in 2004 in order for pensions to benefit from the growth in financial markets. It invests in a mix of equities, fixed income, and alternative investments. The reserves are not intended as a capital stock from which pensions are to be paid in the future. It is merely fed by the difference arising from contributions and disbursements ([112]). To further develop capital markets and make the pension system more sustainable in light of demographic challenges, the pay-as-you-go system could be progressively supplemented with a funded system, which would invest contributions into a highly diversified financial portfolio. Public pensions are complemented by privately run occupational pension schemes that invest mainly in bonds and mutual funds.

Luxembourg's pension funds industry is relatively small and domestically oriented. With 12 registered pension funds and total investments of EUR 1.2 bn, the sector represented a 0.05% share of assets of the total EU pension funds sector in Q2-2024. A share of 28.7% of their assets are invested in bonds, 0.9% in equities and a sizeable 45.4% in investment funds. Of these, 52.1% are allocated to equity funds, and 2.0% to private equity funds.

A set of alternative investment funds that have come into focus recently as a growing group are private credit funds. Private credit funds belong to the non-bank financial sector. A characteristic feature of this kind of financial intermediation is the long chain of institutions involved in channelling funds from the ultimate creditors to the ultimate borrowers, which constitutes a network of leveraged and wholesale-funded off-balance sheet vehicles.

The participation of domestic institutional investors in providing funding for start-ups and venture capital investors is small. A 2024 paper by the think tank CEPS showed that pension funds in Luxembourg accounted for 13% of private equity and venture capital funds raised annually over 2007-2023, which falls short of the 15% EU average and markedly below the 20% shares for Nordic Member-States ([113]). Following the announcement of the "10 Points of Action for Start-ups" plan in March 2025, the government will assess the opportunity and the most relevant and innovative financial programs to channel further investment to venture capital help direct more financial resources to high-potential businesses. The depth of available venture and growth capital.

Luxembourg offers some attractive start-up support programmes for young innovative businesses. Luxembourg benefits from its role as a financial centre and is able to offer some attractive start-up-support programmes. The start-up acceleration programme Fit4Start targets digital ventures with innovative technologies at the core of their business: the internet, blockchain, big data, artificial intelligence, machine learning, robotics, cyber, telecom, open-source technology and/or emerging technologies. The national promotional bank, Société Nationale de Crédit et d'Investissement (SNCI) is a public-law banking institution specialised in medium- and long-term financing of Luxembourg-based companies. SNCI's financing instruments are investments in fixed assets, innovations and exports. SNCI also grants start-up/transmission loans to newly incorporated or inherited SMEs. It may also finance investments of domestic companies abroad. SNCI may finance equity operations either directly, by taking equity positions or granting strategic loans, or through affiliated financing companies.

There are also funds that invest equity into start-ups, such as the Luxembourg Future Fund and the Digital Tech Fund. They invest directly or indirectly in venture capital funds and SMEs to foster the sustainable development of Luxembourg's strategic sectors. Luxembourg Future Fund 1 is a EUR 150 million fund that aims to stimulate the diversification and sustainable development of the Luxembourg economy by attracting venture capital fund managers and early- to later-stage innovative businesses to Luxembourg. It was set up by the European Investment Fund (EIF) and SNCI and combines a EUR 120 million contribution from SNCI with EUR 30 million from the EIF (See the Innovation to Business Annex). In March 2023, the Ministry of Finance, the Ministry of the Economy, the SNCI and the EIF launched the Luxembourg Future Fund 2, with a total capital of EUR 200 million, building on the experience of the first edition. In addition, in March 2025 the government announced that the National Credit and Investment Institution will

([112])https://delano.lu/article/the-fonds-de-compensation-will-not-save-pensions-alain-reuter

([113])Source: Closing the gaping hole in the capital market for EU start-ups – the role of pension funds – CEPS.

devote EUR 300 million over a five-year period to financing start-ups and innovation in Luxembourg

Financing the green transition

Luxembourg performs well on several sustainable development goal indicators, although challenges remain in certain areas. Luxembourg launched a roadmap for sustainable finance in 2018, with the aim of integrating sustainable finance into all areas of Luxembourg's financial centre. In April 2024, the Luxembourgish government introduced a comprehensive 10-point action plan for sustainable finance. This strategic roadmap outlines priorities for enhancing Luxembourg's role as a sustainable finance hub and mobilising private capital for sustainable initiatives. Key objectives include fostering innovation in impact investments, promoting digitalisation within sustainable finance, and broadening the scope of sustainable investments to encompass biodiversity, gender finance and social governance. The plan underscores Luxembourg's commitment to leveraging its financial expertise to drive global sustainability efforts towards achieving the UN Sustainable Development Goals by 2030 and transition to net-zero by 2050.

Luxembourg is a leading hub for green finance within the EU, a status reaffirmed by its top position in the Global Green Finance Index. The latest rankings, published in October 2024, placed Luxembourg eighth out of 97 global financial centres, marking a small downgrade from its fifth place in 2023. Luxembourg's economy has below average emissions intensity, and estimated investment needs of EUR 10.6 bn for the green transition ([114]). Luxembourg is also home to the leading sustainable finance platform, the Luxembourg Green Exchange (LGX), which lists half of the world's green bonds ([115]).

Financial literacy

Financial literacy is above the EU average, but more could be done to improve financial education in wider parts of the population. Luxembourg scores above the EU average in financial literacy with 33% of the population achieving a high score in the Eurobarometer financial knowledge survey, compared to an EU average of 26%. Still, the same share as in the EU as a whole, namely 24%, have a low score. As regards the use of digital financial services, 85% of the population report being comfortable or somewhat comfortable with the use of digital financial services, which is above the EU average but not among the highest ranking group ([116]). This leads to an overall financial literacy indicator of 49.0 vs an EU average score of 45.5 ([117]). In 2017, the Financial Consumer Protection Committee, chaired by the Financial Sector Supervisory Commission (CSSF) developed a national strategy for financial education targeting the entire population. It includes public awareness campaigns, educational initiatives, workshops and seminars, online resources, and collaborations and partnerships. Importantly, it integrates financial education into the school curriculum

([114])European Commission Climate Action Progress Report, 2023

([115])Source: AFME CMU Key Performance Indicators, Seventh Edition, November 2024.

([116])Source: Monitoring the level of financial literacy in the EU - July 2023 - Eurobarometer survey.

([117])CMU Dashboard, August 2023.

Table A5.1: **Financial Indicators**

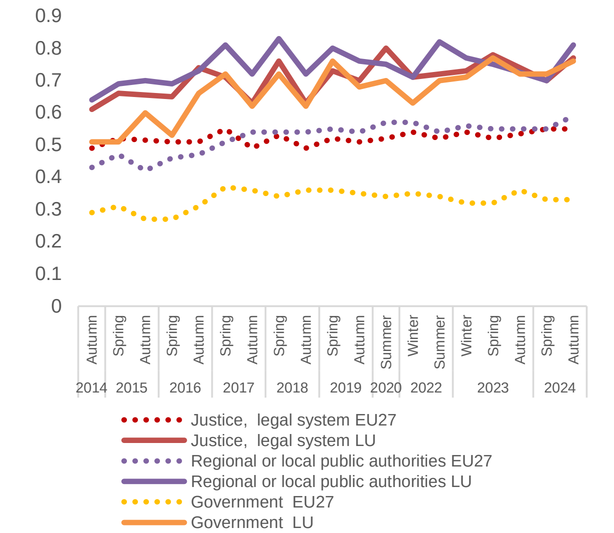
		2017	2018	2019	2020	2021	2022	2023	2024-Q3	EU
Banking sector	Total assets of MFIs (% of GDP)	1784.7	1787.8	1861.8	1935.6	1913.7	1772.2	1847.3	1823.6	248.4
	Common Equity Tier 1 ratio	21.3	20.3	18.8	19.5	18.3	17.6	18.0	18.4	16.6
	Total capital adequacy ratio	22.5	21.4	19.7	21.7	20.5	18.8	19.5	19.7	20.1
	Overall NPL ratio (% of all loans)	0.7	0.8	0.6	0.7	0.6	0.7	0.8	0.9	1.9
	NPL (% loans to NFC-Non financial corporations)	1.7	2.3	1.7	2.4	1.9	2.2	2.7	3.3	3.5
	NPL (% loans to HH-Households)	2.0	1.9	1.4	1.5	1.4	1.3	2.1	2.3	2.2
	NPL-Non performing loans coverage ratio	37.3	36.8	35.1	31.4	34.0	37.2	31.8	31.6	42.1
	Return on Equity[1]	5.7	5.5	5.2	4.4	5.5	5.2	8.3	9.4	10.0
	Loans to NFCs (% of GDP)	41.0	43.8	45.0	43.8	38.8	36.3	32.5	29.4	30.0
	Loans to HHs (% of GDP)	56.6	58.6	60.7	63.6	61.5	60.3	58.3	55.8	44.5
	NFC credit annual % growth	13.8	8.2	6.5	1.0	-1.2	-0.3	-8.3	-6.8	0.8
	HH credit annual % growth	7.2	7.0	7.4	8.3	8.5	5.1	-1.2	0.4	0.7
Non-banks sector	Stock market capitalisation (% of GDP)	251.2	231.6	236.0	288.6	291.1	186.8	215.8	231.0	69.3
	Initial public offerings (% of GDP)	0.20	5.77	1.52	2.70	20.66	0.25	0.11	-	0.05
	Market funding ratio	84.2	83.2	82.1	82.1	81.6	80.8	80.5	-	49.6
	Private equity (% of GDP)	0.42	0.27	0.32	0.37	0.09	0.52	0.26	-	0.41
	Venture capital (% of GDP)	0.02	0.02	0.02	0.06	0.04	0.28	0.04	-	0.05
	Financial literacy (composite)	-	-	-	-	-	-	49.0	-	45.5
	Bonds (as % of HH financial assets)	4.3	3.8	3.8	2.8	2.5	3.0	3.6	-	2.7
	Listed shares (as % of HH financial assets)	4.7	4.5	4.8	5.2	6.0	5.2	5.5	-	4.8
	Investment funds (as % of HH financial assets)	11.8	10.7	11.7	12.5	14.3	12.4	12.2	-	10.0
	Insurance/pension funds (as % of HH financial assets)	14.4	14.9	15.4	14.9	14.9	13.4	14.1	-	27.8
	Total assets of all insurers (% of GDP)	375.9	370.8	441.9	445.8	428.8	368.9	379.8	384.6	54.8
	Pension funds assets (% of GDP)	-	-	3.6	3.6	3.4	2.7	2.4	2.4	23.4

1-3	4-10	11-17	18-24	25-27	Colours indicate performance ranking among 27 EU Member States.

(1) Annualized data
Credit growth and pension funds EU data refers to the EA average.
Source: ECB, ESTAT, EIOPA, CMU Dashboard, AMECO

Luxembourg's institutional framework influences its competitiveness. Public institutions in Luxembourg enjoy a high level of trust with improvements in transparency and accountability, and in the provision of online public services. However, the country could strengthen regulatory practices and further reduce administrative burdens. Although Luxembourg's civil service is performing well, improvements could be made in recruitment and in the learning and skills development of civil servants. The justice system is performing efficiently, but its digitalisation remains slow.

Graph A6.1: **Trust in justice, regional / local authorities and in government**



(1) EU27 from 2019; EU28 before
Source: Standard Eurobarometer surveys

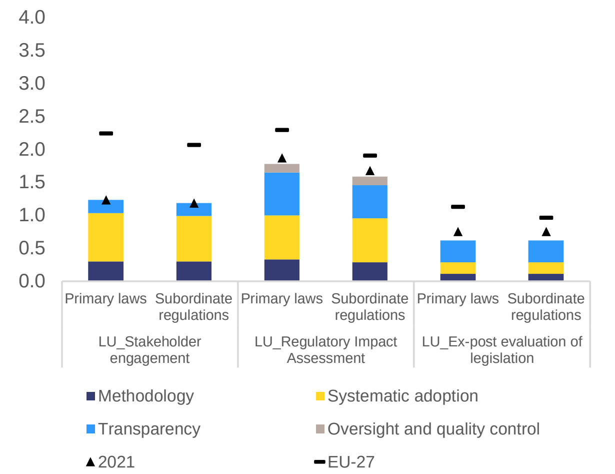
Public perceptions

Trust in public institutions remains above the EU average (Graph A4.1). Less bureaucracy, more transparency about decisions and the use of public money and more communication with citizens can help further increase citizens' trust with Luxembourg's public administration ([118]). The perceived quality of government has also improved and remains above the EU average ([119]).

Quality of legislation and regulatory simplification

Performance in developing and evaluating legislation remains below the EU average and has deteriorated slightly over 2021-2024. Performance is stronger for ex-ante impact assessments and stakeholder engagement than for ex post evaluation of legislation. The use of regulatory tools like public consultation practices, ex-ante impact assessment and reviews of existing regulations is broadly similar for primary laws and subordinate regulations. However, performance remains in all three aspects visibly below the EU average, due to relatively underdeveloped methodology, oversight and quality control mechanisms (Graph A6.2).

Graph A6.2: **Indicators of Regulatory Policy and Governance (iREG)**



Source: OECD (2025), Regulatory Policy Outlook 2025 and Better Regulation across the European Union 2025 (forthcoming).

There is scope to further strengthen its mechanisms for simplifying regulations. For example, when developing new primary laws, regulators are not required to identify substantive compliance costs. Ex post evaluations of legislation do not have to cover substantive compliance costs and an assessment or administrative burdens either. Moreover, periodic ex post evaluations of existing regulations are not mandatory, nor has the government conducted recently in-depth reviews of specific regulatory areas and public stocktakes of legislation (Table A4.1). The latest efforts to simplify regulation include the '*Zesumme Vereinfachen: pour des*

([118])Understanding Europeans' views on reform needs - April 2023 - - Eurobarometer survey, Country Fact Sheet.

([119])Inforegio - European Quality of Government Index

Table A6.1: **Luxembourg. Selected indicators on administrative burden reduction and simplification**

When developing new legislation, regulators are required to ...	**Ex ante impact assessment of legislation**		**Ex post evaluation of legislation**	
	Identify and assess the impacts of the baseline or 'do nothing' option.	○	Is required to consider the consistency of regulations and address areas of duplication.	○
	Identify and assess the impacts of alternative non-regulatory options.	●	Is required to contain an assessment of administrative burdens.	○
	Quantify administrative burdens of new regulations.	●	Is required to contain an assessment of substantive compliance costs.	○
	Quantify substantial costs of compliance of new regulations.	●	Compares the impact of the existing regulation to alternative options.	◐
	Assess macroeconomic costs of new regulations.	○	Periodic ex post evaluation of existing regulations is mandatory.	○
	Assess the level of compliance.	○	Government uses stock-flow linkage rules when introducing new regulations (e.g., one-in one-out).	○
	Identify and assess potential enforcement mechanisms.	○	A standing body has published an in-depth review of specific regulatory areas in the last 3 years.	●
			In the last 5 years, public stocktakes have invited businesses and citizens to assess the effectiveness, efficiency, and burdens of legislation.	○

● Yes / For all primary laws ◕ For major primary laws ◐ For some primary laws ○ No / Never

(1) This table presents a subset of iREG indicators focusing on regulatory costs. The indicators refer to primary legislation.
Source: OECD (2025), Regulatory Policy Outlook 2025 [https://doi.org/10.1787/56b60e39-en] and Better Regulation across the European Union 2025 (forthcoming).

services publics qui facilitent votre quotidien' platform ([120]). Its aim is to simplify interactions with citizens and companies, and foster further administrative improvement in a participative and co-creative way.

The OECD product market regulation indicators show that Luxembourg's licensing system is slightly more burdensome than the EU average and could be further aligned with best practices. Although the government keeps an up-to-date inventory of all permits and licences required/issued to businesses by public bodies, there is no requirement for it to regularly review the inventory and assess whether such licences and permits are still required or should be withdrawn. Moreover, public bodies at central/federal level are not required to observe the once-only principle (see also Annex 4).

Social dialogue

Tripartite social dialogue is highly institutionalised in Luxembourg. Social dialogue takes place in a number of permanent bodies such as the Economic Committee, the Economic and Social Council, the Tripartite Coordination Committee (which is also complemented by sectoral tripartite committees) and the Standing Committee on Labour and Employment. All members of a given socio-professional category are compulsorily affiliated to one of five professional Chambers. These Chambers are associated with the adoption of laws and regulations and play an important role in the legislative field through their opinions. In addition, the ESF+ supports capacity building of social partners, allocating EUR 126 500 in the 2021–2027 programming period ([121]).

([120])https://gouvernement.lu/fr/dossiers.gouv2024_mindigital+fr+dossiers+2022+zesumme-vereinfachen.html

([121])For an analysis of the involvement of Luxembourg's social partners at national level in the European Semester and the Recovery and Resilience Facility, see Eurofound (2025), National-level social governance of the European Semester and the Recovery and Resilience Facility.

Table A6.2: **Digital Decade targets monitored through the Digital Economy and Society Index**

		Luxembourg			EU-27	Digital Decade target by 2030
		2022	2023	2024	2024	EU-27
Digitalisation of public services						
1	**Digital public services for citizens**	**93**	**95**	**95**	**79**	**100**
	Score (0 to 100)	2021	2022	2023	2023	2030
2	**Digital public services for businesses**	**97**	**97**	**97**	**85**	**100**
	Score (0 to 100)	2021	2022	2023	2023	2030
3	**Access to e-health records**	**na**	**67**	**76**	**79**	**100**
	Score (0 to 100)	2021	2022	2023	2023	2030

Source: State of the Digital Decade report 2024r

Challenges persist in terms of representation, especially for smaller firms. There has been a strong decline in unionisation over the past 15 years: union density among resident workers declined from 41% in 2010 to 28% in 2019 ([122]). Micro firms with fewer than 10 employees have lower affiliation rates within employers' organisations, although they represent 87% of Luxembourgish enterprises. Collective agreement coverage rate for small firms (10-49 employees) is only 30%, compared to the overall coverage rate of 59% ([123]).

Digital public services

Luxembourg has made substantial progress in the provision of online public services (Table A6.2). On both public services for citizens (94.8) and businesses (96.7), Luxembourg ranks well above the EU average. Luxembourg have also made improvement in the access to e-health records in the past years. The country had an overall e-health maturity score of 76.1 in 2023, which is slightly under the EU average (79.1).

The share of e-government users is also very high. 94.7% of internet users in Luxembourg engage with digital government services (EU 79.4%) and 75.3% had used existing eID systems to access them (EU 41.1%) ([124]). However, Luxembourg has not yet set up and notified eID schemes for legal persons under the eIDAS Regulation ([125]). This means that Luxembourgish businesses cannot authenticate themselves to access public services provided by other Member States, including those enabled by the Once-Only Technical System, part of the EU Single Digital Gateway ([126]).

Luxembourg is finalising the necessary infrastructure for seamless, automated exchange of authentic documents and data across the EU. There are still additional steps to be taken by Luxembourg to become technically ready to connect to the Once-Only Technical System ([127]).

The digital transformation's priorities focus on advancing administrative reform, promoting digital inclusion, and integrating new technologies ([128]). Electronic document and case management in the public administration is the largest funding item under Luxembourg's recovery and resilience plan (EUR 22.2 million). The recovery and resilience plan also includes EUR 12.7 million of investment in modernising the public administration and digitalisation of public services to improve accessibility for individuals

([122])https://statistiques.public.lu/en/actualites/population/travail/2022/03/20220314.html?utm.

([123])The latest national data about collective bargaining coverage were published in 2013 and refer to 2010. See Statistiques.lu.

([124])European Commission. Digital Decade 2024: Country reports

([125])European Commission, eIDAS Dashboard.

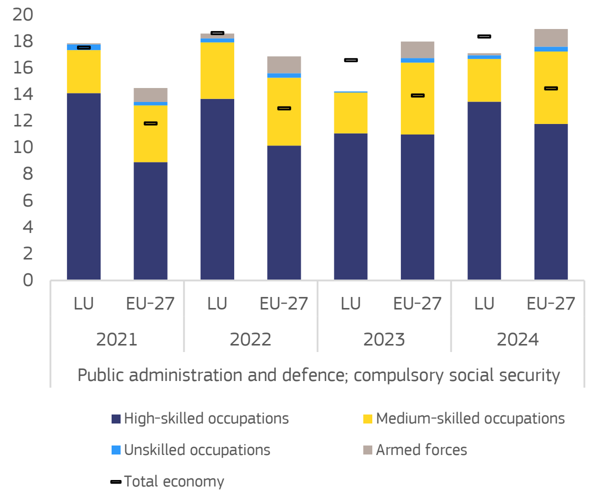
([126])European Commission, The Once Only Principle System: A breakthrough for the EU's Digital Single Market.

([127])European Commission, The Once Only Principle System: A breakthrough for the EU's Digital Single Market.

([128])Government of Luxembourg (n.d.), *Ministry of Digitalisation*..

and businesses. As part of its e-government strategy, Luxembourg intends to make legislation more digitally user-friendly. Continued efforts are needed to apply the once-only principle to the public sector to address the challenges of an overwhelming amount of data and potential interoperability issues. Measures like awareness-raising measures and training for SMEs on adopting AI and data analytics could help to SMEs pursue digital transformation in order to boost growth and competitiveness.

Graph A6.3: **Participation rate of 25-64 year olds in adult learning (%) by occupation**



Source: European Commission, based on the Labour Force Survey

Civil service

Luxembourg has been implementing broad reforms of its civil service to meet the pressing challenges it faces. In Luxembourg, civil servants are generally younger than the EU average, but the share of staff with higher education is below the EU average [129]. Additionally, the participation rate of public administration employees in lifelong learning stood below that of the EU and the total economy in 2023 and 2024 (Graph A6.3). The proportion of public administration workers who frequently work from home is also below the EU average. To enhance its appeal as an employer [130], the government revamped the GovJobs [131] website in early 2024 to centralize job vacancies and application procedures. The GovCampus programme [132], focuses on continuous learning by offering digital solutions for managing training and skills development. This initiative aims to provide a modern, technology-based learning hub. Additionally, a new scheme enables public employees to use coworking spaces, which is expected to boost motivation among civil servants.

Integrity

Companies consider corruption to be a problem when doing business, while enforcement of foreign bribery could be improved. In Luxembourg, 46% of companies consider that corruption is widespread (EU average 64%), while 40% consider that corruption is a problem when doing business (EU average 36%) [133]. Moreover, 52% of companies believe that people and businesses caught for bribing a senior official are appropriately punished (EU average 31%) [134]. There are plans to increase recruitment to the police force and to prosecution services dealing with economic and financial crime [135]. An additional proposal to create a reserve pool of magistrates is still under discussion [136]. The OECD has expressed concerns over the weak enforcement of the OECD Anti-Bribery Convention in Luxembourg and has called on Luxembourg to better identify foreign bribery risks to which companies are exposed and to take a more proactive approach to the investigation and prosecution of bribery of foreign public officials [137]. Furthermore, public procurement continues to be an area at high risk of corruption in Luxembourg [138]. 34% of companies (EU average 27%) think that corruption has prevented

(129) Eurostat. Labour Force Survey.

(130) Government of Luxembourg (n.d.), *Ministry of Civil Service* (accessed 15/12/2024)

(131) https://govjobs.public.lu/fr.html

(132) https://govjobs.public.lu/fr.html.

(133) Flash Eurobarometer 543 on businesses' attitudes towards corruption in the EU (2024).

(134) Ibid.

(135) See Bill No 8299A, adopted on 11 July 2024

(136) Bill No 8299B

(137) See the 2024 country-specific chapter for Luxembourg of the Rule of Law Report, p. 8.

(138) Ibid., pp. 15-16.

them from winning a public tender or a public procurement contract in practice in the last three years ([139]).

Luxembourg has implemented a transparency register for lobbyists, but the information included could be expanded. As with most Member States, Luxembourg has a transparency lobby register. Moreover, significant progress was made in increasing the transparency of lobbying and of interactions between parliamentarians and lobbyists following a revision of the Code of Conduct for Parliamentarians. However, the register – which is part of the framework of the OECD 2024 Recommendation of the Council on Transparency and Integrity in Lobbying and Influence – does not cover additional important information such as the policy or piece of legislation targeted by the lobbying ([140]). Strengthening the legislation can help ensure a level playing field in companies' access to decision-makers.

Justice

The courts are continuing to perform efficiently, and the clearance rate remains stable. The disposition time in civil and commercial cases at first instance increased from 182 in 2022 to 221 in 2023. In administrative cases at first instance, the disposition time decreased from 528 in 2022 to 479 in 2023. The quality of the justice system is considered to be good overall. Digitalisation of justice continues to be slow, although some progress has been made in administrative justice. Despite this progress, digitalisation of justice is still lagging behind overall. As regards judicial independence, no systemic deficiencies have been reported ([141]).

([139])See the 2024 country-specific chapter for Luxembourg of the Rule of Law Report, p. 16.

([140])Ibid., pp. 11-12.

([141])For more detailed analysis of the performance of the justice system in Luxembourg, see the upcoming 2025 EU Justice Scoreboard and the 2024 Rule of Law Report.

Luxembourg faces challenges regarding its clean industry transformation and climate mitigation. The development of the net zero industry suffers from skills shortages and a lack of public support. Despite progress in climate mitigation efforts, the country must intensify its decarbonisation strategies, including through fostering clean mobility. The transition to a sustainable industry demands greater investments in the circular economy and advanced waste management practices to balance environmental impact with economic growth. To address those challenges, providing for the relevant skills of the workforce will be key.

Strategic autonomy and technology for the green transition

Net zero industry

The development of the net zero industry suffers from skills shortages and a lack of public support. The net zero manufacturing output remains very limited ([142])([143]). Luxembourg has a small production capacity for solar PVs, amounting to between 25 and 75 MW/y (a negligible share of EU capacity) ([144]). There are also a few small manufacturers who supply material for clean industry, for instance batteries ([145]). In terms of policy framework, Luxembourg has no investment or incentive schemes to support the manufacturing of net zero technologies. It has submitted to the Parliament a draft law (Bill n° 8284) to support the build-up of manufacturing capacity for net-zero technologies, focusing on the acceleration of administrative procedures. Labour shortages and a lack of relevant skills for the transition to a net-zero economy, specifically in research and innovation, remains an acute issue.

([142])Bruegel, European clean tech tracker, update: 14/7/2024.

([143])EC, Net zero technologies monitoring dashboard.

([144])EC, The net-zero manufacturing industry landscape across the Member States, 14/1/2025.

([145])Meeting with the Ministry of the Economy, 14/01/2025.

Critical raw materials

Luxembourg's manufacturing sector is heavily dependent on imports of critical raw materials. Luxembourg is among the member states with the third highest material footprint in the EU, with 32.05 tonnes of raw material consumption per capita in 2023 (against an EU average of 14.2) ([146]). This reflects the high demand of material extraction of Luxembourg's economy which heavily impacts the environment. Reflecting the small size of the country, its material import dependency is the highest in the EU (88.7% in 2023 against an EU-average of 22%) ([147]). In 2023, the main critical raw materials imported from non-EU countries were PGMs ([148])(mainly from Iran, Lebanon, UAE and Iraq), aluminium (mainly from the UK and Kazakhstan) and copper (from Switzerland and China) ([149]). Imports from some countries might be affected by geopolitical instability. However, Luxembourg's sources of supply are relatively well diversified, as shown by the import concentration index, whose value for Luxembourg is slightly below the EU average (0.19 vs. 0.22) ([150]).

Luxembourg performs well in several sectors of the circular economy that are essential for reducing import dependency in raw materials. The recycling rate for e-waste ([151]), a key source of critical raw materials, is above the EU average, at 85% in 2022. The reuse and recycling rate for end-of-life vehicles ([152]) is above the EU average (96.9% vs. 89.1% in 2022).

([146])Eurostat, *Material footprints*, last updated 31.03.2025.

([147])Eurostat, Dataset [env_ac_mid], 2024

([148])Platinum, palladium, rhodium, ruthenium and iridium.

([149])EC, Raw material Information System, country profile Luxembourg.

([150])The import concentration measures how much a country relies on a limited number of sources for a basket of critical raw materials. The scale is 0-1, where 0 would mean no dependence. Source: COMEXT.

([151])Eurostat, Dataset [cei_wm60], 2024.

([152])Eurostat, Dataset [env_waselvt], 2024.

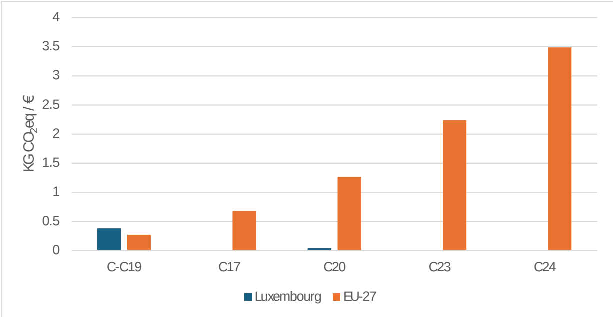
Climate mitigation

Industry decarbonisation

Energy use dominates greenhouse gas emissions from manufacturing in Luxembourg, but lately progress has been made in reducing them. About a tenth of Luxembourg's total greenhouse gas emissions come from industry (153). In 2022, industrial production in Luxembourg emitted 380 g CO_2eq of greenhouse gases per euro of gross value added (GVA), slightly above the EU average (270 g/€). Since 2017, the emissions intensity of Luxembourg's industry declined by 24%, much more than in the EU as a whole (20%). In Luxembourg's overall industrial greenhouse emissions, the shares of energy- and non-energy-related emissions (the latter primarily relate to industrial processes) are at about 65 to 35; the dominance of energy-related emissions is the fourth highest in the EU.

The manufacturing sector in Luxembourg has been improving in terms of emissions intensity, but less than the EU as a whole. Between 2017 and 2022, the energy-related emissions intensity of Luxembourg's manufacturing industry declined by 14%, slightly less than in the EU as a whole (16%) (154). The emissions intensity of manufacturing regarding industry processes and product improved by 17%, less than in the EU overall (23%). At the same time, after years of stability, the share of electricity and renewables in final energy consumption in manufacturing increased by 8 percentage points in 2022, reaching 52%. On the energy efficiency side too, Luxembourg saw major improvements, with final energy consumption per gross value added falling from 2.4 GWh/€ to 2.0 GWh/€ between 2017 and 2022.

Graph A7.1: **GHG emission intensity of the manufacturing and energy-intensive sectors, 2022**



Source: Eurostat.

Luxembourg has put in place policies to support the decarbonisation of industry. Starting from the roadmap "Decarbonisation of Luxembourg industry", Luxembourg has implemented some support measures to promote decarbonisation in the industrial sector, such as the climate pact for businesses, the Fit4Sustainability programme, some aid schemes for companies and the "SME packages sustainability". Further effort is still needed, in particular to replace fossil fuels with electricity and hydrogen.

Reduction of emissions in the effort sharing sectors

To attain its 2030 effort sharing target, Luxembourg needs to swiftly adopt and implement the planned climate mitigation measures (155). In 2023, GHG emissions from Luxembourg's effort sharing sectors are expected to have been 31.7% below those of 2005, significantly higher than its target set by the Effort-Sharing Regulation (ESR) for 2030, -50%. If implemented, by 2030, additional policies

(153) In 2023. Manufacturing includes all divisions of the "C" section of the NACE Rev. 2 statistical classification of economic activities. In the remainder of this section, unless indicated otherwise, data on manufacturing refer to the divisions of the NACE section C excluding division C19 (manufacture of coke and refined petroleum products), and the year 2022. The source of all data in this section is Eurostat; data following the UNFCCC Common Reporting Framework (CRF) are from the European Environment Agency (EEA), republished by Eurostat.

(154) For the GHG emissions intensity of GVA related to energy use and industrial processes and product use respectively, GHG emissions are from inventory data in line with the UNFCCC Common Reporting Format (CRF), notably referring to the source sectors CRF.1.A.2 – fuel combustion in manufacturing industries and construction and CRF.2 – industrial processes and product use. The CRF.1.A.2 data broadly correspond to the NACE C and E sectors, excluding C-19. GVA data (in the denominator for both intensities) are aligned with this sectoral coverage. Therefore, they are not fully consistent with the data referred to in other part of this section.

(155) The national greenhouse gas emission reduction target is set out in Regulation (EU) 2023/857 (the Effort Sharing Regulation). It applies jointly to buildings (heating and cooling); road transport, agriculture; waste; and small industry (known as the effort sharing sectors).

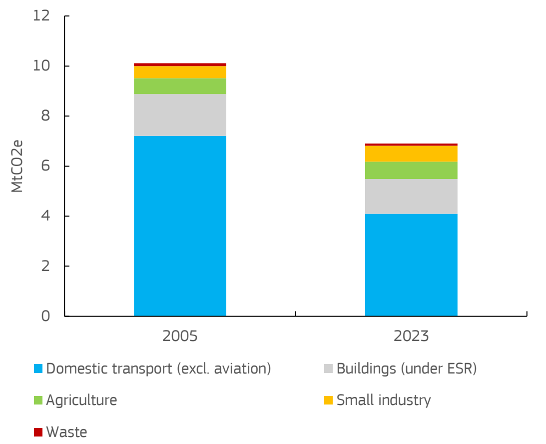
considered in Luxembourg's final updated National Energy and Climate plan are projected to reduce them by 55.6% relative to 2005 levels [156], providing for the overachievement of Luxembourg's emission reduction target set by the Effort-Sharing Regulation by 5.6 percentage points. Given the large impact of the additional measures that are not yet implemented, swift and steady adoption will be critical for the implementation of the full set of measures.

Swift action on decarbonising buildings and transport appears particularly pressing in Luxembourg. Greenhouse gas emissions from road transport and buildings account together for 80% of total national emissions in the effort sharing sectors (2023 data). Between 2005 and 2023, greenhouse gas emissions from buildings decreased by 16% in Luxembourg, much less than by the 33% seen in the EU overall. Speeding up climate mitigation in this sector would help protect households and businesses in Luxembourg from the impact of the forthcoming carbon price.

Luxembourg's remarkable efforts on GHG emissions reduction in road transport need to be sustained. The country has achieved a 43% reduction of GHG emissions in road transport in 2023 compared to 2005, the best performance in the EU in this sector. Fleet electrification, actions to promote sustainable mobility, in particular the extension of the tram line and making public transport free of charge since 2020, contributed to this. With 59 %, road transport still remains the major source of effort sharing emissions in the country. Luxembourg's 2025 budget allocates substantial funds for clean mobility projects [157]. The 2035 National Mobility Plan proposes a global concept capable of managing 40% more journeys compared to 2017, implementing the approaches recommended by the Modu 2.0 sustainable mobility strategy [158]. Through these measures and additional actions foreseen in the national energy and climate plan, Luxembourg demonstrates a robust commitment to enhancing sustainable mobility and reducing reliance on fossil fuels in the transportation sector.

Fuel sales to international carriers or transiting individuals have a significant impact on greenhouse gas emissions from road transport. Emissions associated to fuel sales made to international carriers or private individuals in transit or residing in the border regions represents 2/3 of total fuel sales, due to lower prices compared to neighbouring countries [159], but with a tendency to converge more and more with neighbouring regions after the introduction of the CO2 tax. Luxembourg still needs to decide whether to temporarily opt-out of the Emission Trading System 2 (ETS2) by maintaining the national carbon tax system beyond 2026. As carbon pricing will evolve, the fuel price differential between Luxembourg and its neighbouring nations is a critical factor to reach the 2030 climate target.

Graph A7.2: **Greenhouse gas emissions from the effort sharing sectors, 2005 and 2023**



Source: European Environment Agency

[156] The effort sharing emissions for 2023 are based on approximated inventory data. The final data will be established in 2027 after a comprehensive review. Projections on the impact of current policies ("with existing measures", WEM) and additional policies ("with additional measures", WAM) as per Luxembourg's final updated NECP.

[157] Including €780 million for the Rail Fund (a 30% increase) and €390 million for bus transport. The budget also includes €82 million for transport services for individuals with special needs, and €53 million for school transport. Additionally, €395 million is designated for the Road Fund, set to reach €480 million by 2028. See [Kurs op muer. Ee Muer fir Jiddereen" – Gilles Roth presents the State budget for 2025 - The Luxembourg Government.]()

[158] Luxembourg Government, [PNM 2035 - Plan national de mobilité]()

[159] National Institute of Statistics and Economics Studies (STATEC), 2023, Simulation of the energy transition of the Luxembourg economy.

Sustainable industry

Circular economy transition

Luxembourg performs well in the circular economy sector, despite being more affected by international market variations. Its circular material use rate dropped in recent years, reaching 10.2% in 2023 (vs. an EU average of 11.8%). According to a study (160), this rate is higher (up to 30%) if the import of scrap metal for the steel industry is taken into account. Luxembourg is the Member State with the second highest resource productivity in the EU, with more than EUR 5.63 per kg in 2023 (above an EU average of EUR 2.74). Luxembourg adopted a national circular economy strategy in February 2021, to support the circular economy transition in specific sectors, including industry.

Luxembourg performs well in recycling rates but generates significantly more waste. Luxembourg is among the member states with the highest waste generation, with 712 kg per capita in 2023, above the EU average of 511 kg per capita. The country performs well in terms of municipal waste treatment, with 56.2% of municipal waste recycled in 2023. The recycling rate for packaging waste increased to 40% in 2022, slightly below the EU average (41%). The recycling rate for construction and demolition waste increased to 94.4% in 2022, above the EU average (79.8%).

There is room to further invest in Luxembourg's circular economy. Luxembourg is estimated (161) to need a total additional investment of at least EUR 125 million annually for the circular economy transition, including waste management. Considering the country's ambitions to further develop its economy and its high demographic growth (162) in the past years, Luxembourg would benefit from taking action to reduce waste generation and further invest in the circular economy. There is still potential for instance to expand the pay-as-you-throw system for residual waste, to improve sorting at source and increase recycling, or to further shift reusable and recyclable waste away from incineration, including using economic instruments.

Zero -pollution industry

Air quality in Luxembourg is generally good with some exceptions. Industrial processes and related activities (such as transport, energy production and waste treatment) are one of the main sources of air pollution, which impacts health and the environment. The health impacts of air pollution have decreased in Luxembourg from 2 077 years of life lost (163) in 2016 to 833 in 2022. It is estimated (164) that in Luxembourg each year around 80 deaths can be attributed to fine particulate matter ($PM_{2.5}$); 30 to nitrogen dioxide (NO_2) and 50 to ground-level ozone (O_3).

However, the emissions intensity of industrial air pollutants in Luxembourg causes more damage to health and the environment than on average in the EU, with EUR 29.6 in damage per thousand EUR of gross value added (GVA) (165) in 2021 – representing a total of EUR 103.9 million, compared to an EU average of EUR 27.5 per thousand EUR GVA. To meet its environmental objectives concerning pollution prevention and control, Luxembourg needs to provide an additional EUR 201 million per year (0.26% of GDP) (166).

Luxembourg has made progress in tackling pollution from industrial sources, although some areas of concerns remain. Air emissions intensities from industry (167) have slightly decreased for both particulate matters (PM) 2.5 and 10. However, while intensities are now below the average for $PM_{2.5}$ (from 0.05 g per Euro vs. 0.06 in the EU), they remain above the EU average for PM_{10} (from 0.09 g per Euro vs. 0.08 in the EU) in 2022. Between 2010 and 2022, pollutant

(160) CIRCTER - Circular Economy and Territorial Consequences | ESPON, see CIRCTER SPINOFF - the case of Luxembourg.pdf

(161) European Commission, DG Environment, *Environmental investment needs & gaps assessment programme*, 2025 update. Expressed in 2022 prices.

(162) Eurostat, Dataset [demo_gind], 2025.

(163) Eurostat, Dataset [hlth_cd_iap], 2025.

(164) European Environment Agency, Harm to human health from air pollution in Europe: burden of disease 2024.

(165) EEA, Industrial emission intensity indicators, 2021.

(166) European Commission, DG Environment, *Environmental investment needs & gaps assessment programme*, 2025 update. Expressed in 2022 prices.

(167) Eurostat, Dataset [sdg_09_70], 2024.

releases into air (168) have decreased by 65% for carbon dioxide, 57% for nitrogen oxides, and 64% for sulphur oxide. However, they have increased by 78% for cadmium (Cd), mercury (Hg), and lead (Pb). Over the same period, industrial releases of pollutants to water (169) have decreased in Luxembourg by 87% for Cd, Hg and Pb, 77% for nitrogen, 75% for total organic carbon and 62% for phosphorus. The main industrial contributors to emissions to air in Luxembourg (170), as regards dioxins, are the metals sector, followed by the waste and energy sector, as well as the metals, energy and mineral sectors as regards mercury.

Luxembourg is one of the member states with the most significant drop in industrial releases of pollutants to water. Between 2010 and 2022, industrial releases have decreased by 87% for heavy metal (Cd, Hg, Pb and nickel), 77% for total nitrogen, 75% for total organic carbon and 62% total phosphorus. In Luxembourg, the ferrous-metals processing industry is the main source of industrial emissions to water (171) in Luxembourg.

(168) European Environment Agency, Change of pollutant releases into air in EU-27 countries in the period 2010-2022, 2024.

(169) EEA, Industrial releases of pollutants to water and economic activity in the EU-27, 2024.

(170) European Environment Agency, LRTAP, Air pollutant emissions data viewer (Gothenburg Protocol, LRTAP Convention) 1990-2022, June 2024.

(171) Industrial Reporting under the Industrial Emissions Directive 2010/75/EU and European Pollutant Release and Transfer Register Regulation (EC) No 166/2006 - ver. 12.0 Sep. 2024 (Tabular data).

Table A7.1: **Key clean industry and climate mitigation indicators: Luxembourg**

Strategic autonomy and technology for the green transition				Luxembourg						EU-27	
Net zero industry											
Operational manufacturing capacity 2023											
- Solar PV (c: cell, w: wafer, m: module), MW	25-75 (m)				- Electrolyzer, MW		-				
- Wind (b: blade, t: turbine, n: nacelle), MW	-				- battery, MWh		-				
Automotive industry transformation	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**			**2018**	**2021**
Motorisation rate (passenger cars per 1000 inhabitants), %	670	676	681	682	682	673	675	↗		539	561
New zero-emission vehicles, electricity motor, %	0.70	0.93	1.79	5.47	10.48	15.18	22.48	↗		1.03	8.96
Critical raw materials	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**			**2018**	**2021**
Material import dependency, %		91.2	91.0	90.4	89.6	90.0	88.7	↘		24.2	22.6
Climate mitigation				Luxembourg				Trend		EU-27	
Industry decarbonisation	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**			**2017**	**2022**
GHG emissions intensity of manufacturing production, kg/€	0.5	0.52	0.46	0.44	0.42	0.38		↘		0.34	0.27
Share of energy-related emissions in industrial GHG emissions	34.8	35.4	34.9	34.7	35.6	32.2	34.6	↘		44.8	42.5
Energy-related GHG emissions intensity of manufacturing and construction, kg/€	191.7	195.8	181.0	175.3	180.2	164.0	-	↘		158.4	132.9
Share of electricity and renewables in final energy consumption in manufacturing, %	44.0	44.4	42.4	44.2	44.0	51.6	52.4	↗		43.3	44.2
Energy intensity of manufacturing, GWh/€	2.37	2.52	2.16	2.04	2.04	1.96	1.70	↘		1.29	1.09
Share of energy-intensive industries in manufacturing production						7.3					7.3
GHG emissions intensity of production in sector [...], kg/€											
- paper and paper products (NACE C-17)	-	-	-	-	-		-	-		0.73	0.68
- chemicals and chemical products (NACE C20)	0.12	0.09	0.11	0.05	0.07	0.04	0.04	-		1.25	1.26
- other non-metallic mineral products (NACE C23)	-	-	-	-	-		-	-		2.53	2.24
- basic metals (NACE C24)	-	-	-	-	-		-	-		2.79	3.49
Reduction of effort sharing emissions		**2018**	**2019**	**2020**	**2021**	**2022**	**2023**			**2018**	**2023**
GHG emission reductions relative to base year, %					-20.3	-30.2	-31.7				
- domestic road transport		-16.7	-14.5	-36.0	-31.8	-41.6	-43.2	↘		1.4	5.2
- buildings		-1.5	-1.8	-3.1	-1.0	-14.6	-16.4	↘		21.4	32.9
	2005				**2021**	**2022**	**2023**	**Target**		**WEM**	**WAM**
Effort sharing: GHG emissions, Mt; target, gap, %	10.1				8.1	7.1	6.9	-50.0		-16.8	5.6
Sustainable industry				Luxembourg				Trend		EU-27	
Circular economy transition		**2018**	**2019**	**2020**	**2021**	**2022**	**2023**			**2018**	**2021**
Material footprint, tonnes per person		28.3	27.1	27.4	27.6	31.7	32.1	↗		14.7	15.0
Circular material use rate, %		10.8	9.1	9.4	8.5	12.3	10.2	↗		11.6	11.1
Resource productivity, €/kg		4.3	4.4	4.4	4.6	5.2	5.6	↗		2.1	2.3
Zero pollution industry											
Years of life lost due to PM2.5, per 100,000 inhabitants		280	171	125	135	197	-	↗		702	571
Air pollution damage cost intensity, per thousand € of GVA					29.6						27.5
Water pollution intensity, kg weighted by human factors per bn € GVA						0.2					0.9

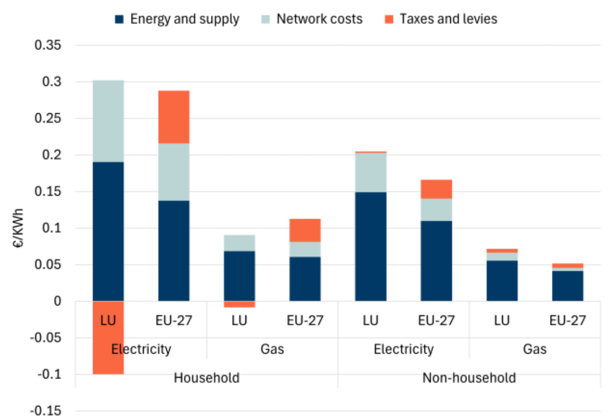
Source: **Net zero industry:** European Commission: The net-zero manufacturing industry landscape across Member States: final report, 2025. **Automotive industry transformation:** Eurostat. **Critical raw materials:** Eurostat. **Climate mitigation:** See footnotes in the "climate mitigation" section; reduction of effort sharing emissions: EEA greenhouse gases data viewer; European Commission, Climate Action Progress Report, 2024. **Sustainable industry:** Years of life lost due to PM2.5: Eurostat and EEA, Harm to human health from air pollution in Europe: burden of disease status, 2024. Air pollution damage: EEA, EU large industry air pollution damage costs intensity, 2024. Emissions covered: As, benzene, Cd, Cr, Hg, NH3, Ni, NMVOC, NOX, Pb, dioxins, PM10, PAH, SOX. Water pollution intensity: EEA, EU large industry water pollution intensity, 2024. Releases into water covered from cadmium, lead, mercury, nickel. Other indicators: Eurostat.

This annex outlines the progress made and the ongoing challenges faced in enhancing energy competitiveness and affordability, while advancing the transition to net zero. It examines the measures and targets proposed in the final updates to the national energy and climate plans (NECPs) for 2030.

Luxembourg has made very good progress in its energy transition. In particular, it has substantially increased its installed solar capacity, and its wind capacity has remained constant. Efforts have also been made with regard to permitting. However, additional measures would be beneficial regarding building renovation and there is untapped potential in energy efficiency. Luxembourg's heavy reliance on fossil fuels makes it important for the country to continue diversifying its energy sources and strengthening energy security.

Energy prices and costs

Graph A8.1: **Retail energy price components for household and non-household consumers, 2024**



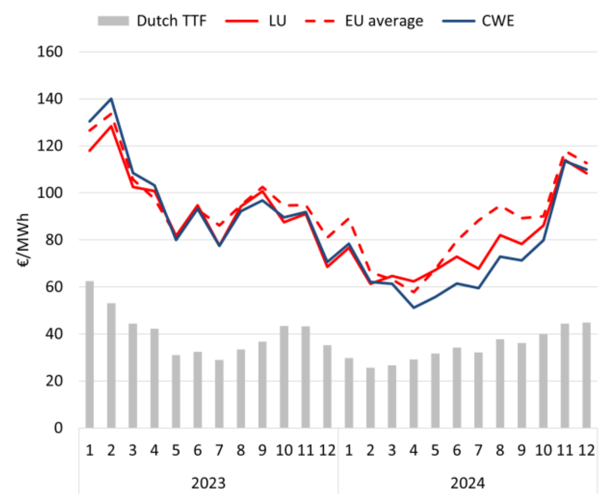
(i) For household consumers, consumption band is DC for electricity and D2 for gas. Taxes and levies are shown including VAT.
(ii) For non-household consumers, consumption band is IC for electricity and I3 for gas. Taxes and levies are shown excluding VAT and recoverable charges, as these are typically recovered by businesses.
Source: Eurostat

In 2024, Luxembourg's retail energy prices stayed below the EU average for household consumers, while non-household consumer prices, despite a year-on-year decrease remained above the EU average. While low taxes and levies accounted for 0,9% and 7,1% of the electricity and gas prices for industrial consumers (in comparison to the EU averages of 15,4% and 11,6%), network costs and the share of the energy and supply component of electricity and gas retail prices for industrial consumers remained substantially higher than the EU average. In contrast, retail prices for household remained below the EU average, despite a slight increase in household electricity prices.

Thanks to a large share of renewables in Luxembourg's electricity mix (90.4% % in 2024), wholesale electricity prices in the German-Luxembourgish bidding zone averaged 78.4 EUR/MWh in 2024 (([172]), below the EU average of 84.7 EUR/MWh. Nevertheless, along with the broader Central Western European markets, Luxembourg experienced price spikes in the spring/summer which occurred amid rising natural gas costs, while stronger increases in the autumn/winter were exacerbated by the Dunkelflaute in the region. Luxembourg experienced significantly lower wind power generation (-33% in Oct.-Dec. vs same period in 2023). This decrease in renewable generation created a demand-supply gap that was covered by ramped up bioenergy generation (+200% in Oct.-Dec. vs same period in 2023). Through the joint German-Luxembourgish bidding zone, Luxembourg was directly exposed to price dynamics in Germany, including those driven by increased use of natural gas and coal-fired generation units in Germany (+11% and +1.8% in Nov 2024 vs same period in 2023), particularly during peak demand hours. As a result, prices spiked, averaging 176 EUR/MWh during evening peak demand hours in November and December ([173]), 60% higher than in 2023([174]).

([172]) Fraunhofer (ENTSO-E data)
([173]) Fraunhofer (ENTSO-E data): Gas prices at peak demand hours from 17:00 to 18:00 on average in November and December 2024 compared to November and December 2023
([174]) Yearly electricity data, Ember (consumption and generation data throughout the paragraph)

Graph A8.2: **Monthly average day-ahead wholesale electricity prices and European benchmark natural gas prices (Dutch TTF)**



(i) the Title Transfer Facility (TTF) is a virtual trading point for natural gas in the Netherlands. It serves as the primary benchmark for European natural gas prices.
(ii) CWE gives average prices in the central-western European market (Belgium, France, Germany, Luxembourg, the Netherlands and Austria).
Source: S&P Platts and ENTSO-E

Flexibility and electricity grids

Luxembourg is highly interconnected in terms of both power and gas but is also highly dependent on its neighbours to meet its energy needs. Its electricity and gas grids are sufficient for its current needs. In anticipation of growing renewable energy generation and power demand, the grid operator is planning to further develop the high voltage grid and improve interconnections, with Germany in particular, between now and 2040. According to the national transmission system operator, about 75% of the total import and transmission capacity is already used during peak import. The transmission system operator sees a need to both increase and modernise the electrical energy import transmission capacities.

Despite participating in regional energy cooperation and having comprehensive legislation, Luxembourg does not participate in any projects of common interest under the TEN-E Regulation ([175]).

Following the constitutional reform of January 2023, Luxembourg could continue its efforts to clarify the legal and institutional framework pertinent to projects of common interest and projects of mutual interest, and permitting in particular. Luxembourg is working on a legal framework for the development of renewable hydrogen, including grids, that accentuates the relevance of the TEN-E Regulation, which also contains provisions on streamlining the permitting process.

Renewable hydrogen (to be produced through electrolysers) can play a role in the integration of energy sectors in the long term. This will have an impact on infrastructure, including on the electrical grids connecting Luxembourg with neighbouring countries. Luxembourg is pursuing its hydrogen ambitions by means of regional cooperation including via the North Seas Energy Cooperation (NSEC) and the Pentalateral Energy Forum (PENTA) ([176]).

Luxembourg's regulatory framework still contains barriers to the development of flexible resources, even if the country has taken steps to support non-fossil flexibility. Luxembourg does not report on the installed non-fossil flexibility capacity in the updated national energy and climate plan. Additionally, demand response resources cannot access wholesale markets nor ancillary services due to legal barriers. Luxembourg has, however, committed to taking steps to develop dynamic electricity prices and a legal framework for aggregators. Hydrogen is envisaged as an additional pathway to increase flexibility in the electricity grid by offering seasonal storage possibilities.

With a 99% smart meter roll-out, the infrastructure for informed consumers is in place but has not yet been translated into consumers taking advantage of the possibilities offered by the market. There is near-zero switching among consumers, and

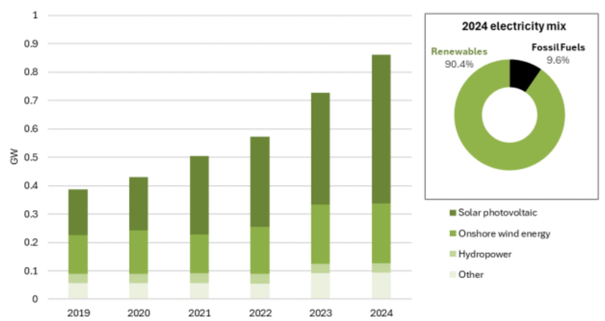
([175])See 2024 Country Report – Luxembourg SWD (2024) 616 final, 19.6.2024

([176])https://energy.ec.europa.eu/topics/infrastructure/high-level-groups/north-seas-energy-cooperation_en household consumers do not have access to dynamic-price contracts, although regulations require them (ACER CEER 2023).

In 2023, electricity accounted for 17.8% of Luxembourg's final energy consumption, below the EU average of 22.9%, and this share has seen a slight increase in the last decade ([177]). When it comes to households, electricity accounts for 17.3% of final energy consumption, while in industry it represents 51.2% (see also Annex 7). For the transport sector, this share remains negligible at 1.3%. Accelerating electrification across sectors would support cost-effective decarbonisation and make affordable renewable energy more accessible to consumers.

Renewables and long-term contracts

Graph A8.3: **Luxembourg's installed renewable capacity (left) and electricity generation mix (right)**



"Other" includes renewable municipal waste, solid biofuels, liquid biofuels, and biogas.
Source: IRENA, Ember

2024 saw an impressive increase of installed solar capacity, which rose to 540 MW compared to 420 MW in 2023. Installed wind capacity remained constant at 210 MW. Total renewable electricity generation, including from sources other than wind and solar, increased by 16% to a total of 1.18 TWh. In 2024, renewable energy sources (RES) accounted for 90% ([178]) of the electricity mix (vs EU overall RES share of 47%).

Efforts are being made to improve permit-granting procedures for renewables projects below a certain threshold. Shorter procedures have been adopted, including procedures for small-scale installations in residential buildings. However, communication and coordination between public authorities is limited. Furthermore, there is currently no competent authority responsible or mandated to mediate between project developers and other relevant authorities thereby ensuring uniform interpretations of permit-granting rules.

Luxembourg is currently working to increase wind capacity by facilitating permitting procedures, establishing a catalogue of procedures and creating a wind register. These measures have yet to be implemented.

Luxembourg has a sliding premium with an upper ceiling support mechanism in place for several renewable energy technologies. Furthermore, the Solidaritéits Pak 2.0 (tripartite agreements in response to the energy crisis), signed in September 2022, encourages companies to source energy directly from renewable energy suppliers through power purchase agreements.

Energy efficiency

Energy efficiency gains have accelerated in Luxembourg, but significant untapped potential remains. In 2023, primary energy consumption (PEC) decreased by 3.5% to 3.65 Mtoe. Final energy consumption (FEC) decreased by 4.3% to 3.5 Mtoe compared to 2022. FEC decreased in all main sectors: in transport by 4.3%, in industrial by 10.4% and in services by 1.7%. Under Annex I to the recast Energy Efficiency Directive (Directive (EU) 2023/1791), Luxembourg should be able to reach a PEC of 2.84 Mtoe and a FEC of 2.80 Mtoe by 2030.

Luxembourg has not notified the Commission of its comprehensive heating and cooling assessment identifying potential for the application of high-efficiency cogeneration and efficient district heating and cooling in line with Article 25(1) of the Energy Efficiency Directive. There is no timeline for this notification.

([177]) CAGR (compound annual growth rate) of 2.3% between 2013 and 2023 and minimum/maximum share of 14.2% and 17.8%, respectively.
([178])Yearly electricity data, Ember.

Luxembourg's efforts in the residential sector to achieve a meaningful contribution to its 2030 reduction target for energy consumption by buildings are on the right track (residential final energy consumption fell by around 9% in 2022 compared to 2018). However, additional efforts would be beneficial in implementing the national long-term renovation strategy, i.e. achieve a reduction of 34% by 2030. For 2022-2023, the reduction is between 11% and 15%.

In 2022, heating and cooling represented 88% of the country's residential final energy consumption. Approximately 140 000 households are using gas to heat their homes, while the heat pump market remains limited. Building regulations have made it practically impossible to install a gas or oil boiler in a new building since 2023.

Luxembourg deploys a supportive national financing framework mobilising energy efficiency investments composed mainly of grants, tax rebates and financial instruments. Luxembourg also implements the energy efficiency obligation scheme.

Security of supply and diversification

Luxembourg introduced national load shedding to improve security of supply and significantly reduce energy consumption in situations threatening the integrity of the networks or the physical safety of individuals.

Despite progress in renewables, Luxembourg's overall energy mix in 2023 remained heavily reliant on fossil fuels, with oil accounting for 61.1% and natural gas for 13.4% of gross inland consumption, while renewables (together with biofuels) accounted for 11.9%([179]). This reliance underscores the importance of Luxembourg's ongoing efforts to diversify its energy sources and strengthen energy security.

([179])Gross inland consumption 2023 (Eurostat).

Fossil fuel subsidies

In 2023, environmentally harmful([180]) fossil fuel subsidies without a planned phase-out before 2030 represented 0.12%([181]) of Luxembourg's GDP([182]), below the EU weighted average of 0.49%. Tax measures accounted for 97% of this volume, while the remaining share were income/price support measures. Additionally, Luxembourg's 2023 Effective Carbon Rate([183]) averaged EUR 112.92 per tonne of CO_2, above the EU weighted mean of EUR 84.80 ([184]).

([180])Direct fossil fuel subsidies that incentivise maintaining or increasing in the availability of fossil fuels and/or use of fossil fuels.

([181])Numerator is based on volumes cross-checked with the Luxembourgish authorities. For all Member States, it includes public R&D expenditures for fossil fuels as reported by the IEA (Energy Technology RD&D Budgets) and excludes, for methodological consistency, excise tax exemption on kerosene consumed in intra-EU27 air traffic.

([182])2023 Gross Domestic Product at market prices, Eurostat.

([183])The Effective Carbon Rate is the sum of carbon taxes, ETS permit prices and fuel excise taxes, representing the aggregate effective carbon rate paid on emissions.

([184])OECD (2024), Pricing Greenhouse Gas Emissions 2024

Table A8.1: **Key Energy Indicators**

	Luxembourg				EU			
	2021	**2022**	**2023**	**2024**	**2021**	**2022**	**2023**	**2024**
Household consumer - Electricity retail price (EUR/KWh)	**0.1988**	**0.2029**	**0.2013**	**0.2027**	**0.2314**	**0.2649**	**0.2877**	**0.2879**
Energy & supply [%]	34.3%	44.4%	85.1%	94.0%	36.6%	54.3%	55.6%	47.8%
Network costs	39.5%	38.6%	61.1%	55.1%	26.7%	25.3%	24.8%	27.2%
Taxes and levies including VAT	26.2%	17.0%	-46.2%	-49.1%	36.7%	20.3%	19.6%	25.0%
VAT	7.4%	7.4%	6.6%	7.4%	14.5%	13.4%	13.8%	14.6%
Household consumer - Gas retail price	**0.0526**	**0.0872**	**0.0866**	**0.0824**	**0.0684**	**0.0948**	**0.1121**	**0.1128**
Energy & supply	54.9%	97.5%	128.5%	83.1%	43.7%	61.0%	64.5%	53.9%
Network costs	27.9%	17.7%	20.8%	27.1%	22.5%	17.3%	17.1%	18.3%
Taxes and levies including VAT	17.1%	-15.1%	-49.3%	-10.2%	33.8%	21.7%	18.4%	27.8%
VAT	7.6%	7.5%	6.6%	7.4%	15.5%	11.6%	10.2%	13.6%
Non-household consumer - Electricity retail price	**0.0969**	**0.1407**	**0.2418**	**0.2049**	**0.1242**	**0.1895**	**0.1971**	**0.1661**
Energy & supply	51.2%	67.8%	67.3%	67.4%	43.0%	66.5%	63.0%	55.8%
Network costs	29.5%	20.0%	25.6%	24.3%	15.8%	10.7%	11.9%	15.5%
Taxes and levies excluding VAT	12.7%	5.1%	0.6%	0.9%	30.4%	9.9%	11.2%	15.4%
Non-household consumer - Gas retail price	**0.0393**	**0.0918**	**0.1066**	**0.0716**	**0.0328**	**0.0722**	**0.0672**	**0.0517**
Energy & supply	64.6%	80.4%	80.5%	71.9%	66.2%	77.3%	77.3%	68.7%
Network costs	18.6%	8.6%	9.9%	14.1%	7.7%	3.8%	5.3%	7.1%
Taxes and levies excluding VAT	10.2%	3.9%	3.3%	7.1%	12.5%	6.1%	7.3%	11.6%
Wholesale electrity price (EUR/MWh)	96.6	234.5	95.5	78.6	111.0	233.2	99.1	84.7
Dutch TTF (EUR/MWh)	*n/a*	*n/a*	*n/a*	*n/a*	46.9	123.1	40.5	34.4

	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Gross Electricity Production (GWh) (2)	**2,235**	**2,200**	**1,908**	**2,234**	**2,211**	**2,258**	**2,532**	-
Combustible Fuels	470	490	547	628	632	546	507	-
Nuclear	-	-	-	-	-	-	-	-
Hydro	1,422	1,337	949	1,094	1,085	1,124	1,236	-
Wind	235	255	281	351	314	312	495	-
Solar	108	119	130	161	180	276	294	-
Geothermal	-	-	-	-	-	-	-	-
Other Sources	-	-	-	-	-	-	-	
Gross Electricity Production [%]								
Combustible Fuels	21.0%	22.3%	28.7%	28.1%	28.6%	24.2%	20.0%	-
Nuclear	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-
Hydro	63.6%	60.8%	49.7%	49.0%	49.1%	49.8%	48.8%	-
Wind	10.5%	11.6%	14.7%	15.7%	14.2%	13.8%	19.6%	-
Solar	4.9%	5.4%	6.8%	7.2%	8.1%	12.2%	11.6%	-
Geothermal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-
Other Sources	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-
Net Imports of Electricity (GWh)	**6,178**	**6,161**	**5,879**	**5,465**	**5,721**	**5,507**	**5,202**	-
As a % of electricity available for final consumption	96.6%	95.4%	91.9%	89.3%	89.5%	89.5%	86.1%	-
Electricity Interconnection [%]	**-**	**58.4%**	**58.2%**	**55.2%**	**168.4%**	**163.5%**	**166.3%**	**163.8%**
Share of renewable energy consumption - by sector [%]								
Electricity	8.1%	9.1%	10.9%	13.9%	14.2%	16.2%	18.0%	-
Heating and cooling	7.5%	8.4%	8.7%	12.6%	12.9%	15.0%	15.5%	-
Transport	6.5%	6.6%	7.7%	12.6%	8.0%	8.7%	9.2%	-
Overall	6.2%	8.9%	7.0%	11.7%	11.7%	14.3%	14.4%	-

	2020	**2021**	**2022**	**2023**	**2020**	**2021**	**2022**	**2023**
Import Dependency [%]	**92.3%**	**92.5%**	**91.5%**	**90.6%**	**57.5%**	**55.5%**	**62.5%**	**58.3%**
of Solid fossil fuels	112.3%	97.4%	101.5%	99.6%	35.8%	37.2%	45.9%	40.8%
of Oil and petroleum products	99.9%	99.9%	99.7%	99.5%	96.8%	91.7%	97.8%	94.5%
of Natural Gas	100.0%	100.0%	100.0%	100.0%	83.6%	83.6%	97.6%	90.0%
Dependency from Russian Fossil Fuels [%]								
of Natural Gas	23.3%	18.7%	0.0%	0.3%	41.0%	40.9%	20.7%	9.3%
of Crude Oil	0.0%	0.0%	0.0%	0.0%	25.7%	25.2%	18.4%	3.0%
of Hard Coal	7.1%	7.0%	4.4%	0.7%	49.1%	47.4%	21.5%	1.0%

	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Gas Consumption (in bcm)	**0.8**	**0.8**	**0.8**	**0.7**	**0.8**	**0.6**	**0.6**
Gas Consumption year-on-year change [%]	-2.3%	-0.8%	-0.2%	-9.4%	7.3%	-22.1%	-6.3%
Gas Imports - by type (in bcm)	**0.8**	**0.8**	**0.8**	**0.7**	**0.8**	**0.6**	**0.6**
Gas imports - pipeline	0.8	0.8	0.8	0.7	0.8	0.6	0.6
Gas imports - LNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas Imports - by main source supplier [%] (1)							
Netherlands	11.5%	9.9%	6.4%	14.8%	10.9%	0.0%	53.5%
Norway	22.0%	17.8%	11.2%	21.5%	42.8%	35.4%	27.5%
United Kingdom	29.9%	11.5%	18.5%	12.9%	5.8%	25.1%	8.5%
Russia	18.2%	25.6%	11.7%	23.3%	18.7%	0.0%	0.3%

Source: Eurostat, ENTSO-E, S&P Platts

Luxembourg faces increasing environmental challenges caused by climate change and the intensification of human activities. Climate risks are increasing in Luxembourg, with serious consequences on its population, environment and economy. Luxembourg and its economy are dependent on natural resources, especially on water and ecosystem services. More action and investments are needed to tackle pollution and nature degradation. Luxembourg's water bodies are among the most affected by pollution in the EU, in particular nitrates and pesticide pollution. Biodiversity is declining, particularly in water ecosystems, and forests and grasslands habitats. This has negative impacts on the species and economic activities that depend on these ecosystems. Luxembourg has taken some steps to implement sustainable agricultural practices, but more efforts are needed to reduce the agri-food sector's environmental footprint.

Climate adaptation and preparedness

Luxembourg is increasingly affected by floods, heatwaves and droughts, reflecting the broader effects of climate change. Recent years have seen significant flooding in 2016, 2018 and 2021, disrupting communities and infrastructure. Heatwaves have also become more frequent, posing health risks and straining water resources. Heat-related mortality reached 53 deaths per 100 000 inhabitants between 2013 and 2022, a 60% increase on the previous period. Droughts have multiplied, with 2022 being particularly severe: with 71% of the country affected. While this was the highest share in the EU that year, Luxembourg's size should be noted 2024 was one of the 10 hottest years ever recorded in Luxembourg. It was also a record year in terms of rainfall since measurements began in 1854 in the Grand Duchy, with a 42.6% increase in rainfall ([185]). The 2021 floods caused EUR 184 million in damages, disrupting infrastructure and essential services. Heatwaves have become more frequent, with temperatures having risen by approximately 1.5 °C since the early 20th century, which impacts public health and increases energy demand for cooling.

Drought conditions in recent years and excess precipitations in 2024 affected agriculture and forestry, leading to concerns about crop yields and forest health. For some crops, yield reductions were almost 30% in 2024 ([186]). In recent years, droughts, heatwaves and the spread of bark beetle, exacerbated by climate change, have damaged or destroyed about two thirds of Luxembourg's forests, according to the 2023 phytosanitary inventory.

Luxembourg has taken some measures to adapt to climate change and boost its preparedness, but further action is needed to update its strategy. The national adaptation strategy, which covered 2018-2023 and is currently under revision, focused on mitigating climate risks across various sectors, including agriculture, water management and public health. Key initiatives included improving infrastructure resilience, promoting sustainable land use and enhancing emergency response systems. The government works with local municipalities and stakeholders to involve the community in adaptation planning. Additionally, Luxembourg is updating its climate action plans in line with its climate law, aiming to integrate binding adaptation measures and promote a proactive approach to climate resilience and sustainability. In particular, Luxembourg should tackle the impact of extreme events on infrastructure, agriculture and forests.

Luxembourg has a robust institutional setup for climate adaptation, involving a range of stakeholders at national and local levels. The Ministry of the Environment, Climate and Biodiversity leads the national adaptation strategy, which focuses on integrating climate risks into policymaking. Local municipalities play a crucial role in implementing adaptation measures, supported by the climate pact 2.0 and the nature pact. Luxembourg's climate law mandates regular updates to adaptation plans, ensuring a proactive approach to climate resilience and sustainability. The aim of this comprehensive framework is to effectively tackle the challenges posed by climate change.

([185]) Le gouvernement luxembourgeois, 2025, *Bilan AgriMeteo: les cultures agricoles au Luxembourg impactées par le record de pluie (+42,6%) en 2024*.

([186]) Le gouvernement luxembourgeois, 2024, *Une récolte céréalière 2024 qui n'est pas à la hauteur des attentes*.

Water resilience

Luxembourg's economy is increasingly dependent on its freshwater resources. The Water Exploitation Index Plus (WEI+), increased from 0.36% in 2016 to 0.67% in 2022, showing that a greater share of the renewable freshwater resources available is being abstracted in Luxembourg. The main demand for water is for the public water supply, accounting for 90% of net water consumption in 2022 (e.g. 8.7 million m^3 of a total 9.7 million m^3) ([187]). Agriculture and manufacturing only accounted for 5% and 4% of water consumption in 2022. However, net water consumption increased significantly between 2010 and 2022: by 133% for agriculture and by 52% for manufacturing.

Luxembourg is the Member State that faces the most significant water quality challenges for both surface and groundwater bodies. According to its third river basin management plan (RBMP) ([188]), none of the surface water bodies in Luxembourg are classified as having good ecological status/potential, far below the EU average (37.3%). Their chemical status has worsened since the second RBMP, and no surface water bodies are classified as having a good chemical status either ([189]). This is mostly due to diffuse and point-source pollution, producing high volumes of nutrients and causing the eutrophication of all water bodies in Luxembourg. Eight water bodies are considered heavily modified water bodies due to dams, shipping, construction and urban development. Urban developments and constructions are the more frequent cause of modifications rather than hydropower. For 14% of surface water bodies, there is not enough flow in the river to promote healthy water life or options for human use of the water downstream. While all groundwater bodies remain in good quantitative status, there are risks that the quantitative status will deteriorate by 2027. Moreover, 50% of groundwater bodies are in poor chemical status due to the presence of nitrates and pesticides.

Luxembourg is one of the best performers in the EU regarding wastewater treatment. In 2020, 100% ([190]) of agglomerations and generated load in Luxembourg met the requirements of the Urban Waste-Water Treatment Directive (UWWTD). However, wastewater point-source discharges are reported for surface and groundwaters. In 2022, it was estimated that discharges of urban waste-water significantly impaired the water quality of 76.92% of river water bodies, 50% of lakes and 31.5% of groundwaters in Luxembourg ([191]). Moreover, the revised UWWTD (to be transposed by 31 July 2027) introduced stricter requirements ([192]), so efforts will be needed to ensure compliance with the new standards.

Additional investment is required to meet Luxembourg's financial needs in the water sector. It is estimated that a total of EUR 339 million per year are dedicated in Luxembourg to support wastewater management (EUR 234 million), drinking water (EUR 105 million), and water management and protection (EUR 1 million), mainly from national sources (99.4%). However, the investment needs reveal a substantial gap for water protection and water management (EUR 125 million per year by 2027). Of this, EUR 13 million per year is needed to meet financing for wastewater management, EUR 18 million per year for drinking water and around EUR 94 million per year for other aspects of the Water Framework Directive (WFD). Water management and protection is therefore the environmental sector with the biggest investment gap in Luxembourg. Given Luxembourg's challenges related to water quality or flood protection, and the dependency of its economy on ecosystems, the country would benefit from investing more in other aspects of the WFD. Sufficient levels of investment will also be

([187])Based on data provided by the European Environment Agency (EEA) between 2010 and 2022.

([188])European Commission, Staff working document accompanying the report from the commission to the council and the European parliament on the implementation of the Water Framework Directive and the Floods Directive - Member State: Luxembourg, February 2025.

([189])Failure to achieve good chemical status is mainly due to a small number of persistent, bioaccumulative and toxic (PBT) substances (polybrominated diphenyl ethers, mercury, polyaromatic hydrocarbons, perfluorooctane sulfonic acid and its derivatives and heptachlor and heptachlor epoxide) and non-PBT substances ((arsenic, but also cadmium, lead and nickel, along with the hydrocarbon fluoranthene).

([190])European Commission, Implementation Reports - European Commission.

([191])WISE-Freshwater, Luxembourg | WISE Freshwater.

([192])Directive 2024/3019, of 27 November 2024. The deadline for transposition is 31 July 2027.

important to meet the requirements of the revised UWWTD and meet the potentially increasing demand for water supply and wastewater treatment infrastructure related to the growing number of inhabitants and new companies setting up in Luxembourg. Luxembourg has the lowest level of environmental taxation per GDP among member states ([193]), especially for taxation on pollution. There is potential to better apply the "polluter pays" principle and use economic incentives to ensure sufficient funding for water protection and management.

Biodiversity and ecosystems

Luxembourg's biodiversity and nature are declining, and urgent measures are needed to protect and restore habitats and species. According to the latest available data ([194]), 32.1% of Luxembourg's habitats are in good status (above the EU average). However, 50% of the country's habitats have a bad conservation status, a higher share than during the last reporting period ([195]) and above the EU average of 35.82%. Similarly, the conservation status of species is concerning, with only 15% reported as having a good status, far below the EU average (30%), and more than 45% in bad conservation status, far above the EU average (21%). Since the last reporting period ([196]), the status of species has declined significantly. This is particularly concerning as Luxembourg has decreased its share of protected areas from 55.8% (in 2021) to 37.8% in 2022. The common farmland bird index has been on a negative trend for years (falling from 115 in 2011 to 80 in 2019), despite a slight increase since 2018 ([197]), illustrating the decline in the bird population highly dependent on the good ecological status of cultivated areas. Over 50% of forest habitats ([198]) have a bad conservation status. Overall, Luxembourg's forest conditions are more degraded than the EU average with a forest health indicator of 0.56 in 2018 (v 0.62 in EU average). Only 14.5% of Luxembourg's trees were in good health, while 12.3% were dying or dead in 2023 ([199]), partly due to pollution and eutrophication, and the situation is worsening. This has serious implications for Luxembourg's environmental and climate resilience, as the loss of biodiversity impairs ecosystems' ability to provide services that help mitigate the effects of climate change (such as regulating water cycles, maintaining soil health and sequestering carbon) and climate-related events such as floods, fires or droughts.

Nature degradation creates significant risks to the competitiveness of Luxembourg's economy as several sectors are directly dependent on ecosystem services. Overall, Luxembourg's degree of dependency on ecosystem services is close to the EU average at 44% of gross value added, a high degree of dependency. Several sectors such as agriculture, forestry, fisheries, construction, water utilities and health services (see Graph A9.1) are particularly dependent on ecosystem services. 100% of the gross value added generated by these sectors is directly dependent on ecosystem services. This means that failure to maintain the capacity of ecosystems to deliver services could entail significant costs or even stop production in these sectors. Protecting and restoring key ecosystems would help maintain the long-term competitiveness of these sectors, among others.

Targeted action is needed in Luxembourg to improve nature conservation and ecosystem restoration. In 2022, 27.1% of Luxembourg was in the Natura 2000 network, above the EU average (18.6%). Therefore, the country is on track to meet its commitment to reach 30% of Natura 2000 sites by 2030, as outlined in its national biodiversity strategy for 2030 ([200]). However, there is scope for Luxembourg to boost action on

([193])Eurostat, Environmental taxes revenues [env_ac_tax], January 2025.

([194])EEA, Conservation status of habitats under the EU Habitats Directive, November 2021.

([195])Assessments on conservation status for habitats for the 2007-2012 reporting period.

([196])Assessments on conservation status for species for the 2007-2012 reporting period.

([197])Eurostat, Common farmland bird index [env_bio2], February 2025.

([198])Assessments done for the forest habitats listed under Article 17 of the Habitats Directive.

([199])Administration de la Nature et des forêts, ministère de l'Environnement du Luxembourg, Résultats de l'inventaire photosanytaire des forêts du Luxembourg, 2023.

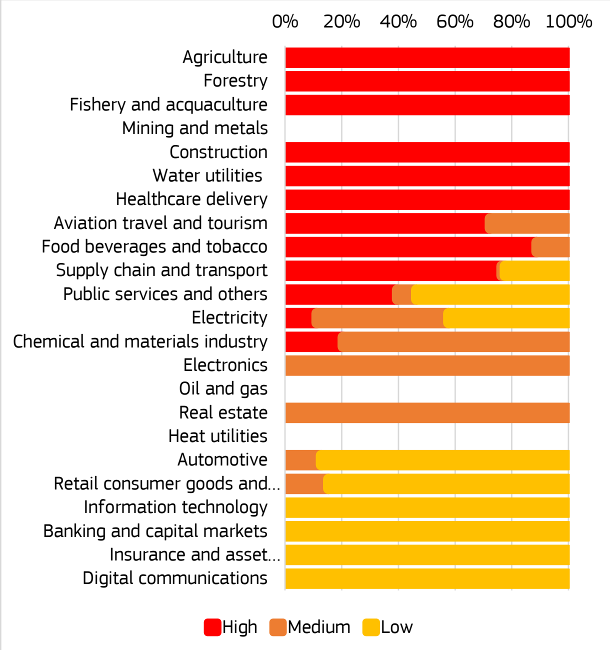
([200])National Biodiversity Strategy for 2030, adopted in January 2023.

climate adaptation and tackle nature degradation: by improving the protection of existing protected zones and implementing measures to restore degraded ecosystems. One area of action is to tackle the loss of ecosystems that naturally help mitigate climate risks. For instance, between 2006 and 2012, the extent of soil areas providing flood control ecosystem services in Luxembourg decreased by 50% due to soil sealing (201), far above the EU average (29%). Another area of action for Luxembourg is to restore 164 km^2 of habitats listed in Annex I to the Habitats Directive, corresponding to up to 6.3% of its territory (202).

Sustainable agriculture and land use

Luxembourg's carbon removals are in line with the level of ambition needed to meet its 2030 target for land use, land-use change and forestry (LULUCF). Luxembourg has seen a comparatively large increase in net LULUCF removals since 2018. To meet its 2030 LULUCF target, additional carbon removals of -0.027 megatonnes of CO_2 equivalent (CO_2eq) are needed (203). The latest available projections show a surplus over the target of -0.040 kilotonnes of CO_2eq for 2030 (204). Therefore, Luxembourg is on track to meet its 2030 target.

Graph A9.1: **Direct dependency(1) on ecosystem services(2) of the gross value added generated by economic sector in 2022**



(1) Dependency based on the sector's own operations, excluding value chain operations within countries and across international value chains. A high dependency indicates a high potential exposure to nature-related shocks or deteriorating trends, which means that the disruption of an ecosystem service could cause production failure and severe financial loss.
(2) Ecosystem services are the contributions of ecosystems to the benefits that are used in economic and other human activity, including provisioning services (e.g. biomass provisioning or water supply), regulating and maintenance services (e.g. soil quality regulation or pollination), and cultural services (e.g. recreational activities).
Source: Hirschbuehl et al., 2025, *The EU economy's dependency on nature*, Link.

Agriculture has significant impacts on Luxembourg's environment. Much of the country is used for agriculture (205). Luxembourg's soils are heavily impacted by excess nitrogen levels and erosion and overall, 41% of Luxembourg's soils are considered unhealthy. In particular, 31% of soils and 86% of all agricultural land is unhealthy due to nitrogen excess (206). 12% of the country is subject to unsustainable soil erosion by water, wind, tillage and harvest,

(201) European Commission, EEA, Accounting for ecosystems and their services in the European Union, 2021.

(202) European Commission, Impact assessment accompanying the proposal for a Regulation on nature restoration, 2023.

(203) National LULUCF targets of the Member States in line with Regulation (EU) 2023/839.

(204) Climate Action Progress Report 2024, COM/2024/498.

(205) The utilised agricultural area in Luxembourg was 132 980 hectares in 2023. Eurostat, Utilised agricultural area by categories [tag00025], March 2025. These figures partially include land used by Luxembourg's farmers in neighbouring countries.

(206) European Commission (2023), Impact assessment accompanying the proposal for the Soil monitoring Law.

affecting 87% of cropland areas. The analysis of the 3rd RBMP for Luxembourg identified nutrients from agriculture as a significant source of pressure on groundwater and surface water, affecting the water status. Excess nutrients are one of the main factors for failure to meet the WFD objectives. According to data from the Nitrates Directive, 20% of groundwater monitoring stations in Luxembourg recorded nitrate concentrations above 50 mg/l between 2016 and 2019, exceeding the healthy threshold for human consumption ([207]). The livestock density index was 1.24 in 2020, far above the EU average of 0.75 ([208]). The share of ammonia emissions from agriculture has reached 93.2% of all emissions in 2022, above the EU average (89.8%). However, after an increasing trend until 2018, the overall ammonia emission in Luxembourg has decreased by 6.59% in 2022 compared to 1990 levels. Luxembourg only monitored the level of pesticide pollution in two monitoring stations (and only for rivers) ([209]). In 2021, 50% of surface water bodies reported pesticide levels that exceed the set thresholds.

Luxembourg should take further action to reduce the environmental footprint of the agri-food sector. The bioeconomy includes all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles, which encompasses the production and processing of agriculture products and food. In 2021, it contributed to EUR 489 million of added value of the Luxembourg's gross domestic product in 2021. Agriculture generated around EUR 138 million, on an upward trend, the beverage industry EUR 40 million, and the food industry contributed around EUR 227 million. Luxembourg's national strategic plan implementing the common agricultural policy aims to bring environmental benefits and to protect natural resources. It allocates EUR 86.5 million to environmental and climate objectives. It aims to extend organic farming practices, reduce the use of pesticides, greenhouse gas and ammonia emissions, and promote carbon sequestration. For example, farmers who abandon the use of pesticides on their farms will receive financial support. The plan also encourages dairy and cattle farmers to limit and reduce the cattle population. However, currently, organic farming makes up 6.2% of Luxembourg's agricultural land, below the 2022 EU average of 10.52%. In 2022, only 4% of agricultural land had landscape features such as woods and non-productive grasslands, below the EU average of 5.6%.

([207])EEA, Nitrate in groundwater in Europe | European Environment Agency's home page, December 2024.

([208])Eurostat, Livestock density index [tai09], February 2025.

([209])EEA, Pesticides in rivers, lakes and groundwater in Europe, December 2024.

Table A9.1: **Key indicators tracking progress on climate adaptation, resilience and environment**

Climate adaptation and preparedness:	Luxembourg						EU-27	
	2018	2019	2020	2021	2022	2023	2018	2021
Drought impact on ecosystems *[area impacted by drought as % of total]*	12.85	17.05	69.83	0	70.54	0.12	6.77	2.76
Forest-fire burnt area (1) *[ha, annual average 2006-2023]*	-	-	-	-	-	-		
Economic losses from extreme events *[EUR million at constant 2022 prices]*	-	157	20	184	-	-	24 142	62 981
Insurance protection gap (2) *[composite score between 0 and 4]*	-	-	-	-	0.75	0.75		
Heat-related mortality (3) *[number of deaths per 100 000 inhabitants in 2013-2022]*	53	53	53	53	53			
Sub-national climate adaptation action *[% of population covered by the EU Covenant of Mayors for Climate & Energy]*	4	7	7	7	4	4	41	44

Water resilience:	Luxembourg						EU-27	
	2018	2019	2020	2021	2022	2023	2018	2021
Water Exploitation Index Plus, WEI+ (4) *[total water consumption as % of renewable freshwater resources]*	0.6	0.8	0.6	0.5	0.7	-	4.5	4.5
Water consumption *[million m^3]*	11	11	10	10	10	-		
Ecological/quantitative status of water bodies (5) *[% of water bodies failing to achieve good status]*								
Surface water bodies	-	-	-	100%	-	-	-	59%
Groundwater bodies	-	-	-	0%	-	-	-	93%

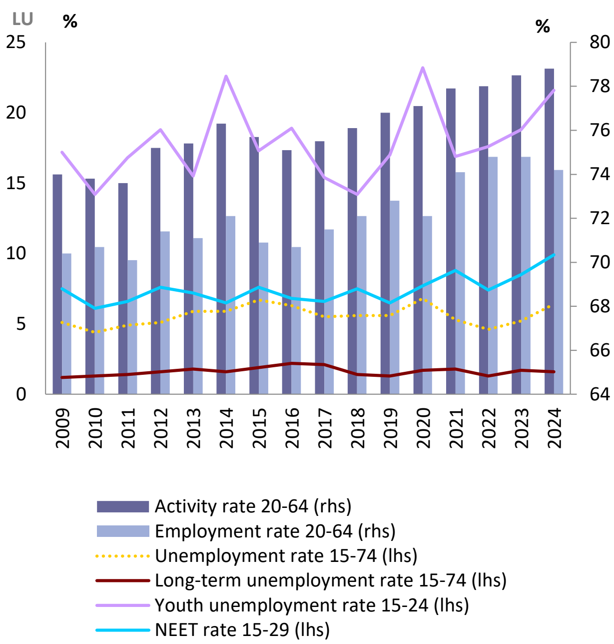
Biodiversity and ecosystems:	Luxembourg						EU-27	
	2018	2019	2020	2021	2022	2023	2018	2021
Conservation status of habitats (6) *[% of habitats having a good conservation status]*	32.1	-	-	-	-	-	14.7	-
Common farmland bird index *2000=100*	77.2	80.2	-	94.3	-	-	72.2	74.4
Protected areas *[% of protected land areas]*	-	-	-	56	38	-	-	26

Sustainable agriculture and land use:	Luxembourg						EU-27	
	2018	2019	2020	2021	2022	2023	2018	2021
Bioeconomy's added value (7) *[EUR million]*	494	491	495	489			634 378	716 124
Landscape features *[% of agricultural land covered with landscape features]*	-	-	-	-	4	-		
Food waste *[kg per capita]*	-	-	147	127	122	-		
Area under organic farming *[% of total UAA]*	4.4	4.4	4.6	5.2	6.2		7.99	-
Nitrogen balance *[kg of nitrogen per ha of UAA]*	-	-	-	-	-	-		
Nitrates in groundwater (8) *[mgNO_3/l]*	-	-	-	-	-	-		
Net greenhouse gas removals from LULUCF (9) *[Kt CO_2-eq]*	- 241	- 364	- 448	- 605	- 648	-	- 256 077	- 240 984

(1) The data show the average for the timespan 2006-2023 based on EFFIS - European Forest Fire Information System.
(2) Scale: 0 (no protection gap) – 4 (very high gap). EIOPA, 2024, Dashboard on insurance protection gap for natural catastrophes.
(3) van Daalen, K. R. et al., 2024, The 2024 Europe report of the Lancet Countdown on health and climate change: unprecedented warming demands unprecedented action, The Lancet Public Health.
(4) This indicator measures total water consumption as a percentage of the renewable freshwater resources available for a given territory and period. Values above 20% are generally considered to be a sign of water scarcity, while values equal or greater than 40% indicate situations of severe water scarcity.
(5) European Commission, 2024, 7th Implementation Report from the Commission to the Council and the European Parliament on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC) (Third River Basin Management Plans and Second Flood Risk Management Plans).
(6) For this indicator, the EU average includes figures for the UK under the previous configuration, EU-28.
(7) European Commission, 2023, EU Bioeconomy Monitoring System dashboards.
(8) Nitrates can persist in groundwater for a long time and accumulate at a high level through inputs from anthropogenic sources (mainly agriculture). The EU drinking water standard sets a limit of 50 mg NO_3/L to avoid threats to human health.
(9) Net removals are expressed in negative figures, net emissions in positive figures. Reported data are from the 2024 greenhouse gas inventory submission. 2030 value of net greenhouse gas removals as in Regulation (EU) 2023/839 – Annex IIa.
Source: Eurostat, EEA.

Although it has proved resilient to external shocks such as the COVID-19 pandemic, Luxembourg's employment growth has significantly slowed down since 2022. This can be attributed to several factors such as slow economic growth, labour shortages and skills mismatches, which are impacting the country's competitiveness. Targeted upskilling and reskilling will help to futureproof the labour market, especially in terms of digital and green jobs. Certain demographic groups – such as older workers, young people and vulnerable groups such as persons with disabilities, the low-skilled and those not born in the EU – are particularly prone to unemployment. Luxembourg's 2030 national employment target is within reach.

Graph A10.1: **Key labour market indicators**



Source: Eurostat, LFS [lfsi_emp_a, une_rt_a, edat_lfse_20, une_ltu_a]

Labour market activity has weakened amid slow economic growth. The employment rate declined to 74.2% in 2024 and the gap between it and the EU average (75.8%) has widened. Although they are not reflected in Luxembourg's employment rate, cross-border workers accounted for 43% in 2024 ([210]). The activity rate was also below the EU average in 2024 (78.8% vs 80.4%), despite being on an upward trend.

([210])Eurostat, Luxembourg National Accounts

Against a backdrop of economic slowdown, with modest real GDP growth of 1.0% in 2024, employment growth is projected to fall back to 0.7%. At the same time, the unemployment rate increased to 6.4% in 2024 from 5.2% in 2023, surpassing the EU average (5.9%) for the first time since 2009. Long-term unemployment declined by 0.1 percentage points (pps) to 1.6% in 2024, but still remains slightly above its low pre-pandemic level. Looking ahead, the country's 2030 employment target of 77.6% remains within reach, contingent on i) a rebound in real GDP from 2025 onwards and ii) measures to address labour-market imbalances. Based on the Commission's 2024 Autumn Forecast, real GDP growth is expected to rise to 2.3% in 2025 and 2.2% in 2026, with employment growth rising to 1.6% and 1.7%, respectively. Unemployment is projected to fall slightly to 5.8% in 2026 (from 6.0% in 2025) as labour market conditions improve.

Labour shortages persist in certain sectors. The job-vacancy rate is low (1.4% in Q4-2024) and below the EU average. The proportion of employers expecting labour shortages to limit their production increased above the EU average both in industry (18.5%) and construction (36%) as of October 2024 ([211]). Specifically, shortages are reported in the tourism, business services and ICT sectors. At the same time, labour market slack ([212]) increased from 10.9% in Q4-2023 (then slightly below the EU average of 11.2%) to 12% in Q4-2024 (well above the EU average of 10.8%), further confirming imbalances between supply and demand. Skills mismatches continue to pose difficulties, as macroeconomic skills mismatches ([213]) increased from 23.0% to 26.8% in 2024, significantly above the EU average (19.2%). Moreover, 80% of small and medium-sized enterprises find it difficult to recruit workers with the right skills ([214]).

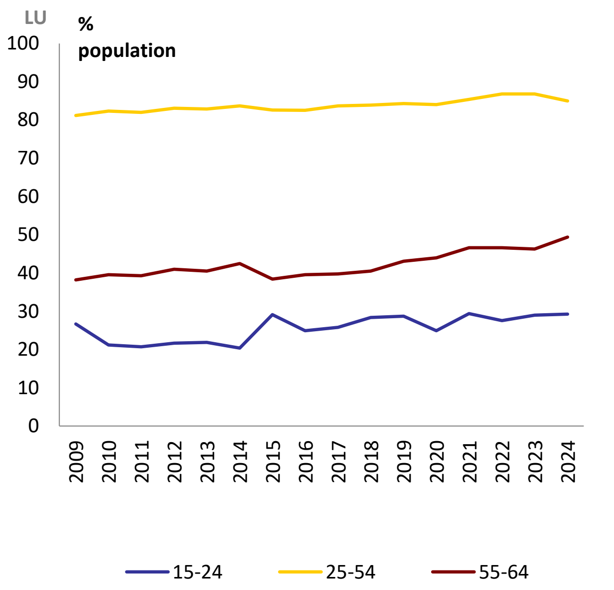
([211])ECFIN European Business and Consumer Surveys

([212])Labour market slack refers to all unmet needs for employment, namely it represents the extent to which labour supply exceeds labour demand in the short run.

([213])The macroeconomic skills mismatch indicator measures the dispersion of employment rates across skill groups (represented by qualification levels, with ISCED 0-2 low; 3-4 medium and 5-7 high).

([214])Education and Training Monitor 2024

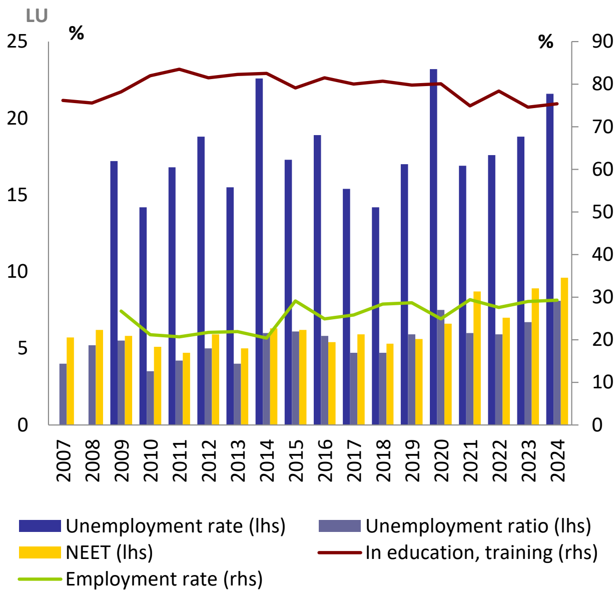
Graph A10.2: **Employment rate by age group (annual)**



Source: Eurostat, LFS [lfsi_emp_a]

Low labour market participation among older workers remains a pressing challenge, while the projected increase in pension spending poses risks to the sustainability of public finances in the medium term. At 49.4% in 2024, the employment rate for older workers (55-64) is among the lowest in the EU, 15.8 pps below the EU average (65.2%). Almost half of Luxembourg's unemployed people aged 55-64 are long-term unemployed, compared with 30% for all unemployed people. The participation of older workers in adult learning is also lagging behind, with a rate of 29.0% over the previous 12 months in 2022 (vs an EU average of 29.9% for older workers, and an overall rate of 45.2% in Luxembourg) ([215]). Participation is expected to increase as a result of the different programmes implemented by Luxembourg's national employment agency and the "Future skills" initiative (pilot programmes to integrate people over 45 years into the labour force) under Luxembourg's recovery and resilience plan. Helping older workers into employment would not only help Luxembourg to achieve its 2030 employment target but would also improve the financial sustainability of the pension system and reduce government debt. This, however, is dependent on more systematic active-ageing policies, focusing in particular on phasing out early retirement schemes and reducing financial incentives to leave the labour market early, health and lifelong learning, and designed to keep older workers in employment. If the current situation persists, whereby limited policy action has been taken to help older workers become more employable and to limit early retirement ([216]), Luxembourg will face the EU's sharpest increase in pensions expenditure by 2070, which is projected to reach approximately 17% of GDP by 2070 – potentially the highest proportion in the EU ([217]). More substantial change can be achieved through pension reform. Consultations on this subject with all relevant stakeholders have been taking place since October 2024. A report summarising key findings was published in January 2025**,** and a closing event is scheduled for 2025.

Graph A10.3: **Labour market outcomes of young people (15-24)**



Source: Eurostat, LFS [edat_lfse_18, lfsi_emp_a, une_rt_a, lfsi_act_a, edat_lfse_20]

Youth unemployment, particularly among men, amid low job vacancies, is a concern. The youth unemployment rate (15-24) stood at 21.6% ([218]) in 2024, 6.7 pps higher than the EU average (14.9%). In addition, monthly data from March 2025 indicate that Luxembourg had one of

([215])Education and Training Monitor 2024

([216])N.B. The effective retirement age was 61.6 in 2022, well below the statutory retirement age of 65.

([217])Cf. 2024 Ageing Report. Economic and Budgetary Projections for the EU Member States (2022-2070), country fiche Luxembourg.

([218])Data with low reliability in 2024.

the highest youth unemployment rates among all EU countries (21.4% vs EU: 14.5%), with the rate for men among the highest in the EU (24.7% vs 17.4% for women). This contrasts with Luxembourg's overall unemployment rate (15-74) which is only slightly above the EU average (6.4% vs 5.9%). The low activity rate of young people is partly due to a high rate of enrolment in education and training among those aged 15 to 24 (school is compulsory until the age of 18). The rate of young people aged 15 to 24 neither in employment, nor in education and training (NEETs) rose from 8.8% in 2023 to 9.5% in 2024, above the EU average of 9.1%. In 2023 the total number of job vacancies fell by 40% according to the public employment service ([219]), following a slowdown in activity, especially in the business consulting, IT, transportation and logistics and construction sectors. The largest increases in unemployment were recorded among the highest qualified (university graduates) and young people under 30. In addition, only 19.7% of 15-29-year-olds in Luxembourg combined study and work in 2023 (below the EU average of 25.7%), which may affect their transition into work ([220]). To address youth unemployment, Luxembourg has implemented the reinforced Youth Guarantee (via the ESF+ and REACT-EU) - which involves the National Employment Agency (ADEM), the Local Youth Action (ALJ) and the National Youth Service (SNJ). It provides, for example, coaching and financial incentives to companies hiring or training young jobseekers.

Vulnerable groups, including persons with disabilities, women with children, low-skilled adults and the non-EU-born, continue to face obstacles to labour market integration. The disability employment gap narrowed from 23.7 pps in 2023 to 19.1 pps in 2024, below the EU average (24 pps). Barriers include a lack of adapted workplaces, private-sector employers failing to comply with legal hiring quotas (only 12% of companies meet this obligation) and weak enforcement mechanisms. Fear of stigmatisation may discourage people from disclosing disabilities, which are not always visible, leading to underreporting. Measures to help narrow the disability employment gap could include continued awareness-raising, mentoring and de-stigmatisation campaigns, additional incentives for companies who meet disability quotas, offer training or adapt workplaces (and/or penalties for those who do not), and the setting of nationwide employment targets. Women with children also face significant labour market constraints, with 35.4% of employed women with children working part-time, much higher than for women without children (19.8%), a figure that exceeds the EU average for mothers in part-time work (31.8%). Language barriers further hinder the non-EU-born and low-skilled workers, limiting access to higher-quality jobs. The employment gap between people born in and outside the EU reached 10 pps in 2024, and the unemployment rate differential between those two categories is still significant. Several negative factors often combine to exacerbate the situation: for example, the high tax rate on low-wage earners leads to one of the most severe unemployment traps ([221]) in the EU: Luxembourg has one of the highest rates in 2024, well above the EU average (91.4% vs 74.4%).

Wage growth in Luxembourg has been slightly below the EU average, while in-work poverty remains among the highest in the EU. Nominal wage growth is expected to reach 3.4% in 2025, after 5.8% in 2022, 7.3% in 2023 and 3.0% in 2024 ([222]). Real wages, in turn, grew by 0.7% in 2024, well below the EU average, and are expected to rise by 0.9% in 2025, following a significant decline in 2022 (2.1%) and a strong rebound in 2023 (4.2%). This recovery reflects both sustained nominal wage growth and a slight fall in inflation, which went down from 3.8% in 2023 to 2.6% in 2024. The statutory minimum

([219])https://adem.public.lu/en/actualites/adem/2023/12/cc-2023-11.html N.B. This decrease slowed down to 16.3% over the course of 2024. The decline mainly affected the IT, banking and building finishing work sectors (cf. 18 625 jobseekers and an unemployment rate rising to 5.9% - Latest news - ADEM - FACILITONS L'EMPLOI - Luxembourg (public.lu)). The year-on-year decrease is 16.3%. This decline (in newly advertised posts and the stock at the end of the month) primarily affects professions in IT (ROME category M18), banking (category C12), and building finishing work (F16).

([220]) Cf. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Participation_of_young_people_in_education_and_the_labour_market

([221])The unemployment trap measures the percentage of gross earnings lost to taxes when a person becomes employed.

([222])For nominal wage growth, pay per employee is considered. It includes: i) Wages and salaries payable in cash or in kind; and ii) Social contributions payable by employers. For real gross wages, the deflator used is HICP. Real wages using this deflator then can differ from real wages shown in AMECO (that uses private consumption as deflator). Data for 2024 and 2025 are based on the European Commission Autumn 2024 economic forecast.

wage increased by almost 17% between January 2022 and January 2025, a real increase of around 5%. In-work poverty remained among the highest in the EU in 2024, at 13.4% (see Annex 11).

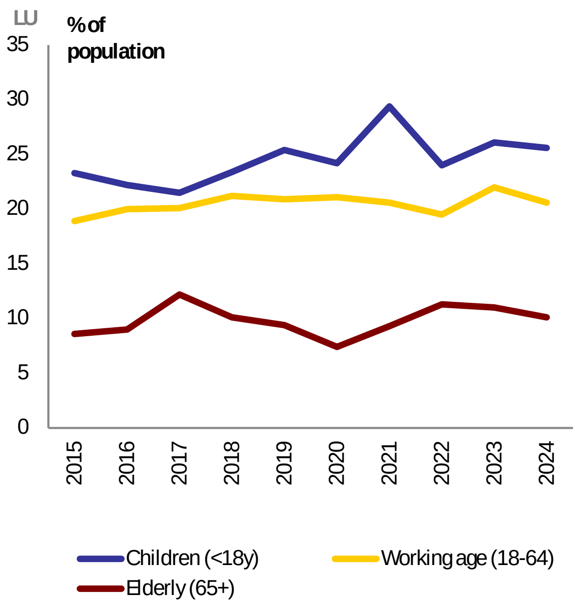
The workforce is adapting to the green and digital transitions, and there is a growing need for skilled workers in emerging sectors. In 2022, employment in the country's energy-intensive industries accounted for 0.9% of total employment, while jobs in the green economy have expanded rapidly. Between 2016 and 2022, employment in the environmental goods and services sector grew by 120.3%, reaching 9.2% of total employment (EU: 3.3%). The job-vacancy rate in construction, a key sector for the green transition, is below the EU average (1.0% vs 3.1% in 2024). The greenhouse gas emission intensity of Luxembourg's workforce has improved, decreasing from 21 tonnes per worker in 2015 to 13.7 in 2023 (EU: 12.3), reflecting progress in the green transition. The ICT sector continues to develop, with ICT specialists accounting for 8% of total employment in 2024, compared to 5% in the EU. Although above the EU average of 19.4%, women are particularly underrepresented, with only 22.5% of women ICT specialists. 66.8% of workers (25-64) have at least basic digital skills, which is above the EU average of 64.7%. Only 60.1% of the general public met this threshold in 2023 (vs 55.6% in the EU): this underlines the fact that further strengthening of upskilling and reskilling would be beneficial (see Annex 12).

Despite its comprehensive social welfare system, Luxembourg faces increasing challenges linked to people at risk of poverty and has seen very high levels of in-work poverty over the past few years. Vulnerable groups, such as the non-EU-born, the low skilled and single-parent households, are particularly affected. A number of structural factors contribute to this situation, including the particular composition of Luxembourg's job market, rising income equalities, the decreasing impact of social transfers in the reduction of monetary poverty, issues of tax fairness and high housing costs. Addressing these issues as a matter of priority will help Luxembourg on its path to inclusive growth and competitiveness.

Driven mainly by income disparities, poverty risks are on the rise, making Luxembourg's 2030 poverty reduction target increasingly difficult to meet. The at-risk-of-poverty or social exclusion (AROPE) rate in Luxembourg has increased by 1.6 percentage points (pps) compared to 2015 ([223]). In 2024, 1 in 5 people were at risk of poverty or social exclusion (20.0% vs 18.4% in 2015), slightly below the EU average (21.0%). Conversely, the average AROPE rate in the EU has been falling overall since 2015 (from a high of 24.0%). Luxembourg's rising AROPE rate is, in terms of its components, driven primarily by steadily increasing at-risk-of-poverty (AROP or relative monetary poverty) rates. The AROP rate has been increasing overall since 2015 (when 15.3% of the population were affected), to reach 18.1% in 2024. This is above the EU average of 16.2%, which has been trending downward. Between 2019 (reference year for the 2030 target) and 2024, the number of people at risk of poverty or social exclusion in Luxembourg increased by 13 000 to 132 000. This makes reaching Luxembourg's 2030 target of 4 000 fewer people at risk of poverty or social exclusion compared to 2019 levels (i.e. 115 000) increasingly challenging, especially since structural issues – such as wage disparities, the decreasing inequality-reducing effect of social transfers and high housing costs – remain prominent despite an overall decrease in inflation since 2022. Luxembourg has dedicated 25% of its total 2021-2027 European Social Fund Plus (ESF+) allocation to the fight against poverty and social exclusion (EUR 3.8 million).

Poverty risks are especially high among children. The AROPE rate for children has also increased overall since 2015 and impacts over 1 in 4 children, particularly affecting single-parent households. In 2023 it fell slightly by 0.5 pps to 25.6% (vs an EU average of 24.2%), as compared to 26.1% in 2023 and 23.3% in 2015. Like for adults, this rising AROPE rate is linked to the increasing AROP rate, which has been rising overall since 2015 (when it affected 21.5% of the population aged less than 18), reaching 24.1% in 2024. This is well above the EU average (19.3%), and one of the highest rates in the EU. In addition, 43.7% of individuals living in single-parent households were at risk of poverty in 2023. While Luxembourg's 2030 target is to reduce the number of children at risk of poverty or social exclusion by 1 000 compared to the 2019 level of 28 000, it has drifted further from that number, with 4 33 000 children affected in 2024. In order to reduce the impact of poverty on children, Luxembourg is implementing the European Child Guarantee (ECG) as part of its 2022 action plan. The implementation of the ECG is supported by the ESF+ and focuses on various areas including, for instance, targeted measures to combat child poverty and to promote inclusion.

Graph A11.1: **At-risk-of-poverty or social exclusion rate (AROPE) by age group**



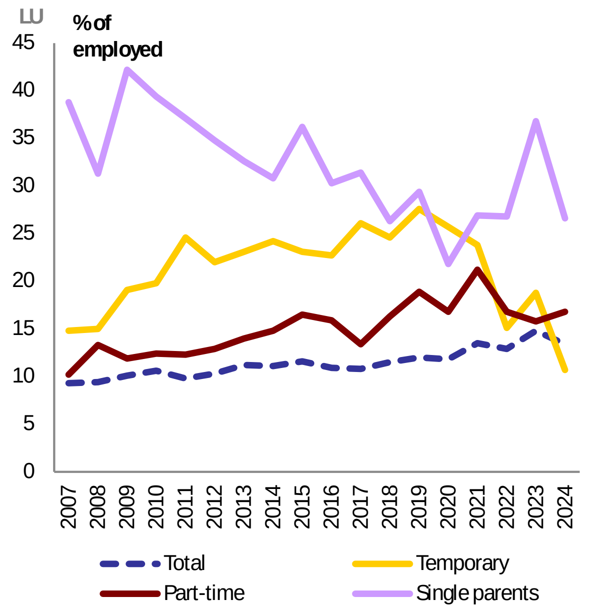
Source: Eurostat, EU-SILC [ilc_peps01n]

Significant levels of in-work poverty are due to structural factors such as income

([223])There are breaks in series for 2016, 2020, 2021 and 2022 data.

inequality. In 2024, the share of the Luxembourg population which was employed but at risk of poverty was 13.4% (well above the EU average of 8.2%) and constitutes the highest rate in the EU. This phenomenon is not new, since the share of the Luxembourg population affected by in-work poverty has been consistently higher than the EU average since at least 2010. It has also been on an overall upward trajectory over the last 20 or so years (with a low of 9.3% in 2007), while the EU average has remained relatively stable overall (8.5% in 2010 vs 8.3% in 2023). Nevertheless, the current level, representing almost 1 in 7 employees constitutes an increase of almost 45% since 2007. Income inequality, as measured by the income quintile share ratio S80/S20, fell slightly from 4.8 in 2023 to 4.7 in 2024, but has risen overall since 2005 (when it was 3.9). The share of income of the poorest 40% of households (S40) was 21.1%, below the EU average of 21.8%.

Graph A11.2: **In-work poverty rate (by group)**



Source: Eurostat, EU-SILC [ilc_iw01, _iw05, _iw07, _iw02]

Several factors contribute to in-work poverty, monetary poverty and income inequality, including for example the composition of the job market and the level of minimum wages. Average annual gross salaries in Luxembourg's financial and insurance sector – which plays a pivotal role in its economy([224]) – are almost 50% higher than the average for the entire economy, and salaries earned in this sector are, for instance, on average 2.8 times higher than those in the hospitality sector (HORECA) ([225]). Concerning minimum wages, Luxembourg has the highest nominal minimum wage in Europe (the minimum wage for unskilled workers is set at EUR 2,703.73, and EUR 3244.48 for qualified workers: these increased on 1 May 2025 and wages are indexed). However, workers that earn a minimum wage remain at or near poverty level when compared to the median income. The inequality-reducing effect of taxes and transfers is also low in Luxembourg (see Annex 2)([226]). The government is working on improving the adequacy of minimum wages, in line with Directive 2022/2041 on adequate minimum wages in the European Union.

The groups most vulnerable to poverty risks include the non-EU-born, the low skilled and single-parent households, **especially those with dependent children**. In 2024, the AROPE rate of non-EU-born people in Luxembourg was 30.3% with a gap of 18.7 pps with native-born people (the EU gap being 10.2 pps). In-work poverty was 23.1% among non-EU-born people, while in-work poverty for native-born people was only 4.3%, with a gap of 18.8 pps, vs an average EU gap of 12.5 pps. Workers whose education levels are classed as low (International Standard Classification of Education 0-2) or medium (ISCED 3-4) face much higher in-work poverty rates in Luxembourg compared to the EU average: 35.5% versus 17.4% for workers with a low level of education, and 18.8% versus 8.6% for those with a medium level. Workers living in households with children face a much higher in-work poverty risk than those without children (17.9% vs 8.8%). This risk is especially pronounced for single parents, with a rate of 26.6%. These factors are exacerbated when the worker has a temporary or part-time contract ([227]), and many or even all of

([224])In 2021 (according to the latest available Eurostat data), financial and insurance activities represented almost 35% of value added in Luxembourg's business economy total, taking the number one position in the EU, ahead of the Netherlands, and reaching around 3 times the EU average. Luxembourg also dominated the EU's financial and insurance activities sector in employment share, accounting for over 12% of its business economy workforce (also around 3 times the EU average).

([225])STATEC, Work and Social Cohesion Report (2024), p64.

([226])European Commission (2024), Economic inequalities in the EU.

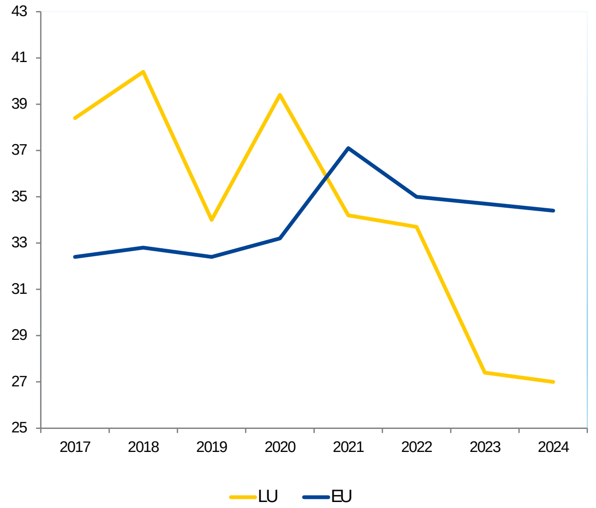
([227])Panorama social 2024, Luxembourg Chamber of Employees, CSL, p109.

these factors can occur simultaneously. Linguistic barriers are a key challenge for non-EU-born workers. Another aggravating factor ([228]) is that foreign diplomas and experience are not always recognised ([229]), thus further exposing them to in-work poverty. In addition, Luxembourg's current collective bargaining agreement coverage rate – around 59% – is below the 80% target set by Directive 2022/2041 on adequate minimum wages in the European Union.

Social transfers are not fully effective in reducing poverty and income inequality. At 27.0%, the impact of social transfers (excluding pensions) in reducing monetary poverty was well below the EU average of 34.4% in 2024. One explanation could be the suspension of the automatic indexation mechanism as regards family benefits from 2006 to 2014, which was not compensated for, despite the gradual reintroduction of automatic indexation after 2014 (and in 2021 for child benefits). The inefficacy of social transfers (Eurofound, 2024), despite their availability, is also partly explained by low take-up rates – a result of low awareness about support measures eligibility, complex administrative procedures and psychological costs ([230]). The government is to set up a *guichet social unique* – a 'one-stop shop' for issues relating to social welfare – to make it easier for people to find out about and access social benefits.

The inequality-reducing effect of taxes and transfers is low. This indicator was also well below the EU average in 2024 (39% vs an EU average of 48%). The Commission's 2024 report on taxation ([231]) shows that Luxembourg's tax-benefit system does not reduce inequality as effectively as in other Member States (see Annex 2). A 2021 OECD study ([232]) comparing 37 countries (of which 21 from the EU) showed that, in Luxembourg, average incomes were taxed seven times more when they came from work rather than from capital, favouring high-income households.

Graph A11.3: **Impact of social transfers (other than pensions) on poverty reduction**



Source: Eurostat, EU-SILC [ilc_li02, ilc_li10]

House prices have increased significantly in the last decade and exhibit signs of overvaluation. House prices have increased by 70% in nominal terms since 2015. Supply constraints continue to keep house prices high owing to a structural lack of housing supply and low or negative residential housing investment growth. House prices increased by 13.9% and 9.6% in 2021 and 2022 respectively. That said, after years of strong growth, they experienced a sharp 9.1% drop in 2023. In 2024, the correction continued with house prices decreasing by 8.3% in Q2-2024, year-on-year (and by 1.7% in Q3-2024). The ongoing correction is driven by the adjustment to the current environment of higher interest rates, which increased from 1.3% in 2021 to 4.1% in 2023. House prices are unlikely to continue to fall as high population growth, the large number of cross-border workers and tax measures support demand while housing supply remains low. The number of housing transactions fell by 43.3% in 2023, after decreasing by 15.1% in 2022. The number of building permits issued fell by 7.5% in 2023 after falling by 22.9% in 2022. In terms of financial stability, in February 2024 the European Systemic Risk Board concluded that the residential housing market in Luxembourg was subject to high risks and the macroprudential policy mix was only partially appropriate and partially sufficient to mitigate the situation.

([228])STATEC, Work and Social Cohesion Report (2024), p60.

([229])STATEC, 2023.

([230])Franziskus, A., & Guio, A.-C. (2024), Précarité et (non-)recours aux aides financières au Luxembourg: une étude qualitative (a LISER study commissioned by the Luxembourg Chamber of Employees, CSL, on Precarity and the (non) take-up of financial assistance in Luxembourg).

([231])European Commission (2024), p83 and p98.

([232])Statistiques des recettes publiques 1965-2020 (OECD, 2021) - Revenue statistics

Overall housing affordability has strongly deteriorated in the last decade reflecting limited housing supply amid growing demand, and household debt is high. House prices have grown faster than household incomes over the past decade. The standardised house price-to-income ratio has increased by nearly 30% since 2015, and more than 60% above the long-term average. While it has improved, with household incomes, since 2022, it stills stands 23% above its long-term average. Long-term price pressures also reflect accessible housing supply not keeping pace with the strong population increase by 50% since 2003. As a consequence, the number of dwellings per capita continues to decrease at a strong pace. Over recent years, both dwelling and residential building permits per capita has been decreasing to below pre-pandemic levels, which could indicate limited new housing supply looking ahead. House price levels compared to incomes remain among the highest in the EU, posing potential structural risks to the domestic economy. Taking into account the cost of mortgage funding, the borrowing capacity of households remained broadly stable over the past decade. However, Luxembourg's household debt-to-GDP ratio stood above pre-pandemic levels in 2023 (at 68% of GDP). Household debt is even higher when expressed as a ratio of household gross disposable income, coming in at around 140%. Net credit flows contracted strongly in 2023 on the back of rising borrowing costs, after having expanded in 2022. Risk factors include: (i) variable rate mortgages, which continue to account for a significant share of new mortgages; (ii) a high median debt service-to-income ratio (16%), reaching 35% for debt holders in the bottom quintile of the income distribution, which make up 9% of all households; and (iii) a high price-to-income ratio. At the same time, the gross saving rate is high.

The overall cost of living is exacerbated significantly by Luxembourg's high housing costs. People in Luxembourg spent 19.1% on their homes in 2024. While the housing cost overburden has been flagged as a critical issue for Luxembourg for several years, in 2023 it fell from 11.5% of the population (above the EU average of 8.8%) to 8.0% in 2024 (below the EU average of 8.2%). Still, it has been rising overall since 2012 (from a low of 4.9%, vs the then EU average of 11.5%) while, conversely, the EU average has followed a downwards trajectory. In 2021, a law was adopted establishing the 'Housing Pact 2.0', which was included in Luxembourg's recovery and resilience plan. It aimed to support municipalities, in cooperation with the State, in promoting the development of affordable and sustainable housing, mobilising existing land and residential potential, and improving residential quality. Nevertheless, given that housing costs have continued to rise, the government introduced a new package of measures in 2024, including financial aid for households, tax breaks and support for the construction sector.

Some households have suffered from fluctuating energy prices and costs stemming from a lack of building energy efficiency, while many have encountered high costs linked to personal transport fuels. In terms of energy poverty, the number of cases of gas and electricity disconnections referred to the Social Welfare Office (*Office social*) more than doubled for gas between 2020 and 2023, and increased by 50% for electricity, while there was an average increase in energy expenses of 35% between 2019 and 2023 due to inflation [233]. More broadly, 4.2% of the population faced arrears on utility bills in 2024, increasing from 3.6% in 2021 even though this was still below the EU average of 6.9%. Structural issues such as leaks, damp or rot affected 18% of dwellings in 2023, an increase of 2.6 pps since 2021, and above the EU average of 15.5%. In response, Luxembourg is advancing a national strategy to address energy poverty, with a focus on improving building energy efficiency through renovations and energy performance certifications. Luxembourg's national energy and climate plan also includes a range of measures to mitigate energy poverty, including social subsidies and energy efficiency programmes for vulnerable households. As for transport poverty, while individuals do not face major obstacles to car ownership, Luxembourg has a higher than EU average share of individuals at risk of poverty with very high expenditure on personal transport fuels (defined as twice the national median), which stands at 19.5% compared to the EU average of 18.3%. The continued dominance of private cars and the stagnation in public transport use – despite public transport being free of charge – highlight challenges in promoting sustainable and inclusive transportation systems.

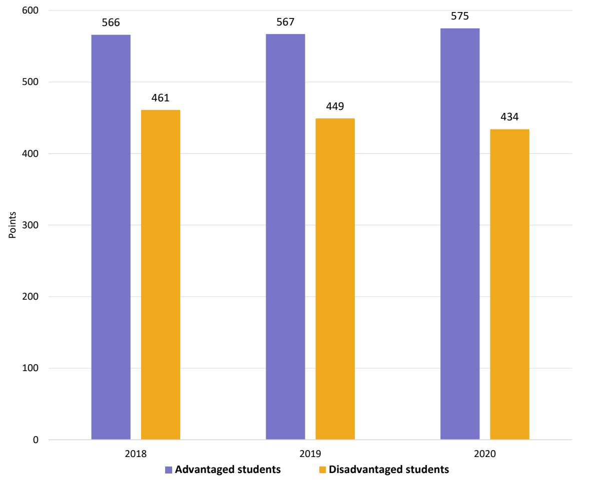
[233] Institut Luxembourgeois de Regulation (ILR).

Low basic skills, especially among disadvantaged students, as well as adults' level of digital skills, limit Luxembourg's overall competitiveness. Weaknesses in language skills adversely impact the development of pupils' basic skills at school. In early childhood education and care (ECEC), children are not familiarised with German, although it is the language of tuition and literacy in primary school. This leads to the early emergence of performance gaps between pupils of various linguistic and socio-economic backgrounds. The share of underachievers among 15-year-olds was well above the EU average in PISA, while the relatively low share of STEM graduates may exacerbate skills shortages. VET participation is strong and generally leads to solid employment prospects, although low female enrolment rates are a concern. Adult participation in training needs to increase significantly, particularly for older workers and the low-skilled - especially as regards digital skills - to address skills mismatches and to maintain a competitive workforce and economy.

Language development from an early age in the instruction languages at school would be crucial for skills development. While participation in ECEC is high for children below the age of three (60.0% in 2023 vs EU average of 37.4%) ([234]), it is below the EU average for children from age three onwards (90.5% vs EU 93.3%). Participation in ECEC has only a moderately positive impact on language skills ([235]), partly because in ECEC children are not familiarised with German, the language of tuition and literacy in primary school. Instead, children aged 1-4 are offered language development activities for French and Luxembourgish only.

Students' basic skills are significantly below the EU average, with educational outcomes closely tied to their socio-economic and linguistic background ([236]). While the share of early school leavers at 7.8% is still well below the EU average of 9.3%), school outcomes remain highly dependent on pupils' socio-economic status and linguistic background. The AROPE rate for children, which particularly affects single-parent households, fell slightly by 0.5 percentage points (pps) to 25.6% in 2024, remaining above the EU average of 24.2% (see Annex 11). Luxembourg's average skills levels, as measured by the OECD Programme for International Student Assessment (PISA) survey in 2018, were significantly lower than the EU average in all three areas tested ([237]). The score gap between disadvantaged and non-disadvantaged students was the largest one observed across all Member States.

Graph A12.1: **Evolution of writing comprehension in German in grade 3, depending on the socio-economic status, between 2018 and 2020**



(1): Pupils' achievements are standardised in such a way that the mean value of the respective reference cohort is always 500 and the standard deviation is always 100 (Fischbach et al., 2014)
Source: LUCET 2021.

National data show that at the time of starting school, pupils have the essential basic skills to begin acquiring literacy. However, from the start of year 3 of primary school (at the age of 8), which is the first time that progress in basic skills is assessed, many pupils' performance in German reading comprehension and mathematics falls noticeably. This fall is particularly pronounced among pupils from disadvantaged backgrounds ([238]). Most pupils

([234])Eurostat: ilc_caindform25b.

([235])Luxembourg Centre for Educational Testing (LUCET) of Luxembourg University: Early Childhood Education and Care in Luxembourg

([236])Luxembourg's mean scores in 2018 stood at 483 (EU average: 492) in mathematics; at 477 (EU average: 487) in science and at 470 (EU average: 487) in reading. Luxembourg did not participate in the 2022 PISA survey.

([237])The shares of low achievers in 2018 stood at 27.2% in mathematics (EU average: 22.9%), 29.3% in reading (EU average: 22.5%) and 26.8% in science (EU average: 22.3%). Luxembourg did not participate in the 2022 PISA survey.

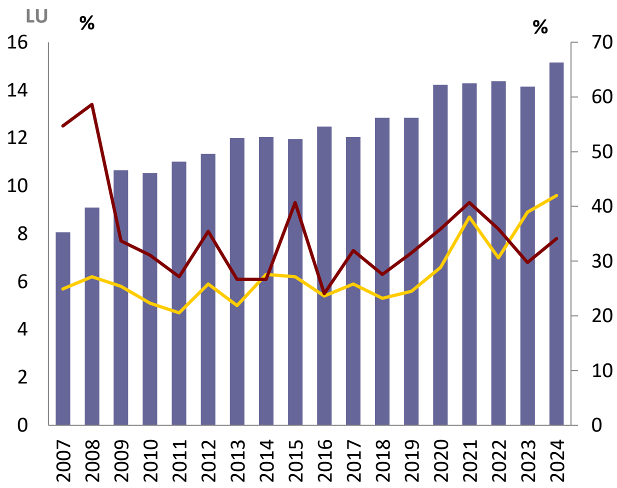
([238])Hornung, C., Wollschläger, R., Keller, U., Esch, P., Muller, C. & Fischbach, A.: "Nouveaux résultats longitudinaux issus du monitoring scolaire national ÉpStan en première et troisième improve their reading comprehension in German by grade 9 (at the age of 14), except pupils from disadvantaged backgrounds and those who speak French or Portuguese at home ([239]).

A pilot initiative providing literacy education in French was launched in four primary schools in 2022/2023 to address performance gaps. In the coalition agreement ([240]), the government announced its intention to extend the French literacy initiative nationwide from 2026/2027 if the pilot yields positive results. The curriculum of primary education is currently being revised to make it competency based. Introducing a national quality framework in education could guide schools to draw up their own quality policies and actions.

Pupils' digital skills have improved but continue to show large performance gaps. Luxembourg belongs to the few countries whose eighth-graders' digital skills have improved since 2018, to an average score of 493.7 (EU average: 496.8) in 2023 ([241]). The overall improvement is likely linked to new measures reinforcing digital sciences in primary and secondary education as of 2020/2021. However, pupils with parents in higher-level occupations show the largest performance gap (59.0 points; EU average: 40.9 points) compared to their peers.

The tertiary attainment rate is among the highest in the EU and enrolments are above the EU average in STEM and ICT subjects. 63.8% of the population aged 25-34 holds a tertiary degree (EU average: 44.2%). Tertiary attainment is especially high among the non-EU-born population (72.4%). In 2022, the share of STEM graduates (22.9%) was lower than the EU average (26.6%). However, the share of tertiary students in STEM subjects was 27.7% (EU average: 27.1%) and 9.8% in ICT (EU average: 5.2%).

Graph A12.2: **Education and labour market for youth**



Source: Eurostat, LFS [edat_lfse_14,edat_lfse_20,edat_lfse_07]

VET attracts a high share of students and generally leads to solid employment prospects. In Luxembourg, 6 out of 10 students in medium-level education are in programmes with a vocational orientation (59.2% in 2022 vs an EU average of 52.4%), reflecting the sector's attractiveness. However, at 26.1%, the enrolment rate in medium-level VET in STEM fields was below the EU average of 36.3% in 2023 ([242]). Although only one third of recent VET graduates (34.5% in 2023) ([243]) had experienced work-based learning, well below the EU average (64.6% in 2023, 65.3% in 2024), recent VET graduates in Luxembourg had an employment rate of 80.0% in 2023 ([244]), close to the EU average (81.0% in 2023, 80.0% in 2024). Benefiting from EU support, Luxembourg has taken measures to strengthen the VET system. For example, the 'Competence centres' will receive EUR 375 000 in ESF+ funding (2023-2025 period) to address skills gaps in various industrial sectors. The 'Update

année scolaire (cycles 2.1 et 3.1): *tendance négative au niveau du développement des compétences et redoublements inefficaces."* University of Luxembourg, Luxembourg Centre for Educational Testing: Rapport national sur l'éducation au Luxembourg 2021, p. 44.

([239]) Sonnleitner, P., Kraëmer, C., Gamo, S., Reichert, M., Muller, C.,., Keller, U. & Ugen, S.: Etude longitudinale des compétences des élèves. University of Luxembourg, Luxembourg Centre for Educational Testing: Rapport national sur l'éducation au Luxembourg 2018, p. 39.

([240]) Accord de coalition 2023-2028

([241]) International Computer and Information Literacy Study (ICILS) in Europe – 2023

([242]) The data is marked "d", meaning the definition used by Luxembourg differs from standard Eurostat methodology, and therefore should be considered with caution when compared with other countries.

([243]) No data for 2024.

([244]) No data for 2024.

cours du soir' project will receive EUR 287 000 in ESF+ funding during the same period and aims to tailor evening courses to meet market demands.

There is scope to improve green competencies and skills at school and during higher education. Learning for sustainability (LfS) is integrated in both initial teacher education and in teachers' continuous professional development. The current primary school curriculum does not explicitly include LfS, nor does it incorporate related educational concepts. However, its ongoing revision is planned to incorporate sustainability as a key interdisciplinary theme. The coalition agreement announced the revision of the secondary school curriculum by 2027, where LfS is to be included explicitly. Luxembourg has taken measures to adapt its VET offer to the needs of the green transition. The National Centre for Continuous Vocational Training (CNFPC) has modernised its offer and infrastructure to include new courses focusing on Industry 4.0 and green skills such as waste management, circular economy and energy efficiency. New initial VET programmes for green and digital occupations have been introduced, including the 'Smart buildings and energies' and 'Smart technologies' technician diplomas.

The labour market is characterised by persistently high skills shortages, skills mismatches and declining levels of digital skills, hindering the economy's competitiveness. In 2024, shortages were reported in several occupations requiring specific skills related to the green transition, including building structure cleaners, environmental and occupational health inspectors and associates, and civil engineering technicians ([245]). Skills mismatches increased from 23.0% to 26.8% in 2024, significantly above the EU average (19.2%). In addition, 80% of all small and medium-sized enterprises find it difficult to find workers with the right skills ([246]). The level of adults' digital skills, vital for the twin transition, has declined. In 2023, 60.1% of the population aged 16-74 had basic or above basic overall digital skills, above the EU average (55.6%) but down from 2021 levels (when it was at 63.8%), at a time when most Member States recorded rises in this area. The share of women with digital skills (56.6% in 2023 vs an EU average of 54.5%) is much lower than that of men (63.6% vs an EU average of 56.7%). Reskilling, and in particular digital upskilling, are therefore key areas for improvement to address skills mismatches and maintain competitiveness. Several relevant initiatives have been launched. These include the public employment service's (ADEM) JobInsights.lu ([247]), which provides real-time data on job openings and labour market trends, particularly in relation to IT skills. Another is the government's 'Skillsbridges' vocational training programme (part of the Recovery and Resilience Plan), which offers adults courses to facilitate career changes in the context of the green and digital transitions.

While adult participation in training rose in 2022, higher participation rates would enhance productivity growth and competitiveness. Adult participation in training increased from 42.6% in 2016 to 45.2% in 2022. Moreover, Luxembourg's adult learning participation rate has consistently stood above the EU average (respectively, 37.4% in 2016 and 39.5% in 2022). However, challenges persist regarding the participation of older workers in learning programmes (29.0% vs EU average of 29.9%, but well below Luxembourg's overall average). Although above the EU average, the participation rate of people with low-level qualifications (20% vs EU average of 18.4%) is below Luxembourg's overall average. Given the limited progress achieved so far, there is still a significant 17.3 pps gap between the current adult training rate and Luxembourg's national 2030 skills target of 62.5% ([248]) which is 2.5 pps above the EU headline target of 60%. The ESF+ supports measures promoting lifelong learning in connection with skills needs for both jobseekers and employees, including older workers. Disadvantaged groups are covered via integrated pathways to work, including training and workshops for social and professional reintegration. The 'Skills4Job' programme is supported by the ESF+ as an operation of strategic importance and aims to support labour market reintegration. Going forward, the implementation of individual learning accounts (ILAs) could help

([245])European Labour Authority 2025 EURES Report on labour shortages and surpluses 2024, based on data from EURES National Coordination Offices.

([246])Education and training monitor 2024.

([247])The online tool Jobinsights.lu.

([248])Adult Education Survey 2022

improve adult learning, regardless of individuals' socio-economic backgrounds.

Table A13.1:**Social Scoreboard for Luxembourg**

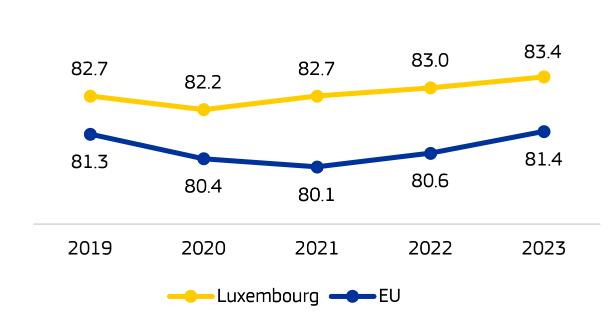
Social Scoreboard for Luxembourg			
Equal opportunities and access to the labour market	Adult participation in learning (during the last 12 months, excl. guided on the job training, % of the population aged 25-64, 2022)	45,2	
	Early leavers from education and training (% of the population aged 18-24, 2024)	7,8	
	Share of individuals who have basic or above basic overall digital skills (% of the population aged 16-74, 2023)	60,1	
	Young people not in employment, education or training (% of the population aged 15-29, 2024)	9,8	
	Gender employment gap (percentage points, population aged 20-64, 2024)	5,5	
	Income quintile ratio (S80/S20, 2024)	4,68	
Dynamic labour markets and fair working conditions	Employment rate (% of the population aged 20-64, 2024)	74,2	
	Unemployment rate (% of the active population aged 15-74, 2024)	6,4	
	Long term unemployment (% of the active population aged 15-74, 2024)	1,6	
	Gross disposable household income (GDHI) per capita growth (index, 2008=100, 2023)	105,3	
Social protection and inclusion	At risk of poverty or social exclusion (AROPE) rate (% of the total population, 2024)	20,0	
	At risk of poverty or social exclusion (AROPE) rate for children (% of the population aged 0-17, 2024)	25,6	
	Impact of social transfers (other than pensions) on poverty reduction (% reduction of AROP, 2024)	27,0	
	Disability employment gap (percentage points, population aged 20-64, 2024)	19,1	
	Housing cost overburden (% of the total population, 2024)	8,0	
	Children aged less than 3 years in formal childcare (% of the under 3-years-old population, 2024)	56,6	
	Self-reported unmet need for medical care (% of the population aged 16+, 2024)	1,0	
Critical situation; To watch	Weak but improving; Good but to monitor	On average; Better than average	Best performers

(1) Update of 5 May 2025. Members States are categorised based on the Social Scoreboard according to a methodology agreed with the EMCO and SPC Committees. Please consult the Annex of the Joint Employment Report 2025 for details on the methodology (https://employment-social-affairs.ec.europa.eu/joint-employment-report-2025-0).
Source: Eurostat

Luxembourg's health system performs comparatively well but faces some challenges that need be addressed if the country is to improve the health of its population and social fairness, while boosting the competitiveness of its economy. Challenges include: (i) fragmentation in the management of the health system; (ii) lack of a dedicated public health strategy; (iii) health workforce shortages; and (iv) lagging digitalisation of the health sector.

Life expectancy at birth in Luxembourg rebounded above its pre-COVID-19 level and was among the highest in the EU in 2023. While women can expect to live 3.4 years longer than men, they live 1.3 years less in good health than men. Treatable mortality is among the lowest in the EU, suggesting that Luxembourg's health system is effective. Yet, it also has one of the highest spending rates per capita, indicating room for efficiency gains.

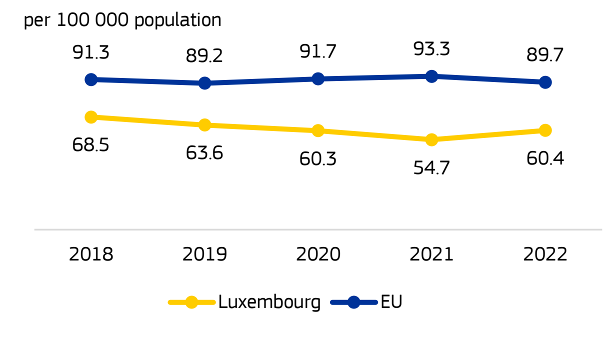
Graph A14.1: **Life expectancy at birth, years**



Source: Eurostat (demo_mlexpec)

Stronger governance could improve efficiency and reduce fragmentation of healthcare delivery. Health spending per capita in Luxembourg is among the highest in the EU, as is public expenditure on health as a proportion of total health spending. Reform efforts in recent years focused on cost containment and refocusing hospital services through a shift to day care and ambulatory services. However, the health system remains hospital-centred with a greater reliance on specialised care services. Further gains could be achieved by: (i) providing incentives for efficiency improvements; (ii) introducing mechanisms for priority setting in budget allocation; and (iii) better planning in outpatient care. Furthermore, integrated care could be improved through the extension of integrated care networks. This would especially reinforce the role of primary care and incentivise the uptake of the "*referring physician*" model. Recent reforms aim to improve the general operating framework for the healthcare system. The first national health plan, published in 2023, following the *Gesondheetsdësch* included in the recovery and resilience plan (RRP), identifies the major health system challenges, analyses various possible scenarios, and proposes priorities and related strategies (although with no concrete or measurable objectives). To address institutional fragmentation, the merger in 2023 of two ministries into the Ministry of Health and Social Security set a path towards stronger governance, alignment and coordination in health policies. The establishment of the National Health Observatory in 2022 and the health system performance assessment framework, currently under development, are steps towards improving capacities for evidence-based governance and integration, and the use of data from various sources to develop effective policies.

Graph A14.2: **Treatable mortality**



Age-standardised death rate (mortality that could be avoided through optimal quality healthcare)
Source: Eurostat (hlth_cd_apr)

An enhanced focus on prevention could also contribute to efficiency gains. In 2022, spending on prevention in Luxembourg accounted for 4.6% of total spending on health, lower than the EU average of 5.5%. Although Luxembourg performs well on health outcomes, having one of the lowest levels in the EU of mortality from cardiovascular diseases and cancer, behavioural risk factors remain a source of concern. Excessive alcohol consumption has been a long-standing public health issue and young people have high rates of regular vaping ([249]). Although prevention is highlighted as a priority in the 2023 National health plan, Luxembourg has no overarching

([249])OECD/European Commission (2024), Health at a Glance: Europe 2024: State of Health in the EU Cycle, Chapter 4.

Table A14.1:**Key health indicators**

	2019	2020	2021	2022	2023	EU average* (latest year)
Cancer mortality per 100 000 population	219.3	203.1	203.4	195.4	n.a.	234.7 (2022)
Mortality due to circulatory diseases per 100 000 population	238.6	224.4	213.2	220.3	n.a.	336.4 (2022)
Current expenditure on health, purchasing power standards, per capita	3 741	3 811	4 172	4 316	n.a.	3 684.6 (2022)
Public share of health expenditure, % of current health expenditure	85.0	86.5	86.2	86.1	85.9	81.3 (2022)
Spending on prevention, % of current health expenditure	2.5	5.3	6.4	4.6	3.5	5.5 (2022)
Available hospital beds per 100 000 population**	345	340	335	320	n.a.	444 (2022)
Doctors per 1 000 population*	3.0	n.a.	n.a.	n.a.	n.a.	4.2 (2022)*
Nurses per 1 000 population*	11.7	n.a.	n.a.	n.a.	n.a.	7.6 (2022)*
Mortality at working age (20-64 years), % of total mortality	17.4	15.6	16.4	16.3	15.6	14.3 (2023)
Number of patents (pharma / biotech / medical technology)	59	57	52	34	42	29 (2023)***
Total consumption of antibacterials for systemic use, daily defined dose per 1 000 inhabitants****	21.1	16.1	15.9	19.1	20.2	20.0 (2023)

*The EU average is weighted for all indicators except for doctors and nurses per 1 000 population, for which the EU simple average is used based on 2022 (or latest 2021) data except for Luxembourg (2017). Doctors' density data refer to practising doctors in all countries except Greece, Portugal (licensed to practise) and Slovakia (professionally active). Density of nurses: data refer to practising nurses (EU recognised qualification) in most countries except France and Slovakia (professionally active) and Greece (hospital only). **'Available hospital beds' covers somatic care, not psychiatric care. ***The EU median is used for patents.
Source: Eurostat database; European Patent Office; ****European Centre for Disease Prevention and Control (ECDC) for 2023.

strategy dedicated to public health and prevention, which could facilitate a shift from curative care to preventive care and secure funding that prioritises a 'health in all policies' approach. Luxembourg's antibiotic consumption is below the European average and antimicrobial resistance concerns have been on the political agenda for several years. Luxembourg participates in the EU4Health-funded joint action on antimicrobial resistance. The 2018 National antibiotic plan was crucial to boost cross-sectoral programmes, policies and research aimed at enhancing public health outcomes.

Luxembourg relies heavily on a foreign-trained health workforce and cross-border workers, which raises concerns about significant fluctuations in staffing levels and accessibility of care. The density of doctors in Luxembourg is the lowest in the EU (3 per 1 000 inhabitants vs an EU average of 4.2). However, due to Luxembourg's small population, specific specialised and complex treatments are available abroad. There were 11.7 nurses per 1 000 population in 2022, compared to an EU average of 7.6. An increasing proportion of hospital employees commute from neighbouring countries (44.9% in 2019 and 48% in 2023). Health professionals can settle where they wish, leading to geographical disparities in the distribution of health workers. In 2017, general practitioner (GP) density ranged from 0.19 GPs per 1 000 population in Vianden to 1.14 in Redange, with higher densities in cantons with hospitals. A 2019 governmental report focused on workforce availability, stressed that by 2034, between 59% and 69% of medical doctors are expected to retire.

In response to these challenges, the health workforce reform included in the RRP has led to the development of initial education programmes for health professionals. A specific training in general medical practice has been introduced at the University of Luxembourg, as well as bachelor's degrees in general nursing and certain nursing specialisations (medical technical assistants in surgery, anaesthesia and intensive care, paediatrics and psychiatry). Other courses are under development including midwifery, medical technical assistant in radiology and certain medical specialisations. Other elements of the reform are expected to focus on boosting the attractiveness of healthcare jobs, and retention policies. Public campaigns have been launched in order to enhance the appeal of healthcare professions and attract more students to medical faculties. A planned legal framework to encourage multiprofessional practices and task-sharing will build on incentives such as: (i) compensation for duties; (ii) pay for interns; and (iii) support for setting up group practices. Finally, a digital healthcare workforce registry, supported under the RRP, will improve health workforce planning.

The Luxembourgish health system's potential to drive innovation and foster industrial development in the EU medical sector remains untapped. Luxembourg is among the EU countries with a relatively low level of public spending on health research and development, in part reflecting the overall limited size of the country and its health system. This is also reflected in the low number of European patents generated in 2023 in the combined areas of pharmaceuticals, biotechnologies and medical devices ([250]). Luxembourg also reports low clinical trial activity, further underscoring the challenge for the EU industry to reap benefits from the single market through multi-country trials ([251]).

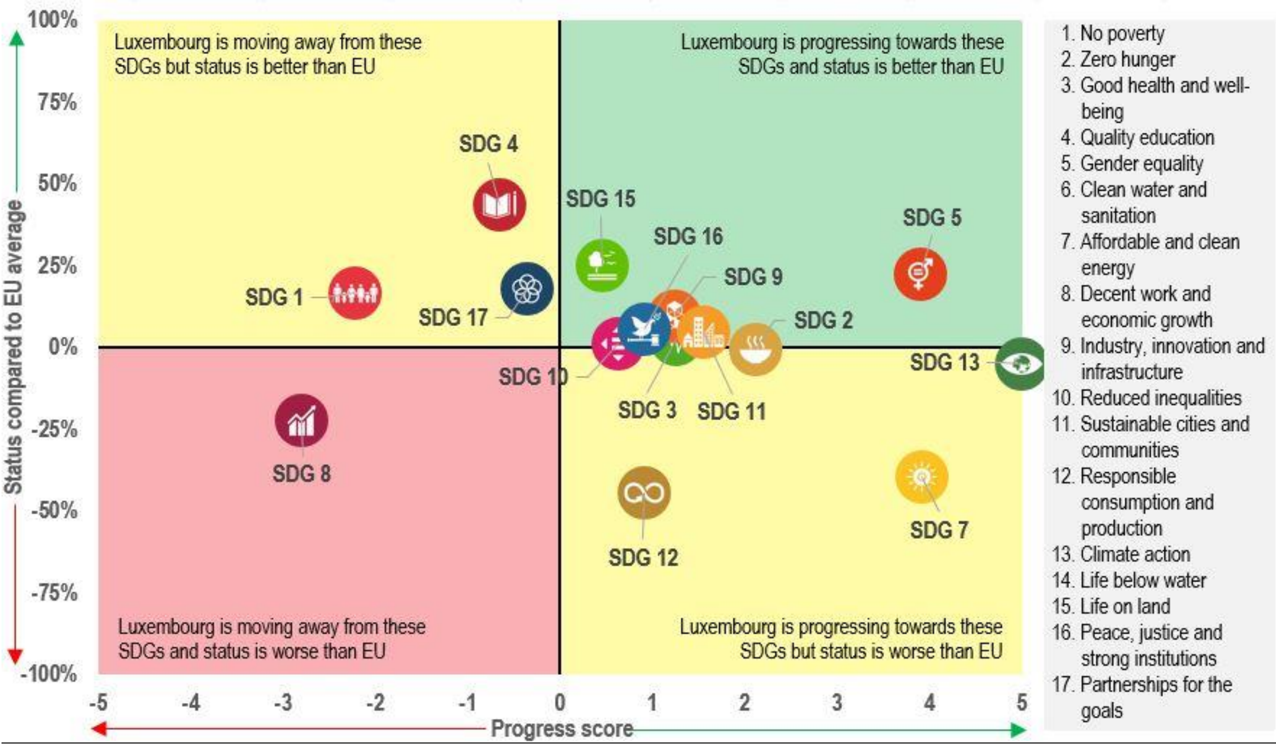
Luxembourg is lagging behind in the uptake of e-health and the overall digitalisation of its health system, and has yet to overcome gaps in data storage and sharing. For instance, in 2024, the share of people accessing their personal health records online (22.0%) was below the EU average (27.7%). Although Luxembourg has a unique patient identifier, it does not have a national health information system that facilitates the collection, quality control, provision and processing of data for assessing population health, the use of services and the performance of the health system. Luxembourg is however preparing the *Data Governance Act* and the digitalisation strategy, which aim at streamlining the information technology systems of the various health providers. The aim is to improve health information flows for primary users and facilitate the secondary use of data, while also improving integrated care and supporting a holistic approach to patient care by multidisciplinary teams. Investments under the RRP aim to boost the digital transformation of the healthcare sector by accelerating telemedicine. In May 2023, additional national funding was granted for accelerating digitalisation including to implement electronic health records. Luxembourg also participates in the EU4Health joint action on the European Health Data Space and benefits from a grant supporting digital infrastructure and secondary use of data in healthcare.

([250])European Patent Office, Data to download | epo.org.
([251])EMA (2024), Monitoring the European clinical trials environment, p. 9.

This Annex assesses Luxembourg's progress on the Sustainable Development Goals (SDGs) along the dimensions of competitiveness, sustainability, social fairness and macroeconomic stability. The 17 SDGs and their related indicators provide a policy framework under the UN's 2030 Agenda for Sustainable Development. The aim is to end all forms of poverty, fight inequalities and tackle climate change and the environmental crisis, while ensuring that no one is left behind. The EU and its Member States are committed to this historic global framework agreement and to playing an active role in maximising progress on the SDGs. The graph below is based on the EU SDG indicator set developed to monitor progress on the SDGs in the EU.

While Luxembourg is moving away from several SDG indicators related to *competitiveness* (SDGs 4 and 8), it is improving on SDG 9. Luxembourg performs well on SDGs 4 and 9 but needs to catch up with the EU average on SDG 8. The number of patent applications to the European Patent Office is above the EU average (192 applications per million inhabitants vs 156 in the EU) (SDG 9). Meanwhile, the rate of young people aged 15-29 neither in employment nor in education and training increased from 6.5% in 2019 to 9.8% in 2024 but remains below the EU average of 11.0% (SDG 8). Furthermore, the percentage of adults with at least basic digital skills decreased from 63.8% of individuals aged 16 to 74 in 2021 to 60.1% in 2023 (EU average: 55.6%) (SDG 4). The recovery and resilience plan (RRP) envisages reforms and investments to promote a data-based economy and digitalisation of public administration. It also includes measures on improving skills and on up- and reskilling to help people join the labour market, with additional skills measures financed by the ESF+. For instance, training under the RRP's 'Future Skills' measure targeted jobseekers, with a target participation rate of 30% for those aged 45 and above.

Graph A15.1: **Progress towards the SDGs in Luxembourg**



For detailed datasets on the various SDGs, see the annual Eurostat report '[Sustainable development in the European Union](#)'; for details on extensive country-specific data on the short-term progress of Member States: [Key findings – Sustainable development indicators - Eurostat (europa.eu)](#). A high status does not mean that a country is close to reaching a specific SDG, but signals that it is doing better than the EU on average. The progress score is an absolute measure based on the indicator trends over the past five years. The calculation does not take into account any target values, as most EU policy targets are only valid for the aggregate EU level. Depending on data availability for each goal, not all 17 SDGs are shown for each country.

Source: Eurostat, latest update of 28 April 2025. Data refer mainly to the period 2018-2023 or 2019-2024. Data on SDGs may vary across the report and its annexes due to different cut-off dates.

Luxembourg is improving on several SDG indicators related to *sustainability* (SDGs 2, 7, 9, 11, 12, 13 and 15). Luxembourg performs well on SDGs 9, 11 and 15 but needs to catch up with the EU average on SDGs 2, 7, 12 and 13. Luxembourg has made progress on organic farming, increasing the proportion of agricultural land dedicated to organic farming from 4.2% in 2017 to 6.2% in 2022, albeit still below the EU average of 10.5% (SDG2). When it comes to the proportion of terrestrial protected areas, Luxembourg performs better than the EU average, with 37.9% of its total area consisting of terrestrial protected areas compared to 26.1% across the EU (SDG 15). On SDG 6, Luxembourg's Water Exploitation Index (WEI+) remained stable at 0.7% of renewable water resources between 2017 and 2022, still below the EU average of 5.8% in 2022. On SDG 7, the share of renewable energy in gross final energy consumption increased from 8.9% in 2018 to 14.4% in 2023 (EU average: 24.6%). In contrast, energy import dependency as a percentage of imports in gross available energy decreased from 95.2% in 2018 to 90.6% in 2023 but remains above the EU average of 58.3%. Despite a slight decrease from 1.31 in 2018 to 1.30 in 2023, the consumption footprint per inhabitant (SDG 12) still exceeds the EU average (0.93). Similarly, Luxembourg improved on net greenhouse gas emissions (SDG 13), decreasing from 16.9 tonnes per capita in 2018 to 10.6 tonnes in 2023, but remaining above the EU average of 6.8 tonnes. The air emission intensity of fine particulate matter from industry decreased from 0.07 to 0.05 grams per euro, below the EU average of 0.06 (SDG 9). The country further improved its performance on the recycling of municipal waste as a percentage of total waste generated (SDG 11) from 49.0% in 2018 to 56.2% in 2023, well above the EU average (48.2%).

While Luxembourg is improving on some SDG indicators related to *social fairness* (SDGs 3, 5, 7 and 10), it is moving away from others (SDGs 1, 4 and 8). Luxembourg performs well on SDGs 1, 3, 4, 5 and 10 but needs to catch up with the EU average on SDGs 7 and 8. The percentage of people with good or very good self-perceived health aged 16 or over increased from 68.6% in 2018 to 74.1% in 2023 (EU average: 67.9%) (SDG 3). Moreover, the percentage of the population unable to keep their home adequately warm remains stable at 2.1%, well below the EU average of 10.6% (SDG 7). Furthermore, the relative median at-risk-of-poverty gap shows improvement, decreasing from 23.6% in 2018 to 17.2% in 2023 (SDG 10), while the in-work-at-risk of poverty rate increased between 2018 and 2023, reaching 14.8%, above the EU average (8.3%) (SDG 8). On SDG 5, Luxembourg reduced its gender employment gap (from 9.1 pps of those aged 20-64 in 2019 to 5.5 pps in 2024; EU average 10.0 pps). Also, positions held by women in senior management as a percentage of board members increased from 13.1% in 2019 to 22.8% in 2024 but remained below the EU average of 32.6%. In terms of the percentage of the population self-reporting an unmet need for medical care, Luxembourg performs better than the EU average (0.8% vs 2.4% for the EU in 2023) (SDG 1). On SDG 4, tertiary educational attainment as a percentage of the population aged 25-64 jumped from 56.1% in 2019 to 63.8% in 2024, well above the EU average of 44.2%. However, the number of early leavers from education and training as a percentage of the population aged 18 to 24 also increased from 7.2% in 2019 to 7.8% in 2024 (EU average 9.3%).

While Luxembourg is improving on one indicator related to *macroeconomic stability* (SDG 16), it is moving away from others (SDGs 8 and 17). Luxembourg performs well on SDGs 16 and 17 but needs to catch up with the EU average on SDG 8. General government gross debt (SDG 17) increased from 22.3% of GDP in 2019 to 26.3% in 2024 but remains very low compared to the EU average of 81.0%. Meanwhile, the investment share of GDP decreased slightly from 16.2% in 2018 to 16.1% in 2023, remaining below the EU average at 21.7% (SDG 8). Finally, on SDG 16, the percentage of the population that perceived the independence of the justice system as "very good" and "fairly good" increased from 70% in 2019 to 77% in 2024, much higher than the EU average of 52%. Luxembourg's RRP includes measures to promote a transparent and fair economy, such as making anti-money laundering supervision of professionals that provide trust and company services more effective and increasing the quality and transparency of the business register, which will help authorities better identify the ultimate beneficiaries of legal entities.

As the SDGs form an overarching framework, any links to relevant SDGs are either explained or depicted with icons in the other annexes.

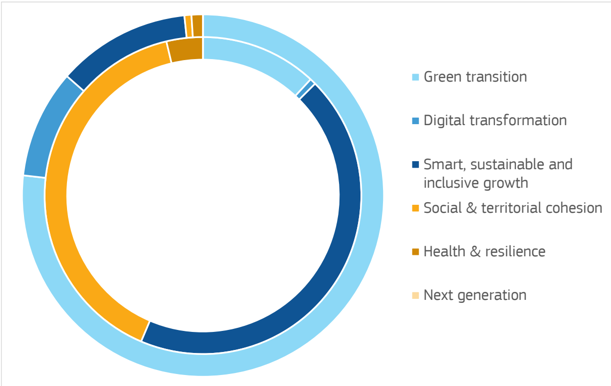
Luxembourg faces structural challenges in a wide range of policy areas, as identified in the country-specific recommendations (CSRs) addressed to the country as part of the European Semester. They refer, among other things, to taxation policy, energy efficiency, pension systems, the labour market, skills and training, transport, the business environment, and research and innovation.

The Commission has assessed the 2019-2024 CSRs considering the policy action taken by Luxembourg to date and the commitments in its recovery and resilience plan (RRP). At this stage, Luxembourg has made at least 'some progress' on 57% of the CSRs ([252]), and 'limited progress' on 98% (Table A16.2).

EU funding instruments provide considerable resources to Luxembourg by supporting investments and structural reforms to increase competitiveness, environmental sustainability and social fairness, while helping to address challenges identified in the CSRs. In addition to the EUR 241.1 million funding from the Recovery and Resilience Facility (RRF) in 2021-2026, EU cohesion policy funds ([253]) are providing EUR 39 million to Luxembourg (amounting to EUR 90 million with national co-financing) for 2021-2027 ([254]) to boost competitiveness and growth. Support from these instruments combined represents around 0.35% of 2024 GDP ([255]). The contribution of these instruments to different policy objectives is outlined in Graphs A16.1 and A16.2. This substantial support comes on top of financing provided to Luxembourg under the 2014-2020 multiannual financial framework, which financed projects until 2023 and has had benefits for the economy and Luxembourgish society. Project selection under the 2021-2027 cohesion policy programmes is advanced and implementation of selected projects had gained momentum.

Luxembourg's RRP contains 13 investments and 10 reforms to stimulate sustainable growth and support green transition and digitalisation. A year before the end of the RRF timespan, implementation is on its way, with around 13.4% of the funds disbursed. At present, Luxembourg has fulfilled 42% of the milestones and targets in its RRP ([256]). Increased efforts are needed to ensure completion of all RRP measures by 31 August 2026.

Graph A16.1: **Distribution of RRF funding in Luxembourg by policy field**



(1) Each RRP measure helps achieve the aims of two of the six policy pillars of the RRF. The primary contribution is shown in the outer circle, while the secondary contribution is shown in the inner circle. Each circle represents 100% of the RRF funds. Therefore, the total contribution to all pillars displayed on this chart amounts to 200% of the RRF funds allocated.
Source: European Commission

Luxembourg also receives funding from several other EU instruments, including those listed in Table A16.1. Most notably, the common agricultural policy (CAP) provides Luxembourg with an EU contribution of EUR 224.8 million under the CAP strategic plan 2023-2027 ([257]). Operations amounting to EUR 9.3 million ([258]) have been signed under the InvestEU instrument backed by the EU guarantee, improving access to financing for riskier operations in Luxembourg.

([252])7% of the 2019-2024 CSRs have been fully implemented, 6% substantially implemented, and some progress has been made on 44%.

([253])In 2021-2027, cohesion policy funds include the European Regional Development Fund, the European Social Fund Plus and the Just Transition Fund. The information on cohesion policy included in this annex is based on adopted programmes with the cut-off date of 5 May 2025.

([254])European territorial cooperation (ETC) programmes are excluded from the figure.

([255])RRF funding includes both grants and loans, where applicable. GDP figures are based on Eurostat data for 2024.

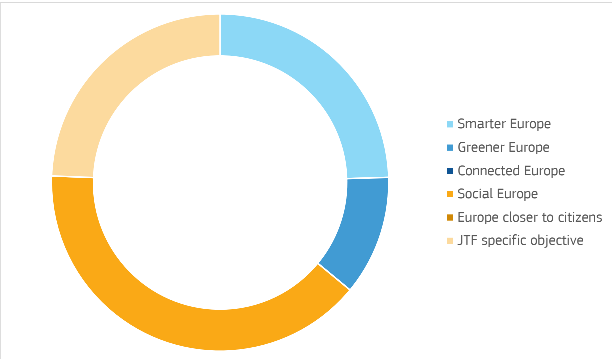
([256])As of mid-May 2025, Luxembourg has submitted 2 payment requests, the last one being under assessment.

([257])An overview of Luxembourg's formally approved strategy to implement the EU's common agricultural policy nationally can be found at: https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans/luxembourg_en

([258])Data reflect the situation on 31.12.2024.

Cohesion policy funds aim to increase the productivity and competitiveness of Luxembourg's firms and improve the business environment. The European Regional Development Fund (ERDF) is used to promote innovation, including in material technologies and manufacturing, as well as to diversify the economy by supporting high-growth small and medium-sized enterprises (SMEs) and start-ups, with an allocation of EUR 22.6 million. The European Social Fund Plus (ESF+) supports upskilling and reskilling initiatives, for unemployed or inactive people and for workers, dedicating around EUR 5.6 million (36% of the total ESF+ allocation) to developing digital skills and jobs in Luxembourg, and EUR 2.5 million (16.5% of the total ESF+ allocation) to green skills and jobs. The ESF+ is also used to support training initiatives which provide beneficiaries with new skills to work in the social and solidarity economy.

Graph A16.2: **Distribution of cohesion policy funding across policy objectives in Luxembourg**



Source: European Commission

Other funds are contributing to competitiveness in Luxembourg, for instance through open calls. The Connecting Europe Facility (CEF) has supported strategic investments in key transport infrastructure projects to enhance connectivity, sustainability and efficiency along the Trans-European Transport Network. The CEF Digital has advanced the deployment of 5G in smart communities, enabling smart urban services and healthcare, as well as connected, automated mobility across the border to Germany. Horizon Europe has supported research and innovation from scientific breakthroughs to scaling up innovations, with research in Digital, Industry and Space, and Climate, Energy and Mobility as top priorities in Luxembourg.

Luxembourg's RRP also contains ambitious measures to improve the business environment and competitiveness. As part of the measures covered by payment requests submitted over the past year, Luxembourg completed measures aimed at digitising the public sector via the development of the 'MyGuichet.lu' mobile application.

EU funds are playing a significant role in promoting environmental sustainability and green transition in Luxembourg during the current seven-year EU budget (multiannual financial framework). The ERDF has a strong focus on promoting the green transition in Luxembourg, with an overall allocation of EUR 10.6 million. This includes investments in smart and clean mobility and the uptake of renewable energy sources and action to increase energy efficiency. Luxembourg is drawing on the Just Transition Fund (JTF) to contribute to reaching carbon neutrality in the south of the country through clean transport and renewable energy projects. Luxembourg's CAP strategic plan allocates EUR 45.5 million (75% of rural development funding) to environmental and climate objectives and EUR 41 million (25% of direct payments) to eco-schemes, supporting biodiversity, organic farming and sustainable practices. For example, farmers wanting to abandon the use of pesticides in their farms will receive financial support.

Luxembourg's RRP, including the REPowerEU chapter, has a comprehensive set of reforms and investments for the green transition. Green mobility measures covered include implementation of a legal framework setting a minimum percentage of clean vehicles in public procurement contracts and a support scheme for electric vehicle charging points.

Promoting fairness and social cohesion are among the key priorities of EU funding in Luxembourg. The ESF+ fosters social cohesion in Luxembourg through active inclusion projects targeting disadvantaged people and vulnerable groups, fostering integrated pathways to work, partnerships with economic actors for sustainable professional integration, workshops for social and professional reintegration and dedicated actions for people with a migrant background. The ESF+ is also used to support the Child Guarantee and fight child poverty through specific actions in the field of education. At least 3 260 unemployed people, 3 000 children and young students, and 1 290 disadvantaged people (including people with a disability or from a migrant background) will benefit under the ESF+ programme.

Luxembourg's RRP contains several reforms and investments related to fairness and social policies. These include upskilling the workforce with the launch of the 'Skillsbridges' programme, the Housing Pact 2.0 to increase the supply of housing, and the digitalisation of health. The Technical Support Instrument (TSI) has been supporting Luxemburg in designing and implementing growth-enhancing reforms, including in identifying financial solutions for the implementation of the Global Biodiversity Framework, which could contribute to the establishment of the 'Naturpakt' which is supported by the Luxembourgish RRP.

Table A16.1:**Selected EU funds with adopted allocations - summary data (million EUR)**

Instrument/policy	**Allocation 2021-2026**		**Disbursed since 2021 (1)**
RRF grants (including the RepowerEU allocation)	241.1		32.4
RRF loans	0		0.00
Instrument/policy	**Allocation 2014-2020 (2)**	**Allocation 2021-2027**	**Disbursed since 2021 (3)** (covering total payments to the Member State on commitments originating from both 2014-2020 and 2021-2027 programming periods)
Cohesion policy (total)	182.4	38.9	161.0
European Regional Development Fund (ERDF)	89.2	14.1	77.0
European Social Fund (ESF, ESF+)	93.3	15.5	80.8
Just Transition Fund (JTF)		9.3	3.2
Migration and home affairs			
Migration, border management and internal security - AMIF, BMVI and ISF (4)	35.8	47.8	23.8
The common agricultural policy under the CAP strategic plan (5)	**Allocation 2023-2027**		**Disbursements under the CAP Strategic Plan (6)**
Total under the CAP strategic plan	224.8		76.7
European Agricultural Guarantee Fund (EAGF)	163.9		62.3
European Fund for Agricultural Development (EAFRD)	60.9		14.4

(1) The cut-off date for data on disbursements under the RRF is 31 May 2025.
(2) Cohesion policy 2014-2020 allocations include REACT-EU appropriations committed in 2021-2022.
(3) These amounts relate only to disbursements made from 2021 onwards and do not include payments made to the Member State before 2021. Hence the figures do not comprise the totality of payments corresponding to the 2014-2020 allocation. The cut-off date for data on disbursements under EMFAF and EMFF is 29 April 2025. The cut-off date for data on disbursements under cohesion policy funds, AMIF, BMVI and ISF is 5 May 2025.
(4) AMIF - Asylum, Migration and Integration Fund; BMVI - Border Management and Visa Instrument; ISF - Internal Security Fund.
(5) Expenditure outside the CAP strategic plan is not included.
(6) The cut-off date for data on EARDF disbursements is 5 May 2025. The information on EAGF disbursements is based on the Member State declarations until March 2025. Disbursements for the Direct Payments (EAGF) started in 2024.
Source: European Commission

Table A16.2:**Summary of 2019-2024 CSRs**

Luxembourg	Assessment in May 2025	Relevant SDGs
2019 CSR 1	**Limited progress**	
Increase the employment rate of older workers by enhancing their employment opportunities and employability.	Limited progress	SDG 8
Improve the long-term sustainability of the pension system, including by further limiting early retirement.	Limited progress	SDG 8
2019 CSR 2	**Limited progress**	
Reduce barriers to competition in regulated professional business services.	Limited progress	SDG 9
2019 CSR 3	**Some progress**	
Focus economic policy related to investment on fostering digitalisation	Some progress	SDG 9
and innovation,	Limited progress	SDG 9
stimulating skills development,	Some progress	SDG 4
improving sustainable transport,	Some progress	SDG 11
and increasing housing supply, including by increasing incentives and lifting barriers to build.	Limited progress	SDG 8
2019 CSR 4	**Limited progress**	
Address features of the tax system that may facilitate aggressive tax planning, in particular by means of outbound payments.	Limited progress	SDG 8, 16
2020 CSR 1	**Some progress**	
Take all necessary measures, in line with the general escape clause of the Stability and Growth Pact, to effectively address the COVID-19 pandemic, sustain the economy and support the ensuing recovery. When economic conditions allow, pursue fiscal policies aimed at achieving prudent medium-term fiscal positions and ensuring debt sustainability, while enhancing investment.	No longer relevant	SDG 8, 16
Improve the resilience of the health system by ensuring appropriate availability of health workers.	Some progress	SDG 3
Accelerate reforms to improve the governance of the health system and e-health.	Some progress	SDG 3
2020 CSR 2	**Substantial progress**	
Mitigate the employment impact of the COVID-19 crisis, with special consideration for people in a difficult labour market position.	Substantial progress	SDG 8
2020 CSR 3	**Some progress**	
Ensure effective implementation of measures supporting the liquidity of businesses, in particular SMEs and the self-employed.	Full implementation	SDG 8, 9
Front-load mature public investment projects [to foster the economic recovery]	Some progress	SDG 8, 16
and promote private investment to foster the economic recovery.	Not assessed / No input to add	SDG 8, 9
Focus investment on the green and digital transition, in particular on sustainable transport	Some progress	SDG 11
and buildings,	Some progress	SDG 7, 8
clean and efficient production and use of energy, contributing to a progressive decarbonisation of the economy.	Some progress	SDG 7, 9, 13
Foster innovation [in particular in the business sector]	Limited progress	SDG 9
and digitalisation, in particular in the business sector.	Some progress	SDG 9
2020 CSR 4	**Limited progress**	
Ensure effective supervision and enforcement of the anti-money laundering framework as regards professionals providing trust and company services, and investment services.	Some progress	SDG 8, 16
Step up action to address features of the tax system that facilitate aggressive tax planning, in particular by means of outbound payments.	Limited progress	SDG 8, 16

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Table (continued)

2021 CSR 1	**No longer relevant**	
In 2022, pursue a supportive fiscal stance, including the impulse provided by the Recovery and Resilience Facility, and preserve nationally financed investment.	No longer relevant	SDG 8, 16
When economic conditions allow, pursue a fiscal policy aimed at achieving prudent medium-term fiscal positions and ensuring fiscal sustainability in the medium term.	No longer relevant	SDG 8, 16
At the same time, enhance investment to boost growth potential. *Pay particular attention to the composition of public finances, on both the revenue and expenditure sides of the budget, and to the quality of budgetary measures in order to ensure a sustainable and inclusive recovery. Prioritise sustainable and growth-enhancing investment, in particular investment supporting the green and digital transition.*	No longer relevant	SDG 8, 16
Give priority to fiscal structural reforms that will help provide financing for public policy priorities and contribute to the long-term sustainability of public finances, including, where relevant, by strengthening the coverage, adequacy and sustainability of health and social protection systems for all.	No longer relevant	SDG 8, 16
2022 CSR 1	**Limited progress**	
In 2023, ensure that the growth of nationally financed primary current expenditure is in line with an overall neutral policy stance, taking into account continued temporary and targeted support to households and firms most vulnerable to energy price hikes and to people fleeing Ukraine. Stand ready to adjust current spending to the evolving situation.	No longer relevant	SDG 8, 16
Expand public investment for the green and digital transitions, and for energy security taking into account the REPowerEU initiative, including by making use of the Recovery and Resilience Facility and other Union funds.	No longer relevant	SDG 8, 16
For the period beyond 2023, pursue a fiscal policy aimed at achieving prudent medium-term fiscal positions.	No longer relevant	SDG 8, 16
Improve the long-term sustainability of the pension system, in particular by limiting early retirement and by increasing the employment rate of older workers.	Limited progress	SDG 8
Take action to effectively tackle aggressive tax planning, including by ensuring sufficient taxation of outbound payments of interest and royalties to zero and low-tax jurisdictions.	Limited progress	SDG 8, 16
2022 CSR 2		
Proceed with the implementation of its recovery and resilience plan, in line with the milestones and targets included in the Council Implementing Decision of 13 July 2021.	RRP implementation is monitored by assessing RRP payment requests and analysing reports published twice a year on the achievement of the milestones and targets. These are to be reflected in the country reports.	
Submit the 2021-2027 cohesion policy programming documents with a view to finalising their negotiations with the Commission and subsequently starting their implementation.	Progress on the cohesion policy programming documents is monitored under the EU cohesion policy.	
2022 CSR 3	**Limited progress**	
Reduce the impact of inequalities on pupils' performance and promote equal opportunities for all students in the educational system.	Limited progress	SDG 4, 8, 10
2022 CSR 4	**Some progress**	
Reduce overall reliance on fossil fuels	Limited progress	SDG 7, 9, 13
by accelerating the deployment of renewables,	Substantial progress	SDG 7, 9, 13
electricity transmission capacity,	Some progress	SDG 7, 9, 13
and investment in energy efficiency in both the residential and non-residential sectors.	Some progress	SDG 7
Support municipalities in developing detailed local plans for the deployment of renewable energy, including wind power and photovoltaics, and for district heating and cooling systems.	Some progress	SDG 7, 9, 10, 11, 13
Further promote electrification of transport and invest in public transport networks and infrastructures.	Some progress	SDG 11

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Table (continued)

2023 CSR 1	**Some progress**	
Wind down the emergency energy support measures in force, using the related savings to reduce the government deficit, as soon as possible in 2023 and 2024. Should renewed energy price increases necessitate new or continued support measures, ensure that these are targeted at protecting vulnerable households and firms, fiscally affordable, and preserve incentives for energy savings.	Some progress	SDG 8, 16
Ensure prudent fiscal policy, in particular by limiting the nominal increase in nationally financed net primary expenditure in 2024 to not more than 4.8%(1). (1) Which is estimated to correspond to an annual improvement in the structural budget balance of at least 0.3% of GDP for 2024, as described in recital 24.	Full implementation	SDG 8, 16
Preserve nationally financed public investment and ensure the effective absorption of RRF grants and other EU funds, in particular to foster the green and digital transitions.	Some progress	SDG 8, 16
For the period beyond 2024, continue to pursue a medium-term fiscal strategy of gradual and sustainable consolidation, combined with investments and reforms conducive to higher sustainable growth, to achieve a prudent medium-term fiscal position.	Full implementation	SDG 8, 16
Reduce risks related to the housing market, in particular by reducing mortgage interest deductibility, and by taking measures to increase the supply of buildable land.	Limited progress	SDG 8
Address the long-term sustainability of the pension system, in particular by limiting early retirement options and increasing the employment rate for older workers.	Limited progress	SDG 8
Increase action to effectively tackle aggressive tax planning, in particular by ensuring sufficient taxation of outbound payments of interest and royalties to zero/low-tax jurisdictions.	Limited progress	SDG 8, 10
2023 CSR 2		
Proceed with the steady implementation of its revised recovery and resilience plan and swiftly finalise the REPowerEU chapter with a view to rapidly starting the implementation thereof. Proceed with the swift implementation of cohesion policy programmes, in close complementarity and synergy with the recovery and resilience plan.	RRP implementation is monitored through the assessment of RRP payment requests and analysis of the bi-annual reporting on the achievement of the milestones and targets, to be reflected in the country reports. Progress with the cohesion policy is monitored in the context of the Cohesion Policy of the European Union.	
2023 CSR 3	**Limited progress**	
Improve the performance of the school education system and promote equal opportunities for all students, in particular by adapting teaching to the needs of disadvantaged students and those from various linguistic backgrounds.	Limited progress	SDG 4
2023 CSR 4	**Some progress**	
Reduce reliance on fossil fuels	Limited progress	SDG 7, 13
by accelerating the deployment of renewable energy, increasing electricity transmission capacity, easing permitting procedures and	Substantial progress	SDG 7, 9, 13
investing in energy efficiency in both the residential and non-residential sectors.	Some progress	SDG 7, 9, 13
Support municipalities in developing detailed local plans for deploying renewable energy, including wind power and photovoltaics, and for district heating and cooling systems.	Some progress	SDG 7, 9, 13
Further promote the electrification of transport and invest in public transport networks and infrastructure.	Some progress	SDG 7, 9, 13
Step up policy efforts aimed at the provision and acquisition of skills and competences needed for the green transition.	Some progress	SDG 7, 4

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Table (continued)

2024 CSR 1	**Limited progress**	
Submit the medium-term fiscal-structural plan in a timely manner.	Full implementation	SDG 8, 16
Wind down the emergency energy support measures before the 2024/2025 heating season.	Some progress	SDG 7
Address the long-term sustainability of the pension system, in particular by limiting early retirement options and by increasing the employment rate for older workers.	Limited progress	SDG 8
Accelerate the adoption of a comprehensive land use policy and a property tax reform and prioritise the development of large-scale district projects on government-owned land.	Limited progress	SDG 8, 11
Increase action to effectively tackle aggressive tax planning, in particular by ensuring sufficient taxation of outbound payments of interest and royalties to zero/low-tax jurisdictions.	No progress	SDG 8,16
2024 CSR 2		
Continue with the swift and effective implementation of the recovery and resilience plan, including the REPowerEU chapter once adopted, ensuring completion of reforms and investments by August 2026. Accelerate the implementation of cohesion policy programmes. In the context of the mid-term review, continue focusing on the agreed priorities, while considering the opportunities provided by the Strategic Technologies for Europe Platform initiative to improve competitiveness.	RRP implementation is monitored through the assessment of RRP payment requests and analysis of the bi-annual reporting on the achievement of the milestones and targets, to be reflected in the country reports. Progress with the cohesion policy programming is monitored in the context of the Cohesion Policy of the European Union.	
2024 CSR 3	**Limited progress**	
Improve the performance and equity of the school education system, including by adapting teaching to the needs of disadvantaged students and those from various linguistic backgrounds.	Limited progress	SDG 4, 10
Address labour shortages and skills mismatches in particular for the green transition.	Some progress	SDG 4
2024 CSR 4	**Some progress**	
Boost competitiveness by supporting business and greenfield investment, in particular in high R&D intensive activities.	Limited progress	SDG 9,8
Reduce reliance on fossil fuels by investing in energy efficiency and renewable energy.	Limited progress	SDG 7, 13
Further promote the electrification of transport and invest in public transport networks and infrastructure.	Some progress	SDG 11

Source: European Commission

Living, working and leisure arrangements around Luxembourg function largely in a cross-border setting. While Luxembourg is a relatively wealthy Member State with high levels of productivity, increasing pressures related to housing and personal mobility, which are linked to the cross-border dynamic, may risk stifling both national and regional growth potential.

The capital city and the areas surrounding it are more economically active than the more remote communes in the post-industrial south and the rural north of the country. However, predominantly residential areas, which must offer local public services, are increasingly situated cross-border.

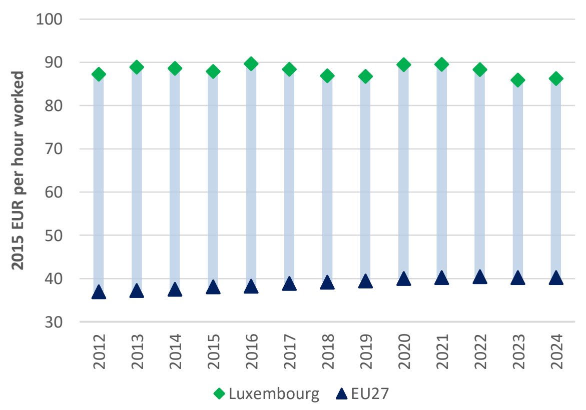
Competitiveness

Luxembourg's GDP per capita is significantly higher than the EU average. In 2023, it was 237% of the EU-27 average in terms of purchasing power standard (PPS) per inhabitant. GDP per capita in PPS is declining when compared to the EU average: from 282% in 2014 to 256% in 2020, to 237% in 2023.

Labour productivity, measured as GDP in PPS per hours worked, was 164% of the EU average in 2023, down from 191% in 2014 and 173% in 2020. GDP growth per head in recent years performed below the EU average, due to an increase in population size and stagnation in productivity growth.

Productivity growth has been sluggish. R&D expenditure as a percentage of GDP in Luxembourg has consistently remained below the EU average. In 2023, it was 1.03% in Luxembourg, compared to the EU average of 2.22%, while business spending in R&D, at 0.48% of GDP, was well below the EU average of 1.47%. Levels of individual basic or above basic digital skills declined in Luxembourg from 63.8% in 2021 to 60.1% in 2023, although they are still higher than the EU average (55% in 2023). In addition, people with a high level of education are concentrated in Luxembourg City and the surrounding area. While only 8.7% of city adult residents have a low level of education, in rural areas and towns this percentage is between 17.7% and 22.1%.

Graph A17.1: **Labour productivity per hour worked**



Unit: Real GDP per hour worked (EUR, 2015 prices).
Source: ARDECO (JRC).

Luxembourg has been successful in attracting workers. The working-age population (aged 20-64) has increased considerably (+2.1% per year) in the last 10 years, while it has stagnated in the EU. This shows that Luxembourg is attractive to workers, although skills shortages remain (see Annex 4). Internet access is almost universal (99% of households in 2023, 6 pps more than the EU average), also in rural areas (98%). The gender employment gap (5.5 pps) is smaller than the EU average (10 pps). Luxembourg's Quality of Government Index score is one of the highest in Europe (1.305) and has improved – particularly in the areas of quality and accountability, and impartiality – compared to 2010 (1.166) ([259]).

Social fairness

While Luxembourg generally scores well across labour market indicators, labour market conditions outside cities are generally less favourable, with people living outside cities also at higher risk of poverty. In 2024, the employment rate (for people aged 20-64) was in line with the EU average but was higher in cities than in towns and suburbs and rural areas. Employment rates are lower for women than for men, especially in towns and suburbs. The percentage of people at risk of poverty or social exclusion is also much higher in

([259]) European Quality of Government Index 2024| University of Gothenburg rural areas and towns and suburbs than in urban areas (see Table A17.1).

Table A17.1:**Socio-economic indicators by degree of urbanisation, 2024**

	Cities	Towns and suburbs	Rural areas
Population with high educational attainment (% of population aged 25-64)	79.5	47.1	48.7
Young adults with high educational attainment (% of population aged 25-34)	85.4	56.9	55.1
Employment rate (% of population aged 20-64)	81.3	71.8	72.9
Female employment rate (% of women aged 20-64)	79.1	68.0	71.1
Unemployment rate (% of labour force)	6.0	7.3	5.8
NEET: Neither in employment nor in education or training (% of population 15-29)	6.4	11.7	9.7
At-risk-of-poverty or social exclusion (% of total population)	12.9	20.3	23.7

Source: Eurostat

Labour market conditions are worse for non-EU migrants, especially in rural areas. In 2024, their employment rate (20-64) was 62.0% in rural areas, compared to 76.5% in cities (and 6 pps lower than the EU average for non-EU migrants in rural areas). Even those with tertiary education have an employment rate of only 68.6%, compared to 83.1% in cities and to 73.5% for non-EU migrants in rural areas in the EU on average. Employment rates are particularly low for non-EU migrant women in rural areas (only 54.7%, compared to 71.4% for men). Similar patterns are observed in unemployment rates, which are nearly double of the national average for non-EU migrants (12.1% vs 6.4%) and are especially high in rural areas (estimated at around 13% compared to 11.6% in cities).

Cross-border workers occupy 6 out of 10 jobs created in the country ([260]). Therefore, a relatively significant number of people working in Luxembourg do not live in Luxembourg's territory.

Lower labour market participation outside cities is correlated with lower educational attainment. In 2024, the percentage of people aged 25-34 with a tertiary degree was much higher in cities (85.4%) than in towns and suburbs (56.9%) and rural areas (55.1%), with a gap persisting at 30-40 pp for a decade. Access to primary schools in rural areas – measured as the percentage of children within a 15-minute walking distance from the nearest school – reached 32.2%, higher than the EU average of rural areas in more developed regions of the EU (28.9%) ([261]), and far below urban areas (83.8%). Improving educational outcomes would help to encourage more people to work or look for a job outside cities and tackle the higher risk of poverty in these areas.

Housing affordability is an issue in Luxembourg. Although the housing cost overburden rate ([262]) matched the EU average level in 2024, it remained higher than in most other EU countries. The rates were similar for every degree of urbanisation: in cities (9.8% in Luxembourg versus an EU average of 9.8%), in towns and suburbs (8.5% in Luxembourg against an EU average of 7.8%) and rural areas (5.9% in Luxembourg versus an EU average of 6.3%). Over the last 20 years, rural communities have seen the strongest relative growth in housing due to lower prices and the opportunities they offer to build single-family homes, which are still very popular. The national government intends to achieve a more efficient uptake of available land for development in order to improve housing conditions, including the potentially building more housing ([263]).

Greenhouse gas (GHG) emissions decreased in 2023 but remain well above the EU average. In 2023, Luxembourg's average GHG emissions per capita were 11.9 tonnes of CO_2 equivalent, compared to 7.1 tonnes in the EU on average (see also Annex 9). The biggest emitters are the transport sector (accounting for 61% of emissions in 2023, compared to 44% in 2008), manufacturing (13% of total emissions in 2023 versus 21% in 2008) and agriculture (11% of total emissions in 2023 versus 9% in 2008). Therefore, emissions tend to be increasingly linked to road transport. The decline in emissions linked to

([260]) Rapport général sur la sécurité sociale 2024 - Inspection générale de la sécurité sociale - Le gouvernement luxembourgeois

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([261]) Measured as an average for 24 Member States, no data available for Bulgaria, Malta and Latvia

([262]) Housing cost overburden is defined as the percentage of the population living in households where the total housing costs ('net' of housing allowances) represent more than 40% of disposable income.

([263]) Programme Directeur d'Aménagement du Territoire 2035 manufacturing activity, situated mainly in the south of the country, could be attributed to more limited volumes of production and adoption of greener technologies.

Public transport is now free throughout the country, but challenges related to personal mobility remain significant. The percentage of population in a 120-km radius that can be reached within 1.5 hours by car was 81.5% in Luxembourg, compared to the EU average of 77% in 2021, while the same indicator referring to rail transport was below the EU average in 2019: 12.6% in Luxembourg, compared to 15.7% in the EU.

The difficulties in finding affordable housing in Luxembourg exacerbate challenges concerning transport and GHG emissions. Personal mobility is of major concern for Luxembourg residents, especially outside the capital and for cross-border commuters, as congestion on the main roads is growing. In 2019, 45% of residents spent more than 30 minutes commuting each way, and a third spent more than 40 minutes each way. This is linked to the development of flows induced by economic and demographic growth, but also to the increase in distances between places of employment, residence, commerce and leisure. Urban sprawl only exacerbates the problem, as it means that people are more often dependent on a private car to get around ([264]).

Shifting towards electric transport would help to tackle GHG emissions. Access to alternative fuel infrastructure ([265]) could be improved, as the number of electric vehicle charging points withing a 10 km drive is 416, below the average for more developed regions in the EU (539). The development of electric mobility is supported by a cohesion policy financed measure to fully electrify local public transport specifically in the south of the country as well as by the recovery and resilience facility, which supports the deployment of charging points across the country. However, alleviating the pressures of congestion requires well-coordinated measures, considering also the cross-border perspective, given the high number of workers who travel across the border from neighbouring countries.

([264])Programme Directeur d'Aménagement du Territoire 2035

([265])Indicators of access to alternative fuel infrastructure are based on calculations by DG REGIO and the JRC, using data from the European Alternative Fuels Observatory (EAFO), Eurostat, TomTom and Eco-Movement.