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COMMISSION STAFF WORKING DOCUMENT

2025 Country Report - Estonia

Accompanying the document

Recommendation for a COUNCIL RECOMMENDATION

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

{COM(2025) 206 final}

European Commission

Estonia

2025 Country Report

ECONOMIC DEVELOPMENTS AND KEY POLICY CHALLENGES

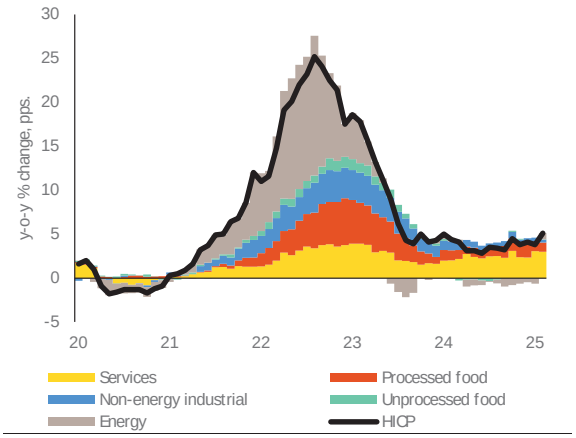
Muted growth with high inflation but steady employment

In 2024, Estonia's economy shrank for the second year in a row. Real GDP declined by 0.3%. The recession was broad-based, with contractions in private consumption and exports, and a sharp fall in investment. Growth showed signs of picking up in the last quarter of 2024, supported by goods exports and consumption, but investment remained weak. The outlook for the recovery is muted for a number of reasons: Estonia's main trading partners are expected to grow only modestly; investment expectations are very uncertain; and several tax increases in 2025 will dampen private spending. Rising government spending may support growth but, as it is directed towards defence, could also mean higher imports. Real GDP is projected to grow by 1.1% in 2025 and 2.3% in 2026.

High inflation accompanied the recession. The harmonised index of consumer prices (HICP) increased by 3.7% in 2024. It fell in the first half of the year but that was later reversed, with inflation in services and food particularly high (see Graph 1.1). Inflation is set to stay on the high side in 2025, as the new budget plans substantial tax increases. The HICP was up by around 5% at the start of the year.

The Estonian labour market remains resilient. After rising to historical levels in 2023, employment and activity rates remained steady at 81.8% and 88.3% respectively in 2024 – among the highest in the EU (see Annex 10)**.** The increase has been particularly marked among older workers in recent years, due the rising retirement age and relatively low pensions compared to wages, which incentivise work beyond pension age. Unemployment has risen as a result of the recession, reaching 7.6% in 2024 (see Social Scoreboard in Annex 13). Labour shortages, previously widely reported, have eased.

Graph 1.1: **HICP breakdown 2020-2025**



Source: Eurostat

Public finances improved in 2024. The general government deficit stood at 1.5% of GDP (down from 3.1% in 2023). This improvement was due to a combination of stronger tax revenues and lower-than-expected government spending. Firstly, increased rates of value added tax (VAT) and environmental taxes were coupled with higher revenues from labour taxes, due to rapid wage growth, and from VAT and corporate income taxes, due to purchases of motor vehicles and distribution of profits in anticipation of future tax increases.

Secondly, the state spent less on defence, social benefits and local government operating expenses than was budgeted for. The general government deficit is forecast to be 1.4% in 2025 and 2.4% in 2026. Government debt is expected to rise from 23.6% of GDP in 2024 to 23.8% in 2025 and reach 25.4% in 2026.

Net expenditure is projected to grow below the recommended maxima. In 2024, net expenditure([1]) in Estonia grew by 1.8% (see Annex 1). This was mainly driven by discretionary revenue measures, mentioned above, whose revenue increasing annual impact is deducted from net expenditure. On the expenditure side, also mentioned above, the foreseen budget was not fully implemented. In 2025, net expenditure is forecast by the Commission to grow by 2.1%, which is below the maximum growth rate recommended by the Council([2]). The cumulative growth rate of net expenditure in 2024 and 2025 taken together is projected at 3.9%, which is also below the maximum rate recommended by the Council.

Some macroeconomic challenges…

Price and cost competitiveness deteriorated amid the protracted recession while the current account remains in deficit and house prices have risen considerably. This was highlighted in the in-depth review for Estonia that was undertaken as part of the macroeconomic imbalance procedure earlier this year. The review also highlighted the limited progress made on the policy front([3]).

In recent years, Estonia's current account has been in deficit, signalling deteriorating competitiveness. The current account swung from surplus in the second half of the 2010s to deficit since 2020, widening to 3.6% of GDP in 2021 and 3.9% in 2022, before narrowing to 1.7% in 2023 and 1.5% in 2024. The decline in goods exports was particularly pronounced.

House prices in Estonia have risen markedly. They were 63% higher in 2024 than in 2019 (20% in real terms, allowing for inflation). In both 2023 and 2024, nominal house prices increased by 6%, and are thought to be overvalued, fuelled by a set of one-off liquidity boosts, such as a release of the second pillar pension funds and buyouts of several Estonian startups, and rising nominal wages. The lack of alternative investment opportunities amid limited housing supply added to house price appreciation (see more in Annex 9). However, Estonia's ratio of non-performing loans is one of the lowest in the euro area, so risks to macroeconomic stability seem to be limited.

…with several factors contributing to competitiveness losses

Estonia's export performance has deteriorated in the past few years. Its world market share increased between

(1) 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.

(2) Council Recommendation of 21 January 2025 endorsing the national medium-term fiscal-structural plan of Estonia (OJ C, C/2025/655, 10.2.2025, ELI: http://data.europa.eu/eli/C/2025/655/oj).

(3) SWD(2025)123 final

2019 and 2021 but has since been stagnating. Russia's war of aggression against Ukraine has changed the geopolitical landscape and driven Estonia to cut its remaining economic ties with Russia. At the same time, Estonia's major trading partners, Finland, Sweden and Germany, have experienced very weak growth over the past few years, which was one of the factors in the decline in exports in 2023 and 2024.

A new challenge in this respect is the uncertainty in global trade. As a very open economy, Estonia heavily relies on trade for its growth. While Estonia's direct exposure to the US is relatively small, the country is vulnerable to US tariffs through their impact on main trading partners and also uncertainty that impacts investment decisions.

Estonia faced a sharp increase in energy and raw material prices following Russia's full-scale invasion of Ukraine and a decline in domestic energy production. In Estonia as in its Baltic neighbours, energy prices have remained high, feeding into production and transport costs. In addition, Estonia has seen strong increases in the price of raw materials, particularly wood and metals, key inputs in construction and furniture production.

Nominal wage growth was strong amid a tight labour market. After sizeable rises in the last two years, nominal wage growth slowed to 5.6%([4]) in 2024. Much higher nominal wages fed through into sharp increases in unit labour costs (ULCs). Nominal ULCs per hour increased by 15.6% in 2023 and 7.6% in 2024, compared to increases of 6.7% and 5.0% respectively in the EU as a whole. Labour productivity per hour worked in Estonia decreased in 2023 and 2024 by 6.3% and 0.8% respectively, whereas in the EU as a whole it decreased by 0.6% in 2023 and increased by 0.4% in 2024.

Much higher costs led to productivity losses. Rising input, capital and labour costs with no accompanying growth affected productivity, particularly labour productivity, which fell to its lowest level in over five years in 2023, to 67.1% of the EU average per hour worked. Permanently higher wage and input costs call for policies that would enable Estonia to move up the value added ladder to remain competitive.

Public finances under pressure to address rising structural spending needs

Estonia is struggling to raise tax revenues, which is needed to fund public spending. As mentioned across this report, Estonia faces several challenges which will require additional public spending, including spending on healthcare, long-term care and defence. The unfavourable economic conditions have lowered the amount of tax collected in recent years. Tax revenues increased to 33.7% of GDP in 2023, but they remained substantially below the EU average of 39% (see Table A13.1 in Annex 2).

Estonia relies heavily on labour and consumption taxes, while capital taxation remains limited. Estonia continues to rely heavily on taxes on labour, which are often seen as detrimental to growth (see Graph A13.1 in Annex 2). A flat-rate tax on labour leads to relatively high taxation of low-wage earners, reducing the redistributive power of the tax system. In 2023, the share of consumption taxes was, at 38.9%, well above the EU

([4]) European Commission, European Economic Forecast. Spring 2025.

average of 26.9%, and is bound to increase further in 2024 mainly due to the VAT rate increase from 20% to 22%. In addition, a security surcharge (until end 2028) will be levied as of mid-2025, temporarily increasing the VAT rate to 24%. In 2023, taxes on capital accounted for 8.5% of total tax revenues in Estonia, versus an EU average of 21.9%. The corporate income tax rate for distributed dividends has increased from 20% to 22% in 2025([5]). In 2025 the reduced tax rate of 14% applied to regular dividends will also be abolished. These measures will reduce the gap with the EU average.

Increasing the share of land or property taxes in overall tax revenues could help boost public revenues, without weighing on economic growth. Recurrent taxes on immovable property amounted to 0.5% of total revenues (EU average of 2.5%) in 2023. Estonia levies a yearly land tax of between 0.1% and 1.0% on all residential and commercial land. Although a land tax still puts some pressure on property owners to rent out or dispose of vacant properties, the effect is modest. According to the 2021 Population and Housing Census([6]), 24% of all dwellings in Estonia were classified as vacant (up from 16% in 2011). Increasing the land tax rate in more affluent areas and taxing vacant properties could increase supply in the housing market and bring in additional public revenue to finance key policies. The negative impact on low-income households could be remedied with targeted, need-based support mechanisms.

A regular expenditure-review process is on track to be implemented. Estonia is working on integrating regular spending reviews and policy evaluations into medium-term budget planning, using the European Commission's Technical Support Instrument. The project is due to be completed in the autumn of 2025, but some key conclusions can already be drawn: (i) introduce annual spending reviews; (ii) integrate spending reviews into budget planning; and (iii) amend the legal framework to improve the spending reviews process and its governance. Implementing such reviews to prioritise key areas of expenditure would contribute to a more efficient allocation of public funds in the face of rising structural spending needs.

Key challenges holding back growth and competitiveness in Estonia

There is a growing need to boost innovation and R&D investment. Estonia's business R&D expenditure as a percentage of GDP remains below the EU average. Underinvestment in R&D, outside the information and communications technology sector, impedes technological advancement. Direct public support for business R&D has increased, but policies beyond grant schemes are underdeveloped. The effective use of public funds, national and EU, is crucial for Estonia to bridge the innovation and productivity gap and achieve sustainable economic growth (see Section 2).

Skills shortages hold back labour productivity and competitiveness. The lack of skilled labour is a particular constraint, especially for Estonia's manufacturing and information and communications technology sectors. The supply of skilled graduates is inadequate and skill levels are highly variable across regions, limiting companies' ability to develop higher value added activities.

([5]) The government also approved an additional 2% security surcharge on corporate income tax as of 2026, but the new coalition government announced in March that this increase would be abolished.

([6]) Population census 2021 | Statistikaamet

Box 1: **UN Sustainable Development Goals (SDGs)**

Estonia performs well and is improving on several of the SDGs related to environmental sustainability (SDGs 2, 7 and 15), but needs to catch up with the EU average on others (SDGs 6, 9, 12, 13 and 14). The country is similarly improving on one (SDG 5) and performing well and improving on two SDGs (4 and 7) related to fairness. However, Estonia is diverging from SDGs related to macroeconomic stability and still needs to catch up on one SDG indicator (SDG 8).

Although Estonia is performing well and improving on quality education (SDG 4), the country still needs to catch up with the EU average on other indicators (SDG 8 and 9) related to productivity.

Estonian policy actively tackles this, but more could be done to focus the training policy on the low-skilled and to improve the hiring rules for foreign workers with technical qualifications (see Section 2).

Estonia needs to reduce its dependence on fossil fuels and oil shale and invest more in renewable energy. Despite progress in reducing oil shale production and use, Estonia faces a significant challenge in its clean transition due to the high reliance on this resource-intensive fossil fuel. Transitioning away from oil shale and supporting companies in their green initiatives is therefore essential to improve competitiveness. Estonia would also benefit from reducing high emissions from road transport by electrifying railways, improving rural public transport and reducing dependence on private cars (see Section 3).

Estonia could benefit from an accelerated transition to a circular economy. Despite progress in waste management, recycling and reuse rates remain below EU standards. To address this, Estonia needs new policies and economic incentives to promote separate waste collection and increase recycling efforts (see Section 3).

Estonia faces persistent challenges regarding its social protection system. The proportion of older people, single-person households and people with disabilities at risk of poverty or social exclusion remains high, due to low social spending and low impact of social transfers (excluding pensions) on poverty reduction. In-work poverty is high among part-time workers and the self-employed, and there are people in non-standard forms of employment not yet eligible for unemployment benefits. Pension adequacy is strained by demographic pressures**.** While Estonia has taken steps to address the challenges, they do not appear to be sufficient to reduce poverty for some groups (see Section 4).

Despite reforms and investments, access to healthcare and long-term care remains uneven due to lack of adequate funding. While reforms and investments are ongoing, self-reported unmet needs for medical care are still among the highest in the EU, as are out-of-pocket payments (on-the-spot payments made by patients to healthcare providers), though they appear to be decreasing. Long waiting times and uneven quality and availability of health and long-term care across municipalities are linked to inadequate public funding, among the lowest levels in the EU (see Section 4).

Box 2:

Barriers to private and public investment

According to Eurostat, total investment in Estonia as a percentage of GDP is relatively high compared to the EU average.

As regards private investment, foreign direct investment plays a bigger role in the economy than in other EU Member States (in 2023, inflows amounted to around 4.5% of GDP), particularly in the tech and information technology sectors. Estonian firms, by contrast, invest much less than their European counterparts. Several barriers contribute to this, especially the following.

- **Uncertainty about the future**. This is probably the greatest obstacle to investment in Estonia, with 88% of firms reporting it as an obstacle. The war in Ukraine and overall geopolitical context is a key factor.
- **Lack of skilled workers.** According to a recent survey, this remains an obstacle for 75% of businesses, and the major obstacle to investment for 32% of businesses.
- **High energy costs.** This is an investment barrier for 73% of Estonian companies, according to 2024 data.
- **Access to finance.** 16% of firms face financial constraints, more than double the figure for last year and well above the EU average of 6.9%. Estonian firms rely mostly on own resources and equity and much less on capital markets to finance new investments, with a market funding ratio of just 15.8% as of end 2023, compared to an EU average of 49.6%.

Public investment in Estonia is shaped by the green and digital transitions and increased defence spending due to Russia's full-scale invasion of Ukraine. In addition, public investment is hampered by the difficulties of investing in outlying and eastern border regions where the particular lack of private finance makes public investment all the more important.

- The implementation of Estonia's RRP is well underway. At present, Estonia has fulfilled 49 % of the milestones and targets in its RRP.
- It remains important to accelerate the implementation of the cohesion policy programme. 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.
- Estonia 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, Estonia 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.

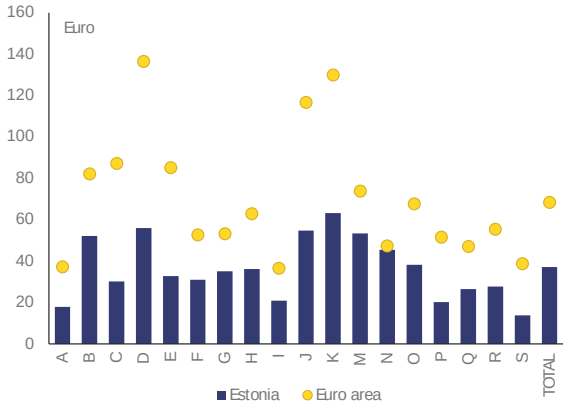
INNOVATION, BUSINESS ENVIRONMENT AND PRODUCTIVITY

Competitiveness is hampered by low labour productivity and skills shortages

Recent economic trends have resulted in competitiveness losses for Estonian companies. As described in the previous section, the Estonian economy has been in recession for two consecutive years. Yet the labour market has remained quite resilient, with high employment rates and strong increases in nominal wages. This has driven labour productivity down to well below the euro area average in most sectors ([7]) (Graph 2.1).

Skills mismatches and low levels of skills challenge labour productivity growth. While the shortage of labour has eased, the lack of skilled workers remains the major obstacle to investment for 32% of businesses, and there are skills mismatches, with both over- and under-qualification (see Annexes 4 and 10). With a growing information and communications technology (ICT) sector, the most critical gap is in science, technology, engineering, maths, computers and software. Current challenges will become even more acute as the digital and green transitions require more specialists than are expected to graduate from tertiary and vocational education. Without more skilled people, Estonia risks getting stuck in a low-skills trap in some sectors, limiting companies' ability to develop higher value added activities.

Graph 2.1: **Gross value added per employee in 2023, NACE activities**



(1) Real estate activities (L), activities of households as employers (T), and activities of extraterritorial organisations (U) are not shown.
(2) Sector codes: A agriculture; B mining; C manufacturing; D energy; E water supply; F construction; G wholesale and retail trade; H transport; I accommodation and food services; J information and communication; K financial services; M professional and scientific services; N administrative and support services; O public administration and defence; P education; Q health services; R arts and entertainment; S other services.
Source: Eurostat

To ensure that the supply of skills matches the demands of the labour market, skills development policies are planned from primary education to adult learning. Estonia actively promotes science, technology, engineering and mathematics education at all levels, focusing on updating curricula, enhancing teaching quality and fostering student interest (see section 4). It has set up ICT and engineering academies, supported by EU cohesion

(7) See In-Depth Review 2025 Estonia, SWD(2025) 123 final.

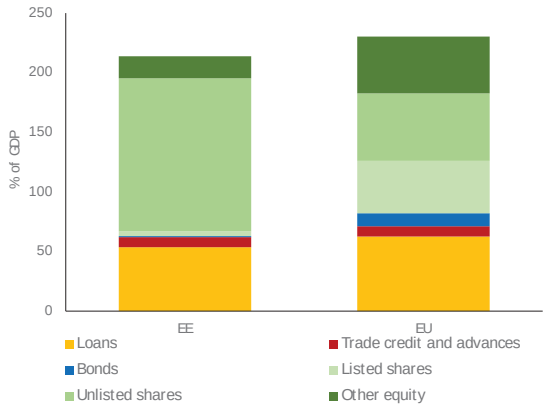
policy. Although Estonia performs well in adult learning, there are considerable differences across age and skills groups (see Annex 12). Participation is lowest among the low-skilled population, with less than 19% participating in adult learning. The Estonian recovery and resilience plan contains measures to improve the skills of young people through the 'My First Job' scheme, helping to closing the skills gap. Investing more in career guidance and increasing training opportunities could reduce skill mismatches, especially for the low-skilled.

Attracting and retaining qualified workers can help Estonia address skills shortages. While Estonia's capacity to attract and retain foreign talent has grown in the last years, it still falls short of meeting the growing demand for skills in key sectors, considering the recent data on the most requested occupations and OSKA projections([8]) (see Annex 10). Simpler rules to hire foreign workers with technical qualifications targeting sectors with persistent skills shortages could help alleviate skills gaps.

Becoming more competitive is especially pressing at regional level

At regional level, policies aimed at closing productivity gaps have had limited effect. Regional GDP per capita data show that Tallinn and Harju county have a much higher economic output per person than other regions (Annex 17). Scaling-up and larger tech-based companies are based in Tallinn and Tartu, as are ICT companies, which are the main investors in innovation. At the same time, Estonia's economic restructuring, aimed at reducing oil shale reliance, is set to cause significant job losses in Ida-Virumaa county, where oil shale companies are major employers. Simultaneously, the green transition is creating labour shortages in technical professions and specialised occupations, despite growing awareness of green skills among small and medium-sized enterprises (SMEs). In other regions, the economy is largely based on forestry, agriculture, wood and food processing, which have less added value (see Annex 17).

Graph 2.2: **Composition of NFC funding in % of GDP**



(1) The sum of NFC liabilities reflects only the total of the NFC liabilities considered. Reference period 2023.
Source: Eurostat, FISMA E2 calculations

Some market failures are related to the ineffectiveness of policies to close disparities. Regional economies are more exposed to risks stemming from the limited supply of skills, high uncertainty and insufficient access to finance. This limits domestic and foreign private investment. It also affects policy outreach in critical domains like energy and renewables, resource productivity, and research and innovation, where the investment required exceeds companies' profits or savings (see Annex 5). Estonia's performance on licensing processes is only average

([8]) The Estonian Qualification Authority (OSKA) General labour forecast 2022 -2031 : OSKA üldprognoos 2022-2031 | OSKA uuringud; The need for foreign labour until 2035: Välistööjõud | OSKA uuringud

compared to other OECD countries (see Annex 4). Improving it, and taking further action to lessen the personal cost of insolvency for entrepreneurs could help boost investment at local and other levels, as could reducing uncertainty in building regulations([9]) (see Annex 4).

Improving access to finance and leveraging public funding could help raise competitiveness

Access to finance remains a constraint for businesses, hampering innovative investment. According to the SME access-to-finance survey, a higher proportion of Estonian SMEs report financing constraints compared to the EU average, demonstrating the need for improved financial instruments and market access (see Annex 5). SMEs also report a particularly high degree of late payments, resulting in delays in the repayments of loans, and forcing companies to look for additional financing (See Annex 4). Estonian firms rely less on funding from capital markets than the EU average, with a significant share of investment funded internally (see Graph 2.2). This is influenced by the income tax system, and the prevalence of SMEs contribute to this trend. A modest institutional investor base further compounds the issue. Further promoting institutional investors' participation in the venture-capital market, and the equity market more generally, could help address this problem (Annex 5).

A coordinated approach targeting the diverse funding sources could help to boost innovation potential. The effective use of public funds, national and EU, could help Estonia bridge the innovation and productivity gap and achieve sustainable economic growth. There is also scope to leverage national, private and institutional financing through financial instruments and coordinated investments. Addressing fragmentation in funding programmes could improve policy effectiveness and facilitate the shift towards higher value added activities. To adapt to new challenges, it could be useful to strengthen long-term strategic planning. This could be done through stronger integration of new strategic sectors like defence, and raising resource efficiency (see Annex 17).

A growing need to boost innovation and R&D investment, particularly in defence

Underinvestment in research and development, outside the ICT sector, impedes technological advancement. Data from the Innovation Scoreboard (see Annex 3) show that Estonia's business R&D expenditure as a percentage of GDP remains below the EU average, underscoring the need for enhanced investment strategies. The overall picture is distorted by the strong ICT sector, which accounts for nearly half of total R&D expenditure. Concurrently, the number of patent applications filed under the Patent Cooperation Treaty per EUR 1 billion of GDP has declined, suggesting that the public science base does not translate into technological performance and business innovation as well as it might (see Annex 3). While direct public support for business R&D has increased, policies beyond grant schemes are underdeveloped, hindering Estonia's ability to address the needs of firms with limited ability to make use of research discoveries.

([9]) OECD Economic Survey Estonia, 2024.

In addition, the share of applied research in total R&D financing decreased to 23% in 2023. The Applied Research Centre was launched in 2024 and is expected to help companies to better exploit research results. Still, it will take time to develop a fully functional research technology organisation capable of benefiting a wide range of businesses. Strong collaboration between business and academia is missing, and there is scope to strengthen the role of universities in innovation, to enable faster deployment of new technologies.

Since the start of Russia's war of aggression against Ukraine, Estonia has been increasing its spending on defence. In line with the NATO rules, the country has allocated at least 2% of its GDP to military expenditure since 2015. The budget strategy for 2025 to 2028 calls for yearly defence allocations of no less than 3.3% of GDP. In addition, in March 2025, the government declared its plan to increase it further, to at least 5% from 2026 onwards. This strong focus on defence aims to reassure investors as to the credibility of Estonia's military deterrence and thereby reduce geopolitical investment risks.

Increased defence spending could also benefit Estonia's innovative defence and aerospace companies. More than half the military budget is earmarked for acquiring equipment. In 2024, around 20% of the defence-equipment-related tenders were won by Estonian suppliers. The number of companies in the sector has already grown from a handful at the start of the decade to more than 140. The Estonian government has decided to develop a defence industry park for the production of ammunition and military explosives, which will also boost foreign investments into Estonia([10]). However, the Estonian defence industry also faces challenges in raising funds from the private market due to the rules and restrictions that some banks, mutual-, pension- and venture-capital funds have against investing in lethal technologies.

([10]) Estonian Public Broadcasting (ERR)

DECARBONISATION, ENERGY AFFORDABILITY AND SUSTAINABILITY

Estonia faces high energy prices and security challenges on critical energy infrastructure

Estonia's is moving towards renewable energy though domestically sourced oil shale remains a significant part of the energy mix. After prohibiting imports and purchases of Russian natural gas in 2022, Estonia reduced its natural gas demand by 28% between August 2022 and July 2024, significantly exceeding the EU's 15% target. From 2022 to 2023, Estonia's energy mix shifted significantly towards renewables (the share rose from 27.2% to 34.6%). Despite a slight decrease in its share in the energy mix from 60.5% in 2022 to 58.2% in 2023, domestically sourced oil shale remained the primary energy source (see Annex 8).

Electricity prices in Estonia remain high and volatile due to the intermittent nature of renewable energy. In 2024, Estonia's average wholesale electricity price was EUR 87.3/MWh, similar to other Baltic states but higher than the EU average of EUR 81/MWh (see Annex 8). Renewable energy sources account for a growing proportion of electricity generation, up from 50% in 2023 to 57% in 2024. Unfortunately, the supply of renewable energy is volatile (subject to weather conditions) and often insufficient when demand is largest (for example during dark winter months). This pushes up electricity prices and impacts the economy, driving inflation and affecting households and businesses' competitiveness. For instance, in 2024, 73% of Estonian companies cited energy costs as an investment barrier.

In addition, Estonia faces energy security issues due to hybrid attacks on pipelines and submarine cables in the Baltic Sea. Successful synchronisation with the continental European electricity network as of 9 February 2025 strengthens energy security but demands additional efforts to improve grid resilience and protect critical energy infrastructure. In addition, recent disruptions in the energy connection with Nordic countries have shown the vulnerabilities of the energy supply system in Estonia. The implementation of measures to ensure security of supply in the Estonian energy market is therefore crucial (see Annex 8).

Investing in renewable energy capacity and streamlining permitting processes are crucial. In line with the recovery and resilience plan, legislation was amended in 2024 to streamline planning, permitting and environmental impact assessment processes for wind energy projects, and wind priority development areas were set up (with a total capacity of 1 000 MW). However, there is scope for additional measures to promote investment in renewables and support flexibility technologies such as battery storage systems, to ensure grid stability and renewable energy integration.

Energy-intensive industry and low resource productivity undermine Estonia's competitiveness

Estonia is among the worst performers in the EU in terms of resource productivity, largely due to the resource-intensive oil shale industry. The Estonian economy is highly energy-intensive due to the still quite considerable use of oil shale in the energy sector, and for transport and heating buildings. High energy-intensity combined with an increase in energy consumption puts a strain on the competitiveness of the Estonian economy. In 2023, Estonia generated only EUR 0.63 per kg of material used consumed, compared to the EU average of EUR 2.22 (see Annex 7). The construction, wood and metalworking industries, which are significant exporters in Estonia, are heavy consumers of energy and raw materials, such as wood and energy produced from oil shale, contributing to the country's poor resource productivity. This could be improved by switching away from fossil fuels, which account for almost 30% of domestic extraction used (a significant component in the calculation of resource productivity). Despite a decrease in 2023, the domestic extraction of fossil fuels remains high at 8.1 tonnes per capita, above the 2020 level of 7.4 tonnes. Efforts are underway to phase out oil shale production and use, which could be accelerated. Beyond the shift away from oil shale, other significant measures to boost resource productivity and decarbonise could include: further development of resource-efficient green technologies, support for energy and resource efficiency in major sectors, as outlined in the 2023 Circular Economy Action Plan and further improvements in circularity.

Supporting companies in their green transition and in developing clean technologies is crucial to reducing the Estonian economy's resource intensity. The Green Fund, supported by the Recovery and Resilience Facility, finances the development and scaling-up of innovative green start-ups and small to medium-sized enterprises, enhancing their competitiveness. Estonia has high potential for net-zero technologies and should continue to further develop 'clean industry' (see Annex 7).

Estonia's transition to a circular economy is underway but could be faster

Estonia has made progress in waste management but there is still room for improvement. Although Estonia's circular material use rate is above the EU average (18.1% in 2023 after reaching 21.4% in 2022, see Annex 7 for further details), Estonia's rate of preparing for reuse and recycling of municipal waste is 33%, significantly below the EU average of 49% (see Annex 7).

Estonia could take further steps to fully embrace circular economy practices and align with EU standards. Accelerating the transition to a circular economy is crucial for enhancing Estonia's competitiveness, as it promotes sustainable economic development, improves resource efficiency and reduces reliance on imported raw materials. To speed up the transition to a circular economy, Estonia could introduce new policy instruments to support municipalities in organising separate collection of different waste types and improve recycling performance. Economic policy instruments to make reuse and recycling more economically attractive

could be introduced, such as pay-as-you-throw schemes and financial penalties for not meeting recycling targets. An incineration tax to incentivise recycling practices could be introduced at municipality level.

Climate risks pose significant threats to Estonia's economy and society. In the period from 1980 to 2023, insurance covered only 15% of economic losses due to extreme weather and climate-related events. From 2013 to 2022 considerable loss of life resulted from extreme heat, one of the highest figures in northern Europe. With the trend increasing over time, climate impacts are posing a risk to public health, especially for vulnerable groups (see Annex 9). Strengthening the capacity for systemic risk assessments would be key to drawing up proper adaptation action plans and to ensuring that the public and businesses were prepared.

Improving energy efficiency is needed

Estonia continues to make significant progress in its efforts towards reaching the 2030 EU targets for energy efficiency. However, the country could intensify its efforts in the residential sector and better target energy renovation schemes towards the most vulnerable households, to reach the 2030 building decarbonisation objective set in its latest long-term renovation strategy and achieve the target for reduction of emissions under the Effort Sharing Regulation. Estonia continues to rely mostly on grant-based funding schemes for energy efficiency, and the use of financial instruments remains limited.

Decarbonising transport and improving urban mobility

Estonia's record on transport could be improved. Estonia outperforms the EU average in factors such as transport infrastructure (Annex 17). However, the sector is a high greenhouse gas emission producer accounting for about 15% of the country's total emissions, with 90% of those just from road transport. Estonia's car ownership rate is one of the highest in the EU. In 2023, its cars were amongst the oldest in the EU and 75.5% were petrol-powered. As a corollary, only 6.3% of new vehicles were electric (see Annex 7). Although the increase in electric cars is a positive trend, the figure is worse than both Estonia's Baltic neighbours and the EU average of 14.5%. The cross-border Rail Baltica project, which aims to strengthen connectivity between the Baltic states and the rest of the EU, is crucial for shifting transport from road to rail and enhancing sustainable mobility. However, its progress has been slow and would benefit from measures to speed up implementation.

To reach the 2030 target for reducing greenhouse gas emissions ([11]) and achieve the target under Effort Sharing Regulation, policies would have to be designed and implemented swiftly. Estonia has recently introduced vehicle taxes for private passenger cars based on weight and CO_2 emissions. However, taxes with lower rates for older vehicles – designed to avoid negative impacts on vulnerable groups – may fail to induce a

([11]) The national greenhouse gas emission reduction target is set in Regulation (EU) 2023/857 (the Effort Sharing Regulation), to align action in the sectors concerned with the objective of reaching the EU-level economy-wide target of achieving a 55% reduction in greenhouse gas emissions relative to 1990 levels.

shift towards a cleaner vehicle fleet, while still placing a burden on the most vulnerable in rural areas with inadequate public transport. To ensure a just and fair transition, structural measures could help to support transport for Estonia's vulnerable populations who may be negatively affected.

To reduce people's dependence on private cars, Estonia is making efforts to electrify the railway network and develop other means of public transport. Currently, 12% of the rail network is electrified compared to an EU average of 57% (2022), but investments are being made with support from various EU budget instruments. Estonia is considering purchasing sustainable electric buses with associated recharging infrastructure to provide green, on-demand public transport in rural areas. It would take the share of sustainable buses in the whole public bus fleet up to 42% from the current 30%.

The shift of freight transport from road to rail has been lagging. Creating incentives for companies would help speed up the shift of freight to rail.

Better transport policy can help reduce regional disparities. Improving transport mobility by integrating local transport systems can address regional disparities. Integrated ticketing and planning systems are crucial. Harjumaa county (including Tallinn) has implemented such a system under the recovery and resilience plan, but further efforts and digitalisation are needed.

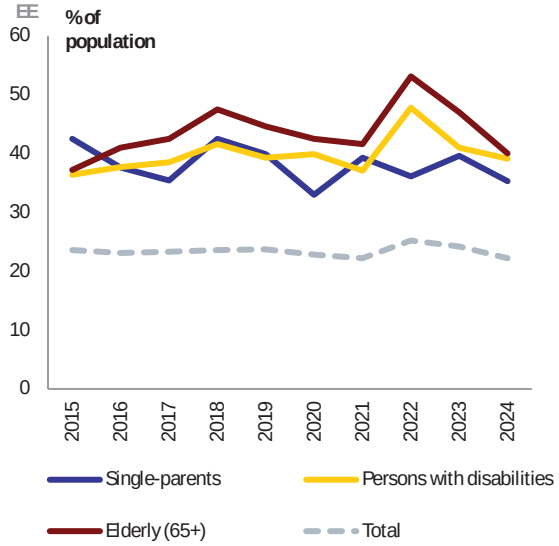
SKILLS, QUALITY JOBS AND SOCIAL FAIRNESS

Strengthening social protection

Due to gaps in social protection, Estonia continues to face challenges related to poverty and social exclusion, despite recent improvements. Effective social policy is key to Estonia's competitiveness. While increases in pensions and child benefits have improved some social indicators, the risk of poverty and social exclusion rate (AROPE) remains high in 2024, especially among older people, in particular people aged 65 and over living alone, persons with disabilities and single-person households. Behind Estonia's relatively high poverty figures is its low expenditure on social protection benefits – remaining among the lowest in the EU at 15.4% of GDP in 2023, against 26.8% for the EU as a whole. The impact of social benefits (excluding pensions) on poverty also remains well below the EU average (see Annex 11). Reviewing the adequacy and efficiency of the benefits system could help reduce poverty risks, as could targeting support towards vulnerable groups such as persons with disabilities, single-person households and older people.

In-work poverty remains relatively high, particularly for those in non-standard forms of work. The In-work poverty rate was 10.3% in 2024 (EU: 8.2%). It was particularly high among part-time workers and the self-employed, and is aggravated by relatively low minimum wages, despite recent increases to adjust for inflation and agreements with social partners (see Annex 11). The share of low-wage earners is among the highest in the EU. Increasing collective bargaining coverage and the membership in in trade unions and employers' organisations could help improve working conditions and their involvement in policymaking.

Graph 4.1: **At risk of poverty or social exclusion (AROPE) rates for different population categories**



Source: Eurostat, EU-SILC [ilc_peps01n]

Gaps in unemployment benefit coverage remain a challenge, particularly gaps for those in non-standard forms of work, including self-employed people. The self-employed remain not covered by unemployment insurance, which increases their risk of poverty. They continue to rely on the non-contributory state unemployment allowance (under the same conditions as employees) and have access to sickness benefits only through voluntary coverage. Estonia plans to reform its unemployment insurance system by 2026 and to expand eligibility for unemployment benefits to individuals in non-standard

forms of work who are currently excluded ([12]).

Regional disparities remain pronounced, with rural areas and the eastern border regions facing greater poverty risks. Poverty rates are more than twice as high in the Ida-Viru (35%) and Lääne-Viru (29.2%) counties than in Harju (15.5%) and Rapla (14.1%) (see Annex 11). The north-east and south-east border regions are lagging behind the national average poverty rate due a lack of entrepreneurial activity, leading to fewer paid jobs and lower incomes, as well as lower skills levels and limited access to services in rural areas. Rural areas also report the highest rates of young people not in employment, education or training, along with higher school leaving rates. There is scope for special support for the border areas, to further address income and regional inequalities and to strengthen social protection mechanisms so as to provide an effective safety net for the most affected households and vulnerable groups, and to support entrepreneurship (see Chapter 2).

Estonia faces difficulties maintaining adequate pensions, in part due to demographic pressures. Despite recent pension increases, driven mostly by inflation adjustments and rising social tax contributions, pensions remain among the lowest in the EU relative to wages, contributing to high old-age poverty (see Annex 11)([13]). The adequacy of minimum pensions (EUR 372 as of April 2024) remains an issue. The 2021 pension reform, which made it possible to opt out of the statutory funded pension scheme, risks further undermining pension adequacy and increasing the long-term poverty risk for retirees. To mitigate this, Estonia has introduced measures such as an income tax exemption, the possibility to increase contributions to mandatory funded pensions (the second pillar) and allowances for pensioners living alone. In spite of these efforts, improving pension adequacy remains key to reducing the risk of poverty for older people.

Improving access to health and long-term care

Despite past measures, Estonia faces persistent challenges in healthcare and long-term care provision. Access to adequate healthcare and long-term care contributes to competitiveness by ensuring that skilled workers need not stop working prematurely for health reasons or to care for family members. Thanks to reforms and increased investment in recent years, self-reported unmet needs for medical care fell from 12.5% in 2023 to 8.5% in 2024. However, unmet needs remain among the highest in the EU, due to long waiting times and the uneven quality and availability of healthcare services across the country. Unmet needs are twice as high for persons with disabilities, mostly as a result of regional disparities in access to services (see Annex 11). Public expenditure on long-term care and healthcare services remains low and well below the EU average, and workforce shortages and reliance on municipal funding further limit service provision. Low public spending leads to

([12]) These include sole proprietors, entrepreneur account holders and members of management and supervisory bodies. Those in temporary employment, part-time and on-call work, temporary agency work, other multi-party employment relationships and dependent self-employment are already covered.

([13]) Under current policies, public pension spending is projected to decline by about 1 pp of GDP by 2070 (see Annex 11).

high out-of-pocket([14]) payments for healthcare (see Annex 14).

Estonia is developing community-based service centres, reorganising special care institutions, strengthening primary healthcare and developing home care services, to address these issues, with the support of the Recovery and Resilience Facility and EU cohesion funds. The 2023 long-term care reform allocated additional funding to local governments, reducing out-of-pocket costs for general care services. Estonia is also gradually increasing dental care benefits and reducing co-payments for medical goods.

However, Estonia has not reformed the financing of its health and long-term care systems. To further reduce the unmet need for medical care and high out-of-pocket payments, adequate financing and quality remain crucial, especially as population ageing is expected to increase demand. Strengthening home and community-based care, alongside assistive technologies, would help improve service accessibility and effectiveness across the country. Innovative healthcare solutions could be further explored, such as integrating healthcare with the social sector and using mobile trailers with facilities for medical examinations.

Lack of affordable and low quality of housing

House prices have increased rapidly and, although wages had mostly caught up by 2024, the lack of affordable housing in Tallinn remains an issue for labour mobility. Residential property prices boomed in 2021 and 2022, outpacing wage growth and reducing housing affordability. The boom was fuelled by – among other things – pension fund withdrawals and the conversion of stock options from Estonian unicorns([15]) into real estate investments, particularly in and near Tallinn. In 2023 and 2024, residential real estate prices have more or less stagnated while wages have continued to increase. Still, compared to incomes, real estate prices per square metre remain above the EU average. Furthermore, partly due to a lack of competition between mortgage providers, which is hindered by high costs associated with refinancing, mortgage interest rates in Estonia (and Latvia) are the highest in the EU ([16]). High interest rates and rising average property prices have reduced households' borrowing capacity over the past decade, with a higher share of annual income going on mortgage payments. The housing cost overburden rate has almost doubled since 2021, reaching 8.6% in 2024 (see Annex 11). The cost of housing is a particularly acute issue in Tallinn, which accounts for a third of the population and over half of GDP. In 2024, apartments were 2.9 times more expensive per square metre in the capital than in the rest of Estonia (up from 2.3 in 2010) ([17]). This is an obstacle for labour mobility and results in lost competitiveness.

There is room to improve the quality of the housing stock, especially outside major urban areas. While Estonia has very high levels of property ownership, with

([14]) "Out-of-pocket payments" refer to direct payments made by individuals to healthcare providers at the time of service use

([15]) A unicorn is a privately owned start-up company, which has reached a valuation of $1 billion or more.

([16]) European Central Bank (2025), Loans for house purchases.

([17]) KV.EE real price statistics. The rest of Estonia refers to unweighted average price in all counties except Harjumaa, where Tallinn is located.

80.7% of people living in homes they own in 2023 (EU average: 69.2%), investment in existing properties is limited outside major urban areas. Low incomes and low property values are an obstacle in rural areas, resulting in incremental deterioration of the housing stock.

Investment in education will help alleviate skills shortages

The performance of the education system is relatively strong but teacher shortages are a challenge. According to the OECD PISA results, Estonia is one of the EU's top performers in basic skills. However, inequalities have been widening slightly over the past decade, and teacher shortages pose a risk to the quality of education. Shortages remain particularly severe in science and mathematics, with intense labour market competition for graduates and support specialists. Many new teachers leave the profession, leading to an insufficient supply of fully qualified staff. The shortages of fully qualified teachers are exacerbated by an ageing teacher population; the Estonian teaching force is one of the oldest in the EU (see Annex 12). Estonia could improve teacher shortages by implementing the 2022-2026 teacher action plan, focusing on teacher retention, while preparing a follow-up to the plan that goes beyond 2026.

The education system could still be better aligned with skills needs in the labour market. The high rate of early school leavers (11% in 2024) is a persistent challenge for skills supply to the labour market. Early school leavers have significantly lower employment rates and are at greater risk of poverty and social exclusion. (see Annex 12). The dropout rate from higher education is relatively high, as is the gender gap in favour of women. While educational attainment tends to be higher among women than men, women are often hired for less prominent positions, limiting the full use of their skills. The dropout rate is also higher for people with disabilities. Estonia has raised the compulsory education age to 18. However, the effectiveness of this reform will depend on its implementation and appropriate funding. The high rate of early school leaving could be reduced by fully implementing the reform of vocational education and training (VET), which seeks to better integrate VET with upper secondary general education. Furthermore, persisting skills shortages (see Section 2) could also be better addressed by better aligning education policy with the OSKA labour market forecasting system, to improve the labour market relevance of education and training. Increasing tertiary educational attainment and reducing dropout rates could improve the skills available in the workforce. There is also scope for further involving social partners in designing education policies relevant to the labour market. Addressing these challenges could also help reduce skills shortages and thus improve Estonia's competitiveness (see Section 2).

These findings are consistent with the second-stage analysis in line with the Social Convergence Framework. The analysis points to challenges related to the high share of the population at risk of poverty or social exclusion, high income inequality, the low impact of social transfers on poverty reduction, and high self-reported unmet needs for medical care. However, it does not point to overall social convergence challenges for Estonia,

also in light of the measures implemented or planned.([18])

([18]) 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 boost competitiveness, sustainability and social fairness, Estonia 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;
- **ensuring new and stable sources of public revenue**, including increasing the share of property taxation in public revenue and implementing spending reviews;
- **strengthening the societal and economic resilience of regions,** paying particular attention to Estonia's eastern borders;
- **addressing skills shortages and mismatches to strengthen labour productivity and innovation performance**, including by reducing early school leaving, making education and training more relevant to the labour market and better attracting and retaining talent from third countries;
- **improving access to financing and funding,** especially for small businesses and companies in remote regions, to facilitate innovative investment, including by promoting institutional investors' participation in the venture capital and equity market and addressing fragmentation in funding programmes;
- **boosting innovation and R&D investment** by prioritising applied research funding, strengthening the role of universities in the innovation system and enabling faster deployment of new technologies;
- **securing critical energy infrastructure**, while investing in renewable energy capacity, reducing overall dependence on fossil fuels and moving away from oil shale, streamlining permitting processes and enhancing flexibility technologies such as battery storage systems;
- **improving resource productivity and reducing the energy intensity of the economy** by continuing to support the take-up of resource-efficient green technologies and supporting resource efficiency and circularity more generally;
- **decarbonising transport** and achieving the target under the Emission Sharing Regulation by shifting freight transport from road to rail, speeding up electrification of railways and supporting the transition to electric vehicles;
- **to support upward social convergence, reducing poverty by strengthening social protection** for older people, people with disabilities and single-person households by increasing the adequacy and efficiency of the benefit system and better targeting vulnerable groups, and by extending coverage of unemployment benefits, in particular to those in non-

standard forms of work who are still excluded;

- **improving access to long-term care and healthcare** to reduce unmet needs for medical care and reduce out-of-pocket payments, by reforming the funding of healthcare and long-term care.

ANNEXES

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ANNEX 1: FISCAL SURVEILLANCE AND DEBT SUSTAINABILITY

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

The reformed framework, which entered into force on 30 April 2024([19]), 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.

Estonia submitted its plan on 11 October 2024. The plan covers the period until 2028, presenting a fiscal adjustment over four years. On 21 January 2025, the Council adopted the Recommendation endorsing Estonia's plan.([20])

The assessment of the implementation of the Council Recommendation endorsing Estonia's plan is carried out on the basis of outturn data from Eurostat and the Commission's Spring 2025 Forecast and taking into account the Annual Progress Report (APR) that Estonia submitted on 29 April 2025. Furthermore, given Estonia's request to activate the National Escape Clause ([21]) in accordance with the Commission Communication of 19 March 2025([22]), the assessment also considers, as appropriate, 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.([23])

([19]) 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.

([20]) OJ C, C/2025/655, 10.02.2025, ELI: http://data.europa.eu/eli/C/2025/655/oj.

([21]) On 30 April 2025, Estonia requested to the Commission and to the Council the activation of the National Escape Clause. On this basis, the Commission adopted a Recommendation for a Council Recommendation allowing Estonia to deviate from, and exceed, the net expenditure path set by the Council, COM(2025)604.

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

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

Developments in government deficit and debt

Estonia's government deficit amounted to 1.5% of GDP in 2024. Based on the Commission's Spring 2025 Forecast, it is projected to decrease to 1.4% in 2025. The government debt-to-GDP ratio amounted to 23.6% of GDP at the end of 2024 and, according to the Commission, it is projected to increase to 23.8% end-2025.

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

	Variables		2024	2025		2026	
			Outturn	APR	COM	APR	COM
1	General government balance	%GDP	-1.5	-1.5	-1.4	-2.5	-2.4
2	General government gross debt	%GDP	23.6	22.5	23.8	24.0	25.4

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

Developments in net expenditure

The net expenditure([24]) growth of Estonia in 2025 is forecast by the Commission([25]) to be below the recommended maximum. Considering 2024 and 2025 together, the cumulative growth rate of net expenditure is also projected below the recommended maximum cumulative growth rate.

Table A1.2: **Net expenditure growth**

	Annual			Cumulative*		
	REC	APR	COM	REC	APR	COM
	Growth rates					
2024	n.a.	1.1%	1.8%	n.a.	n.a.	n.a.
2025	7.1%	1.0%	2.1%	9.2%	2.1%	3.9%
2026	5.1%	5.0%	4.1%	14.8%	n.a.	8.2%

* 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 Estonia, Annual Progress Report (APR) and Commission's calculation based on Commission Spring 2025 Forecast (COM).

General government defence expenditure in Estonia amounted to 2.0% of GDP in 2021, 2.2% of GDP in 2022 and 2.7% of GDP in 2023.([26]) According to the Commission 2025 Spring Forecast, expenditure on defence is projected to amount to 3.4% of GDP in 2024 and 3.8% of GDP in 2025.

([24]) 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.

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

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

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

	Variables		2023	2024	2025	2026
			Outturn	Outturn	COM	COM
1	Total expenditure	bn NAC	16.7	17.4	18.7	19.7
2	Interest expenditure	bn NAC	0.1	0.2	0.2	0.3
3	Cyclical unemployment expenditure	bn NAC	0.0	0.0	0.0	0.0
4	Expenditure funded by transfers from the EU	bn NAC	0.7	0.5	0.7	0.8
5	National co-financing of EU programmes	bn NAC	0.1	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**	**15.8**	**16.5**	**17.7**	**18.5**
8	Change in net nationally financed primary expenditure (before DRM)	bn NAC		0.7	1.2	0.8
9	DRM (excl. one-off revenue, incremental impact)	bn NAC		0.4	0.9	0.1
10=8-9	**Change in net nationally financed primary expenditure (after DRM)**	**bn NAC**		**0.3**	**0.3**	**0.7**
11	Outturn / forecast net expenditure growth	% change		1.82%	2.1%	4.1%
12	Recommended net expenditure growth*	% change		1.9%	7.1%	5.1%
13=(11-12) x 7	Annual deviation	bn NAC		0.0	-0.8	-0.2
14 (cumulated from 13)	Cumulated deviation	bn NAC		0.0	-0.8	-1.0
15=13/17	**Annual balance**	**% GDP**		**0.0**	**-2.0**	**-0.4**
16=14/17	**Cumulated balance**	**% GDP**		**0.0**	**-2.0**	**-2.3**
17	p.m. Nominal GDP	bn NAC	38.2	39.5	41.5	43.5

* 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 and the national escape clause**

			2021	2022	2023	2024	2025	2026
1	Total defence expenditure	% GDP	2.0	2.2	2.7	3.4	3.8	4.1
2	*of which: gross fixed capital formation*	% GDP	0.7	0.7	1.3	1.2	1.5	1.5
3	Flexibility from increases in defence expenditure	% GDP					1.5	1.5
4	**Cumulated balance after flexibility**	**% GDP**					**-3.5**	**-3.8**

Source: Eurostat (COFOG), Commission Spring 2025 Forecast and Commission's calculation

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

	Variables		2024	2025		2026	
			Outturn	APR	COM	APR	COM
1=7+8+9	**Real GDP**	**% change**	**-0.3**	**1.7**	**1.1**	**2.5**	**2.3**
2	Private consumption	% change	-0.3	-0.4	1.4	1.5	2.4
3	Government consumption expenditure	% change	0.3	0.0	1.2	2.0	2.5
4	Gross fixed capital formation	% change	-6.9	7.6	1.6	1.1	3.1
5	Exports of goods and services	% change	-1.1	2.5	2.2	3.0	2.4
6	Imports of goods and services	% change	0.0	2.0	2.6	2.6	2.9
	Contributions to real GDP growth						
7	- Final domestic demand	pps	-2.0	1.9	1.4	1.5	2.6
8	- Change in inventories	pps	1.2	-1.7	0.0	-0.9	0.0
9	- Net exports	pps	-0.9	0.4	-0.3	0.2	-0.3
10	Output gap	% pot GDP	-4.3	-3.6	-3.4	-2.1	-1.5
11	Employment	% change	0.2	-0.1	-0.1	0.5	0.2
12	Unemployment rate	%	7.6	7.1	7.6	6.6	7.3
13	Labour productivity	% change	-0.5	1.8	1.2	2.0	2.0
14	HICP	% change	3.7	5.1	3.8	3.4	2.3
15	GDP deflator	% change	3.7	3.9	3.9	2.8	2.6
16	Compensation of employees per head	% change	5.6	5.2	4.5	5.1	4.0
17	Net lending/borrowing vis-à-vis the rest of the world	% GDP	-0.8	n.a.	-0.7	n.a.	-0.4

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**	**42.5**	**43.5**	**43.8**	**42.7**	**42.8**
	of which:					
2	- Taxes on production and imports	14.1	14.4	14.9	14.6	15.2
3	- Current taxes on income, wealth, etc.	9.0	9.9	9.9	9.1	9.2
4	- Social contributions	12.7	12.6	12.7	12.6	12.6
5	- Other (residual)	6.7	6.6	6.3	6.4	5.8
8=9+16	**Expenditure**	**44.0**	**45.0**	**45.2**	**45.2**	**45.3**
	of which:					
9	- Primary expenditure	43.4	44.5	44.6	44.7	44.7
	of which:					
10	- Compensation of employees	12.3	11.8	11.9	11.7	11.9
11	- Intermediate consumption	6.4	6.5	6.6	6.7	6.8
12	- Social payments	15.1	15.3	15.4	15.2	15.4
13	- Subsidies	0.7	0.8	0.8	0.8	0.8
14	- Gross fixed capital formation	6.1	7.1	7.2	7.0	7.1
15	- Other	2.9	3.0	2.8	3.3	2.7
16	- Interest expenditure	0.6	0.5	0.5	0.5	0.6
18=1-8	**General government balance**	**-1.5**	**-1.5**	**-1.4**	**-2.5**	**-2.4**
19=1-9	**Primary balance**	**-0.9**	**-1.0**	**-0.8**	**-1.9**	**-1.8**
20	Cyclically adjusted balance	0.6	n.a.	0.3	n.a.	-1.7
21	One-offs	0.0	0.0	0.0	0.0	0.0
22=20-21	**Structural balance**	**0.6**	**0.2**	**0.3**	**-1.5**	**-1.7**
23=22+16	Structural primary balance	1.2	0.8	0.8	-0.9	-1.1

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)**	**23.6**	**22.5**	**23.8**	**24.0**	**25.4**
2=3+4+8	Change in the ratio (pps. of GDP)	3.4	-1.1	0.2	1.5	1.5
	Contributions**					
3	**Primary balance**	**0.9**	**1.0**	**0.8**	**1.9**	**1.8**
4≈5+6+7	**'Snow-ball' effect**	**-0.1**	**-0.7**	**-0.6**	**-0.6**	**-0.5**
	of which:					
5	- Interest expenditure	0.6	0.5	0.5	0.5	0.6
6	- Real growth effect	0.1	-0.4	-0.2	-0.5	-0.5
7	- Inflation effect	-0.7	-0.9	-0.9	-0.6	-0.6
8	**'Stock-flow' adjustment**	**2.6**	**-1.3**	**0.0**	**0.1**	**0.2**

* 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	0.1	0.3	0.4	0.6	0.4
2	Cash disbursements of RRF grants from EU	n.a.	0.3	0.0	0.6	0.3	0.6	0.4

	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	0.1	0.1	0.0
4	Gross fixed capital formation	0.0	0.0	0.0	0.0	0.1	0.2	0.0
5	Capital transfers	0.0	0.0	0.0	0.2	0.3	0.3	0.3
6=4+5	Total capital expenditure	0.0	0.0	0.1	0.3	0.3	0.5	0.3

	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	0.3	0.0	0.0	0.0	0.0

Source: Annual Progress Report

Cost of ageing

Total age-related spending in Estonia remains stable overall, at around 17% of GDP (see Table A1.9)**.** This aggregate stability results from a projected decrease in pension and education spending being offset by rising expenditure on healthcare and long-term care. The decline in public pension spending of about 1 pp of GDP by 2070 is situated mostly in the 2060s.

Public healthcare ([27]) and long-term care ([28]) expenditure remain below the EU average and are set to remain mostly stable over the forecast horizon. Public healthcare expenditure is projected at 5.1% of GDP in 2024 (below the EU average of 6.6%) and is expected to increase by 0.3 pps by 2040 and by a further 0.3 pps by 2070. Public expenditure on long-term care is projected at 0.5% of GDP in 2024 (below the EU average of 1.7%) and is expected to increase by 0.2 pps of GDP by 2040 and by a further 0.4 pps of GDP by 2070.

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)	
EE	17.3	-0.3	0.3	0.2	-0.5	**-0.2**	17.1	**EE**
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)	
EE	17.3	-1.1	0.6	0.6	-0.5	**-0.5**	16.9	**EE**
EU	24.3	0.2	0.6	0.8	-0.4	**1.3**	25.6	EU

Source: 2024 Ageing Report (EC/EPC).

([27]) Key performance characteristics, recent reforms and investments are discussed in Annex 11.

([28]) The quality and the accessibility of the long-term care system are covered in Annex 9.

National fiscal framework

The Estonian Fiscal Council is a relatively small Independent Fiscal Institution (IFI) closely attached to the central bank. It performs the legally required activities of a euro area IFI (endorsement of the macroeconomic forecast and assessment of compliance with the budget balance rule). It is involved in the assessment of the budgetary plans but does not provide an endorsement. There is logistical support from the Estonian central bank and the three economists also come from the central bank. While the current set-up seems to be working, issues of independence may arise.

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

2023	Estonia	EU Average
Country Fiscal Rule Strength Index (C-FRSI)	13.65	14.52
Medium-Term Budgetary Framework Index (MTBFI)	0.72	0.73

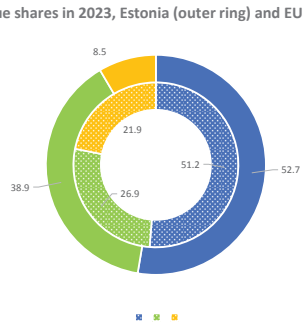
The Country Fiscal Rule Strength Index (C-FRSI) shows the strength of national fiscal rules aggregated at the country level based on i) the legal base, ii) how binding the rule is, iii) monitoring bodies, iv) correction mechanisms, and v) resilience to shocks. The Medium-Term Budgetary Framework Index (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 Estonia'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.

Estonia's recent tax reforms will help the government generate much-needed additional revenue in light of its defence and healthcare spending needs. Overall, tax revenues were equivalent to 33.7% of Estonia's gross domestic product (GDP) in 2023, considerably below the EU average of 39% (see Table A2.1). They increased to 35.5% in 2024. The tax mix relies strongly on taxes on labour and consumption, which accounted for 52.7% and 38.9% of total tax revenues respectively in 2023 (see Graph A2.1). In particular, the share of consumption taxes was significantly above the EU average of 26.9%, and may rise even further due to the increase in the standard VAT rate from 20% to 22% in January 2024 and the increase in the reduced VAT rates for accommodation services (from 9% to 13%) and press publications (from 5% to 9%) that came into effect in January 2025. In addition, a 'security surcharge' will be levied from July 2025, temporarily increasing the standard VAT rate by a further 2 percentage points to 24% for three years.

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



Source: Taxation Trends Data, DG TAXUD

Despite recent tax reforms, Estonia's corporate-tax system is likely to continue to encourage business reinvestment. A 2% security surcharge will be levied on corporate profits from January 2026 to December 2028. This will come on top of the recent increase in the corporate-tax rate from 20% to 22%, effective as of January 2025. Together with the abolition of the reduced 14% tax rate that applied to regular dividends, this may somewhat diminish the attractiveness of Estonia's tax environment for businesses. At the same time, Estonia continues to not levy corporate-income tax on reinvested or retained earnings, encouraging businesses to instead reinvest profits for growth rather than distributing them, fostering innovation and expansion. The forward-looking average effective tax rate, which indicates the expected tax burden for investment ([29]), was 15.7% in 2023, below the EU average of 18.9%.

Revenues from environmental taxes as a share of GDP are 0.6 percentage points higher in Estonia than the EU average (2.6% vs 2.0%), but have decreased over time. Estonia levies relatively high excise duties on road fuels, and has introduced a new vehicle tax that came into effect in January 2025. On pollution and resources taxes, Estonia has already implemented four of the six main types of pollution and resources taxes (i.e. taxes on NOx emissions, waste landfilling, discharge of waste into water, and plastic products). There may be scope to expand waste disposal taxes, including taxes on incineration. Estonia does not have taxes on fertilisers and pesticides. The share of environmental taxes in total revenues was 7.7% in 2023.

The personal income tax system remains simple and predictable in Estonia, but it is somewhat less progressive than that of other Member States. This is borne out by the labour tax wedge([30]), which is below the EU

([29]) Effective average tax rates measure the effect of taxation on investment projects earning economic rents. This indicator is based on a comparison of the net present value of pre-tax and post-tax cash flows. It is used to analyse investment decisions at the extensive margin, e.g. when a multinational enterprise decides to locate a plant in one of many jurisdictions (for the first time) or to make one of a number of technology choices.

([30]) 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

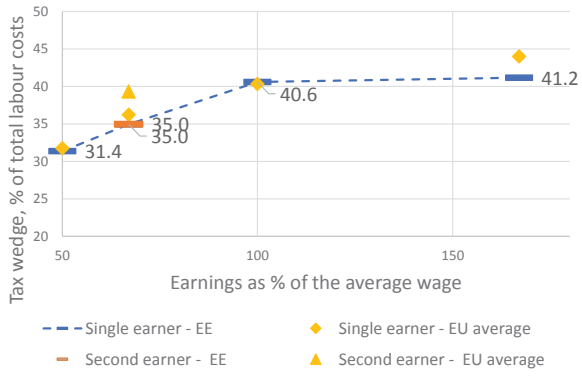
Table A2.1: **Taxation indicators**

		Estonia					EU-27				
		2010	2021	2022	2023	2024	2010	2021	2022	2023	2024
Tax structure	Total taxes (including compulsory actual social contributions) (% of GDP)	33.0	33.8	32.8	33.7	35.5	37.8	40.2	39.7	39.0	
By tax base	Taxes on labour (% of GDP)	17.1	17.3	17.0	17.8		19.8	20.5	20.1	20.0	
	of which, social security contributions (SSC, % of GDP)	12.2	11.6	11.3	12.0		12.9	13.0	12.7	12.7	
	Taxes on consumption (% of GDP)	13.6	13.4	13.1	13.1		10.9	11.2	10.9	10.5	
	of which, value added taxes (VAT, % of GDP)	8.5	9.1	9.1	9.1		6.8	7.3	7.4	7.1	
	Taxes on capital (% of GDP)	2.3	3.1	2.7	2.9		7.1	8.5	8.7	8.5	
Some tax types	Personal income taxes (PIT, % of GDP)	5.3	6.8	6.3	6.3		8.6	9.6	9.4	9.3	
	Corporate income taxes (CIT, % of GDP)	1.3	1.5	1.6	1.9		2.2	2.9	3.2	3.2	
	Total property taxes (% of GDP)	0.4	0.3	0.3	0.3		1.9	2.2	2.1	1.9	
	Recurrent taxes on immovable property (% of GDP)	0.3	0.2	0.2	0.2		1.1	1.1	1.0	0.9	
	Environmental taxes (% of GDP)	3.3	2.6	2.5	2.6		2.5	2.4	2.1	2.0	
	Effective carbon rate in EUR per tonne of CO_2 equivalents	NA	76.9	NA	73.4		NA	86.0	NA	84.8	
Progressivity & fairness	Tax wedge at 50% of average wage (single person) (*)	37.3	31.5	32.3	30.8	31.4	33.9	31.8	31.5	31.5	31.8
	Tax wedge at 100% of average wage (single person) (*)	40.1	38.2	39.1	39.9	40.6	40.9	39.9	39.9	40.2	40.3
	Corporate income tax - effective average tax rates (1) (*)	16.5	15.7	15.7	15.7		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) (*)	6.4	7.9	6.7	7.2		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 %) (*)		5.5	4.9				35.5	32.6		
	VAT gap (% of VAT total tax liability, VTTL) (**)		1.5	4.4	5.9			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

average for single people with high incomes (see Graph A2.2). The recent replacement of the progressive basic exemption with a universal flat exemption from tax of EUR 8 400 per year is likely to reduce the progressivity of the tax system at the upper end of the income spectrum even further. On the other hand, Estonia has been successful in increasing work incentives for low-income earners, which is reflected in the reduction in the tax wedge for workers earning 50% of the average wage from 37.3% in 2010 to 31.4% in 2024. Overall, however, the redistributive effect of Estonia's tax and benefits system remains somewhat below the EU average. The reduction in income inequality as measured by the Gini coefficient was 7.2 points in 2023, which was below the EU average of 7.7 points.

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

Estonia performs well on tax compliance and tax administration, including digitalising the tax administration. Outstanding tax arrears decreased in 2022 by 0.6 percentage points to 4.9% of total net revenue (in comparison with the previous year). The amount of arrears that the Estonian tax administration considers collectable was rather

percentage of total labour costs (the sum of the gross wage and social-security contributions paid by the employer).

stable between 2018 and 2022, at around 87%. The VAT compliance gap (an indicator of the effectiveness of VAT enforcement and compliance) was estimated at EUR 152 million or 4.4% of the VAT total tax liability in 2022, an increase of 2.9 percentage points compared with 2021. Nevertheless, with an EU average VAT compliance gap of approximately 7.0%, Estonia still ranked ninth among the EU Member States in 2022 (i.e. only eight EU Member States had a lower VAT compliance gap). Between 2018 and 2022, the VAT compliance gap fell from 5.6% to 4.4%. In Estonia, the cost-of-collection ratio (expressed as a percentage of total net revenue) remained stable at below 0.5% during the period 2018-2022.

Estonia's digitalisation of the tax administration is well-advanced. Estonia is one of only seven EU countries which has both launched and implemented: (i) a strategy for digital transformation; (ii) a strategy to identify the skills required for a successful digital transformation; and (iii) a strategy for building a digital culture within the tax administration. Estonia's tax administration pre-fills only personal-income-tax files; corporate-income-tax and value-added-tax returns remain not pre-filled. Nevertheless, the percentage of e-filing stands at above 95% for corporate-income-tax returns, personal-income-tax returns and VAT returns (100% of all three types of returns have been submitted electronically since 2018).

Estonia scores well on dispute resolution. The number of mutual-agreement-procedure ([31]) cases initiated in the year 2023 was only two ([32]). No cases were pending from previous years.

([31]) The Mutual Agreement Procedure (MAP) is an administrative procedure between tax authorities of Member States engaged in a tax dispute. During the MAP, national authorities endeavour to resolve the dispute within 2 years, or 3 years if the procedure is extended due to a justified request.

([32]) See page 4 in the following document: https://taxation-customs.ec.europa.eu/document/download/6bab1a20-40a1-4b97-852d-29246fd11cae_en?filename=DRM_2023_Final.pdf

Estonia's innovation system is now performing slightly above the EU average, but the progress made in the public science base does not fully translate into technological performance and business innovation. According to the 2024 European Innovation Scoreboard([33]), Estonia has rejoined the group of 'strong innovators'. In 2022, Estonia's performance in the Summary Innovation Index was 98.6% of the EU average, while the figure reached 104.8% in 2024. Estonia's R&D intensity ([34]) increased over the 2017-2023 period: R&D intensity was 1.84% in 2023, compared to 1.76% in 2022. While the country possesses a dynamic R&D base, in particular in the ICT sector, and good framework conditions for tech start-up support for the innovativeness of Estonia's economy, its performance in technological developments as captured by patent data has declined in recent years. Innovation in green technologies could be further strengthened. Research and innovation (R&I) funding of data science is lagging behind given the increasing pace of developments in AI tools.

Science for innovative ecosystems

Estonia has a good quality public research base, with stable funding. The quality of research outputs, as measured by the share of scientific publications within the top 10% most cited publications worldwide as a percentage of total publications, is slightly above the EU average (10.2% in 2021 vs 9.6%) and has increased over the last decade (7.0% in 2012). Public expenditure on R&D as a percentage of GDP is also just above the EU average (0.76% vs 0.72%), remaining more or less unchanged over the last few years.

R&I funding of data science is lagging behind given the increasing pace of developments in AI tools. Estonia has established itself as a hub of data science and informatics. While the new national Applied Research Centre has health data solutions among its five priorities, the Estonian Research Agency has so far dedicated just a small percentage of funding from its budget to computer science and informatics ([35]). Investments in AI research in the fields where Estonia has developed scientific strongholds over the years could allow it to exploit many underused or even untapped opportunities. For instance, Estonia could further capitalise on its extensive work on health data and genome research.

Business innovation

The volume of business R&D activities has expanded in recent years. Many Estonian businesses have increased R&D investments in recent years, particularly by hiring researchers. This is reflected in the researchers employed by business per thousand of the active population. Business enterprise expenditure on R&D reached 1.06% of GDP in 2023 compared to 0.59% in 2017. However, this is still well below the EU average of 1.49% and only around half of the expected 2% level. ICT is the core sector of the Estonian R&I ecosystem: business expenditure in the ICT sector accounts for 49.2% of total R&D expenditure. On technology developments captured by patent data, Estonia's patent applications filed under the Patent Cooperation Treaty per billion euro

([33]) 2024 European Innovation Scoreboard (EIS), country profile Estonia. 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).

([34]) Defined as gross domestic expenditure on R&D as a percentage of GDP.

([35]) https://www.etag.ee/wp-content/uploads/2022/01/Eesti_teadus_2022.pdf, p. 72.

of GDP steadily declined from 1.52 in 2017 and 1.02 in 2021 to 0.6 in 2022.

While the level of direct public support to business R&D has increased in recent years, the policy mixes beyond grant schemes are less developed. Support to business R&I has been strengthened in recent years. Overall, direct public support to business R&D increased from 0.056% of GDP in 2017 to 0.100% in 2022, in line with the EU average of 0.100%. However, the policies beyond grant schemes are less developed. The corporate income tax system has no special provisions to favour investment in R&D.

Cooperation between public research and businesses remains limited, but the new Applied Research Centre will help companies to better exploit research results. In 2022, R&D activities commissioned by businesses to universities and public research organisations represented 6.8% of public R&D. This is an improvement compared to 5.2% a year earlier and reaches nearly the EU average of 6.96%. In 2024, Estonia launched the national Applied Research Centre, co-funded by the European Regional Development Fund and partly also by the recovery and resilience plan. However, it will take years to develop a fully functional research technology organisation that benefits a wide range of businesses. The Applied Research Centre will help Estonian businesses develop knowledge-intensive products and services. Its fields of activity will be health data, biorefining, drone technologies, hydrogen technologies and autonomous vehicles. Its first laboratories are expected to be established in 2025, starting with a biorefining lab. Estonia is strengthening R&I Centres of Excellence that are also enablers of cooperation between academia and business: in 2024, the Estonian Research Agency launched 10 Centres of Excellence.

Business R&D that supports innovations in green technologies could be further strengthened. According to the European Innovation Scoreboard, the share of Estonian patented inventions in environment-related technologies dropped substantially in recent years. As part of the recovery and resilience plan, the Enterprise and Innovation Foundation supports the development of new green and energy efficient technologies by innovative start-ups through the SmartCap investment funds. Moreover, as part of the national Applied Research Programme, the Estonian Business and Innovation Agency has been managing a new clean-tech programme since 2024, including support in recycling materials and developing sustainable technologies. Estonia has launched several notable R&D projects co-funded by Horizon Europe programmes in the field of bio-based industry. However, implementation of the bio-based solution by industry has been lagging.

Estonia has made considerable progress in business digitalisation, but areas such as data analytics still need attention to fully align with its EU Digital Decade targets. The adoption of digital technologies by businesses in Estonia shows mixed progress. Estonia outperforms the EU average in cloud computing adoption (52.6% vs 38.9%) but its performance in data analytics (25.6% vs 33.2%) remains below average. In 2024, AI adoption by Estonian firms surpassed that of European ones (13.3% vs 12.6%), while small and medium-sized enterprises (SMEs) with at least a basic level of digital intensity accounted for 71.2%, slightly below the EU average of 72.9%. To drive digital transformation, Estonia has launched initiatives under its recovery and resilience plan together with national strategies such as European Digital Innovation Hubs. The AI & Robotics Estonia Hub provides businesses with assistance in testing and validating innovative robotics, AI technologies and algorithms.

The government's commitment to digital transformation and its supportive regulatory environment further fuel the growth of the digital sector. Estonia has already demonstrated its strong position in the digital economy, ranking 4th in EU in terms of

its digital economy's contribution to gross value added. Estonia is a front runner in providing key public services digitally both for businesses and for citizens ([36]). Nevertheless, in 2021 the Estonian Digital Agenda 2030 revealed three priorities: (i) developing further digital public services; (ii) focusing on cybersecurity; and (iii) improving connectivity across the country. The Digital Agenda 2030 strategy is linked to far-reaching R&D programmes aimed at establishing Estonia as a centre of excellence for deep-tech start-ups.

Financing innovation

The venture capital level stabilised at above 0.3% of GDP in 2022 and 2023, the highest level in the EU. Venture capital intensity picked up from 2018, quadrupling in five years. Estonia has a well-established tech ecosystem that has attracted investments of over 1% of GDP in the last decade ([37]).

Alternative financing has gained traction in the Estonian financial ecosystem thanks to public-funded initiatives together with a thriving ecosystem for start-ups and tech businesses. New private equity and venture capital funds aimed at SMEs have largely benefited from the support of national promotional institutions (e.g. Enterprise Estonia) and supranational organisations (European Investment Fund, Baltic Innovation Fund, European Bank for Reconstruction and Development) over the past decade. They have played an essential role in expanding alternative sources of funding and creating a critical mass of investors. Initiatives such as EstFund (established in 2016 by the Estonian government and the European Investment Fund) have encouraged the growth of local private equity/venture capital funds. The availability of venture capital has fuelled the innovation ecosystem. Fundraising has benefited significantly from the creation of the Baltic Innovation Fund in 2012 and a five-year extension of the initiative in July 2019. This public support has been complemented by a range of organisations that not only foster the entrepreneurial spirit among Estonians, but also seek to attract foreign founders and investors. The business-friendly legislation and tax system supports entrepreneurship.

Innovative talent

The shortage of skilled workers affects Estonia's innovation capacity. The number of ICT graduates is one of the highest in the EU, but the declining number of new graduates in science and engineering is of particular concern. This number has fallen several years in a row to 9.2 per thousand of those aged 25-34 in 2022, compared to the EU average of 17.5. The decline in engineering, construction, manufacturing and maths may hinder Estonia's innovation performance in the long run (see Annex on Education and Skills).

Entrepreneurship education in Estonia is high quality and well developed in all educational levels. It is an important education policy priority, and it has been anchored in the Education Strategy 2035 and in national curricula. Between 2016-2023 a systematic entrepreneurship education program, *Edu ja Tegu,* was run which successfully developed and expanded this educational area. As a result, by 2023, 43% of kindergartens, 83% of schools and 94% of universities had introduced or were implementing entrepreneurship education. Nevertheless, further efforts could be made in higher education to align the entrepreneurship education curriculum with labour market needs as practical entrepreneurial experiences in higher education remain limited.

([36]) Estonia 2024 Digital Decade Country Report.

([37]) 'State of European Tech 24: The definitive take on European tech'.

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

Estonia	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)	2.10	1.25	1.73	1.75	1.76	1.84	:	2.24	3.45
Science and innovative ecosystems									
Public expenditure on R&D as % of GDP	0.88	0.65	0.75	0.75	0.76	0.76	:	0.72	0.64
Scientific publications of the country within the top 10% most cited publications worldwide as % of total publications of the country	7.0	8.0	8.8	10.2	:	:	:	9.6	12.3
Researchers (FTE) employed by public sector (Gov+HEI) per 1000 active population	4.6	4.5	4	4.5	4.7	4.9	:	5.7	:
International co-publications as % of total number of publications	50.6	59.0	65.8	67.8	67.7	69.8	:	55.9	39.3
R&D investment & researchers employed in businesses									
Business enterprise expenditure on R&D (BERD) as % of GDP	1.21	0.59	0.95	0.98	0.99	1.06	:	1.49	2.70
BERD performed by SMEs as % of GDP	0.40	0.29	0.50	0.98	0.50	:	:	0.40	0.30
Researchers employed by business per thousand active population	2.1	2.4	3.2	3.5	4.3	4.3	:	5.7	:
Innovation outputs									
Patent applications filed under the Patent Coop. Treaty per billion GDP (in PPS €)	0.7	1.5	1.2	1.0	0.6	:	:	2.8	:
Employment share of high-growth enterprises measured in employment (%)	11.48	10.94	12.71	:	:	:	:	12.51	:
Digitalisation of businesses									
SMEs with at least a basic level of digital intensity % SMEs (EU Digital Decade target by 2030: 90%)	:	:	:	:	66.95	:	71.2	72.91	:
Data analytics adoption % enterprises (EU target by 2030: 75%)	:	:	:	:	:	25.57	:	33.17	:
Cloud adoption % enterprises (EU Digital Decade target by 2030: 75%)	:	:	:	50.52	:	52.6	:	38.86	:
Artificial intelligence adoption % enterprises (EU target by 2030: 75%)	:	:	:	2.77	:	5.19	13.89	13.48	:
Academia-business collaboration									
Public-private scientific co-publications as % of total number of publications	6.4	8.7	8.7	8.8	8.5	8.6	:	7.7	8.9
Public expenditure on R&D financed by business enterprises as % of GDP	0.026	0.032	0.049	0.039	0.052	:	:	0.050	0.020
Public support for business innovation									
Total public sector support for BERD as % of GDP	0.116	0.056	0.091	0.097	0.100	:	:	0.204	0.251
R&D tax incentives: foregone revenues as % of GDP	0.000	0.000	0.000	0.000	0.000	:	:	0.102	0.141
BERD financed by the public sector (national and abroad) as % of GDP	0.116	0.056	0.091	0.097	0.100	:	:	0.100	0.110
Financing innovation									
Venture capital as a % of GDP (calculated as a 3-year moving average)	0.033	0.024	0.104	0.231	0.343	0.335	:	0.074	:
Seed stage funding share (% of total venture capital)	14.2	13.8	23.5	19.4	14.8	15.3	:	7.3	:
Start-up stage funding share (% of total venture capital)	76.8	48.1	22.0	38.7	47.8	46.1	:	44.0	:
Later stage funding share (% of total venture capital)	9.0	38.1	54.4	41.9	37.4	38.6	:	48.7	:
Innovative talent									
New graduates in science and engineering per 1000 population aged 25-34	13.6	10.7	9.51	9.75	9.18	:	:	17.5	:
Graduates in the field of computing per thousand population aged 25-34	3.03	3.72	4.19	5.50	4.9	:	:	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

Estonian companies' competitiveness has suffered from the weak economic situation and declining productivity of recent years. Strong integration into the Single Market, high business efficiency and a supportive regulatory framework (especially in entrepreneurship) are among the key strengths of the Estonian business environment. Cost pressures and increasing competition are some of the key challenges for the industry and particularly for small and medium-sized enterprises (SMEs).

Economic framework conditions

GDP growth is expected to be moderate in 2025, but productivity is still weak. Total factor productivity declined by 1.3% in 2024 and is expected to continue declining in 2025. Inflation and cost pressures in Estonia remain among the highest in the euro area and a large increase in nominal labour costs is continuing to weigh on the economy. Uncertainty about the future is the greatest obstacle to investment in Estonia, with 88% of firms reporting it as an obstacle ([38]). The share of firms investing has remained relatively stable, but the share of firms expecting to increase their level of investment dropped significantly in 2024 to a net balance of -12% ([39]).

Estonia performed relatively well in terms of labour and material shortages in 2024. Only 8.6% of firms faced constraints related to labour shortages (EU average 20.2%), which was also slightly lower than in the previous year when the share had already considerably decreased ([40]). Similarly, only 4.2% of firms faced material shortages in 2024 (less than half the EU average of 10%) ([41]). The vacancy rate has also been decreasing since 2022([42]), with unemployment increasing in the last two years. Unemployment reached 7.6% in 2024 and is expected to remain at the same level in 2025.

The level of labour shortages is relatively low, but the non-availability of skilled labour remains an issue for Estonia. 75% of the companies (in line with EU average) listed it as an obstacle for investment in the 2024 EIB investment survey ([43]) and 32% stated it as a major obstacle ([44]). Shortages are particularly prevalent in the STEM sector (see Annex 12). For example, the European Centre for the Development of Vocational Training estimates that almost 14 000 new jobs will be created between 2025 and 2035 in computer programming. This is over 10 000 more jobs than in any other sector, demonstrating the changing skill requirements and employee profile ([45]). The share of enterprises providing ICT training in Estonia was still below EU average in 2024 ([46]). However, Estonia's recovery and resilience plan (RRP) has measures to facilitate access to transversal skills and Estonia has reported significant progress in digital skills in 2023.

Estonia is performing above the EU average in innovation ([47]). However, fewer Estonian firms reported innovation activity in the last financial year than in the previous year (only 24% in 2024, lower to 43% in 2023 and the 2024 EU average 32%) ([48]). Estonia generally underperforms in business R&D investment and public support for business R&D ([49]). Estonian firms also reported a share of investment in intangible assets of 26%,

([38]) EIB Investment Survey 2024: European Union overview
([39]) EIB Investment Survey 2024 Country Overview: Estonia
([40]) ECFIN BCS
([41]) ECFIN BCS
([42]) Eurostat
([43]) EIB Investment Survey 2024: European Union overview
([44]) EIB Investment Survey 2024 Country Overview: Estonia.
([45]) CEDEFOP Skills Forecast.
([46]) European Innovation Scoreboard 2024 Country Profile Estonia
([47]) European Innovation Scoreboard 2024 Country Profile Estonia.
([48]) EIB Investment Survey 2024 Country Overview: Estonia
([49]) European Innovation Scoreboard 2024 Country Profile Estonia

significantly lower than the EU average of 38% ([50]) (see Annex 3).

SMEs make up a particularly large share of Estonia's industrial firms – 99.9% ([51]). The share of value added by SMEs in the non-financial business sector (NFBS) was 81.7% in 2023, the highest within EU. The share of SME employment was 82.7%, significantly higher than the EU average 65.2%, so Estonian SMEs are particularly important to Estonia's competitiveness ([52]). Estonia is also known for its start-ups and has produced 10 unicorn companies ([53]).

Estonian SMEs reported costs of production and labour as their biggest challenge in 2023. This was still slightly better than the EU average and Estonia's Baltic peers – at 6.1 (on a scale from 1 to 10; the EU average was 6.8, Lithuania 6.3 and Latvia 6.5). Other significant challenges are competition (where Estonia ranked worse than the EU average) and the non-availability of skilled staff and experienced managers. Estonian SMEs reported a particularly low level of challenges in access to finance and regulation ([54]). The availability of skilled staff was considered an obstacle to investment by a particularly large share of micro and small companies (78%) ([55]). In 2023, Estonia experienced the worst decline in the value added of SMEs (inflation-adjusted) among EU Member States (minus 20.4%) ([56]). Estonia is also expected to remain one of the worst performers in 2024 ([57]).

Regarding enabling business infrastructure, Estonia performs well in logistics. Estonia has a good overall score in the World Bank's Logistics Performance Index and better than the scores of its Baltic peers Latvia and Lithuania ([58]). However, infrastructure is not Estonia's strongest component within the index. Improvement is needed in both physical and digital infrastructure, but neither of these two areas was flagged up as a significant obstacle to investment in Estonia (fewer than 30% of respondents considered them to be an obstacle) ([59]).

Estonia has strengthened its digital infrastructure with significant advancements in connectivity. Fibre to the premises (FTTP) coverage reached 76.9% in 2023 – well above the EU average of 64% – although rural areas still require substantial improvement (67.8% vs the EU average of 52.8%). Very high capacity network (VHCN) coverage stands at 76.9%, slightly below the EU average of 78.9%. To address connectivity challenges, Estonia has allocated EUR 24.3 million through different initiatives under its RRP. Estonia's overall 5G coverage reached 87.5% in 2023, just below the EU average of 89.3%. Estonia has demonstrated strong growth in 5G deployment, with a 102% annual increase that is significantly above the EU average of 10%. However, 5G coverage in the critical 3.4-3.8 GHz spectrum band remains at 43.7% – below the EU average of 50.6%.

In terms of cybersecurity, Estonia has made commendable strides in enhancing digital resilience. 90.9% of enterprises deploy ICT security measures – slightly below the EU average of 92.8%. The number of enterprises in Estonia that experienced ICT security incidents leading to unavailability of ICT services due to attack from outside increased slightly from 3.1% in 2022 to 3.6% in 2024, exceeding the EU average of 3.4%.

56.7% of Estonian SMEs experienced late business-to-business payments in 2024. This

([50]) EIB Investment Survey 2024 Country Overview: Estonia.

([51]) SME Performance Review 2024 - Estonia country sheet
([52]) SME Performance Review Annual Report 2023/2024.
([53]) why estonia - Startup Estonia.
([54]) SME Performance Review Annual Report 2023/2024.

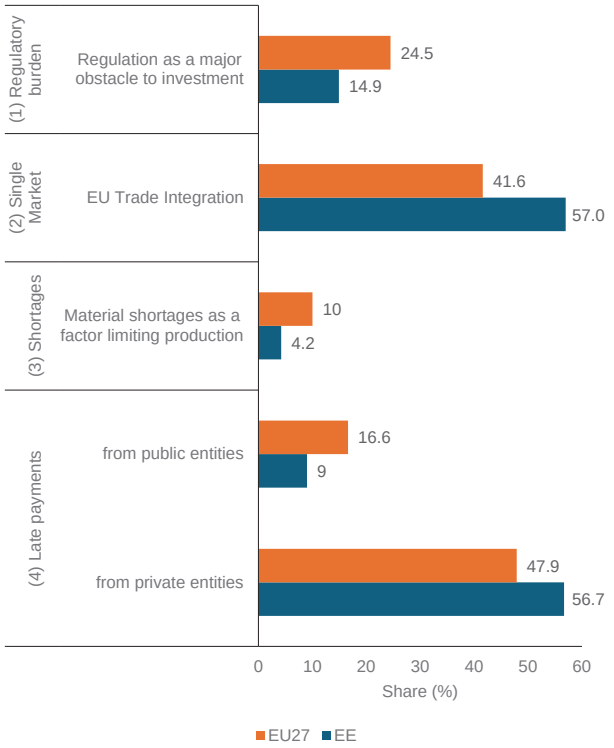
([55]) EIB Investment Survey 2024 Country Overview: Estonia

([56]) Annual growth rate of SME adjusted for inflation value added in the NFBS in 2023 in the EU-27 and across EU Member States – Estonia, available in SME Performance Review Annual Report 2023/2024 .
([57]) SME Performance Review Annual Report 2023/2024

([58]) Logistics Performance Index (LPI).
([59]) EIB Investment Survey 2024: European Union overview

was significantly higher than the EU average of 47.9%, showcasing payment issues in Estonian businesses ([60]). In 2023, 54% of companies in Estonia were affected by late payments. This was the highest share in the last five years and well above the EU average. These late payments resulted in 44% of firms delaying their own payments to their suppliers in 2023, triggering a domino effect in late payments down the value chain. 39% of firms indicated that late payments were affecting their production and operations, and 30% indicated that late payments were delaying their repayments of loans or obliging them to use additional financing ([61]). The share of finance-constrained firms has more than doubled since last year (according to the latest EIBIS), mainly due to a greater share of firms being rejected when applying for finance or thinking that it was too expensive (see Annex 5).

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.

The attractiveness of Estonia to foreign investors has generally been quite high. Estonia is outperforming its Baltic peers and Finland on foreign direct investment (FDI). The inward FDI stocks dropped significantly as a share of GDP in 2022 but returned to almost the previous level of around 100% in 2023 (97.7%). This was higher than the EU average of 84.1% ([62]).

Regulatory and administrative barriers

Regulation is less of an obstacle in Estonia but further simplification is warranted. 48% of firms see Estonia's business regulations as an obstacle to investment. 52% see labour regulations as an obstacle. Both scores are better than the average for the EU (66% for

([60]) SAFE survey

([61]) EU Payment Observatory Analysis.

([62]) Eurostat.

business and 62% for labour regulations) and its Baltic peers (e.g. 61% for both in Latvia) ([63]). In addition, Estonia is one of the best performers in the OECD's Product Market Regulation indicator, which shows that Estonia has fewer regulatory barriers in product markets than the OECD average. However, Estonia could further simplify its regulatory and administrative burden, particularly in licensing where Estonia is ranked around the OECD average. It could also further align itself with best practices, for example by regularly reviewing and updating the licences required to start a business ([64]). The share of firms in Estonia employing staff to deal with regulatory compliance is above EU average ([65]).

Tax compliance costs for SMEs have traditionally been relatively low in Estonia compared to the EU average as well as its Baltic peers. While several recent tax reforms may imply some adjustment costs for smaller businesses, Estonia's digitised tax system is likely to ease the transition and help minimise compliance burdens. In 2022, Estonia was at the lower end for both total enterprise tax compliance cost and corporate income tax (CIT). In terms of value added tax (VAT) compliance cost, Estonia was around the EU average in 2022 ([66]). The recent tax reforms may make Estonia's tax environment less attractive for businesses, but the corporate tax system is likely to remain favourable (see Annex 2).

Estonia has taken steps to improve its insolvency framework in recent years. Previously, Estonia was considered to have an average framework in place but scored relatively low particularly in treatment of failed entrepreneurs. This might have deterred aspiring entrepreneurs. Improvement on this, for example in relation to time to discharge, has taken place already between 2016 and 2022 ([67]). However, the personal cost of insolvency could yet be further reduced in Estonia ([68]). In 2023, both business registrations and bankruptcy declarations increased in Estonia, with bankruptcies growing by 51.7% (the third fastest rate in the EU). This increasing trend continued in 2024 ([69]).

Estonia is considered to have a supportive national context for entrepreneurship. Estonia scored fifteenth (with a score of 5.4) in the Global Entrepreneurship Monitor National Entrepreneurial Context Index 2024/2025, which provides an overview of how supportive the national context is to start a new enterprise. Despite a good overall score, Estonia's score dropped significantly from previous year largely due to declines in two government policy conditions, 'Support and Relevance' and 'Taxes and Bureaucracy' as well as in the 'Entrepreneurial Education Post-School' condition. Estonia could improve in particular in entrepreneurial education, with only 44.7% of adults in Estonia (which ranked 45 out of 51 countries) considering themselves to have the skills and knowledge to start a business ([70]). The self-employment rate of 10% in Estonia was below the EU average, particularly in terms of female and youth self-employment ([71]).

Single Market

Estonia is a small open economy and continues to be well integrated into the Single Market and to actively engage in international trade. 74% of Estonian companies engage in international trade ([72]) and Estonia scored fifth in terms of EU trade

([63]) EIB Investment Survey 2024: European Union overview

([64]) OECD PMR country note Estonia.

([65]) EIB Investment Survey 2024 Country Overview: Estonia

([66]) Tax compliance costs for SMEs 2022.

([67]) OECD working paper Enhancing insolvency frameworks to support economic renewal 2022.

([68]) OECD Economic Surveys: Estonia 2024.

([69]) Eurostat

([70]) GEM Global Entrepreneurship Monitor 2024/2025

([71]) OECD report The Missing Entrepreneurs 2023.

([72]) EIB Investment Survey 2024 Country Overview: Estonia

integration, demonstrating a high degree of EU trade integration (measured using the percentage ratio of trade volumes to GDP). This percentage decreased slightly from last year, in line with a general trend among EU Member States (57% in 2024, 60% in 2023) ([73]). However, a large majority of Estonian exporters (88% vs the EU average of 60%) reported that they have to comply with different standards and consumer protection rules in different EU Member States. This share is particularly high in the manufacturing and construction sector (94% in 2024), indicating fragmentation in those sectors ([74]). Estonia's services trade restrictiveness is generally below the OECD average and is particularly low in the insurance sector. However, architectural and legal services are more restricted than the global average, particularly for the movement of professionals ([75]). This restrictiveness is less reflected in the intra-EEA trade, Estonia having in contrast a low level of intra-EEA trade restrictions e.g. in legal services ([76]).

Estonia generally complies well with EU law. Estonia's single market transposition deficit was just above the EU average in December 2024 and was at the same level as the previous December at 0.9%. This signals that some further work on the timely transposition of directives into national law could be warranted. The transposition of nine single market directives was overdue (in December 2024) and the average delay in transposing those directives was also higher than EU average. In terms of the conformity deficit (the percentage of wrongly transposed single market directives), Estonia is performing better than the EU average (it ranks 12). Estonia had 12 pending single market infringement proceedings in December 2024, which was half the EU average of 24. This was an increase on the previous year but Estonia is still one of the best performers in the infringement category this year. In 2024, Estonia resolved 100% of the SOLVIT cases it handled as lead centre (the EU average was 84.9%) ([77]).

Regulatory restrictiveness for professions is generally lower than the EU average. However, legal professions are subject to relatively heavy regulation. Lawyers and notaries in Estonia face particularly stringent entry and conduct regulations ([78]). This can impact competitiveness in the legal sector.

Public procurement

Estonia continues to have an average performance in public procurement. In single bids, Estonia scored around the EU average in 2024 with 27%, slightly decreasing from 26% in the previous year. Despite an average performance in general, Estonia was still among the worst performers in direct awards in 2024 (the percentage of public procurement negotiated without any call for bids), with a score of 13% ([79]).

Estonia is making progress on strategic public procurement. In particular, Estonia is taking steps in green public procurement, though social and innovation procurement is lagging a bit behind. On socially responsible public procurement, Estonia has a comprehensive legal framework but there are only a few good examples in practice, and there is a general lack of awareness about the possibilities it offers and how to apply it in practice. One of the key factors hindering progress in strategic public procurement is a lack of professionalism. Estonia has launched (together with the OECD) a project called 'Promoting the Uptake of Strategic Public Procurement in Estonia through

([73]) Eurostat

([74]) EIB Investment Survey 2024 Country Overview: Estonia

([75]) OECD Services Trade Restrictiveness Index 2024 Estonia.

([76]) OECD Services Trade Restrictiveness Index 2024 Simulator.

([77]) Country data: Estonia | Single Market and Competitiveness Scoreboard

([78]) OECD PMR country note Estonia.

([79]) Commission internal

Professionalising the Public Procurement Workforce' ([80]). Completion of this project would enable both Estonian enterprises and public authorities to better leverage strategic public procurement.

([80]) Ministry of Finance, 2023.

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

Estonia							
POLICY AREA	**INDICATOR NAME**	**2020**	**2021**	**2022**	**2023**	**2024**	**EU-27 average**
Investment climate							
Shortages	Material shortage, firms facing constraints, %[1]	7.1	21.7	20.4	4.4	4.2	10.0
	Labour shortage, firms facing constraints, %[1]	7.9	27.2	23.3	9.1	8.6	20.2
	Vacancy rate, vacant posts as a % of all available ones (vacant + occupied)[2]	1.1	1.5	1.8	1.5	1.3	2.3
Infrastructure	Transport infrastructure as an obstacle to investment, % of firms reporting it as a major obstacle[3]	6.7	2.8	5.5	8.6	8.3	13.4
	VHCN coverage, %[4]	-	73.4	76.3	76.9	-	78.8
	FTTP coverage, %[4]	-	73.4	76.3	76.9	-	64.0
	5G coverage, %[4]	-	18.3	43.3	87.5	-	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]	8.9	5.6	9.5	14.7	14.9	24.5
Late payments	Payment gap - corporates B2B, difference in days between offered and actual payment[5]	15.0	13.9	13.2	15.3	-	15.6
	Payment gap - public sector, difference in days between offered and actual payment[5]	13.9	11.0	15.9	18.1	-	15.1
	Share of SMEs experiencing late payments, %*[6] — from public or private entities in the last 6 months	37.8	48.4	45.2	53.7	-	-
	Share of SMEs experiencing late payments, %*[6] — from private entities in the previous or current quarter	-	-	-	-	56.7	47.9
	Share of SMEs experiencing late payments, %*[6] — from public entities in the previous or current quarter	-	-	-	-	9.0	16.6
Single Market							
Integration	EU trade integration, % (Average intra-EU imports + average intra EU exports)/GDP[2]	50.3	58.1	65.4	59.7	57.0	41.6
	EEA Services Trade Restrictiveness Index[7]	0.039	0.039	0.039	0.039	0.042	0.050
Compliance	Transposition deficit, % of all directives not transposed[8]	0.5	1.2	0.4	0.9	0.9	0.8
	Conformity deficit, % of all directives transposed incorrectly[8]	1.4	0.9	0.9	1.1	0.8	0.9
	SOLVIT, % resolution rate per country[8]	100	100	100	100	100	84.9
	Number of pending infringement proceedings[8]	12.0	8.0	7.0	10.0	12.0	24.4
Public procurement							
Competition and transparency in public procurement	Single bids, % of total contractors**[8]	27	25	32	26	27	-
	Direct awards, %**[8]	12	9	11	12	13	7.0

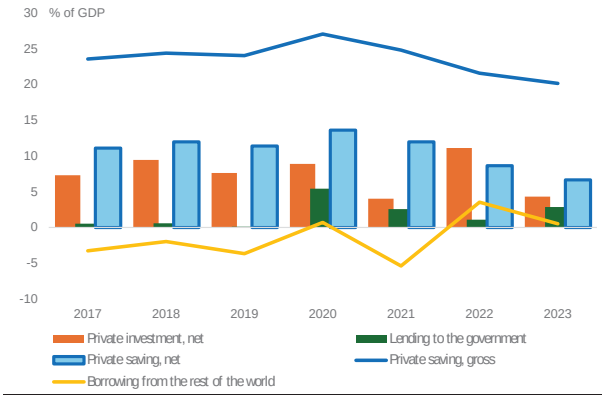
*Change in methodology in 2024: reporting late payments from public and private entities separately.
** Data on single bids for 2024 is provisional and subject to revision. Due to missing data, the EU average of direct awards data is calculated without Romania.
Sources: (1) ECFIN BCS, (2) Eurostat, (3) 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).

Estonian firms access only a part of the above average savings of the country's households, also as direct retail participation in capital markets is low. Moreover, pension-fund assets have been decreasing following a policy change in 2021 that turned the 'second pillar' of pensions into a voluntary savings scheme. Apart from its very modest size, the country's institutional investor base also has a conservative investment profile and mostly invests outside Estonia. In addition, over 95% of companies in Estonia are SMEs, which find it difficult to access the capital markets and their opportunities. This leaves internal financing as the main alternative to bank funding for Estonian firms. Thanks to public support initiatives, alternative funding through private equity and venture capital has gained traction in the country, boosting early-stage entrepreneurial activity. Nevertheless, financing gaps remain for companies in the later financing stages.

Availability and use of domestic savings

The Estonian economy invests part of its net savings abroad. Over the last decade, the private savings ratio, net of fixed capital consumption, fluctuated around its ten-year average of 10.1% of GDP, reaching a maximum of 13.6% in 2020 (see Graph A5.1). The net private investment ratio, which measures the net contribution of the private sector to capital accumulation in the country, exhibited a ten-year average of 7.3% of GDP and reached a maximum of 11.1% in 2022. At the same time, during the same period the government balance was in regular surplus, averaging 0.8% of GDP. Thus, except for the last couple of years, the high positive balance between net domestic savings and net investment, together with the government surpluses, resulted in net lending abroad by Estonia, averaging 0.7% of GDP, with a peak of 5.4% in 2021. Hence, some of Estonia's net savings, i.e. after accounting for the investments that are necessary to merely maintain the existing capital structure of the economy, are used to finance projects abroad, except over the last couple of years.

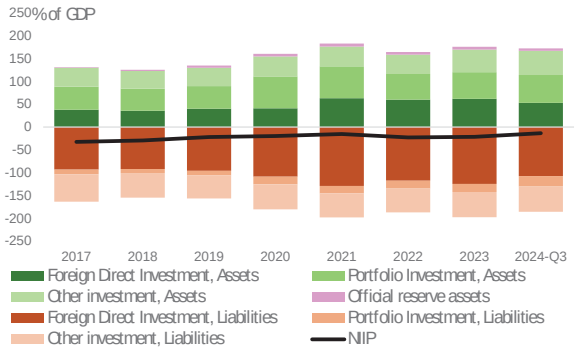
Graph A5.1: **Net savings-investment balance**



Source: AMECO.

The Estonian economy exhibits a negative net international investment position. Between 2009 and 2023 the NIIP has strengthened almost every year, reflecting an improvement in international competitiveness, however remaining in negative territory (see Graph A5.2). As of Q3-2024, total assets on foreigners reached 172.1% of GDP, while liabilities to foreigners stood at 185.8% of GDP, resulting in a negative NIIP of 13.7% of GDP (see Graph A3.2). The accumulated net portfolio investment, which reached 38% of GDP as of Q3-2024, did not suffice to counterbalance a negative net foreign direct investment balance of -54.7%, together with net other investments of -2.3%. The stock of official foreign reserve assets amounted to 5.3% of GDP. The Estonian economy thus appears to be a net capital importer, notably mainly by means of foreign direct investments in the country.

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



Source: ECB.

Structure of the capital markets and size of the financial sector

In terms of capital market development, Estonia lags behind the rest of the EU. Nevertheless, despite the similar economic structure and size, stock exchanges of Estonia have been able to achieve a somewhat higher level of development than its neighbouring countries. Whereas the market capitalisation of listed stocks reached 5.9% in Lithuania and only 1.2% in Latvia, it amounted to 12.2% of GDP in Estonia at the end of Q3-2024. In comparison, the EU average is 69.3% of GDP. State and local government-controlled companies account for slightly more than a third of market capitalisation in Estonia. The situation is similar in the debt securities market: the corporate bond market is very thin and activity there was very weak even when low interest rates prevailed in financial markets over the previous decade.

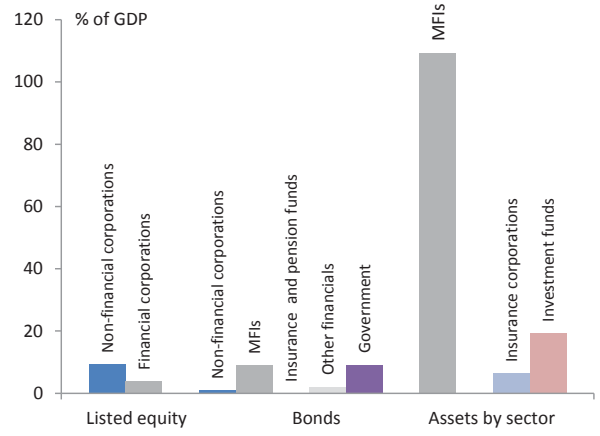
The prospects for capital market development are limited by the low number of listed enterprises. Estonia has established a good market infrastructure, as well as a regulatory framework that meets international standards, ensuring adequate market transparency and investor protection. Nevertheless, local businesses tend to rely on bank intermediation rather than attracting investments through stock and bond issues or from alternative sources. This results in low interest from institutional and retail investors, and thus few local opportunities to raise share capital. As there is a relatively large share of foreign-owned companies in Estonia, some companies can borrow from their parent companies. The small size of the local market also leads large companies to borrow abroad to a significant extent and to issue bonds in foreign markets. Lacking market activity by institutional investors creates conditions for weak demand for corporate stocks and bonds. Furthermore, the level of borrowing by the Estonian general government is low, and so few government bonds are issued. In terms of the international market, projects developed in Estonia are relatively low value, which makes them less attractive to international investors. The relative lack of liquidity in the market, which is reflected in the sluggish trading activity and in the relatively large spreads between bid and offer prices, even for the most liquid shares, hampers attractiveness for short-term investors and traders.

Over the course of 2024, the Minister of Finance put together a strategy for the Estonian capital markets. In this respect, in September 2024, for the first time, the state issued bonds aimed at Estonian retail investors. The offer was oversubscribed more than four times. The bond has been listed on Nasdaq Tallinn where it can be traded on the secondary market. Moreover, the listing of state-owned companies was discussed.

Estonia's monetary financial sector is very small compared with the EU average and concentration is high. At the end of Q3-2024, banks' total assets were equivalent to 108.7% of GDP, significantly below the EU average of 248.1%. The banking sector is highly concentrated, and borrowing costs are among the highest in the EU in almost all lending segments. The top five monetary financial institutions represent more than 90% the sector, vs. an EU average of 54%. Foreign presence is high and accounts for over half of

total assets. Notably, Swedbank ([81]) and SEB Pank, which are the second and third largest banks in Estonia, are Swedish owned. While in 2016 the share of domestic banks was still only 6.6%, this share had amounted to almost half of the sector by end 2023, which is largely due to the establishment of the Luminor head office in Estonia in 2019, now the largest bank in terms of assets, and currently majority owned by US investment firm Blackstone. Luminor has branches in Latvia and Lithuania and has sizeable loan portfolios in these countries. At the end of 2023, AS Luminor was the biggest entity in terms of total assets (31%), followed by Swedbank AS (27%), AS SEB Pank (16%) and then AS LHV Pank (12%). The financial groups that own the biggest banks in Estonia often also own the insurance companies, fund managers and lease companies with the largest market share through the banks. Due to its integration with the Nordic banking systems, the financial sector of Estonia depends partly on developments in parent banks and their strategic decisions.

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



Source: ECB, EIOPA, AMECO.

The Estonian insurance sector is very small. The total value of assets of the insurance sector in EU countries is equivalent to 54.8% of GDP on average. By contrast, the figure for insurers registered in Estonia was only 6.6% at the end of Q3-2024. The small size of insurance-sector assets in the country can be explained by the underdevelopment of life insurance. Non-life insurance has the largest share of the total insurance market (86% at the end of Q1-2023). A major role in the Estonian insurance sector is played by mandatory insurance products that are compulsory either by law or as a requirement of a lender financing the purchase of an asset. This structure is very different from that found in most EU countries, where life insurance is often used as a long-term savings product (e.g. to build up pension pots). About half of all insurers operating in the Estonian market are branches of foreign insurance companies; several Estonian insurers also operate in the Latvian and Lithuanian markets.

Assets held by Estonian pension funds have been decreasing following a policy change in 2021 that turned the second pillar pension into a voluntary savings scheme. The total value of pension funds was equivalent to 12% of GDP at the end of 2022, down from 19% in 2020. Since the start of 2021, pension investors can exit the second pension pillar before reaching retirement age, which 20% of Estonian pension savers did over 2021. More money was withdrawn in subsequent waves of exits. In 2022, the value of pension fund assets declined mainly because of the drop in securities prices ([82]). According to Eesti Pank, Estonia's three-pillar pension system saw assets reach 22% of GDP again in Q3-2024, driven by significant growth in third-pillar funds and strong second-pillar returns.

([81]) In October 2021, the ownership of the subsidiary banks in Estonia, Latvia and Lithuania was placed in the holding company Swedbank Baltics AS which is wholly owned by Swedbank AB, and which is under the supervision of the European Central Bank.

([82]) Eesti Pank, 2023, The Structure of the Estonian Financial Sector.

Resilience of the banking sector

Financial soundness indicators suggest that Estonian banks have remained strong, despite facing a challenging macroeconomic environment. Estonia's banking sector has coped relatively well with the multiple shocks in recent years, from the pandemic crisis to Russia's aggression against Ukraine and the energy crisis. Despite remaining high and still above the EU average of 20.1%, capital adequacy of Estonian banks has been steadily declining over time, from 30% in 2017 to 21.2% in Q3-2024 (see Table A5.1). This ratio comes with heterogeneity across banks: the two subsidiaries of Swedish banks rely on internal ratings-based models for certain segments of their loan portfolios, which traditionally result in lower risk-weights and higher capital ratios, even though in the last two years these ratios have declined. The Common Equity Tier 1 (CET1) ratio has exhibited a notable downward trajectory, falling from 30% in 2017 to 19.9% in Q3-2024, however still above the EU average of 16.6%. The decline reflects reforms to corporate taxation, which have incentivized banks to prioritize dividend payouts over profit retention, but also growing bank leverage and the extension of banks' loan portfolios. Differences across institutions are also significant; especially small banks exhibit lower buffers.

Eesti Pank and Finantsinspektsioon have both set additional requirements for the own funds held by the banks in order to ensure their resilience. In response to rapid credit growth over 2022, the countercyclical capital buffer (CCyB) was tightened to 1% from December 2022 and was further raised to 1.5% effective since December 2023 on top of the base requirement for own funds and the capital conservation buffer. The four largest banks have to hold an additional 2% in own funds for the systemically important institution buffer. The internal ratings-based banks have to meet the own funds requirement by applying a minimum risk weight of at least 15% on average to the mortgage-backed claims of Estonian residents.

The profitability of Estonian banks is high. Over 2023 Estonian banks achieved a record-high return on equity ratio of 18.5%, which fell back to 17.7% in Q3-2024, still significantly exceeding the EU average (10%). The profitability of the banks was mainly bolstered because current accounts are a large share of total deposits and are generally not remunerated in Estonia, which contributes to quite large spreads between interest income and interest expenses. The dominance of floating-rate loans, together with the still resilient quality of the loan portfolio and a relatively high cost-efficiency have also contributed to a significant increase in banks' profitability.

Banks' balance sheets show improved asset quality. With an aggregate non-performing loan (NPL) ratio of 1.2% in Q3-2024, which is below the EU average of 1.9%, credit quality has improved significantly over the past years. The level of problem loans remains good taking into account the extent of the decline in the economy. Although problem loans have been growing slowly since the start of 2023 as a share of the bank portfolios, that share remains small compared to what was seen in earlier episodes or in other EA countries. The biggest deterioration in quality has been in consumer loans, mostly at smaller banks. The quality of the corporate loan portfolio is generally good. Companies in real estate and construction account for a large part of the loan portfolio of the Estonian banking sector, but the share of those loans that are overdue has remained small throughout the recession. With 31.7% in Q3-2024, banks' aggregate coverage ratio of NPLs by the provisions made in Estonia remains short of the EU average by almost 10 percentage points. Yet, the statistics from the European Central Bank show that the ratio of restructured, or forborne, loans to NPLs in Estonia has been one of the highest in the EA for the past couple of years, which may indicate that the banks operating in Estonia

handle payment difficulties more proactively and before the loans become non-performing.

Funding risk remains low in general and liquidity ratios remain at a good level. The banks get a lot of their funding from local depositors, but those deposits are still not enough to finance all of the lending activity of the banks: the loan-to-deposit ratio was 101% in Q3-2024, comparable to the EU average of 106.7%. Alternatives to local deposits are intragroup loans from foreign parent banks, deposits from other countries including those taken through deposit platforms, and covered bonds. Over 2024, the liquidity coverage ratio increased to 203.6% in Q3-2024, as demand deposits were partially replaced by term deposits. As a result, banks' funding costs also rised, especially for smaller banks, as these have lower shares of demand deposits.

Resilience of the non-bank financial intermediaries

Estonian insurers have a relatively strong exposure towards the banking sector. At the end of 2020 on average approximately 42% of insurers' total investment was concentrated towards banks, according to EIOPA. Moreover, the bank exposure was predominantly situated with cross-border banks (65%) and in bank bonds (mainly covered bonds). Estonian insurers hold more liquid assets, above the EA median (57%). Solvency is below the EU average, but significantly above regulatory limits.

Sources of business funding and the role of banks

Firms in Estonia rely less than the EU average on funding from capital markets. More specifically, the market-funding ratio ([83]) as of end-2023 was only 15.8%, compared with an EU average of 49.6%. At the end of 2023, bank finance through loans accounted for 25% of all funding sources for Estonian non-financial corporations (NFCs), whereas listed shares and bonds accounted for only 2.3% of funding. The equivalent figures for the EU average are 27.2% for bank funding and 23.8% for listed shares and bonds. The small share of listed shares and bonds in the capital structure of firms is compensated for by the high share of unlisted shares in Estonia, which is 60% vs an EU average of 24.5%. At 214%, NFC funding as a share of Estonian GDP more or less corresponds to the EU average of 230.3% of GDP (see Graph A.1).

Estonia has a large share of investment funded internally. The primary and most significant source of funds for companies is equity, or the internal funds from within that company. These internal funds are primarily current cash flows and financial buffers that were built up by the country's firms in previous years. This favouring of internal funding is partly because of the Estonian income tax system, under which profits are not taxed until they are paid out as dividends. It is also partly because Estonian companies are generally small or medium-sized, and external funding is more expensive for smaller companies than it is for large companies. According to the 2024 EIB Investment Survey ([84]), 74% of Estonian firms' investment needs are covered by internal funding, compared with an EU average of 66%. Moreover, the country has a high share of finance-constrained firms (16% vs an EU average of 6.9%).

At the same time, 23% of all Estonian firms surveyed in 2024 believed that their investment activities over the last three

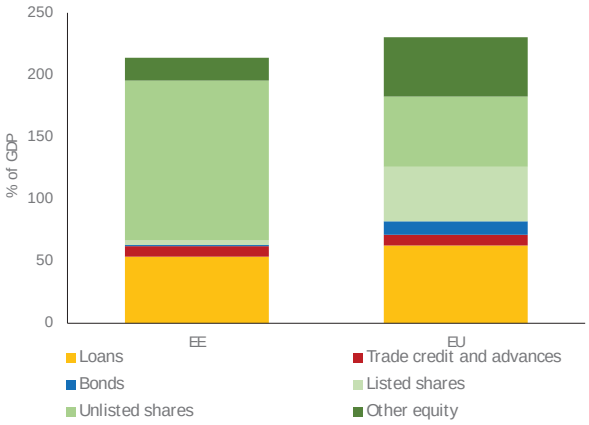
([83]) i.e. the volume of corporate bonds and listed shares of NFCs relative to the volume of those two and bank loans to NFCs.

([84]) EIB Investment Survey 2024 - Estonia.

years were not sufficient. This is – together with the other two Baltic countries (Lithuania and Latvia) – one of the highest levels of self-reported underinvestment among the EU (EU average of 14%), suggesting that there is a financing gap in Estonia relative to investment demand, especially for SMEs. Although firms have no major problem accessing loans in Estonia, there has been a sharp increase in the share of firms in the country that are dissatisfied with the cost of finance (up from 5% in 2022 to 26% now). The level of dissatisfaction among Estonian firms is higher than in the EU overall (14%). The widespread use of loan contracts with floating interest rates means that the recent rise in interest rates has almost entirely passed through into the loan costs of Estonian companies, which has put Estonian companies in a more difficult position than their foreign competitors because the interest rates on loans are higher in Estonia.

Although the rate of growth in borrowing by Estonian companies and households slowed down in 2023, it is still one of the highest in the euro area. Companies' interest in increasing their investments or taking loans has been hampered by falling profits and a large part of production capacity in the economy remaining underutilised amidst unusually high interest rates. Over the course of 2024, credit growth recovered, as lending standards eased on the back of expectations of monetary policy easing. However, credit growth generally remains modest, with the exception of the real estate and construction sectors, which have again become the sectors with the fastest growth in borrowing. For NFCs, annual credit growth stabilised over 2024 reaching 6.5% in November 2024. At the end of November 2024, bank credit accounted for 26.6% of the total corporate debt portfolio of Estonian firms. Households have continued to borrow quite actively despite the recession, as unemployment has remained moderate while nominal wages have grown. For households, the annual rate of credit growth for adjusted loans gradually edged up from 6.3% in mid-2023 to 7.5% in November 2024. The yearly growth in the stock of housing loans has accelerated gradually and reached 7% by the end of September 2024. As debt liabilities increased at a similar rate to disposable income, the debt burden of households did not change over 2024.

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



The sum of NFC liabilities only reflects the total for the NFC liabilities considered. Reference period 2023.
Source: Eurostat and FISMA E2 calculations.

Capital markets and the participation of retail investors

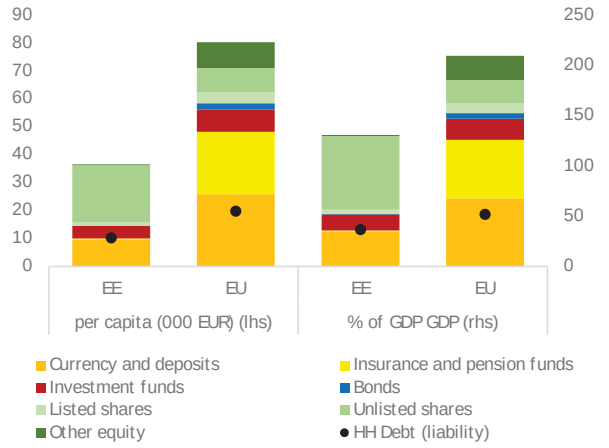
The market capitalisation of Estonia's stock market expressed as a percentage of GDP is among the lowest in the EU. The equity market is extremely small in terms of capitalisation (equivalent to 12.2% of GDP vs an EU average of 69.3% as of 2024-Q3) and volumes traded. The capital markets in Estonia have contracted in recent years, partly due to the country's 2021 pension reforms, which enabled savers to withdraw funds from pillar 2 pension schemes. In addition, the start of Russia's war of aggression on Ukraine has led to a decline in investor sentiment, resulting in reduced trading and holding by Estonian investors of international securities. The small size and low liquidity of the equity markets has prompted major index providers to continue to classify Estonia, and also Latvia and Lithuania, as 'frontier' markets despite their sound macro-economic and institutional frameworks.

The funding of NFCs via the capital markets is very low in comparison with other EU countries. The market-funding ratio stood at 15.8% at the end of 2023, vs 49.6% for the EU on average ([85]). Local businesses tend to rely on bank intermediation and own funds rather than attracting investments through stock and bond issues or from alternative sources. As there is a relatively large share of foreign-owned companies in Estonia, some companies can borrow from their parent companies. The small size of the local market also leads large companies to borrow abroad more often and to issue bonds in foreign markets. Furthermore, the level of borrowing by the Estonian general government is low, and so few sovereign bonds are issued. This all results in: (i) few local investment opportunities; (ii) low interest from institutional and retail investors; and thus (iii) few local opportunities to raise share capital. The lack of market activity by institutional investors further weakens demand for corporate stocks and bonds.

In addition, most companies (over 95%) in Estonia are SMEs, which find it difficult to gain access to the capital markets and their opportunities. Although Nasdaq's Baltic First North Market offers a trading facility with reduced reporting requirements, targeting primarily smaller cap issuances, SMEs and start-ups seeking to list on Baltic First North face a significant challenge due to the mandatory audit of their financial statements every six months. Moreover, Estonia cannot take advantage of this SME market because there are no established SME growth markets in Estonia, nor in the other Baltic states.

([85]) CMU Dashboard indicators

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



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

Estonian households' financial assets have almost no exposure to bonds, listed shares, pension funds, or insurance funds. The saving rate of Estonian households is relatively low and they hold relatively few financial assets. In particular, they hold very little in investment and pension products. Since the country's 2021 pension reforms, households' financial assets held in pension and insurance funds has fallen from the equivalent of 21% of GDP in 2020 to perhaps 1.4% of GDP in 2023 (vs. 58.3% in the EU on average in 2023), according to Eurostat data (Graph A5.5). Instead, households' financial assets held in investment funds has increased over the last couple of years to 16% of GDP in 2023, (still below the EU average of 21% of GDP in 2023). All in all, the share of households' total financial assets held in pension funds, insurance funds or directly in financial investment instruments was equivalent to barely 17% in 2023, substantially short of the EU average of 79%. Instead, the most investment instrument most preferred by Estonian households is private equity (unlisted shares), followed by bank deposits. The government introduced an investment account system in 2011, but this has achieved only moderate success. One reason for this is that certain popular investment vehicles, such as equity crowdfunding, have been excluded from the

benefits of this system, including the ability to defer income tax.

Recent policy initiatives aim to promote the degree of retail participation in Estonian financial markets. In September 2024, the Estonian state issued, for the first time, government bonds to retail investors. These government bonds offer small investors a fixed interest rate and the opportunity to trade those bonds on the Tallinn Stock Exchange. The offer was oversubscribed by more than four times. Encouraging the build-up of universal funded supplementary pension schemes would positively contribute to (i) the sustainability and adequacy of pension benefits; (ii) investment in equity; (iii) access to finance; (iv) growth; and (v) innovation.

The role of domestic institutional investors

Estonia's institutional investor base remains very small. Total assets under the management of domestically based pension funds, insurance corporations and investment funds at the end of 2022 were equivalent to 22.4% of Estonian GDP, one of the lowest levels in the EU (where the average is equivalent to more than 100% of GDP). Domestic institutional investors allocate only a very small portion of their portfolio to domestic financial assets.

Estonian insurers favour secure fixed-income investment instruments and have a relatively large exposure to the banking sector. The investment instruments most preferred by insurance companies are fixed-income securities (about 70%), mostly comprised of corporate bonds (e.g. of banks) and (foreign) government bonds. Estonian insurers hold another 15% in investment funds and equity. The European Insurance and Occupational Pensions Authority calculated that on average approximately 42% of Estonian insurers' total investment was concentrated in banks at the end of 2020. These investments were predominantly in the equity of cross-border banks (65%) and in bank bonds (mainly covered bonds). The large majority of the insurance sector's investments are made abroad.

Pension funds have contributed to the development of the Estonian capital markets, but their domestic investment remains low. Thanks to the Investment Funds Act of 2016, pension funds in the country were given more opportunities to invest in Estonia. However, only about 11% of pension-fund assets are now held in Estonian assets. One of the challenges of developing the Estonian capital markets would therefore be to incentivise the pension funds to invest more domestically by creating the right capital markets eco-system.

The participation of domestic institutional investors in providing funding for start-ups and venture-capital investors is increasing. The three Baltic states (Estonia, Latvia and Lithuania) and the European Investment Fund have created the Baltic Investment Funds, a joint 'fund of funds' investing in private equity and venture capital in the region. This has injected significant momentum into the Estonian private-equity market. This initiative has encouraged pension funds and other private investors to enter the market, investing in domestic private-equity funds.

The depth of venture and growth capital

Even though its venture-capital and private-equity markets are very young, Estonia is one of the leading private-equity/venture-capital ecosystems in the EU. According to the CMU Dashboard, Estonia leads Europe in annual venture-capital investments relative to GDP, with new venture-capital investments equivalent to 0.44% in 2022, and 0.15% in 2023 (vs. an EU average of 0.08% and 0.05%

respectively). Equally, the country leads in terms of annual private-equity investments relative to GDP (equivalent to 1.3% of GDP in 2022 vs and EU average of 0.6%). Finally, Estonia also dominates in terms of capital raised through IPOs, which was equivalent to 1.5% of the country's GDP in 2023, vs an EU average of 0.1%. In the past eight years, listed companies in Estonia have raised more than EUR 1.2 bn through public share offerings. Moreover, crowdfunding and peer-to-peer (P2P) lending platforms have grown rapidly to offer alternative debt-based funding. Nevertheless, gaps have been identified in both: (i) the later financing stages for companies, where capital requirements are higher; and (ii) the very early stages, where risk is too high for some investors. Nevertheless, early-stage entrepreneurial activity in Estonia is significantly higher than the EU average. The country also has a high number of unicorn companies, relative to its size (see annex on Innovation to business).

Estonia has high ambitions to become a major European hub for the finance sector and for those developing pioneering financial solutions. In this regard, Finantsinspektsioon, the country's financial supervisory authority has taken the initiative to create an innovation hub. In 2023, Finantsinspektsioon also launched a regulatory sandbox to help FinTech companies adapt their technology to local regulatory requirements. The government is also in the midst of creating a FinTech strategy, as the country does not have one yet, unlike Latvia and Lithuania. Furthermore, Estonia's high ambitions in the e-finance domain are underscored by new legislation introduced by the Ministry of Finance that will set operational and supervisory requirements for the FinTech sector. The bill includes provisions to cover crowdfunding platforms and platforms that facilitate investment in crypto assets. Moreover, the bill will require all virtual currency-service providers licensed by the FSA to apply for activity licences.

Financing the green transition

Sustainable finance in Estonia is still in the initial stages of development. The average issuance in the country over 2021-2023 of bonds with environmental, social, and governance objectives as a share of Estonia's total bond issuance was one of the lowest of all EU Member States ([86]). However, Estonia is leveraging EUR 100 mn from the NextGenerationEU recovery fund to bolster venture capital for green technology start-ups and scale-ups. After initially offering direct investment to early-stage companies, the SmartCap Green Fund set up with the EU money is now providing anchor investments in two specialist green-tech venture-capital funds and extending its direct investment focus to take in companies ready to scale up. The Green Fund was set up in 2022 by state-owned fund-management company SmartCap, whose main role is to act as a fund of funds, using public money to attract in private investment. Estonia also uses European Investment Bank finance and EU cohesion policy funds to move faster towards a carbon-neutral and more digital society.

Financial literacy

Financial literacy in Estonia is above the EU average. According to a 2023 Eurobarometer survey ([87]), Estonians exhibit a higher level of financial literacy than the EU average. Specifically, 23% of Estonians have a high level of financial literacy, 61% a medium level, and 16% a low level, outperforming the EU averages of 18% (high), 64% (medium), and 18% (low). Financial literacy is crucial for promoting retail-investor participation in

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

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

Table A5.1: **Financial indicators**

		2017	2018	2019	2020	2021	2022	2023	2024-Q3	EU
Banking sector	Total assets of MFIs (% of GDP)	104.7	99.1	101.1	123.4	121.4	104.7	109.3	108.7	248.4
	Common Equity Tier 1 ratio	30.0	30.3	25.7	27.0	23.3	20.9	20.9	19.6	16.6
	Total capital adequacy ratio	30.6	31.0	26.3	27.8	24.3	22.0	22.2	21.2	20.1
	Overall NPL ratio (% of all loans)	1.9	1.3	1.6	1.6	1.1	0.8	1.1	1.2	1.9
	NPL (% loans to NFC-Non financial corporations)	3.2	2.2	2.5	1.9	1.4	1.2	1.0	1.3	3.5
	NPL (% loans to HH-Households)	1.6	1.3	1.7	1.6	0.9	0.6	1.0	1.1	2.2
	NPL-Non performing loans coverage ratio	25.4	25.0	34.4	30.9	30.6	32.9	34.1	31.7	42.1
	Return on equity[1]	9.2	9.8	8.3	7.4	9.5	10.9	18.5	17.7	10.0
	Loans to NFCs (% of GDP)	28.8	27.7	25.6	27.4	26.3	25.3	25.7	25.6	30.0
	Loans to HHs (% of GDP)	33.6	32.9	32.5	35.0	32.9	31.5	32.0	32.6	44.5
	NFC credit annual % growth	5.8	4.7	2.7	3.4	6.8	11.7	5.8	4.2	0.8
	HH credit annual % growth	7.1	6.6	6.4	5.1	7.9	11.1	6.4	7.0	0.7
Non-banks sector	Stock market capitalisation (% of GDP)	10.8	9.9	9.8	11.1	17.1	12.8	13.1	12.2	69.3
	Initial public offerings (% of GDP)	0.21	0.84	0.00	0.02	0.84	0.23	1.45	-	0.05
	Market funding ratio	23.1	24.5	24.1	22.3	22.5	20.5	15.8	-	49.6
	Private equity (% of GDP)	0.04	0.67	2.41	1.27	1.60	1.26	0.28	-	0.41
	Venture capital (% of GDP)	0.02	0.12	0.09	0.10	0.47	0.42	0.14	-	0.05
	Financial literacy (composite)	-	-	-	-	-	-	46.5	-	45.5
	Bonds (as % of HH financial assets)	0.2	0.3	0.3	0.3	0.3	0.3	0.4	-	2.7
	Listed shares (as % of HH financial assets)	1.5	1.4	1.6	2.0	3.4	2.8	3.2	-	4.8
	Investment funds (as % of HH financial assets)	1.4	1.2	1.3	1.4	11.9	10.4	12.3	-	10.0
	Insurance/pension funds (as % of HH financial assets)	14.5	14.3	15.4	15.4	1.5	1.1	1.1	-	27.8
	Total assets of all insurers (% of GDP)	7.3	7.2	7.0	7.3	7.2	5.9	6.3	6.6	54.8
	Pension funds assets (% of GDP)	-	-	16.7	19.0	-	-	-	-	23.4

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

[1] Annualised data.

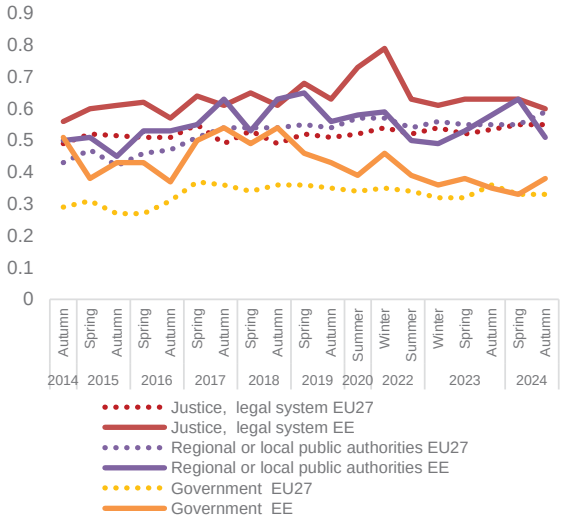
Credit growth and pension funds EU data refers to the EA average.

Source: ECB, ESTAT, EIOPA, DG FISMA CMU dashboard, AMECO.

capital markets but also for familiarising SMEs with alternatives to bank financing.

Estonia's institutional framework influences its competitiveness. While trust in the national government and justice is above the EU average, trust in regional and local authorities has decreased recently. Overall, Estonia has a well-established regulatory framework and a productive civil service. Estonia has made remarkable progress in digital public services, surpassing EU Digital Decade targets for both citizens and businesses ([88]) The country is perceived as a good place for doing business, with effective justice and relatively low administrative burden.

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 national government and justice is above the EU-27 average (Graph A6.1). Trust in regional and local authorities has decreased recently. When asked about aspects that can increase trust in Estonia's public administration, 53% of citizens pointed to more transparency about decisions and the use of public money (EU: 44%), 46% to less bureaucracy (EU: 52%) and 34% to more moral integrity in the public administration (EU: 23%) ([89]). The perceived quality of government has improved and stands above the EU average ([90]). In 2022 the government launched a pilot project for regional development agreements with wider territorial scope. These agreements bring together central, regional and local administrations and non-governmental organisations to agree on the design of sectoral policies and measures to encourage entrepreneurship and competitiveness.

Quality of legislation and regulatory simplification

Overall performance in developing and evaluating legislation is above the EU average. It has also remained broadly stable over 2021-2024. Performance in regulatory tools like ex ante impact assessments and stakeholder engagement is stronger than for ex post evaluation of legislation. It is also stronger for primary laws than for subordinate regulations. There is scope for strengthening oversight and quality controls of regulatory impact assessments and ex post evaluation of legislation for both primary and secondary legislation (Graph A6.2).

In 2023, the government prepared an open government roadmap ([91]) to improve public consultations which contained 30 recommendations for state institutions and local governments. It also drew up a roadmap on public engagement in EU affairs ([92]). One of the new requirements is that all ministries will

([88]) The Digital Decade Policy Programme sets out a pathway for the EU's digital transformation, including concrete commitments from Member States to jointly achieve objectives (e.g. competitiveness, resilience, sovereignty) and digital targets by 2030.

([89]) Understanding Europeans' views on reform needs - April 2023 - - Eurobarometer survey

([90]) Inforegio – European Quality of Government Index

([91]) Open government roadmap (2023).

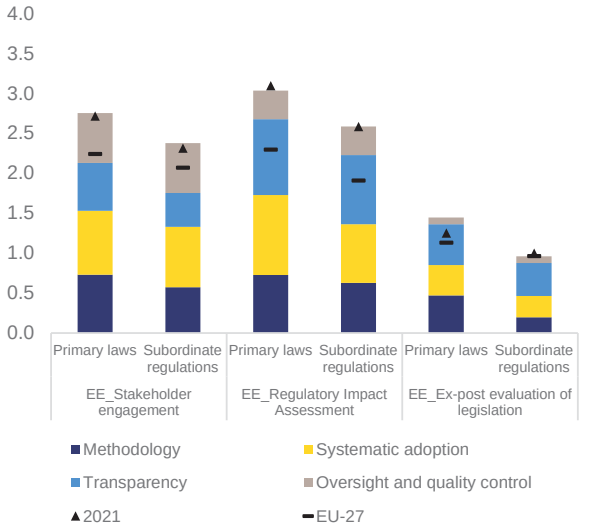
([92]) Public engagement roadmap in EU matters: sample documents.

prepare an annual public engagement plan and make this available to stakeholders.

Estonia has mechanisms for simplifying regulation and identifying administrative burdens. However, these typically apply to some (and not all) primary laws. Additional practices, such as conducting in depth reviews of specific regulatory areas and public stocktakes of legislation could further enhance such mechanisms (table A6.1). Reducing administrative burden is closely linked to advancing digital government in Estonia. Since 2020, the government has launched a set of measures to reduce reporting burden for companies by means of data-sharing between agencies. The first phase was aimed at sharing data from reporting on wages, salaries and labour costs. The next phase will focus on data relating to economic transactions, accommodation and the environment ([93]).

Estonia actively promotes innovation in policymaking ([94]). An innovation award funded by the 2021-2027 EU cohesion policy encourages projects that contribute to economic growth and business development in Estonia, as well as innovation procurement. One such example of innovation procurement is a public sector experimentation guide created for public sector entities ([95]). Moreover, Estonia has committed in the future to allocating 2% of the total public procurement volume and 5% of total procurement costs to innovation procurement ([96]).

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).

([93]) Data-based reporting | Statistikaamet

([94]) Public Sector Innovation Awards | Government Office

([95]) Innotiim esitleb avaliku sektori katsetamise juhendit | Riigikantselei

([96]) Riigihangetes hakatakse hindama innovatsiooni | Majandus- ja Kommunikatsiooniministeerium

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

	Ex ante impact assessment of legislation		Ex post evaluation of legislation	
When developing new legislation, regulators are required to …	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).

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

		Estonia			EU-27	Digital Decade target by 2030
		2022	2023	2024	2024	EU-27
Digitalisation of public services						
1	**Digital public services for citizens**	**92**	**94**	**96**	**79**	**100**
	Score (0 to 100)	2021	2022	2023	2023	2030
2	**Digital public services for businesses**	**98**	**99**	**99**	**85**	**100**
	Score (0 to 100)	2021	2022	2023	2023	2030
3	**Access to e-health records**	**na**	**89**	**98**	**79**	**100**
	Score (0 to 100)	2021	2022	2023	2023	2030

Source: State of the Digital Decade report 2024

The OECD product market regulation indicators show that Estonia's licensing system is slightly more burdensome than the EU-27 average and could be further aligned with best practices. For example, although the government keeps an up-to-date online inventory of all permits and licences required/issued to businesses by public bodies, there is no requirement for the government to regularly assess whether such licences and permits are still required or should be withdrawn (see also Annex 4). Moreover, the B-READY indicators ([97]) show considerable potential for cutting the time it takes to obtain building and environmental permits. Unlike 19 other EU Member States, Estonia does not have a dedicated institution for promoting pro-productivity policies.

([97]) World Bank. 2024. Business Ready 2024. Washington, DC: World Bank. doi:10.1596/978-1-4648-2021-2.

Social Dialogue

The involvement of social partners in reforms and policies in Estonia has improved in recent years but remains limited. The main challenges are related to the relatively low collective bargaining coverage rate (only 19% in 2021) as well as the extremely low density of trade union and employers' organisations (respectively 6% and 25% in 2019([98])). The last measure concerning the social dialogue was implemented in November 2021, when changes in the Collective Agreements Act entered into force, establishing criteria to extend collective agreements. Prior to the legislative change, there were altogether three sectoral (extended) collective agreements in two sectors: one in health care and two in transport (one covering freight transport, the other covering passenger transport). Strengthening social dialogue remains important in order to increase collective bargaining coverage. Technical Assistance allocates nearly EUR 1 million to trade union and employers' main organisations. In addition, ESF+ currently supports social dialogue with around EUR 400 000.([99])

Digital public services

Estonia is among the EU's top performers in terms of digital public services (Table A4.2) It is using AI to improve quality of digital public services ([100]). Estonia has excelled also in terms of access to e-health records. It achieved a score of 97.5 in 2023, compared to an EU average of 79.1. Citizens can access all relevant health data online through the national e-health portal which integrates records from public and private providers. However, accessibility and interoperability are hindered slightly by the absence of an e-health mobile application.

Estonia is advancing towards seamless, automated exchange of authentic documents and data across the EU. It has developed the necessary infrastructure and is beginning the process of connecting up the first authorities to the Once-Only Technical System ([101]).

The proportion of e-government users reached 94.7% in 2023 (EU 75%), while the proportion of Estonians using eID reached more than double the EU average (EE 89.4%; EU 41.1%) ([102]). However, Estonia has not yet set up and notified eID schemes for legal persons under the eIDAS Regulation([103]). This means that Estonian businesses cannot authenticate themselves to access public services provided by other Member States, including those enabled by the Once-Only Technical System([104]), part of the EU Single Digital Gateway.

([98]) OECD/AIAS database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS)

([99]) For an analysis of the involvement of Estonia'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.

([100]) https://www.ria.ee/en/state-information-system/machine-learning-and-language-technology-solutions/burokratt#implementation

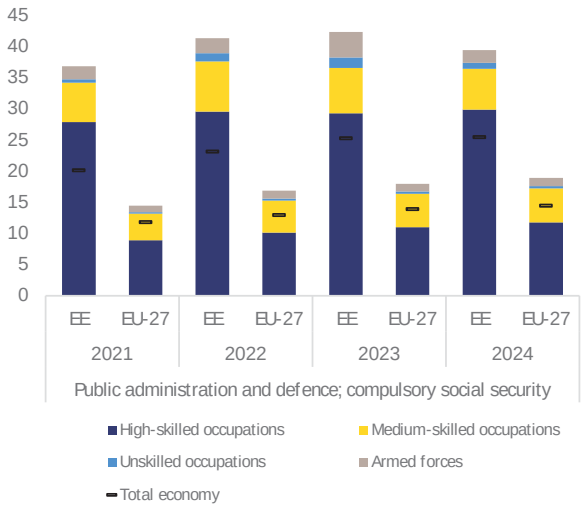
([101]) European Commission, Once-Only Technical System Acceleratormeter.

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

([103]) European Commission, eIDAS Dashboard.

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

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

A high level of skills among Estonian civil servants has enabled a productive civil service. Estonia has a very high proportion of civil servants with higher education qualifications (EE 72.2%; EU 54%([105])). The proportion of civil servants pursuing continuous training is also far above the EU average (Graph A6.3). Although the average age of civil servants in Estonia is among the lowest in the EU, the country has identified several agencies where ageing may become a concern. Workforce ageing is occurring faster at local government level. In 2023, staff turnover decreased to 14.2%, compared to 16.4% in 2022. A major reason why civil servants are leaving their jobs is an increase in the public administration's workload without a corresponding increase in resources. Civil service restructuring is another reason ([106]). In 2023, legal amendments reduced salary growth for senior civil servants up until 1 April 2028.

Integrity

A lower percentage of companies than the EU average consider corruption to be a problem. In Estonia, only 36% of companies consider that corruption is widespread (EU average 64%), while only 10% consider that corruption is a problem when doing business (EU average 36%) ([107]). Moreover, 52% of companies believe that people and businesses caught for bribing a senior official are appropriately punished (EU average 31%) ([108]). Some high-level corruption cases are ongoing, including proceedings against a former minister. However, there are no ongoing foreign bribery cases. ([109]) Furthermore, only 7% of companies (EU average 27%) think that corruption has prevented them from winning a public tender or a public procurement contract in practice in the last three years ([110]). Healthcare, the local government and political party financing as well as obtaining residence and work permits are considered to be at high-risk of corruption ([111]).

Estonia has implemented a public register for lobbyists and discussions were initiated on introducing lobbying rules in Parliament. As with most Member States, Estonia has implemented rules on government. Moreover, specific guidelines on 'revolving doors' are currently being developed by the Public Ethical Council and are expected in 2025. In addition,

([105]) Eurostat. Employees by educational attainment level, sex, age.

([106]) Civil Service Yearbook 2023, MoF (2024). Available at: https://www.fin.ee/sites/default/files/documents/2024-05/ATAR%202023.pdf (Accessed on 05/01/2025).

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

([108]) Ibid.

([109]) See the 2024 country-specific chapter for Estonia of the Rule of Law Report, p. 10.

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

([111]) See the 2024 country-specific chapter for Estonia of the Rule of Law Report, p. 14.

political groups started discussions on possible guidelines on lobbying also for Parliament, which could foster transparency in corporate lobbying. ([112])

Justice

The justice system is performing efficiently. The length of court proceedings in first instance civil and commercial cases has increased (from 158 days in 2022 to 196 days in 2023). The length of court proceedings in first instance administrative cases has remained stable year-on-year (166 days in 2022, 167 days in 2023). The number of pending cases is among the lowest in the EU. The quality of the justice system is considered to be good overall. Estonia is among the best performing Member States in terms of digitalisation of justice. As regards judicial independence, no systemic deficiencies have been reported. ([113])

([112]) Ibid., p. 12.

([113]) For more detailed analysis see the upcoming 2025 EU Justice Scoreboard and the 2024 Rule of Law Report.

Estonia faces significant challenges regarding its clean industry transition and climate mitigation, specifically in transitioning away from oil shale and increasing its net zero technology manufacturing capacity (with commitments made to cease electricity production from oil shale by 2035 and to phase out oil shale in energy production by 2040), as relevant policy frameworks and incentive schemes remain limited. The country relies heavily on imports for critical raw materials, posing a geopolitical risk. Its greenhouse gas emissions reduction efforts in transport lag behind targets. In the sustainable industry domain, Estonia's circular economy transition is hindered by low recycling rates and underinvestment, requiring substantial policy and financial commitments to improve resource productivity and waste management. This annex reviews the areas in need of urgent attention in the areas of clean industry transition and climate mitigation in Estonia, looking at different dimensions.

Strategic autonomy and technology for the green transition

Estonia's manufacturing capacity across all net zero technologies remains modest, but there is potential for innovative technologies ([114]). Estonia hosts innovative wind turbine companies such as Eleon, and focuses on research and innovation within the industry. It plans to establish a large, cutting-edge manufacturing base and innovation platform for new-generation offshore wind technology solutions. Estonia is also home to advanced solutions in battery and storage technologies and electrolysers. In hydrogen, Estonia has an active industrial community, and Estonian companies are involved in two Important Projects of Common European Interest (IPCEIs) on the hydrogen value chain ([115]).

Currently, Estonia has no policy framework aiming at scaling up its net zero technology manufacturing capacity. A few relevant incentive schemes are in place, targeting batteries and storage technologies. Focusing on small to medium-sized enterprises, Estonia provides grants for the development of green technologies, including net zero technologies, as part of its recovery and resilience plan. In addition, the Estonian clean tech association, representing over 130 clean tech companies, is working together with the Ministry of Climate on a roadmap for the clean technology sector ([116]).

One of the main challenges to Estonia's clean transition is the continued use of oil shale, a particularly resource-intensive fossil fuel. In terms of resource productivity, measured as gross domestic product (GDP) over domestic material consumption (DMC), Estonia was among the worst EU performers in 2023 ([117]). In domestic extraction used, which is a significant component within the domestic material consumption, fossil fuels represent a large share for Estonia (almost 30%). Despite a decrease in 2023, the domestic extraction of fossil fuels remains above the 2020 level at 8.1 tonnes per capita (7.4 tonnes in 2020). ([118]). The country is however making progress in reducing the production and use of oil shale ([119]). The transition away from oil shale means that jobs and skills needs are shifting too; increasing green skills through reskilling and

([114]) European Commission: Directorate-General for Energy, The net-zero manufacturing industry landscape across the Member 2025, https://data.europa.eu/doi/10.2833/2181110.

([115]) European Commission

([116]) The Estonian Cleantech Association, 2024

([117]) Eurostat

([118]) Statistics Estonia

([119]) Statistics Estonia, 2024

upskilling is particularly important for Estonia (see Annex 12 on Education and Skills).

Transforming the car industry

Faster transition to electric vehicles would advance decarbonisation in Estonia. While Estonia does not have a domestic car manufacturing industry, it is among the five countries with the highest motorisation rate in the EU, with 630 cars per thousand inhabitants in 2023. In terms of car age, Estonia has one of the oldest car fleets in Europe, with 32.3% of cars being older than 20 years ([120]). For new cars purchased in 2023, Estonia was among the countries with the highest share of petrol-powered cars (75.5%). Only 6.3% of newly purchased vehicles in 2023 in Estonia were fully electric, which is slightly below both Baltic peers Latvia and Lithuania and well below the EU average of 14.5% ([121]).

Critical raw materials

Estonia mines oil shale and peat but relies on imports for critical raw materials. The country ranks 136th out of 183 countries in the Mining Contribution Index ([122]). However, Estonia is home to one of Europe's largest phosphorite deposits ([123]). A recent report by the Geological Survey of Estonia showcases north Estonia's potential for critical raw materials and recommends further studies ([124]). In terms of import dependencies for critical raw materials, Estonia import concentration is around the EU average of 0.22, which indicates a moderate degree of import dependency. The main critical raw materials imported to Estonia from non-EU countries in 2023 were titanium (Russia, Saudi-Arabia) and rare earth elements (Russia) ([125]). This indicates a particularly high degree of geopolitical risk.

Aside from domestic primary production, recycling and increased use of secondary materials can help reduce dependency on imports. Estonia performs well in the circular use of materials. In recent years it has been among the top five EU performers, with a circular material use rate of 21.4% in 2022 compared to the EU average of 11.5%([126]).

Estonia is taking a leading role in rare earth metal separation. Two ongoing studies of the University of Tartu supported by the Just Transition Fund focus on the extraction of rare earth metals from raw materials (e.g. natural ores) in an environmentally friendly manner ([127]). In addition, Estonia is in a position to become an important player in magnet manufacturing. A plant for the production of permanent rare earth magnets, used for example in the manufacture of electric vehicles, is expected to start operations in 2025 ([128]).

Climate mitigation

Industry decarbonisation

Manufacturing production in Estonia has a low greenhouse gas emissions intensity, and only accounts for a minor share of total emissions. Around 8% of Estonia's total greenhouse gas emissions come from industry, among the lowest share in the EU ([129]). With

([120]) Eurostat

([121]) European Environment Agency

([122]) Mining Contribution Index (MCI) 6th edition

([123]) The Geological Survey of Estonia, 2023; See also Annex 8.

([124]) The Geological Survey of Estonia, 2025

([125]) JRC RMIS Country Profile Estonia

([126]) Eurostat

([127]) Invest in Estonia, 2024

([128]) Invest in Estonia, 2023

([129]) 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

120 g CO2eq per euro of gross value added (GVA), the emissions intensity of manufacturing in Estonia only amounts to 44% of the EU average (270 g) and is the fourth lowest in the EU. Between 2017 and 2022, the emissions intensity of Estonia's industry declined by 62%, significantly more than in the EU overall where it declined by 20%. Emissions related to industry processes and product use account for a relatively large share of emissions from manufacturing, 51%. In the EU overall, this is at 43%, with the rest related to energy use.

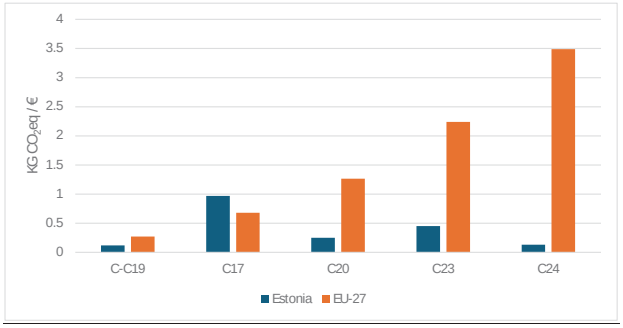
The recent decline of the greenhouse gas emissions intensity of Estonia's manufacturing in both categories is due to cleaner energy sources and energy efficiency improvements. Between 2017 and 2022, both the energy- and non-energy-related emissions intensity of manufacturing declined by around 60%, among the largest declines in the EU ([130]). In the same period, the share of electricity and renewables in final energy consumption of the manufacturing sector increased by 9 percentage points, to 61%, the fifth highest in the EU; the energy intensity of manufacturing in Estonia declined by 28%, from 1.4 GWh to 1.0 GWh per euro of GVA. Estonian energy-intensive industries have been particularly affected by high energy prices, and in 2024 energy costs were reported as an obstacle to investment by 73% of Estonian companies ([131]).

Framework (CRF) are from the European Environment Agency (EEA), republished by Eurostat.

([130]) 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 CRF1.A.2 – fuel combustion in manufacturing industries and construction and CRF2 – industrial processes and product use. The CRF1.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.

([131]) See the EIB Investment Survey 2024 Country Overview: Estonia. For a detailed analysis of energy prices, see Annex 8 on the affordable energy transition.

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



Source: Eurostat.

Estonia's energy-intensive industries ([132]) are not large greenhouse gas emitters. They account for 8% of Estonia's manufacturing GVA (2022). Except for paper and paper products sector, which emits 1 kg of greenhouse gases per euro of GVA, Estonia's energy-intensive sectors have very low emission intensities of production, between 0.1 and 0.5 kg CO2eq/€, well below EU levels as a whole.

Estonia has started putting in place policies to support the decarbonisation of the industry. It has adopted policies to deploy renewables such as offshore wind and measures to improve energy efficiency and support the hydrogen economy as part of its long-term development strategy 'Estonia 2035'.

Reduction of emissions in the effort sharing sectors

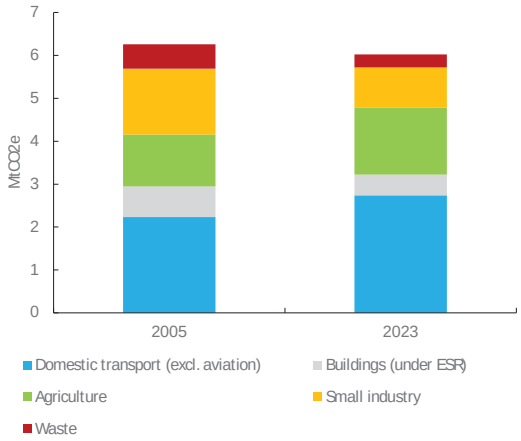
To attain its 2030 target for the effort sharing sectors, Estonia needs to swiftly specify and implement further climate

([132]) Notably, the manufacture of paper and paper products (NACE division C17), of chemicals and chemical products (C20), "other" non-metallic mineral products (C23; this division includes manufacturing activities related to a single substance of mineral origin, such as glass, ceramic products, tiles, and cement and plaster), and basic metals (C24). To date, these industries are energy-intensive – i.e. consuming much energy both on site and/or in the form of purchased electricity – and greenhouse gas emissions intensive, in various combinations.

mitigation policies ([133]). GHG emissions from Estonia's effort sharing sectors in 2023 are expected to have been 2.8% below those of 2005. By 2030, current policies are projected to reduce them by 13.5% relative to 2005 levels; additional policies currently considered by Estonia are projected to achieve reductions of a further 3.9 percentage points. This results in a sizeable shortfall against Estonia's effort sharing target of 24%, of 6.6 percentage points ([134]). Swift and steady adoption and implementation of further climate mitigation measures will be critical. While Estonia plans to use domestic flexibilities available under the Effort Sharing Regulation, this would not be sufficient to close the gap.

Swift action on decarbonising transport appears particularly exigent in Estonia. Between 2005 and 2023, greenhouse gas emissions from road transport increased by 23% in Estonia, while they decreased by 5% in the EU overall. Speeding up climate mitigation in these sectors would help protect households, businesses and transport users in Estonia from the impact of the forthcoming carbon price.

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



Source: European Environment Agency.

Sustainable industry

Circular economy transition

Despite some positive trends, Estonia still lags behind on the circular transition. Estonia's circular material use rate has been increasing since 2014 (it reached 21.4% in 2022, with a negative change in 2023 to 18.1%) and is still above the EU average of 11.8%. Nevertheless, Estonia remains one of the worst EU performers for material usage and resource productivity. In 2023, Estonia generated EUR 0.63 per kg of material against the EU average of EUR 2.23 ([135]). The material footprint of 29.9 tonnes per capita in 2023 is the fourth highest value in the EU and more than double the EU average of 14 tonnes per capita, indicating an over-consumption of raw materials.

Estonia, despite low municipal waste generation per capita, struggles with recycling and composting due to insufficient systems and overcapacity in waste

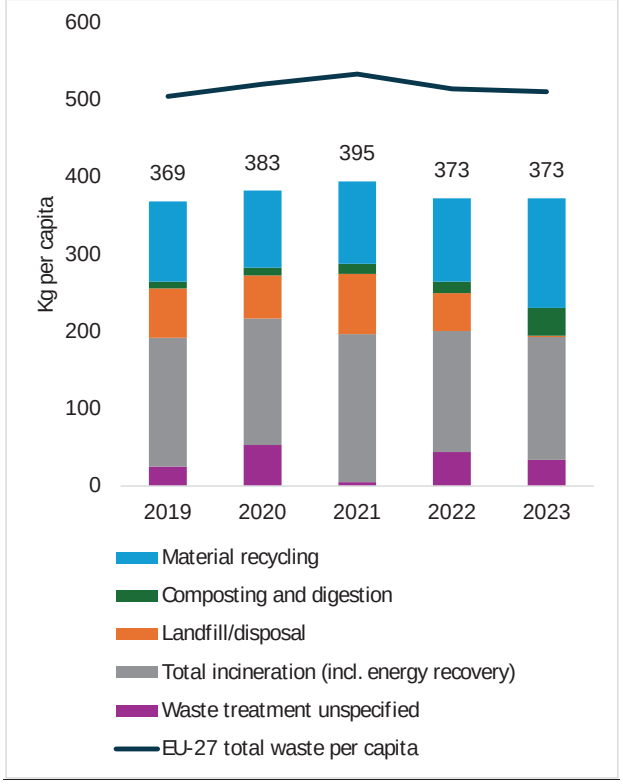
([133]) The national greenhouse gas emission reduction target is set out in Regulation (EU) 2023/857 (the Effort Sharing Regulation), to align the action in the sectors concerned with the objective of reaching the EU-level economy-wide target of greenhouse gas reductions of at least 55% relative to 1990 levels. The target applies jointly to the sectors outside the current EU emissions trading system, notably buildings (heating and cooling), road transport, agriculture, waste, and small industry (known as the effort sharing sectors).

([134]) The emissions from effort sharing sectors 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 Estonia's final updated national energy and climate plan.

([135]) Resource productivity measures the total amount of materials directly used by an economy in relation to GDP. Improving resource productivity can help to minimise negative impacts on the environment and reduce dependency on volatile raw material markets.

treatment facilities. Although Estonia is one of the Member States with the lowest municipal waste generation per capita, its 33% rate of preparing for reuse and recycling in 2022 put it significantly below the estimated EU average of 49% in the same year (see Graph A7.3). In addition, concerns have been raised about Estonia's lack of a unified waste data management system at the local level and about the quality of the data provided. Estonia started diverting municipal waste from landfilling by putting in operation a mechanical biological treatment plant. Finally, the share of composting and digestion is rather low, at 5% in 2022, due to an insufficient separate collection system and uneven capacity for treating biowaste across regions.

Graph A7.3: **Municipal waste treatment**



Source: Eurostat

There is scope for Estonia to implement additional policies to increase circularity. In 2023, Estonia adopted a white paper outlining the broad objectives and framework for the transition to a circular economy. In the same year, Estonia also published a circular economy action plan ([136]) under the recovery and resilience plan. The action plan groups together 10 key actions for the transition from across the policy landscape. Other circular economy-related activities in the plan include: support for the digitalisation of the economy: reskilling of workers; and the adoption of resource-efficient green technologies.

Current investment in the circular transition is insufficient. To meet its environmental objectives for the circular economy and waste, Estonia needs to increase circular economy investments by an estimated EUR 54 million per year, with an additional EUR 12 million needed for waste management action. Combined, this amounts to EUR 66 million per year, representing 0.18% of Estonia's GDP ([137]). To close the circular economy investment gap, EUR 14 million is needed for recent initiatives, such as eco-design for sustainable products, packaging and packaging waste, labelling and digital tools, critical raw materials recycling, and measures proposed under the amendment of the Waste Framework Directive. A further EUR 40 million in investment is needed to unlock Estonia's circular economy potential.

Zero pollution industry

Air quality in Estonia is generally good, with some exceptions. The latest available annual estimates (for 2022) by the European Environment Agency for Estonia attribute 100 deaths each year (or 880 years of life lost (YLL)) to fine particulate matter ($PM_{2.5}$); 10 deaths each year (or 180 YLL) to nitrogen dioxide (NO_2); and 30 deaths each year (or 1 300 YLL) to ozone.

Estonia's rate for pollutant releases to air is around the EU average. The emissions of several air pollutants have decreased

([136]) Ministry of Climate, 2023, *Eesti taaste ja vastupidavuskava raames sätestatud ringmajanduse tegevuskava*, Link.

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

significantly since 2005, while GDP growth has continued. According to the inventories submitted under Article 10(2) of the National Emission Reduction Commitments (NEC) Directive in 2024, Estonia has met its emission reduction commitments for 2020-2029 for air pollutants, NOx, non-methane volatile organic compounds (NMVOC), sulfur dioxide (SO_2), ammonia (NH_3) and $PM_{2.5}$. According to the latest projections submitted under Article 10(2) of the NEC Directive, Estonia is on track to meet its emission reduction commitments for 2030 onwards for NO_x, NMVOC, SO_2, NH_3 and $PM_{2.5}$. Estonia submitted its updated national air pollution control programme to the Commission on 30 March 2023. To meet its environmental objectives on pollution prevention and control (towards zero pollution), Estonia needs to provide an additional EUR 66 million per year (0.18% of GDP), mostly related to measures on clean air ([138]).

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

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

Strategic autonomy and technology for the green transition				Estonia						EU-27	
Net zero industry											
Operational manufacturing capacity 2023											
- Solar PV (c: cell, w: wafer, m: module), MW	50-100 (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), %		550	563	598	608	620	622	630	↗	539	561
New zero-emission vehicles, electricity motor, %		0.10	0.32	0.28	1.78	2.15	3.37	6.30	↗	1.03	8.96
Critical raw materials		**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**		**2018**	**2021**
Material import dependency, %			23.4	24.4	26.7	30.4	25.3	19.2	↘	24.2	22.6

Climate mitigation				Estonia				Trend	EU-27	
Industry decarbonisation	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**		**2017**	**2022**
GHG emissions intensity of manufacturing production, kg/€	0.35	0.33	0.33	0.18	0.11	0.12	0.14	↘	0.34	0.27
Share of energy-related emissions in industrial GHG emissions	44.7	52.4	50.5	49.1	41.2	48.8	50.8	↗	44.8	42.5
Energy-related GHG emissions intensity of manufacturing and construction, kg/€	122.6	122.1	120.3	79.4	54.3	49.7	-	↘	158.4	132.9
Share of electricity and renewables in final energy consumption in manufacturing, %	52.4	53.4	47.2	55.1	57.8	61.1	63.9	↗	43.3	44.2
Energy intensity of manufacturing, GWh/€	1.41	1.41	1.27	1.18	1.04	1.01	1.02	↘	1.29	1.09
Share of energy-intensive industries in manufacturing production						8.4				7.3
GHG emissions intensity of production in sector [...], kg/€										
- paper and paper products (NACE C-17)	0.70	0.62	0.72	0.94	0.95	0.97	1.21	-	0.73	0.68
- chemicals and chemical products (NACE C20)	0.17	0.17	0.17	0.13	0.14	0.25	0.33	-	1.25	1.26
- other non-metallic mineral products (NACE C23)	3.96	3.60	3.91	0.67	0.30	0.45	0.66	-	2.53	2.24
- basic metals (NACE C24)	0.22	0.20	0.17	0.18	0.11	0.13	0.08	-	2.79	3.49
Reduction of effort sharing emissions		**2018**	**2019**	**2020**	**2021**	**2022**	**2023**		**2018**	**2023**
GHG emission reductions relative to base year, %					-7.6	-10.6	-2.8			
- domestic road transport		18.3	16.8	9.9	13.2	18.1	22.7	↗	1.4	5.2
- buildings		-11.5	-19.1	-23.2	-26.7	-41.9	-32.0	↘	21.4	32.9
	2005				**2021**	**2022**	**2023**	**Target**	**WEM**	**WAM**
Effort sharing: GHG emissions, Mt; target, gap, %	6.2				5.7	5.5	6.0	-24.0	-10.5	-6.6

Sustainable industry				Estonia				Trend	EU-27	
Circular economy transition		**2018**	**2019**	**2020**	**2021**	**2022**	**2023**		**2018**	**2021**
Material footprint, tonnes per person		30.6	28.7	28.4	26.9	27.5	29.9	↗	14.7	15.0
Circular material use rate, %		13.8	15.3	16.4	20.0	21.4	18.1	↗	11.6	11.1
Resource productivity, €/kg		0.6	0.7	0.8	0.9	1.0	1.0	↗	2.1	2.3
Zero pollution industry										
Years of life lost due to PM2.5, per 100,000 inhabitants		191	67	49	84	96	-	↗	702	571
Air pollution damage cost intensity, per thousand € of GVA					28.1					27.5
Water pollution intensity, kg weighted by human factors per bn € GVA						0.2				0.9

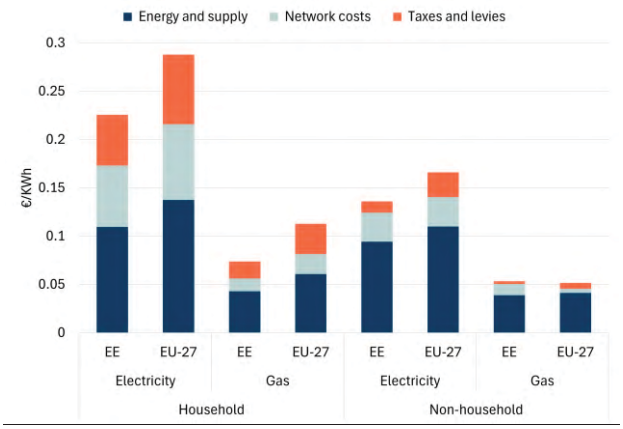
Source: **Net zero industry:** European Commission: The net-zero manufacturing industry landscape across Member States: final report, 2025. **Automotive industry transformation:** Eurostat. **Critical raw materials:** Eurostat. **Climate mitigation:** See footnotes in the "climate mitigation" section; 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 (draft) updates to the national energy and climate plans (NECPs) for 2030.

In 2024, Estonia has progressed towards a cleaner energy system, has massively developed its renewable electricity production, and has achieved the synchronisation project with the European continental grid. The most pressing challenges revolve around high energy prices, and security of supply linked with security of energy infrastructure.

Energy prices and costs

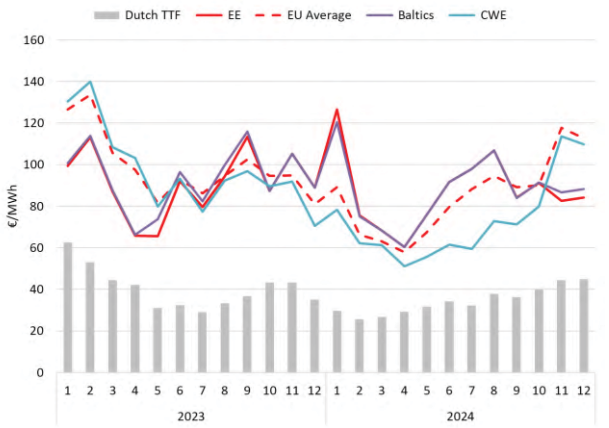
Graph A8.1: **Retail energy price components for household and non-household consumers, 2024**



(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 ID for electricity and I4 for gas. Taxes and levies are shown excluding VAT and recoverable charges, as these are typically recovered by businesses.
Source: Eurostat

Estonia retail energy prices in 2024 remained consistent with 2023 levels, still below the EU average for households' electricity (-22%) and gas (-34%) and industry electricity prices (-16%), but above the EU average in the case of industry gas prices (+7%). The share of the energy and supply component for both gas and electricity prices decreased between 2023 and 2024, following the same trend as the EU average. Retail prices components (energy and supply, network costs, taxes and levies) shares in Estonia follow EU-wide trends, with the exception a lower taxes and levies component for non-household consumers (8.6% compared to 15% for EU) and higher than average gas network costs (17.8% in Estonia compared to 7.1% in the EU) also for non-household consumers.

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) Baltics and CWE respectively provide average prices in the Baltic market (Estonia, Latvia, and Lithuania) and central-western European market (Belgium, France, Germany, Luxembourg, the Netherlands, and Austria).
Source: S&P Platts and ENTSO-E

Estonia's wholesale electricity prices were, at an average of 86.5 EUR/MWh in 2024 ([139]), on par with the other Baltic states but above the EU average (81 EUR/MWh). Prices in Estonia declined early in the year amid falling natural gas costs. They then surged during the spring/summer, diverging from Central Western European markets. Electricity consumption decreased in Estonia compared with 2023, but the 650 MW Estlink 2 connection, which usually brings cheaper electricity from Finland as well as limited non-fossil flexibility, was out of service and this

([139])Fraunhofer (ENTSO-E data).

created a supply-demand gap in the summer. This gap was mainly covered by higher imports from Latvia (increasing almost tenfold in summer 2024 ([140]) vs 2023) where not only hydropower but also costly natural gas-fired generation were ramped up (respectively +45% ([141]) and +13% in summer 2024 vs summer 2023), especially during peak demand hours. Consequently (and to a greater extent than in 2023), these conditions drove concentrated price spikes in evening hours (18h-21h), when solar output declined and demand remained high. However, average daytime hourly prices throughout the year were lower than in 2023, probably due to the uptake of solar output in Estonia (+28% in 2024) and in neighbouring markets ([142]). Prices in Estonia and the Baltic region then stabilised in the winter, supported by stronger wind generation than in 2023 ([143]) and Estlink 2 returning to operation in September, while Central Western European markets faced strong price spikes due to the Dunkelflaute ([144]).

Flexibility and electricity grids

Estonia is part of the Baltic capacity calculation region (CCR) ([145])**.** It is connected to Finland and Latvia and indirectly to Sweden via the Estlink interconnectors and the Baltic transmission network. In 2024, the regional electricity trade continued to be influenced by the Baltic region's dependence on imports from the Nordic countries (especially Finland). Congestion in the Estlink interconnectors is hindering full price convergence with Finland. Similarly, cross-border capacity with Latvia is sometimes limited and this affects market integration with the rest of the Baltic region. Member States should ensure that a minimum of 70% of technical cross-border capacity is available for trading. Estonia's wholesale electricity market faces challenges due to its small size and reliance on oil shale generation, which frequently acts as the main driver of prices (especially when renewable generation is low).

The EU Member States' electricity interconnection target is at least 15% by 2030, but Estonia's level of electricity interconnection is already 59.63% and therefore four times higher than the EU target. This is an important basis for the synchronisation of the Estonian electricity system with the EU electricity system, which successfully took place in February 2025. The investment part of the synchronisation project has been progressing well. It is crucial to speed up the upgrades of Estlink 1 and Estlink 2, which have suffered delays. Further attention should also be paid to advancing the Estonian-Latvian offshore Elwind project. Estonia has other important projects to ensure the efficient functioning of the energy market by improving cross-border interconnections, such as EstLink 3 between Estonia and Finland and the Estonia-Latvia 'fourth interconnection' (both of these could be completed by 2035). Price differentials between Finland and Estonia and recent incidents affecting undersea cables underscore the importance of these projects. Estonia actively participates in the Baltic Energy Market Interconnection Plan (BEMIP) High Level Group to boost regional cooperation with neighbouring countries.

Estonia is reforming its energy infrastructure permitting processes to increase renewable development. Legislation was amended in 2024 to streamline planning, permitting and environmental impact assessment processes for wind energy projects, and to establish wind priority development

([140]) June to August.
([141]) ENTSO-E.
([142]) Fraunhofer (ENTSO-E data).
([143]) In November-December 2024, electricity generation from wind power amounted to 0.07 TWh in Latvia (+73% vs the same period in 2023), 0.37 TWh in Estonia (+210%) and 0.8 TWh in Lithuania (+53%).
([144]) Yearly electricity data, Ember (generation and consumption data throughout the paragraph).
([145]) Estonia, Latvia, Lithuania, Poland, Finland and Sweden are part of the Baltic capacity calculation region (CCR). A CCR is a group of countries that calculate cross-border electricity trade flows together.

areas (1 000 MW total capacity). This is part of Estonia's recovery and resilience plan (RRP).

No comprehensive data are available on renewable energy sources (RES) curtailment in 2024. ACER (basing its calculations on ENTSO-E data) observed 129 instances of negative prices in Estonia in 2023.

Estonia is actively expanding its energy flexibility through energy storage deployment, demand response solutions and market integration. Eesti Energia developped Estonia's first large-scale storage system, a 26.5MW BESS, with larger projects also in development. Some renewable energy developers have announced plans to construct battery energy storage systems in Estonia (as stand-alone systems or coupled with additional generation capacity). These are expected to be operational in 2025.

Estonia has implemented a smart metering system that gives 99% of consumers access to a smart meter. Dynamic price contracts are offered to household consumers, facilitated by the availability of smart meters. The Estonian government did not implement direct compensation measures for household energy bills in 2024 (as it had in previous years). The focus instead shifted towards long-term strategies to enhance energy security and stabilise prices.

Regarding energy communities, the concepts of energy communities (ECs) and renewable energy communities (RECs) are defined in legislation, which also contains some rights and obligations. According to the draft NECP, Estonia is planning to promote individual and collective self-consumption of renewable energy and RECs by issuing a handbook for RECs. The draft NECP does not set quantitative targets for self-consumption or for ECs. The framework would generally benefit from further improvements.

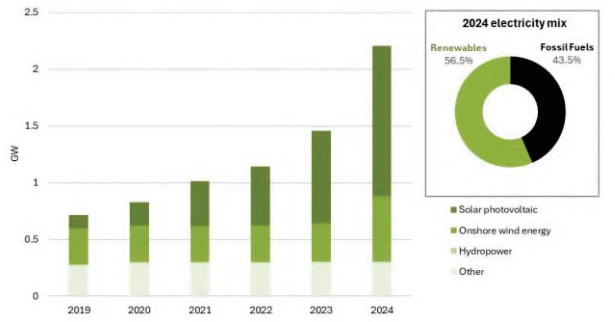
Electricity accounted for 20.1% of Estonia's final energy consumption (FEC) in 2023 (slightly below the EU average of 22.9%) and this share has slightly increased in the last decade ([146])**, partly due to an unfavourable electricity-to-gas price ratio that disincentivizes electrification and cost-effective decarbonization.** Electricity accounts for 19.9% and 45.5% of households' and industry's FEC respectively. The transport sector's FEC is negligible at 0.6%. Further progress in electrification across sectors is required in order to cost-effectively decarbonise the economy and bring the benefits of affordable renewable generation to consumers. In 2024's second semester, Estonia had relatively low retail electricity prices, but its household electricity-to-gas price ratio reached 2.8. For this consumer segment, while price differentials discourage electrification, taxes and levies for electricity and gas are similar, leaving little room for fiscal adjustment. For energy-intensive industries on the other hand, the electricity-to-gas price ratio was below the EU average but still affected by a fiscal burden skewed towards electricity. Taxes and levies made up 8,5% of electricity costs and 5,1% for gas, increasing the price ratio from 2.4 to 2.5. ([147])

([146]) The CAGR (compound annual growth rate) was -0.3% between 2013 and 2023. The minimum/maximum shares were 20.1% and 24.3% respectively. Source: Final energy balances, Eurostat.

([147]) Analysis based on Eurostat data for the second semester of 2024. For household consumers, consumption band is DC for electricity and D2 for gas, which refer to medium-sized consumers and provide an insight into affordability. For non-household consumers, consumption band is ID for electricity and I4 for gas, referring to large-sized consumers, providing an insight into international competitiveness (price used for the calculation excludes VAT and other recoverable taxes/levies/fees as non-household consumers are usually able to recover VAT and some other taxes).

Renewables and long-term contracts

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



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

In 2024, renewable energy sources (RES) accounted for 57% (vs 47% in the EU as a whole), an increase on 50% in 2023 ([148])**.** Renewable installed capacity in Estonia surged by 52% in 2024, from 1 456 MW in 2023 to 2 226 the following year. Estonia's total wind capacity in Estonia was 594 MW (+70%) in 2024 (all of this was onshore). As regards the acceleration of solar deployment, total installed capacity was 1326 MW in 2024 (+63%). Estonia's share of renewable electricity is projected to reach 100% in 2030. Wind power will become the main source of renewable electricity (with a 73% share and 6.84 GW of installed capacity), followed by solar PV (with a 11% share and 1 GW of installed capacity).

Estonia's framework is now moderately-to-strongly aligned with the Commission's Recommendation on Permitting([149])**.** The Estonian authorities have taken several important steps in this regard, including introducing legislation that enables favourable permit-granting procedures and streamlining offshore permit-granting procedures. Estonia has developed a comprehensive procedural manual for project developers and municipalities. A single contact point mediates exchanges between project developers and relevant authorities. A single unified application process for marine activities has been introduced. The digitalisation of all permit procedures has improved efficiency and transparency. Environmental regulations are characterised by clearly defined deadlines, including maximum duration times for the entire permitting process. More could be done (for instance, by allowing sandboxing) because lack of implementation may be delaying development of more innovative research projects. Estonia's RRP is set to fund a project to strengthen the expertise of local authorities in the area of renewable energy by hiring specialists, but the results of this measure remain to be seen.

Estonia has made a commitment to have 400 MW installed onshore wind capacity by 2026 as part of the Wind Pledges under the European Wind Power Action. According to the draft NECP, Estonia will develop 1.3 GW of onshore wind and 1 GW of offshore wind by 2030. These goals are consistent with Estonia's non-binding agreement (as defined by the non-binding goals in the 2023 EU Sea Basins agreements). However, no new schedule on the expected allocation of support for renewables has yet been released on the Union Renewables Development Platform. The Commission Recommendation([150]) that was issued following the adoption of the draft plan underlines the importance of developing comprehensive long-term planning for the deployment of renewable energy (particularly wind) in order to increase visibility for the EU's manufacturing industry and grid operators in line with the European Wind Power Package.

In the draft NECP, Estonia refers to the use of tenders to shift nearly half of the central government's electricity consumption to renewable energy by means of power purchase agreements (PPAs).

([148]) Yearly electricity data, Ember.
([149]) Commission Recommendation (EU) 2024/1343
([150])Commission recommendation (EU) 2024/606

Energy efficiency

Estonia continues to make significant progress towards the 2030 EU targets for energy efficiency. Primary energy consumption (PEC) decreased by 12.9% to 4.11 Mtoe in 2023. Final energy consumption (FEC) decreased by 5.9% to 2.61 Mtoe. Compared with 2022, FEC decreased in all main sectors: by 5.9% in industrial, by 2.9% in residential, by 1.0% in transport and by 20.7% in services. This progress is above the EU average and highlights Estonia's commitment to energy efficiency. The recast Energy Efficiency Directive requires Estonia to reach a PEC of 3.14 Mtoe and a FEC of 2.53 Mtoe by 2030.

Estonia has not notified its comprehensive heating and cooling assessment. This assessment should identify the potential for the application of high-efficiency cogeneration and efficient district heating and cooling, as required by Article 25(1) of the recast Energy Efficiency Directive. No estimate is available on when it will be done.

Estonia needs to step up its efforts in the residential sector if it is to make a meaningful contribution to the 2030 building decarbonisation milestone set in its latest long-term renovation strategy (LTRS). Residential FEC decreased between 2022 and 2023 but, from a medium-term perspective, it has been stagnating or even slightly increasing since 2018 (when climate corrections are applied).

Heating and cooling represented more than 85% of Estonia's FEC in 2022. Approximately 20 000 heat pumps were sold in 2023 (a decrease of 8% on 2022). Financial subsidies are available for up to 70% of the cost of replacing an old boiler with a heat pump or other environmentally friendly alternatives. Estonia's relatively high share of renewables in heating and cooling (66.67% in 2023) is mainly related to biomass use. Heat pumps cover slightly more than 10% of this share.

Estonia continues to rely mostly on grant-based funding schemes for energy efficiency and the use of financial instruments remains limited. No new schemes were created for the financing of energy efficiency in 2024, but several previously implemented schemes remain in place (e.g. the Green Fund and the Apartment Building Reconstruction grant). As regards EU funds, Estonia's RRP, which was updated in 2023 to address REPowerEU objectives, continued to drive progress in 2024 (particularly through increased investment in residential and service buildings).

Security of supply and diversification

Estonia already banned imports and purchases of Russian natural gas in 2022. Estonia reduced its natural gas demand by 28% between August 2022 and July 2024, but this was well below the EU's 15% target. Estonia accesses natural gas via Lithuania's 'Independence' floating storage regasification unit (FSRU) in Klaipeda, Finland's Inkoo FSRU via the Balticconnector and Latvia's Inčukalns underground storage facility.

Estonia's energy mix saw a notable shift towards renewables from 27.7% in 2022 to 34.6% in 2023. Domestically sourced oil shale remained the main source, though its share did decrease slightly from 60.5% to 58.2%. Natural gas usage remained relatively stable, rising marginally from 6.0% to 6.3%.

The Estonian governing coalition took a decision in principle in 2024 to initiate a special plan for the potential location of a future nuclear power plant. Estonia does not currently have nuclear capacity.

Fossil fuel subsidies

In 2023, environmentally harmful([151]) fossil fuel subsidies without a planned phase-out before 2030 represented 0.11%([152]) of Estonia's GDP([153]), below the EU weighted average of 0.49%. Tax measures accounted for the full volume. Additionally, Estonia's 2023 Effective Carbon Rate([154]) averaged EUR 96.85 per tonne of CO_2, above the EU weighted mean of EUR 84.80([155]).

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

([152]) Numerator is based on volumes disclosed by the Estonian authorities via the 2025 NECPR reporting. 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.

([153]) 2023 Gross Domestic Product at market prices, Eurostat.

([154]) 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.

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

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

	Estonia				EU			
	2021	**2022**	**2023**	**2024**	**2021**	**2022**	**2023**	**2024**
Household consumer - Electricity retail price (EUR/KWh)	**0.1631**	**0.2353**	**0.2249**	**0.2257**	**0.2314**	**0.2649**	**0.2877**	**0.2879**
Energy & supply [%]	46.8%	56.1%	50.1%	48.6%	36.6%	54.3%	55.6%	47.8%
Network costs	28.9%	22.0%	27.6%	28.2%	26.7%	25.3%	24.8%	27.2%
Taxes and levies including VAT	24.2%	21.9%	22.4%	23.3%	36.7%	20.3%	19.6%	25.0%
VAT	16.7%	16.7%	16.7%	18.0%	14.5%	13.4%	13.8%	14.6%
Household consumer - Gas retail price	**0.0592**	**0.1098**	**0.0945**	**0.0738**	**0.0684**	**0.0948**	**0.1121**	**0.1128**
Energy & supply	63.0%	72.9%	69.1%	58.3%	43.7%	61.0%	64.5%	53.9%
Network costs	13.9%	7.0%	10.3%	18.0%	22.5%	17.3%	17.1%	18.3%
Taxes and levies including VAT	23.1%	20.1%	20.6%	23.7%	33.8%	21.7%	18.4%	27.8%
VAT	16.7%	16.7%	16.6%	18.0%	15.5%	11.6%	10.2%	13.6%
Non-household consumer - Electricity retail price	**0.1058**	**0.1906**	**0.1494**	**0.1361**	**0.1242**	**0.1895**	**0.1971**	**0.1661**
Energy & supply	56.3%	67.7%	59.6%	56.8%	43.0%	66.5%	63.0%	55.8%
Network costs	17.3%	10.3%	16.6%	18.1%	15.8%	10.7%	11.9%	15.5%
Taxes and levies excluding VAT	11.6%	6.5%	8.6%	8.6%	30.4%	9.9%	11.2%	15.4%
Non-household consumer - Gas retail price	**0.0409**	**0.1098**	**0.0745**	**0.0533**	**0.0328**	**0.0722**	**0.0672**	**0.0517**
Energy & supply	63.7%	76.0%	71.7%	59.8%	66.2%	77.3%	77.3%	68.7%
Network costs	13.6%	5.1%	10.3%	17.8%	7.7%	3.8%	5.3%	7.1%
Taxes and levies excluding VAT	7.1%	2.6%	1.6%	5.3%	12.5%	6.1%	7.3%	11.6%
Wholesale electrity price (EUR/MWh)	86.5	192.0	91.0	87.0	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)	**13,160**	**12,364**	**7,616**	**6,078**	**7,204**	**8,937**	**5,745**	-
Combustible Fuels	12,397	11,682	6,836	4,959	6,095	7,650	4,317	-
Nuclear	-	-	-	-	-	-	-	-
Hydro	26	15	19	30	23	23	24	-
Wind	723	636	687	844	733	668	683	-
Solar	14	31	74	245	354	596	721	-
Geothermal	-	-	-	-	-	-	-	-
Other Sources	-	-	-	-	-	-	-	
Gross Electricity Production [%]								
Combustible Fuels	94.2%	94.5%	89.8%	81.6%	84.6%	85.6%	75.1%	-
Nuclear	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-
Hydro	0.2%	0.1%	0.2%	0.5%	0.3%	0.3%	0.4%	-
Wind	5.5%	5.1%	9.0%	13.9%	10.2%	7.5%	11.9%	-
Solar	0.1%	0.2%	1.0%	4.0%	4.9%	6.7%	12.5%	-
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)	**-2,734**	**-1,897**	**2,157**	**3,644**	**2,629**	**1,011**	**3,304**	-
As a % of electricity available for final consumption	-35.3%	-22.9%	26.1%	42.4%	32.5%	13.8%	47.2%	-
Electricity Interconnection [%]	**63.2%**	**69.0%**	**67.6%**	**67.6%**	**83.4%**	**85.8%**	**69.4%**	**62.8%**
Share of renewable energy consumption - by sector [%]								
Electricity	17.6%	19.7%	22.0%	28.3%	29.2%	29.1%	31.8%	-
Heating and cooling	52.2%	53.7%	52.2%	58.8%	61.3%	65.4%	66.7%	-
Transport	0.4%	3.3%	6.2%	12.2%	11.2%	8.5%	9.1%	-
Overall	29.5%	30.0%	31.7%	30.1%	37.3%	38.5%	41.0%	-

	2020	**2021**	**2022**	**2023**	**2020**	**2021**	**2022**	**2023**
Import Dependency [%]	**10.5%**	**1.4%**	**6.2%**	**3.5%**	**57.5%**	**55.5%**	**62.5%**	**58.3%**
of Solid fossil fuels	391.8%	95.2%	95.8%	268.7%	35.8%	37.2%	45.9%	40.8%
of Oil and petroleum products	130.0%	54.9%	108.6%	81.2%	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	46.2%	11.5%	0.0%	0.0%	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	100.0%	83.0%	66.7%	0.0%	49.1%	47.4%	21.5%	1.0%

	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Gas Consumption (in bcm)	**0.5**	**0.5**	**0.5**	**0.4**	**0.5**	**0.4**	**0.3**
Gas Consumption year-on-year change [%]	-5.0%	2.9%	-8.2%	-8.2%	14.1%	-25.3%	-14.2%
Gas Imports - by type (in bcm)	**0.5**	**0.5**	**0.5**	**0.4**	**0.5**	**0.4**	**0.3**
Gas imports - pipeline	0.5	0.5	0.5	0.4	0.5	0.4	0.3
Gas imports - LNG	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Gas Imports - by main source supplier [%]							
Latvia	0.0%	0.0%	0.0%	50.3%	82.8%	84.2%	48.7%
Finland	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	51.3%
Russia	98.4%	99.8%	99.0%	46.2%	11.5%	0.0%	0.0%

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

Estonia faces major challenges in climate adaptation such as the wide gap in climate insurance coverage and increased vulnerability to extreme weather events. It has made some progress in implementing policy measures on climate adaptation, but Estonia has one of the three regions identified as hotspots of climate risks most affected by climate change: low-lying coastal regions. Estonia is vulnerable to impacts of climate change such as rises in temperature, rainfall and sea level and extreme weather phenomena accompanied by coastal and inland floods, wildfires and new pathogens. The state of nature and ecosystems is also a cause for concern in Estonia, reducing the country's climate resilience.

Climate adaptation and resilience

Estonia is vulnerable to the impacts of climate change. The impacts for Estonia include rises in temperature, rainfall and sea level, extreme weather phenomena such as coastal and inland floods, wildfires and new pathogens. Coastal regions and inland water bodies are at risk of more frequent flooding due to rising sea levels and increased precipitation. In the past, an unexpected emergence of Vibrio infections in the Baltic Sea coincided with warming sea surface temperature patterns. Heatwaves are expected to become more frequent and intense, posing a public health threat, and droughts will increase in frequency and severity, affecting agriculture and water resources. Storms are a hazard to the electricity grid especially in rural areas. Estonia's RRP includes an investment to strengthen the electricity grid and protect it against storms at the same time.

The climate risks pose significant threats to Estonia's economy and society. Between 1980-2023, Estonia suffered economic losses estimated at EUR 332 million due to weather- and climate-related extreme events. The overall insurance coverage over this period only covered 15% of the economic losses ([156]). Estonia also recorded one of the highest number of deaths per 100 000 citizens due to extreme heat in northern Europe([157]). The trend increases over time, posing a risk to public health, especially for vulnerable populations.

Estonia has implemented in the last years several national policy measures related to adaptation and preparedness. In 2017, it adopted a national adaptation strategy and a plan on climate change adaptation (NAP). Since then, Estonia has strengthened its adaptation governance structures. In 2023, the establishment of a Climate Ministry gave further emphasis to climate change mitigation and adaptation issues. However, Estonia has limited capacity for conducting systemic risk assessments, which may hinder progress. Estonia is also preparing a climate law expected to take effect in 2025, to improve climate change adaptation. The law sets national climate change adaptation goals, mainstreams climate adaptation in sectoral development plans, and requires regular assessments of climate risks and action plans prepared at both national and local levels. This aligns with the European Climate Law recommendations ([158]).

Many local authorities in Estonia are developing local energy and climate plans. Approximately 41.7% of the population live in areas covered by the Covenant of Mayors for Climate and Energy. Five of the main local authorities participate in the EU mission on adaptation to climate change to enhance their work on climate adaptation.

([156])EEA, 2024, *Economic losses from weather- and climate-related extremes in Europe*, Link.

([157]) ibid.

([158])C(2023) 9602.

Water resilience

Despite Estonia having sufficient water resources, measures are needed to tackle deteriorating chemical water quality, boost resilience and narrow the annual investment gap. The Water Exploitation Index Plus (WEI+) reached 2.2 in 2022, having stabilised after peaking at 8.5 in 2018, with no indication of serious overuse of water resources. Nevertheless, there has been a deterioration in the ecological status of surface water bodies, and a steep reduction in the share of surface water bodies in good chemical status. The assessment of the third river basin management plan shows that the ecological status/potential of surface water bodies has deteriorated since the second plan, with 53% reported as having good ecological status/potential against the EU average of 37%. The most significant pressure identified is diffuse pollution. More precisely, the problem is nutrient pollution affecting 93% of water bodies. The situation regarding chemical status has not improved since the second plan, with only 9.7% of surface water bodies classified as having good chemical status (EU average 31%). The status of 83% of surface water bodies remains unknown, even though the Water Framework Directive entered into force over 20 years ago.

None of the 16 coastal waters reach good ecological nor good chemical status. Failure to achieve good chemical status is mainly due to two specific substances: mercury and polybrominated diphenyl ethers. Both pose significant threats to humans and to the aquatic environment, and are in the group of ubiquitous, persistent, bio-accumulative and toxic substances. Water abstraction is one of the main forms of pressure on groundwater bodies in Estonia. According to the third plan, 26% of groundwater bodies are reported as having poor chemical status. Failure is mostly due to mining of oil shale, industry and agriculture. Other reasons are deteriorating quality in drinking water protected areas and saline or other intrusion, which might be linked to excess abstraction of groundwater bodies adjacent to the coast.

Untreated urban waste water in Estonia significantly impacts water quality, affecting nearly all coastal waters and half of the country's rivers. The Urban Wastewater Treatment Directive (UWWTD) aims to protect human health and the environment from the effects of untreated urban waste water. An infringement proceeding was opened against Estonia in February 2024 for failure to meet the Directive's requirements on discharges of industrial waste water into urban wastewater treatment plants. The third river basin management plan reports that water quality is affected by urban wastewater discharges. In particular, discharges undermine the water quality in 94% of coastal waters and 50% of Estonia's rivers.

Estonia needs to invest more each year in water, primarily in wastewater management. Water investments in Estonia are estimated to be around EUR 73 million per year (in 2022 prices) in the 2021-2027 period (see Graph A9.2). Of this, EUR 21 million is for wastewater management, EUR 17 million for drinking water and around EUR 34 million for the other aspects of the Water Framework Directive (water management and protection). To meet the environmental targets under the Water Framework Directive and the Floods Directive, Estonia has an investment gap of EUR 65 million per year (0.18% of GDP), with most related to waste water (EUR 59 million per year). Drinking water measures require an additional 7 million per year.

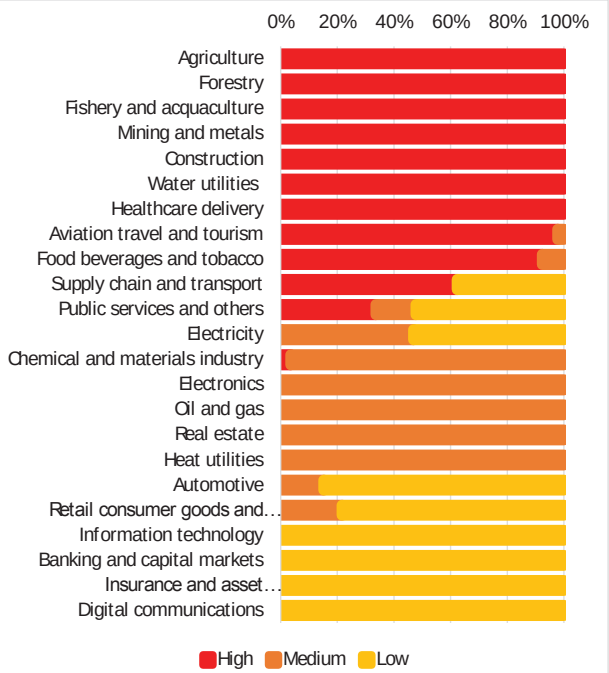
Biodiversity and ecosystems

The state of nature and ecosystems is a cause for concern in Estonia, reducing the country's climate resilience. Estonia is host to

60 habitat types and 96 species covered by the Habitats Directive ([159]). In 2022, 17.9% of land in Estonia was covered by the Natura 2000 network (EU coverage 18.6%). Including other nationally designated protected areas, a total of 21% of land is protected. Estonia protects 18.7% of its marine waters, exceeding the EU average of 12.1%. The share of species reported as having good conservation status in 2018 is 56.2%, a 2.7% increase on the 53.5% reported in the previous reporting period. The share of assessments for species in bad or poor conservation status slightly increased to 36% (from 35% in the previous period). The common farmland bird index, too, indicates a downward trend in species' conservation status. It fell from 74.1 in 2018 to 69 in 2020 and below the EU average of 74.6 in the same year. Estonia's 2030 environmental development plan contains several measures that aim to improve biodiversity in agricultural ecosystems, including enhancing the biodiversity of agricultural landscapes, with a particular focus on pollinators and farmland birds.

Nature degradation creates significant risks to the economy and to competitiveness. 40% of Estonia's gross value added is very highly and directly dependent on ecosystem services. Several sectors such as agriculture, forestry, fisheries, construction, mining and metals, water utilities and healthcare (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. In addition, Estonia has a particularly high degree of dependency on ecosystem services in its economy's downstream value chain, with 50% of gross value added being highly dependent. 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.

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

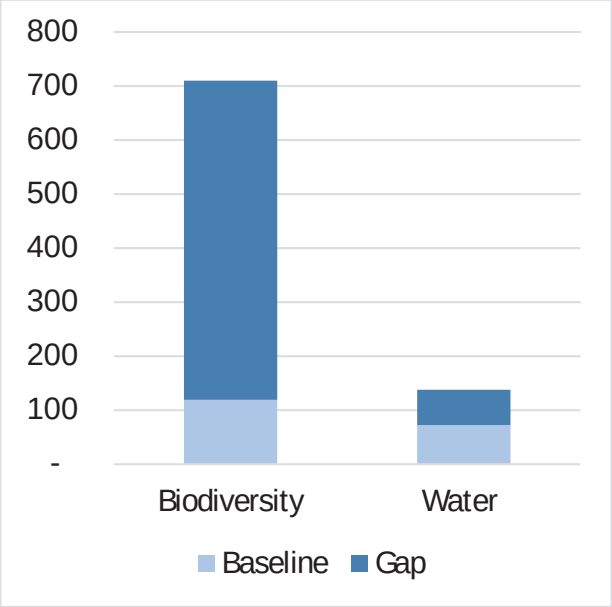


(1) Dependency based on the sector's own operations, excluding value chain operations within countries and across international value chains. A high dependency indicates a high potential exposure to nature-related shocks or deteriorating trends, which means that the disruption of an ecosystem
service 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.

To meet the environmental objectives concerning the protection and restoration of biodiversity and ecosystems and other related horizontal measures, Estonia has an investment gap estimated at around EUR 0.6 billion per year, corresponding to 1.63% of its GDP (see Graph A9.2).

([159])EEA, 2019, Number of habitats and species per Member State, Link.

Graph A9.2: **Investment needs and gaps in EUR million, in 2022 constant prices**



Source: European Commission, DG Environment, Environmental investment needs & gaps assessment programme, 2025 update.

Sustainable agriculture and land use

Estonia's carbon removals are in line with the 2030 target for land use, land-use change and forestry (LULUCF). In 2014, net carbon removals turned into net emissions and have remained above zero since then. Since 2020, however, LULUCF emissions have fallen. As recommended in the previous European Semester, continued improvements in forest management and action to restore wetlands could help Estonia continue to reverse the decline in net carbon removals from the atmosphere. To meet its 2030 LULUCF target, additional carbon removals of -0.4 million tonnes of CO_2 equivalent (CO_2eq) are needed ([160]). The latest available projections show a surplus compared to the target of -0.4 million tonnes of CO_2eq for 2030 ([161]). Therefore, Estonia is on track to meet the 2030 target.

Although Estonia's overall greenhouse gas emissions from agriculture are relatively moderate, Estonia's agriculture is still a source of emissions and continues to have an impact on air, water and soils. In 2022, agriculture generated 1.6 million tonnes of CO_2eq, accounting for around 11% of the country's total emissions (excluding LULUCF). This includes 856 000 tonnes of CO_2eq from livestock. Pesticide levels have exceeded the set thresholds in 20% of surface water monitoring stations ([162]). Peat extraction has destroyed approximately 30 000 ha of raised bogs in Estonia, with around 20 000 ha still in use. Drained peatlands are among the country's largest source of greenhouse gas emitters. The drainage of bogs increased Estonia's total emissions by 2.3-2.7 times compared to their natural state. Restoring these degraded areas is crucial, both for biodiversity protection and for climate change mitigation.

Estonia is transitioning to a more sustainable food system by fostering sustainable farming practices and raising agronomic standards, in particular by encouraging organic farming and environmental training for farmers. 23.4% of Estonia's land is under organic farming. This is the second highest result in the EU and well above the EU average of 10.5%. Estonia is contributing substantially to achieving the target to have 25% of the EU's agricultural land under organic farming by 2030. Forests cover around 50% and agricultural land covers some 25% of the country. Agricultural land is mainly cultivated with extensive techniques. Estonia's common agricultural policy (CAP) strategic plan uses around EUR 456 million (68%) of its total CAP budget to support environmental and climate objectives. The focus is on carbon sequestration, biodiversity and valuable

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

([161]) Climate Action Progress Report 2024, COM/2024/498.

([162]) EEA, 2024, Pesticides in rivers, lakes and groundwater in Europe, Link.

grasslands, as well as increasing knowledge about sustainable production. Farmers can receive additional payments if they commit to adopting certain agronomic practices that are beneficial for the environment and climate. Estonia's CAP strategic plan implements enhanced standards for good agricultural and environmental conditions, which contribute to greater environmental and climate ambitions and applies to almost all utilised agricultural land. For example, the plan sets a requirement for increased soil cover during the sensitive winter period in order to protect soils across the whole country. For the same purpose, over 23% of utilised agricultural land receives support for practising organic farming, which contributes to a reduced use of pesticides, improved water and soil quality, and carbon sequestration. In order to maintain good agri-environmental conditions, it is also important to continue to raise environmental awareness. Therefore, in many cases, one of the basic conditions for farmers to receive support is to attend training on environmental topics.

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

Climate adaptation and preparedness:	Estonia						EU-27	
	2018	2019	2020	2021	2022	2023	2018	2021
Drought impact on ecosystems *[area impacted by drought as % of total]*	31.46	7.84	0	9.07	4.73	15.55	6.77	2.76
Forest-fire burnt area (1) *[ha, annual average 2006-2023]*	31	31	31	31	31	31		
Economic losses from extreme events *[EUR million at constant 2022 prices]*	-	-	-	-	-	4	24 142	62 981
Insurance protection gap (2) *[composite score between 0 and 4]*	-	-	-	-	0.88	0.63		
Heat-related mortality (3) *[number of deaths per 100 000 inhabitants in 2013-2022]*	96	96	96	96	96			
Sub-national climate adaptation action *[% of population covered by the EU Covenant of Mayors for Climate & Energy]*	43	43	43	43	43	42	41	44

Water resilience:	Estonia						EU-27	
	2018	2019	2020	2021	2022	2023	2018	2021
Water Exploitation Index Plus, WEI+ (4) *[total water consumption as % of renewable freshwater resources]*	2.6	1.1	1.0	1.7	2.2	-	4.5	4.5
Water consumption *[million m^3]*	498	409	357	411	483	-		
Ecological/quantitative status of water bodies (5) *[% of water bodies failing to achieve good status]*								
Surface water bodies	-	-	-	47%	-	-	-	59%
Groundwater bodies	-	-	-	7%	-	-	-	93%

Biodiversity and ecosystems:	Estonia						EU-27	
	2018	2019	2020	2021	2022	2023	2018	2021
Conservation status of habitats (6) *[% of habitats having a good conservation status]*	56.7	-	-	-	-	-	14.7	-
Common farmland bird index *2000=100*	74.1	74.7	69.0	-	-	-	72.2	74.4
Protected areas *[% of protected land areas]*	-	-	-	21	21	-	-	26

Sustainable agriculture and land use:	Estonia						EU-27	
	2018	2019	2020	2021	2022	2023	2018	2021
Bioeconomy's added value (7) *[EUR million]*	1 762	1 878	1 927	2 293			634 378	716 124
Landscape features *[% of agricultural land covered with landscape features]*	-	-	-	-	6	-		
Food waste *[kg per capita]*	-	-	125	128	134	-		
Area under organic farming *[% of total UAA]*	21.0	22.3	22.4	23.0	23.4		7.99	-
Nitrogen balance *[kg of nitrogen per ha of UAA]*	-	-	-	-	-	-		
Nitrates in groundwater (8) *[mgNO_3/l]*	4.8	5.0	5.5	5.2	-	-		
Net greenhouse gas removals from LULUCF (9) *[Kt CO_2-eq]*	3 471	3 279	1 243	812	339	-	- 256 077	- 240 984

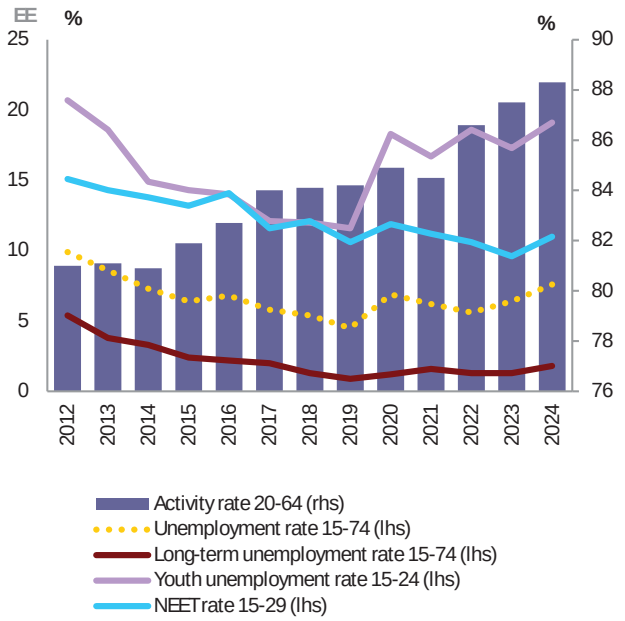
(1) The data show the average for the timespan 2006-2023 based on EFFIS - European Forest Fire Information System.
(2) Scale: 0 (no protection gap) – 4 (very high gap). EIOPA, 2024, Dashboard on insurance protection gap for natural catastrophes.
(3) van Daalen, K. R. et al., 2024, The 2024 Europe report 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.

Despite the recession, in 2024 the Estonian labour market remained resilient. The employment rate remained high, above the 2030 national target for the third consecutive year and ranking among the highest in the EU. However, signs of strain are emerging, with the unemployment rate rising since 2022 and sustained labour shortages in key sectors. Russia's war of aggression against Ukraine has negatively impacted the economy, adding to structural challenges such as persistent regional disparities, labour market inequalities, skills mismatches and shortages impacting Estonia's competitiveness and potential economic growth.

Employment remained strong in 2024 even as unemployment increased. After rising to historically high levels in 2023, the employment and activity rates remained high in 2024 at 81.8% and 88.3%, making the country one of the 'best performers' in the EU (75.8% and 80.4% respectively). This high employment rate, already above the national 2030 target of 81.3%, is even more remarkable against the background of the very large influx of Ukrainian refugees living in Estonia (equal to about 2.6% of the Estonian population) ([163]). Ukrainians are well integrated into the labour market, with 57% of temporary protection beneficiaries (20-64 years old) employed, and the share of Ukrainians among all registered unemployed people declining from 12.5% in November 2022 to 6.8% in September 2024. In 2024, Estonia had one of the highest employment rates (75.7%) among older workers (in the age group 55-64), significantly higher than the EU average (65.2%). The employment rate of older workers has been rising steadily, largely because of the gradual increase in the retirement age and the strong motivation to continue working due to low pensions relative to wages. However, the unemployment rate has been rising from 5.6% at the onset of the recession in 2022 to 6.4% in 2023, and even further to 7.6% in 2024 (EU: 5.9%). It is expected to remain around 7% in 2025 due to prolonged expectations of weak economic activity and demand. Long-term unemployment rose considerably in 2024, reaching 1.8% and almost equalling the EU average of 1.9%.

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



Activity rate and Employment rate (% of population), total, ages 20-64
Unemployment rate and long-term unemployment rate (% of labour force), total, ages 15-74
Youth unemployment rate (% of labour force), total, ages 15-24
NEET: Not in employment, education or training (% of population), total, ages 15-29
Source: Eurostat, LFS

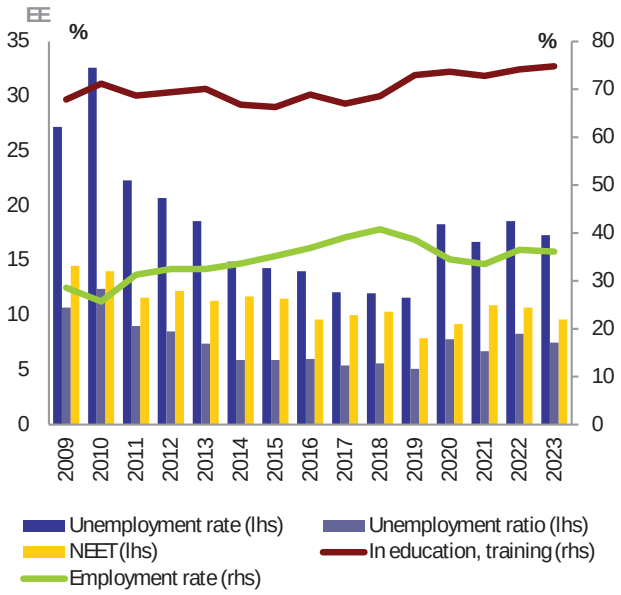
Regional differences are considerable, with higher unemployment rates in rural areas. In 2023, the unemployment rate reached 10.1% in the north-east of the country compared to unemployment rates between 6% and 7.5% in other regions. This can be partly explained by the predominance in the north-east region of the industrial sector (particularly the oil shale sector). This sector was most affected by the recession, which also led to expectations of a higher unemployment rise among men. Many other socio-economic indicators are

([163])Statistics Estonia (data from Jan 2024).

considerably worse than average in the border regions both in north-east and south-east Estonia, with significant variations in GDP per capita between Põhja-Eesti and the remaining regions (see Annex 17).

Despite efforts to improve young people's labour market outcomes, challenges persist. The youth unemployment rate (15-24) increased in 2024 and is higher than the EU average (19.1% vs EU: 14.9%) and significantly above the rate for the general population. It also remains significantly above pre-pandemic levels. Youth employment and labour force participation stood at 35.4% and 43.7% in 2024, respectively, slightly above the EU average. After steadily decreasing in the last decade, the share of young people not in employment, education and training (NEET) rose to 11% in 2024, above pre-COVID-19 levels and in line with the EU average. Young people not in education or training face more difficulties in finding a job in rural areas, also due to lower educational outcomes and higher early school leaving, regional gaps, and language barriers for the Russian-speaking population. To help NEETs transition into employment, the Estonian government adopted the reinforced Youth Guarantee action plan in 2022. The action plan focuses on increasing youth employment, which includes preventing young people from ending up in a NEET situation and supporting young people who do experience such a situation. As part of its recovery and resilience plan (RRP), Estonia is implementing the 'My First Job' scheme, which helps get young people into employment by paying a wage subsidy to the employer and reimbursing them the training costs.

Graph A10.2: **Labour market outcomes of young people (15-24)**



Employment rate (% of population), total, ages 15-24;
Youth in education and training (% of population), total, ages 15-24
Youth unemployment rate (% of labour force), total, ages 15-24
Youth unemployment-to-population ratio (% of population), total, ages 15-24
NEET: Not in employment, education or training (% of population), total, ages 15-24
Source: Eurostat, LFS

Vulnerable groups, including adults with lower-level qualifications and persons with disabilities, also face barriers to labour market integration. Employment outcomes in Estonia are closely tied to educational attainment (see Annex 12). The employment rate for people with less than lower-secondary educational attainment, at 65.7%, was more than 23 percentage points (pps) lower than for those who have post-secondary educational attainment in 2024. After rising sharply in 2022, the disability employment gap narrowed by 6 pps in 2023 and stabilised in 2024, below the EU average (20.8 pps vs 24 pps in 2024). Estonia set the target for the employment rate of persons with disabilities at 52% by 2030. Despite this, the risk of poverty and social exclusion among persons with disabilities is one the highest in the EU (see Annex 11). Targeted measures would help to better integrate underrepresented groups and those

outside the labour market as well as help them retain an adequate standard of living.

Nominal wage growth was strong in 2024, coupled with reduced inflation rates, allowing for real wages to rebound. Nominal wages growth in Estonia is expected to slow to 5.8% in 2024 after reaching 8.2% in 2023 ([164]), above the EU average in both years (5.9% in 2023 and 5% in 2024). Real wages have only partly recovered from the losses in 2022 and 2023, with a projected increase of 2.3% in 2024 on the back of decreasing inflation, and they remain below 2021 levels. Unit labour costs are projected to grow by 5.7% in 2024, significantly less than in 2023 (15.2%). Labour productivity continued to decline, with the country's productivity per hour worked falling to 67.9% of the EU average in 2023, the lowest in over five years. Gross disposable household income per capita remained under pressure in 2023, falling again to 126% of the 2008 value from 130.5% in 2022 (EU: 111.1% in 2023, up from 110.5% in 2022, 2008=100), reflecting rising living costs and the eroded purchasing power. Minimum wages will rise by 8% in nominal terms and reach EUR 886 in 2025, outpacing both inflation and average wage growth, and thereby improving the purchasing power of low-income earners. However, they remain among the lowest in the EU. In-work poverty continues to be high, at 10.2% in 2024 (EU: 8.2%), potentially indicating further scope to improve the adequacy of minimum wages (see Annex 11).

Social dialogue could be further strengthened to increase collective bargaining coverage. The share of collective bargaining in Estonia is particularly low ([165]), while the share of low-wage earners is among the highest in the EU ([166]). The involvement of social partners in reforms and policies in Estonia has improved in recent years but remains limited. The 2023 agreement on the minimum wage framework (on top of the regular yearly minimum wage negotiations) sets out the minimum wage growth rate until 2027, when it should reach 50% of the average salary.

The gender pay gap remains high, although the situation is slowly improving. After rising to 21.3% in 2022, the unadjusted gender pay gap fell to 16.9% in 2023. While it is still among the highest in the EU (EU: 12.7% in 2022), it has decreased significantly in the long term, falling by 12.9 pps since 2013. At the same time, Estonia is among the best performers as regards the gender employment gap (1.7% vs 10% in the EU in 2024). According to national statistics ([167]), the largest salary differences between men and women were reported in the fields of wholesale and retail trade, motor vehicle and motorcycle repair (25.5%), information and communication (25.1%), and financial and insurance activities (24.9%). Under the RRP, steps have been taken to reduce the gender pay gap, including the development of a digital tool prototype ([168]) to help employers analyse the wage gap in their company and take informed wage decisions.

Labour shortages have decreased, but some sectors and occupations face significant challenges. The job vacancy rate remains

([164]) European Commission, European Economic Forecast. Autumn 2024. For nominal wages, pay per employee 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 the Harmonised Index of Consumer Prices (HICP).

([165]) OECD/AIAS database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS); EE's collective bargaining coverage: 19.1% in 2021.

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

([167]) Statistics Estonia's and Eurostat's methodologies for calculating the gender wage gap differ. Eurostat's wage gap does not take into account companies and institutions with less than 10 employees, or the fields of agriculture, forestry and fishing, public administration and defence.

([168]) A digital tool for analysing the gender pay gap, known as the 'Palgapeegel' ('Pay Mirror') platform: Palgapeegel | Majandus- ja Kommunikatsiooniministeerium.

relatively low (1.5% in Q4-2024), below both its pre-pandemic level (1.9% in Q4-2019) and the EU average (2.3% in Q4-2024), continuing its decline since peaking in Q1-2022. However, significant shortages are reported in ICT, financial and insurance activities, public administration, defence, education and healthcare. According to CEDEFOP-EURES data ([169]), the most requested occupations were teachers, sales workers, personal service workers, metal and machinery workers and construction workers ([170]). Labour shortages are expected to be further exacerbated by an ageing workforce, with the share of those aged 65+ rising to 20.5% in 2024 (EU: 21.6%), a 4.1 pps increase over the last decade. The ageing of teachers and high retirement rates are already creating shortages in the education system (see Annex 12), with healthcare and education also impacted by the difficult working conditions. In October 2024, the share of employers expecting labour shortages to limit their production was relatively low in industry (8.9%), construction (8.5%), and services (6.1%) ([171]), compared to both the EU averages and pre-pandemic levels. On the other hand, unmet demand for employment as measured by the labour market slack ([172]) increased to 12.8% in 2024, slightly above the EU average (11.7%).

Skills shortages and mismatches persist. In 2024, Estonia's macroeconomic skills mismatch ([173]) slightly increased to 15.8% from 15.4% in 2023, but it remained below the EU average of 19.2%. Despite a slight increase in 2024, the overqualification rate in Estonia has been on a declining trend since 2013, with 22.2% of higher education graduates employed in occupations not requiring such qualifications in 2024 (EU: 21.5%). On the opposite side, 12% of workers are underqualified according to the OECD, and 23% report that some of their skills are lower than what is required for their job (OECD average: 10%) ([174]). Improving the labour market relevance of education and training can help further address labour shortages and skills mismatches, by improving career guidance, addressing the gender pay gap, increasing reskilling and upskilling opportunities, and better anticipating skills needs. These efforts would help Estonia maintain its employment rate in line with the national target of 81.3% and make progress towards achieving the 2030 adult learning target of 52.3%.

Attracting talent can help address Estonia's workforce shortages. According to the Estonian Qualifications Authority, annual labour demand will exceed the number of new entrants in the next years (See Annex 12), making employment increasingly reliant on higher labour force participation and migration ([175]). While the integration of foreign workers has grown, it is still not always aligned with evolving labour market needs. Exceptions exist for start-ups, ICT specialists, and other categories, but many sectors struggle to attract skilled workers without high-end salaries ([176]). Better anticipation of skills needs through expanded use of the OSKA system and accessible pathways for skilled foreign labour in sectors facing persistent shortages will contribute to sustaining Estonia's competitiveness.

The workforce is adapting to the green and digital transitions, with a growing need for skilled workers in emerging sectors. Estonia

([169]) EURES - Countries and occupations | CEDEFOP..

([170]) From Jan to Sept. 2024.

([171]) Commission, DG ECFIN Business and consumer surveys.

([172]) Labour market slack refers to all unmet needs for employment, or the extent to which labour supply exceeds labour demand in the short run. It has four components: underemployed people working part-time, unemployed people, people seeking work but not immediately available, and those available to work but not seeking.

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

([174]) Survey of Adults Skills 2023: Estonia | OECD.

([175]) OSKA general forecast 2022-2031

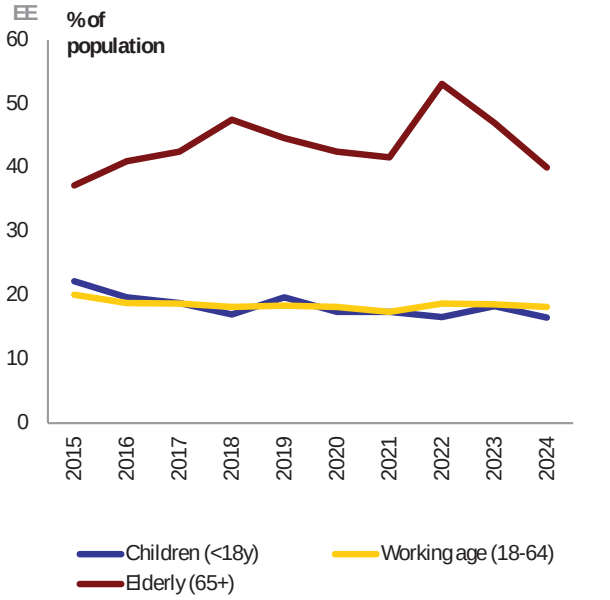
([176]) Foreign workers are exempted from the migration quota if their salary is at least 1.5 times the national average wage

has a large and growing pool of digital experts and strong digital skills across the population. In 2024, ICT specialists made up 7.2% of the workforce (EU: 5%). In particular, as regards women working as ICT specialists, Estonia is performing very well with 27.6%, well above the EU average of 19.5%. The share of the general population with at least basic digital skills exceeds the EU average (62.6% vs 55.6%), as does the share of workers with these skills (71% vs EU: 64.7%). However, 67% of Estonian companies struggle to recruit ICT specialists, highlighting that a skills gap still exists. Under the RRP, Estonia is taking measures to strengthen the capacity of businesses to foster the digital transition, through upskilling and retraining in ICT, as well as through a better recognition of skills acquired outside formal learning. To ensure that basic digital skills are widespread among its population, Estonia is implementing measures to 'educate the educators' supported by the European Social Fund. The green transition had a sizeable impact on the Estonian labour market, with employment in energy-intensive industries declining from 2.8% in 2020 to 1.7% in 2024. Upskilling and reskilling in these industries is growing (see Annex 12), with the share of workers taking part in education and training rising from 8.7% in 2015 to 19.6% in 2023 (EU: 10.9%). Investments under the RRP and Just Transition Fund include measures to mitigate the social and employment impact of this transition, including retraining and upskilling programmes for workers in the oil shale industry and effective job transition measures. The European Social Fund Plus will integrate the development of green skills into labour market, education and training measures, which helps increase the attractiveness and people's awareness of study fields related to green and digital change.

Despite recent improvements, Estonia continues to face significant challenges related to poverty and social exclusion, particularly among vulnerable groups and in rural areas. Although inflation levels have stabilised after the peaks in recent years, some households, older people especially, struggle to meet their essential needs. Income inequalities also persist, partially related to low minimum wages and the limited redistributive impact of the tax and benefits system. The limited capacity of the social protection system and uneven access to quality long-term care services also pose risks for Estonia's sustainable and inclusive growth. Addressing these challenges will support more inclusive growth and strengthen competitiveness.

Poverty and social exclusion risks remain high, especially for some groups and in rural areas. After peaking at 25.2% in 2022, when it reached its highest level in nine years, the at-risk-of-poverty or social exclusion (AROPE) rate decreased significantly in the last two years, falling to 24.2% in 2023 and to 22.2% in 2024. This improvement was mainly driven by the at-risk-of-poverty (AROP) rate falling by 2.3 percentage points (pps) to 20.2% in 2024. While the AROPE and AROP rates are now back to 2021 levels, they remain higher than the EU averages (21% and 16.2% in 2024). Persistent poverty risks are driven by a combination of factors, including limited economic opportunities and employment support, and are aggravated by insufficient access to healthcare and social services, especially in rural areas. For older people and persons with disabilities, the AROPE rates (39.4% and 39.1%) fell considerably in the last two years, dropping by 13.1 and 8.7 pps respectively, but remain among the highest in the EU due partly to the relatively low adequacy of pensions and the social protection system (see below). In 2024, 71.5% of older people living alone and 50.2% of single-person households experienced poverty. There are significant regional differences in the social situation in Estonia (see Annex 17), with relative poverty being more than twice as high in the counties of Ida-Viru (35%) and Lääne-Viru (29.2%) than in Harju (15.5%) and Rapla (14.1%). Many other socio-economic indicators are considerably worse than average in the north-east and south-east border regions. Further targeted support aimed at strengthening social cohesion and resilience in these regions could be considered. Addressing these vulnerabilities will help Estonia move towards its national 2030 target of reducing the number of people at risk of poverty or social exclusion by 39 000 compared to 2019, as so far this number has declined by only 9 000.

Graph A11.1: **At-risk-of-poverty or social exclusion rate, age groups**

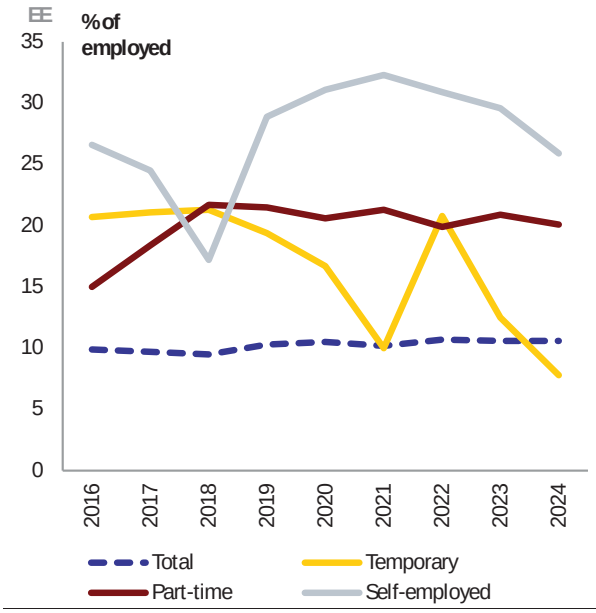


AROPE: At-risk-of-poverty or social exclusion rate (% of total population).
Source: Eurostat, EU-SILC [ilc_peps01n]

The risk of poverty or social exclusion among children is relatively low, but disparities persist. After an increase in 2023, the AROPE rate for children fell by 1.8 pps to 16.5% in 2024, remaining below the EU average of 24.8% in 2023. The poverty or social exclusion risk for children is highly dependent on the education level of their parents, spanning from 10.1% for parents with higher education to 45.6% for children of parents with a low level of education. Single-parent households face a higher poverty risk (35.3%). To mitigate the impact of poverty on children, Estonia is also implementing the European

Child Guarantee (ECG) as part of its 2022 action plan. While considerable progress has been made in the provision of the key social services covered under the ECG, more work is needed to target the most vulnerable groups and to achieve the national 2030 target of reducing the number of children in poverty by 13 000.

Graph A11.2: **In-work-poverty rate, groups**



In-work-poverty rate (% of employed). Employed who have an equivalised disposable income below 60% of the national equivalised median income.
Source: Eurostat, EU-SILC

Despite recent efforts, Estonia continues to face high in-work poverty risks. In 2024, in-work poverty in Estonia remained above the EU average (10.3% vs 8.2%), with a high AROP rate among part-timers (27% vs 14.3% for the EU in 2023), the self-employed (29.6% vs 20.7% for the EU) and quasi-jobless households (75.9% vs 61.2% for the EU). Household income declined further in 2023 (see Annex 10) and, while inflation eased considerably in 2024, prices have increased around 40% over the last three years ([177]). As a result, 7.7% of the population, or approximately 104 700 people, experienced material and social deprivation in 2024. Estonia has raised minimum wages in recent years to reduce in-work poverty, but they remained among the lowest in the EU in 2024 at EUR 820 per month, barely above the AROP threshold (EUR 807 per month). In 2025, the minimum wage will increase by 8% in nominal terms, outpacing both projected inflation and average wage growth (see Annex 10). The minimum wage framework, drawn up with social partners in 2023, sets the growth rate trajectory until 2027, when the minimum wage should reach 50% of the average salary.

The social protection system still has adequacy and coverage gaps. Estonia's social protection benefits expenditure is one of the lowest in the EU (15.4% vs 26.8% of GDP in 2023) and in the Baltics. The current geo-political situation and increased public spending on defence calls for efficient and well-targeted funding that will slowly but steadily continue to improve social protection. The impact of social transfers (excluding pensions) on poverty reduction increased from 27.7% in 2023 to 31.5% in 2024, below the EU average of 34.4%, pointing to further scope for increasing both the efficiency and effectiveness of social benefits. The low coverage and restrictive eligibility criteria of unemployment benefits, especially for people in non-standard forms of work and the self-employed, contribute to higher poverty risks. The self-employed are not covered by unemployment insurance and can only access the non-contributory unemployment allowance (under the same conditions as employees). There are also gaps in sickness benefits, where the self-employed only have access to voluntary coverage. With the self-employed and part-time workers accounting for a growing share of total employment – rising from 9% to 12% and from 11.7% to 15.7% respectively in the last decade ([178]) – it is crucial that Estonia proceeds as planned with reforming its unemployment insurance system by 2026 and proposing

([177]) Statistics Estonia. This indicates the increase in the cost of a basket of consumer goods; it does not, however, reflect all of the increase in the cost of living. Namely, Estonia's consumer price index does not include an interest rate component.

([178]) Estonian Central Bank, 'Job Market Review 2, 2024'.

legislation in 2025 to extend the coverage of the unemployment insurance benefits system to people in non-standard forms of work. The subsistence benefit (Estonia's minimum income scheme) is relatively low (41.4% of the poverty threshold vs 55.6% for the EU; 41.4% of the income of a low-wage earner vs 46.1% for the EU) ([179]).

Inequalities are relatively high, exacerbated by economic and structural factors that impact lower-income groups. Income inequality, as measured by the income quintile share ratio, fell in 2024 , when the income of the richest 20% of the population was around 5 times that of the poorest 20%. Wealth inequalities in Estonia are among the highest in the euro area, with the richest 10% holding 59% of net wealth (euro area average: 53.4%). The income share of the bottom 40% is below the EU average, but it rose back to 2020 levels in 2024. Estonia has one of the smallest middle classes in the EU, with 55% of households in the medium-income bracket ([180]). It has one of the largest low-income classes in the EU, with 33% of households in this category. Inequalities are mainly driven by the low adequacy of the social safety net and the weak income redistribution system. The impact of taxes (see Annex 1) and transfers in reducing income inequality (measured by the S80/S20 ratio) is weak (40% vs 48% for the EU) ([181]). Other significant factors include the high percentage of low-wage earners, leading to high in-market income inequality, and the low coverage of collective bargaining (21%). Several tax reforms (see Annex 12) in 2025 are not expected to reduce income inequality ([182]). The Estonia 2035 development strategy, adopted in 2021, sets modest strategic goals for reducing inequality and poverty, but acknowledges the importance of addressing regional, gender and age-based inequalities in the job market.

Pension adequacy remains a challenge, with low replacement rates and demographic pressures. Pensions increased sharply in recent years, growing by 10.6% in 2024 due to indexation and rising social tax revenues. However, they remain among the lowest in the EU relative to work incomes and a main driver of old-age poverty, with an aggregate replacement ratio of 50% in 2024 (vs 61% in the EU) and a relative median income ratio of 61% for those aged over 65 in 2024 (EU: 90% in 2024) ([183]). The adequacy of minimum pensions (EUR 372 as of April 2024) remains an issue. The 2021 pension reform, which introduced the option to opt out from the statutory funded pension scheme, risks further undermining pension adequacy and increasing long-term poverty risk for retirees ([184]). By the end of 2022, 214 000 people had opted out of the scheme, taking out around 30% of the total funding (EUR 1.8 billion) ([185]). Recent adjustments, an income tax exemption up to EUR 776 ([186]) and allowances for pensioners living alone can help reduce old-age poverty. Demographic trends are likely to put financial pressure on the pension system, which is increasingly relying on longer working lives to maintain its adequacy and fiscal sustainability. The share of the population aged 65 and over is projected to rise from 20.4% in 2022 to

([179]) SPC benchmarking exercise on minimum income - Income 2022.

([180]) Eurofound (2024): Developments in income inequality and the middle class in the EU | European Foundation for the Improvement of Living and Working Conditions, p. 63.

([181]) Source: European Commission calculations based on Eurostat.

([182]) Euromod analysis (2024).

([183]) The aggregate replacement ratio is defined as the ratio of the median individual gross pension of people aged 65-74 to the median individual gross earnings of people aged 50-59., while the relative median income ratio compares the median equivalised disposable income of individuals aged 65 and over to that of all individuals aged below 65.

([184]) Ministry of Finance and Ministry of Social Affairs: Estonian Pension System Sustainability Analysis (2022): Eesti pensionisüsteemi jätkusuutlikkuse analüüs_sotsiaalministeerium.pdf.

([185]) 2024 Ageing Report Estonia - Country Fiche

([186]) As of January 2025.

27.1% in 2050, with the old-age dependency ratio increasing from 32.3% to 46.2%.

Estonia continues to face challenges with long-term care and healthcare provision, as quality and availability vary significantly across municipalities. Despite falling sharply in 2024, self-reported unmet needs for medical care remain among the highest in the EU, at 8.5% (EU: 2.5%) (see Annex 14). It remains roughly twice as high for persons with disabilities compared to others, mostly related to regional income inequalities. Estonia's long-term care (LTC) services are severely underfunded, with one of the lowest public expenditure levels in the EU (0.4% of GDP vs 1.7% in 2022). The lack of quality services is exacerbated by staff shortages. In 2019, only 10.3% of people aged 65 and over used home care services (EU: 28.6%), and in 2022 only 2.9% of those aged over 65 received public home care, compared to 4.3% in 24-hour residential care. In 2023, home services recipients were significantly less than those utilising residential care ([187]), pointing to an insufficient supply of home care services. Supply has increased in the last 10 years, but significant regional differences remain due to reliance on municipal funding. Access to social services varies significantly depending on the municipality, driven by inequalities in supply and pricing. While quality assurance measures exist, such as recommended guidelines for service providers and municipal supervisors, enforcement of these measures is weak. The insufficient availability of care services often shifts caregiving responsibilities to relatives, particularly women, limiting their job market participation and reducing Estonia's competitiveness. With demand for healthcare and LTC growing due to demographic changes, ensuring sufficient funding for both is warranted.

Estonia has made progress in addressing healthcare and LTC challenges, supported by EU funds. Initiatives include community-based service places (including for the elderly) and integrated centres for social and welfare services supported by the European Regional Development Fund. Several reforms included in the Estonian recovery and resilience plan were adopted to help improve LTC access, such as legislation defining long-term care and requiring local authorities to prioritise home-based care with quality services. An action plan was also introduced to integrate social and healthcare services. The European Social Fund Plus (ESF+) is financing accessible, high-quality social services to support carers and persons with disabilities in accessing the job market and society. A major step in LTC provision was the care reform which entered into force in July 2023. It provided additional financial resources to local governments to help them organise LTC, reducing out-of-pocket payments for general care services. Challenges remain in ensuring the adequate financing, quality and availability of care services in all municipalities. Better coordination between social security, healthcare systems and municipalities, along with prioritisation of home and community-based care and assistive technologies, could improve the quality of these services.

Energy and transport poverty remain relatively low. In 2024, 3.6% of households were unable to keep their homes adequately warm and 5.7% faced arrears on utility bills, both below the EU averages (9.2%. and 6.9%). Estonia addresses energy poverty mainly through social welfare measures and financial assistance for low-income households, aiming to improve building energy efficiency and provide support for energy bills. Other structural measures will be supported by the Social Climate Fund in the coming years. As regards transport poverty, the share of people who could not afford a car stood at 7.2% in 2024 (EU: 5.6%), with vulnerable income groups experiencing fewer difficulties than their EU counterparts.

House prices have been trending upwards at a fast pace, almost doubling since 2015.

([187]) According to the Ministry of Social Affairs.

After increasing by 15.1% and 22.2% in 2021 and 2022 respectively, the growth rate slowed by 5.9% in 2023. In Q3-2024, house prices were still growing at 6.4% year-on-year. They are estimated to be overvalued by around 10% as at end-2024. Mortgage rates increased from 2.7% in 2022 to 5.5% in 2023, moderating mortgage issuance slightly. Building permits decreased significantly in 2022 and 2023, returning to the lower level of 2015, implying that housing supply will drop and house prices will continue to increase. However, the number of permits started increasing again in 2024.

Overall housing affordability has deteriorated over the past decade. House prices have increased more rapidly than household income in the last ten years and the house price-to-income ratio has grown by around 10% since 2015. House price levels compared to incomes remain one of the highest in the EU. Taking into account the cost of mortgage funding, the borrowing capacity of households worsened over the past decade as well since an average household now needs a higher share of its annual income for mortgage payments. While the rental market is very small, the ratio of new rents to incomes decreased over the last decade.

Despite recent increases, Estonia's housing cost overburden is still relatively low. In 2024, 8.6% of the population faced housing costs above 40% of their total disposable household income (EU: 8.2%), up 3.7 pps from 2022. Among those at risk of poverty, the housing cost overburden rate rose by 10.7 pps to reach 29.6% (vs 31.1% for the EU), driven by limited access to affordable housing. As a result, the percentage of households living in overcrowded accommodation rose to 18.4% in 2024, 5.7 pps higher than in 2020. The latest partial homelessness count took place in 2021 when just over 1 000 people were reported as homeless. Home ownership in Estonia remains much higher than the EU average (80.7% vs 69.2% for the EU in 2023), with a smaller share of the population renting (19.3% vs 30.2% for the EU).

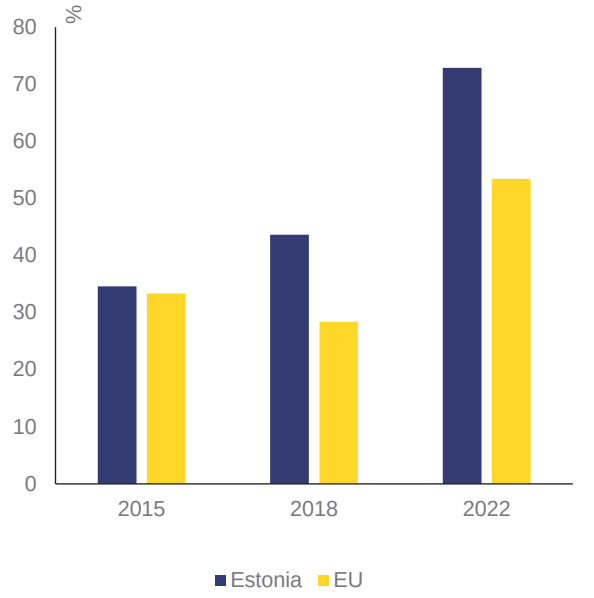
Estonia provides its young people with high-quality basic education, but skills shortages and mismatches risk limiting the country's competitiveness. However, inequalities have been widening slightly over the past decade, and teacher shortages pose a risk to the quality of education, especially in science, technology, engineering and maths (STEM) fields. Estonia does not fully capitalise on its high-performing basic education system as the share of young people leaving the education system with lower secondary education or less is still relatively high. To tackle early leaving from education, skills shortages and mismatches, the country extended obligatory learning until age 18 and is restructuring vocational upper secondary education. In many sectors of the economy, skills shortages and mismatches hamper productivity and innovation. Against the backdrop of a shrinking workforce and low resource and labour productivity, the education and training system is under pressure to ensure a sufficient supply of highly skilled graduates in fields relevant to the labour market, especially in upper secondary vocational and higher education.

A recent reform of early childhood education and care (ECEC) aims to improve quality and participation. Participation in ECEC of children aged three to the start of compulsory education (seven years) stood at 91.2% in 2023, somewhat below the EU average of 94.6% and the EU target of 96% by 2030. The rate was 37.8% for children under the age of three, close to the national Barcelona target of 40.5% and in line with the EU average (37.5%). While municipalities are legally required to provide a place in childcare to every child from 18 months onwards, some struggle to do so due to a shortage of places. A new ECEC law, which will take effect in September 2025, is expected to help alleviate these shortages and further improve quality by integrating childcare services and preschool education into a single system and standardising requirements (e.g. on staff qualifications). Integrated ECEC systems, like the one to be fully established through the reform, are in line with EU policy recommendations ([188]).

While Estonia is one of the EU's top performers in basic skills, educational inequalities have slightly increased over the last decade. The 2022 OECD Programme for International Student Assessment (PISA) confirmed that the country has the smallest share of low-achieving pupils in the EU (only 15% of pupils have a low performance in mathematics, 13.8% in reading and 10.1% in science). However, the performance gap between advantaged and disadvantaged pupils has slightly widened (4.5 pps in mathematics, 4.7 pps in reading and 5.1 pps in science), but the increase was below the EU average (7.4 pps, 8.2 pps and 7.4 pps, respectively). This widening socio-economic gap risks exacerbating educational inequalities. These inequalities have negative implications later in life, limiting the participation of disadvantaged young people in higher education and of adults who are less qualified in lifelong learning. In turn, this impacts these vulnerable young people's labour market prospects and career opportunities.

([188]) Council Recommendation of 22 May 2019 on High-Quality Early Childhood Education and Care Systems.

Graph A12.1: **Teacher shortages (2015-2022)**



(1) % of students in schools where principals report that a lack of teaching staff hinders instruction

Source: OECD (2023), PISA 2022 results (Volume II)

Persistent teacher shortages pose a risk to the quality of education. The 2022 PISA survey shows a significant increase in the number of pupils who study in schools where school leaders perceive the shortage of teachers (73% vs 44% in 2018) or of qualified teachers (51% vs 33% in 2018) as an obstacle to teaching (see Graph A10.1). Shortages remain particularly severe in science and mathematics and for support specialists. The shortages of fully qualified teachers ([189]) are exacerbated by: (i) an ageing teacher population ([190]); (ii) high dropout rates of entry-level teachers ([191]); and (iii) the new requirements for Estonian language proficiency to manage the transition to Estonian as language of instruction in all public schools. A recent audit warned that the share of qualified teachers is moving away from the 2026 target of 90% ([192]). The reasons for teacher shortages relate to: (i) high workloads, flat career structures and below-average pay for tertiary-educated workers; (ii) a lack of recognition for the teaching profession; (iii) insufficient preparation for the job, especially for novice teachers; and (iv) varying levels of school management quality. As Estonia's workforce is shrinking, competition from other sectors further exacerbates teacher attrition, particularly in subjects linked to STEM ([193]).

Policies to attract and retain more teachers target initial education, career structure, pay and working conditions, but funding constraints may be a challenge. As admissions to initial teacher education programmes have increased in recent years (partly due to scholarships), teacher retention is a key issue. This starts with graduates from initial teacher education who do not work as teachers, constituting a teacher reserve that could reduce the shortage of qualified teachers ([194]). The 2022-2026 teacher action plan sets out measures to make the teaching profession more attractive ([195]). The Education Ministry plans to extend the plan beyond 2026. There are, however, no publicly available progress reports on the action plan. Teacher pay still lags behind the pay of similarly educated workers ([196])). After pay rises of 23.9% in 2023 and 6.6% in 2024, no funding for further increases is included in the 2025 state budget and in the government-approved fiscal strategy for the next four years ([197])). The government has developed a four-stage career

([189]) The share of fully qualified teachers (teaching certificate and master's degree) decreased from 87% to 81% between 2017 and 2022.

([190]) educ_uoe_perp01: in 2022, 37.1% of teachers were over 55, well above the EU average of 24.8%.

([191]) In 2022, 55% of teacher training graduates had worked as a teacher for five consecutive years after graduation.

([192]) National Audit Office, 2024, Õpetajate vastavus kvalifikatsiooninõuetele ja ainepädevus.

([193]) Leijen et.al. (2024) The shortage of teachers in Estonia, European Journal of Teacher Education.

([194]) Arenguseire Keskus (2024). Õpetajate reserv Eestis

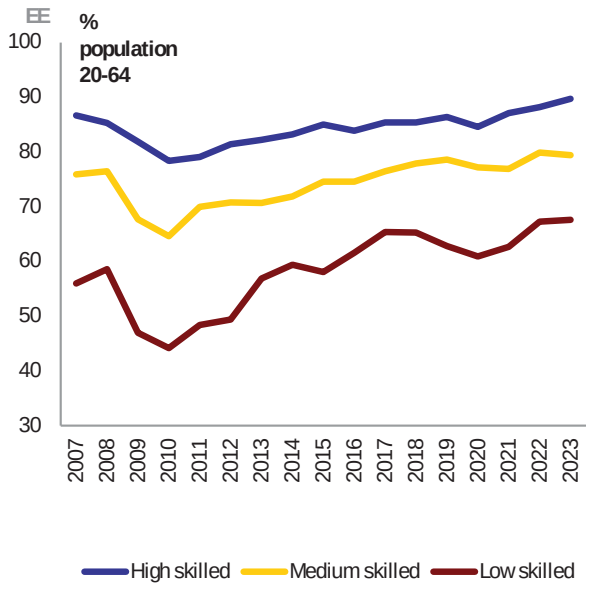
([195]) Estonian Ministry of Education and Research. (2021). Õpetajate järelkasvu tegevuskava (Action Plan for the Next Generation of Teachers).

([196]) OECD (2024) Education at a Glance, Figure D3.1.

([197]) Ministry of Finance (2024): 2025 state budget 2025. aasta riigieelarve seletuskiri_final.pdf.

model with potential salary increases per level, but its implementation depends on the availability of state funding.

Graph A12.2: **Employment rate by educational attainment (annual)**



Employment rates of people aged 20-64 (% of population)
Source: Eurostat, LFS [lfsa_ergaed]

Early school leaving and dropping out from higher education result in an insufficient supply of skilled graduates. More than 1 in 10 young people leave the education and training system with very low or no qualifications (11% in 2024), and boys are more likely to do so than girls (13.3% vs 8.6%). While this is close to the EU average (9.3%), the early leaving rate has not significantly decreased in the last decade. Early school leavers have significantly lower employment rates (see Graph A12.2) and higher at -risk-of-poverty-and-social-exclusion (AROPE) rates (Estonia has one of the highest AROPE rates in the EU, see Annex 10). In 2024, 42.7% of Estonians aged 25-34 held a university degree (EU: 44.2%), but the dropout rate from higher education is relatively high, as is the gender gap (21.6 pps vs an EU 11.2 pps difference in favour of women in 2024). While women tend to have higher educational attainment than men, they are often hired for less prominent positions, limiting the full use of their skills. Estonia's gender pay gap remains high despite the country's strong performance in the gender employment gap (see Annex 10). Early school leaving remains higher for persons with disabilities (24.9% vs 8.9% for people with no disability in 2024), indicating the need for stronger inclusion efforts.

To reduce early school leaving, the government raised the compulsory education age to 18 in 2024 (previously 16 years). The reform will require ninth grade pupils in the 2025/2026 academic year to stay in formal or non-formal education until 18, unless they complete their education earlier. It aims to ensure that less than 5% of pupils leave education and training early and that all young people acquire upper secondary education or vocational skills. Its effectiveness will depend on implementation and adequate funding.

An ambitious reform aims to boost the attractiveness of vocational education. In 2023, 43.4% of pupils in medium-level education attended vocational education and training (VET) programmes (EU: 52.4%) ([198]). VET graduates' exposure to work-based learning fell to 79.8% in 2025 (EU: 65.3%). The new reform aims to better integrate vocational education with other educational levels by bridging formal and non-formal learning and strengthening links between general, vocational and applied higher education. The reform: (i) promotes work-based learning; (ii) brings in new curricula focused on general competencies; (iii) proposes vocational secondary education as a viable alternative to general upper secondary education; and (iv) puts in place career counselling and flexible study arrangements to retain students and reduce dropout rates. The first pilots of the new curricula will be implemented in 2025/2026, with all VET curricula updated by 2027. Employment rates of VET graduates have fluctuated – dropping from 77% before the

([198]) European Commission, Education and Training Monitor 2024.

COVID-19 pandemic to 72% in 2020 and 2021, then rising to 84.7% in 2023. This highlights the need for the VET system to better respond to labour market demands and improve the flexibility of VET provision ([199]).

Estonia performs well in adult skills and digital literacy, but skills shortages and mismatches remain. Estonian adult skills exceed the OECD average, although older adults are significantly less proficient in all areas ([200]). In 2023, 62.6% of the population had at least a basic level of digital skills (vs 55.6% in the EU). However, skills shortages and mismatches remain, with over 18 000 additional workers needed every year according to OSKA projections ([201]) – with half of these requiring higher education and a third requiring vocational skills. According to the OECD, 23% of workers report that they have lower skills than required for their job (OECD: 10%). On qualifications, almost 40% of workers are overqualified or underqualified ([202]). Mismatches can also be a driver of unemployment when unemployed persons are inefficiently matched with job vacancies. Depending on the region and industry, the contribution of mismatch to the level of unemployment is roughly 5-8%, a study found ([203]). In 2022, 41.8% of adults participated in education and training over the last 12 months, exceeding the EU average of 39.5%. Participation is higher among young people (49.5% for 25-34-year-olds vs 31.2% for 55-64-year-olds) and considerably lower for adults with lower levels of education at 18.9%, in line with the EU average. Estonia aims to further strengthen adult learning, targeting an annual participation rate of 52.3% by 2030 to support upskilling and labour market adaptability. In addition, a project funded by the EU's Technical Support Instrument, running between 2024 and 2026, aims to help Estonia improve its skills forecasting and governance.

Estonia is making educational pathways more flexible to better reach under-represented groups. The rise in varied and flexible learning and career pathways gives new opportunities to different societal groups to participate in learning. Efforts focus on recognising skills acquired in different contexts and boosting transparency for learners, employers and other specialists through a digital skills profile tool. Micro-credentials, or 'micro-qualifications' in Estonia, are a flexible tool for adult learners to gain partial or full qualifications. To regulate this emerging field and extend the micro-qualifications system to vocational education and adult training institutions, amendments to the Adult Education Act were adopted in July 2024 and will enter into force in 2025. These lay down micro-qualifications and set out principles for providing them and a quality assurance mechanism. Nevertheless, it is challenging to ensure that these new opportunities cater to the varied learning needs of different groups (e.g. low-skilled adults, older adults, people with little learning experience).

EU funds support large scale programmes that aim to shape the development of adult learning opportunities. The ongoing professional qualifications system reform ([204]), financed by the European Social Fund (ESF), improves the system's flexibility and responsiveness to market changes. If implemented effectively, it can improve adult education and career and training planning. In 2023, EUR 70 million was allocated under the European Social Fund Plus (ESF+) to open up

([199]) Cedefop & ReferNet (2023) VET developments in line with national and European priorities.

([200]) OECD (2024), Survey of Adult Skills 2023: Estonia.

([201]) The Estonian Qualification Authority (OSKA): OSKA üldprognoos 2022-2031 | OSKA uuringud.

([202]) OECD (2024), OECD Economic Surveys: Estonia 2024.

([203]) Ferraro, S., & Kommer, P. (2023). Is there a labour market mismatch in Estonia? Measuring regional, occupational and industrial labour market mismatch. *Baltic Journal of Economics*, *23*(2), 200–228.

([204]) ESF project 'Reform of Estonian professional qualifications system' - OSKA.

adult learning opportunities, including by supporting the development of professional and general skills.

As part of the broader need for upskilling and reskilling the current workforce, developing green skills is particularly critical for Estonia's green transition. The country is facing economic restructuring to decrease its dependence on oil shale. 40% of the biggest employers registered in the Ida-Viru County (in North-East Estonia) are oil shale companies. The shift from oil shale for energy production threatens around 16 000 jobs, posing broader economic risks in the region. In 2024, Estonia reported labour shortages in occupations requiring specific skills related to the green transition, including plumbers and pipe fitters, electricians, and industrial and production engineers ([205]). 31% of small and medium-sized enterprises recognise the growing importance of green skills (EU: 42%). Estonia is expanding upskilling and reskilling efforts in energy-intensive industries. Among those, investments under the Just Transition Fund aim to mitigate the social and employment impact of the transition, including through reskilling and upskilling programmes for workers in Ida-Viru's oil shale industry and job transition measures. In addition, Estonia supports the green skills relevant to VET and adult education under its recovery and resilience plan.

Estonia has a high share of tertiary ICT graduates but faces a shortage of specialists in STEM fields due to rising demand. Among young people (16-24), basic digital skills proficiency is among the highest in the EU (86.8% vs 69.6% on average). The share of STEM tertiary graduates is slightly higher than the EU average (27.5% vs 26.6% in the EU in 2022), and the share of ICT graduates is one of the highest (9.6% vs 4.5% in the EU). Among pupils in medium-level VET, 49.2% were enrolled in STEM fields in 2022 (36.2% in the EU). However, the supply is insufficient to meet the growing demand as the green and digital transitions require more STEM specialists than are currently projected to graduate ([206]). Computer programming will have by far the highest number of job openings in the next 10 years (see Annex 3), and the lack of computer and software skills is the main gap identified among under-skilled Estonian workers ([207]).

The country promotes teaching and learning STEM subjects at all types and levels of education. From primary school to upper secondary education, VET, adult education and non-formal learning, programmes and initiatives aim to raise interest in STEM, update learning content and improve teaching quality. Student enrolment has increased in ICT but declined in technology and engineering. This has resulted in setting up ICT and engineering academies, funded partly by EU cohesion policy ([208]). Closing the supply gap for STEM professionals will largely depend on these measures.

([205]) European Labour Authority, *EURES Report on labour shortages and surpluses 2024*, 2025.

([206]) OSKA. (2020a). Eesti tööturg täna ja homme 2019-2027 (Estonia's labour market today and tomorrow 2019-2027).

([207])OECD (2024): Survey of Adult Skills 2023: Estonia

([208]) Education and Youth Board; IT Akadeemia programm, Inseneriakadeemia.

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

Social Scoreboard for Estonia		
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)	41,8
	Early leavers from education and training (% of the population aged 18-24, 2024)	11,0
	Share of individuals who have basic or above basic overall digital skills (% of the population aged 16-74, 2023)	62,6
	Young people not in employment, education or training (% of the population aged 15-29, 2024)	11,0
	Gender employment gap (percentage points, population aged 20-64, 2024)	1,7
	Income quintile ratio (S80/S20, 2024)	5,03
Dynamic labour markets and fair working conditions	Employment rate (% of the population aged 20-64, 2024)	81,8
	Unemployment rate (% of the active population aged 15-74, 2024)	7,6
	Long term unemployment (% of the active population aged 15-74, 2024)	1,8
	Gross disposable household income (GDHI) per capita growth (index, 2008=100, 2023)	126,0
Social protection and inclusion	At risk of poverty or social exclusion (AROPE) rate (% of the total population, 2024)	22,2
	At risk of poverty or social exclusion (AROPE) rate for children (% of the population aged 0-17, 2024)	16,5
	Impact of social transfers (other than pensions) on poverty reduction (% reduction of AROP, 2024)	31,5
	Disability employment gap (percentage points, population aged 20-64, 2024)	20,8
	Housing cost overburden (% of the total population, 2024)	8,6
	Children aged less than 3 years in formal childcare (% of the under 3-years-old population, 2024)	36,8
	Self-reported unmet need for medical care (% of the population aged 16+, 2024)	8,5

Critical situation	To watch	Weak but improving	Good but to monitor	On average	Better than average	Best performers

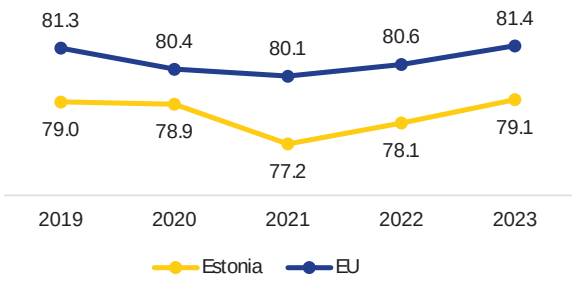
(1) Update of 5 May 2025. Members States are categorised based on the Social Scoreboard according to a methodology agreed with the EMCO and SPC Committees. Please consult the Annex of the Joint Employment Report 2025 for details on the methodology (https://employment-social-affairs.ec.europa.eu/joint-employment-report-2025-0).

Source: Eurostat

Estonia's health system faces challenges that need to be addressed if the country is to improve the health of its population and social fairness, while boosting the competitiveness of its economy. These challenges include: (i) limited access to care and low life expectancy, the latter linked to high treatable mortality; (ii) suboptimal funding and cost-effectiveness of the health system; (iii) shortages of healthcare workers; and (iv) an uneven geographical distribution of healthcare resources.

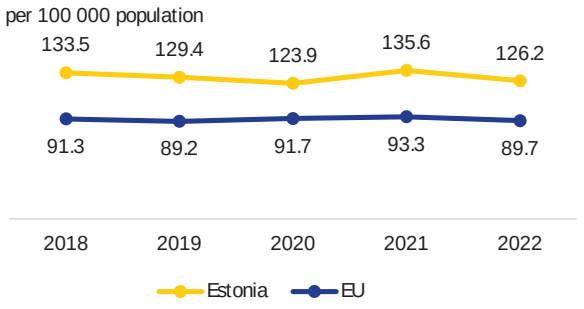
Life expectancy at birth in Estonia rebounded to its pre-COVID-19 level but remains among the lowest in the EU. There are striking gender gaps in health outcomes. While women can expect to live nine years longer than men, they can only expect to live about 2.6 years longer than men in good health. Treatable mortality remains among the highest in the EU (126.2 per 100 000 population in 2022 vs an EU average of 89.7), suggesting that the health system is not as effective as it should be. Diseases of the circulatory system ('cardiovascular diseases') and cancer remain the leading causes of death, with mortality rates higher than the EU average. Estonia participates in several joint actions funded by EU4Health, which address treatable mortality, particularly caused by cancer. Estonia's suicide rate is one of the highest in the EU. In 2025, Estonia launched its first Suicide Prevention Action Plan for 2025–2028, aiming to comprehensively reduce the number of suicides. In 2022, a mental health action plan for 2023–2026 was adopted. It focuses on improving mental health services, promoting mental well-being, and reducing stigma associated with mental health issues.

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



Source: Eurostat (demo_mlexpec)

Graph A14.2: **Treatable mortality**



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

Health expenditure in Estonia is low, as is the share of health costs supported by public funds. In 2022, health spending per inhabitant (adjusted for differences in purchasing power) was one of the lowest in the EU and only 75% of it was publicly funded (see Annex 1). The country therefore has a high level of out-of-pocket payments for healthcare (23.2% in 2022 vs an EU average of 14.3% ([209])). Accordingly, Estonia received a country-specific recommendation in 2024 to 'improve access to and financing of healthcare and long-term care' (see Annex 16). Out-of-pocket payments went predominantly towards outpatient medical goods, followed by dental care, long-term care and outpatient specialist care. Estonia is gradually increasing dental care benefits and reducing co-payments for medical goods. Starting in 2025, the Medicines and

([209]) OECD/European Commission (2024), Health at a Glance: Europe 2024 - State of Health in the EU Cycle, pp.186-187.

Medical Devices Reimbursement Act will reduce co-payments for medicines, medical devices, and inpatient nursing care, with additional compensation measures taking effect in May 2025. In 2023, spending on public health increased, primarily driven by rising wages of healthcare professionals. The government is currently conducting an analysis of Estonia's healthcare financing and exploring potential solutions. Several options to make the financing of healthcare more sustainable have been proposed by experts, but a final decision has not been taken yet. Historically, investment levels have been low, with a marked increase in recent years. In 2022, investment in health capital formation as a share of total health expenditure was higher than the EU average ([210]). Through its recovery and resilience plan (RRP), Estonia is investing EUR 72 million to address health-related challenges. This is complemented by EUR 1.4 million under the cohesion policy funds for 2021-2027 ([211]).

Spending on disease prevention is close to the EU average, yet preventable mortality remains high. In 2022, spending on prevention accounted for 5.7% of Estonia's total health expenditure, close to the EU average of 5.5%. The rate of preventable mortality is among the highest in the EU, linked to a high prevalence of behavioural risk factors. These include tobacco smoking/vaping, dietary risks, alcohol consumption and low levels of physical activity. Estonia has introduced several policies to address these challenges, including its national health plan for 2020-2030. It aims at increasing life expectancy by promoting healthy choices and addressing risk factors. The "Estonia 2035" strategy focuses on innovation, a sustainable economy, and an inclusive society. In 2019, amendments to Estonia's Tobacco Act banned displays of tobacco products, flavoured e-cigarette liquids and remote tobacco sales.

Access to healthcare is limited, as Estonia's health system is under resourced. In 2024, the proportion of the Estonian population reporting unmet needs for medical care remained among the highest in the EU (8.5% vs an EU average of 2.5%) (see Annex 11). Long waiting times are the main reason for these unmet needs, with lower income groups affected the most. Access to healthcare is particularly low in rural areas (see Annex 17). A range of measures under the RRP and the cohesion policy aim to improve the accessibility of the health system. The Estonian RRP envisages investments to: (i) improve health infrastructure (construction of a county hospital and health centre in Vijandi); (ii) implement organisational reforms; (iii) strengthen primary healthcare; and (iv) support the health workforce. A Hospital Network Development Roadmap has been prepared, with a view to enhancing the Estonian healthcare system. Furthermore, with the help of the cohesion policy funds, Estonia improves healthcare by setting up multidisciplinary healthcare centres and offering complex services via multiprofessional teams and investing in integrated care. Estonia also participates in the Joint Action CIRCE-JA([212]) funded by EU4Health aimed at transferring good practices in primary care between EU countries.

([210]) see Health at a Glance Europe 2018, 2020, 2022 and 2024.

([211]) The EU cohesion policy data reflect the status as of 13 May 2024.

([212]) https://circeja.nfz.gov.pl/

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

	2019	2020	2021	2022	2023	EU average* (latest year)
Cancer mortality per 100 000 population	279.5	265.0	265.8	246.7	n.a.	234.7 (2022)
Mortality due to circulatory diseases per 100 000 population	570.3	560.2	599.4	575.0	n.a.	336.4 (2022)
Current expenditure on health, purchasing power standards, per capita	1 739	1 901	2 058	2 014	n.a.	3 684.6 (2022)
Public share of health expenditure, % of current health expenditure	74.5	77.1	76.1	74.8	76.1	81.3 (2022)
Spending on prevention, % of current health expenditure	3.6	4.9	8.8	5.7	n.a.	5.5 (2022)
Available hospital beds per 100 000 population**	402	397	389	374	n.a.	444 (2022)
Doctors per 1 000 population*	3.5	3.5	3.4	3.5	n.a.	4.2 (2022)*
Nurses per 1 000 population*	6.2	6.4	6.5	6.6	n.a.	7.6 (2022)*
Mortality at working age (20-64 years), % of total mortality	18.6	19.0	17.6	17.8	18.3	14.3 (2023)
Number of patents (pharma / biotech / medical technology)	1	4	4	0	4	29 (2023)***
Total consumption of antibacterials for systemic use, daily defined dose per 1 000 inhabitants****	11.8	10.5	10.1	12.4	12.7	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.

Shortages of health staff limit the availability of care. Estonia faces persistent shortages in its health workforce. In 2022, Estonia had fewer doctors (3.5 per 1 000 population) and nurses (6.7 per 1 000 population) than the EU average (4.2 and 7.6 respectively). The number of new medical graduates in Estonia plateaued between 2010 and 2022 and remained significantly below the EU average. A high proportion of doctors and nurses are aged 55 and over, raising concerns about the long-term accessibility of health services. There is an acute shortage of family doctors and medical staff, particularly outside the major cities of Tallinn and Tartu. Working conditions are a major deterrent to entering the profession, particularly low pay. The government has taken steps to address these challenges, including by increasing the minimum hourly wages of doctors and nurses as of 1 April 2023. The Hospital Network Development Roadmap includes measures to train the workforce on teamwork, task shifting between specialists and using digital solutions. The government has also approved a Strategic Framework for addressing health workforce shortages as part of the Estonian RRP. The RRP also includes measures to improve the reimbursement system for doctors, nurses and pharmacists as well as to incentivise health staff to work in remote areas. It is also addressing the low graduation levels of nurses by increasing admissions to nursing training by 5%. Estonia participates in the Joint Action HEROES ([213]) funded by EU4Health, aimed at sharing expertise among EU countries on health workforce planning.

The Estonian health system's potential to drive innovation and foster industrial development in the EU medical sector remains largely untapped. Estonia is among the EU countries with the lowest levels of public spending on health research and development. This is reflected in the low number of European patents granted: 4 in 2023 in the combined areas of pharmaceuticals, biotechnologies and medical devices (vs an EU median of 29 ([214])). Clinical trial activity in Estonia is also limited ([215]) (see Annex 4).

Estonia aims to scale up the digitalisation of its health system, **with support from EU programmes.** The shares of people accessing their personal health records online and using online health services (excluding phone) instead of in-person consultations are well

([213])JA HEROES | Health workforce planning project (https://healthworkforce.eu/the-project/).

([214]) European Patent Office, Data to download | epo.org.

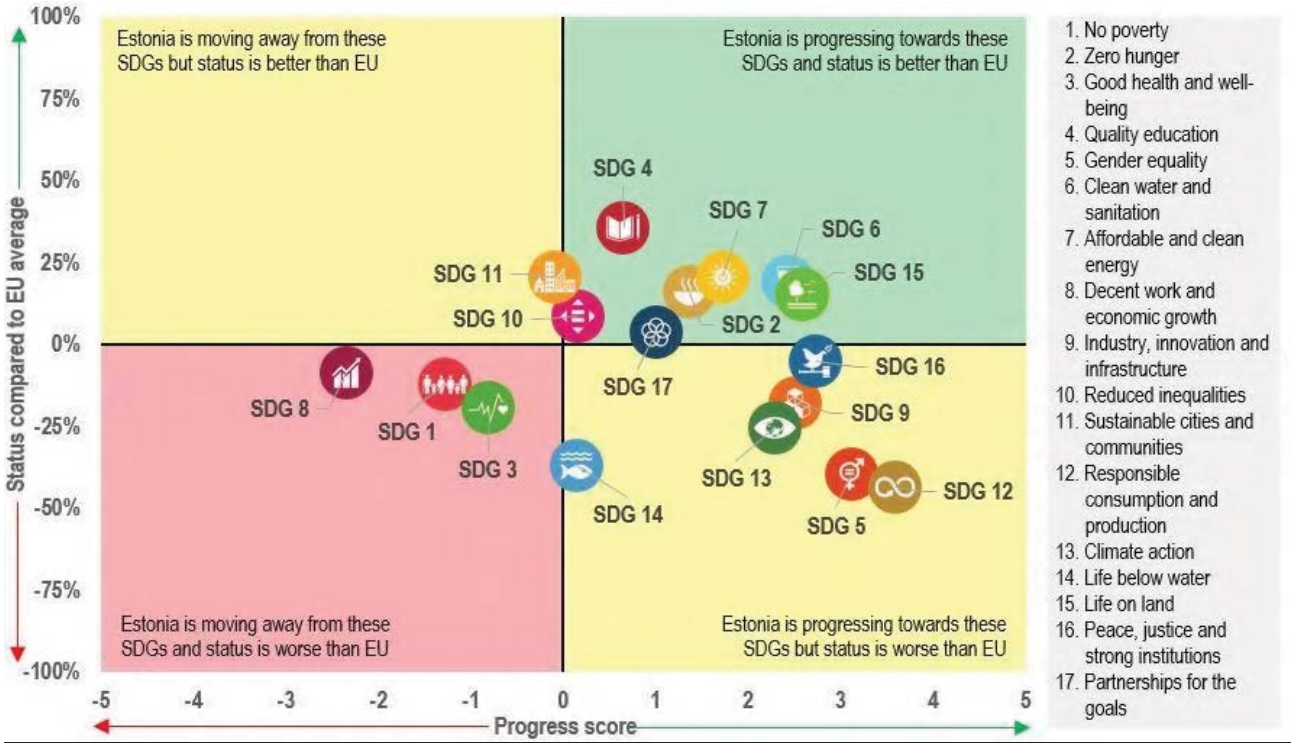
([215])EMA (2024), Monitoring the European clinical trials environment, p. 9.

above the EU average, despite a slight drop between 2022 and 2024. However, there is still room for improvement. Measures to boost the digital transformation of Estonia's health sector set out in its RRP include updating the governance framework for e-health and coordinating the development of e-health services. Legislative amendments are also planned to improve access to specialised care in primary care settings by expanding e-consultation to include remote consultations with specialists. Estonia also participates in joint actions and direct grants under EU4Health aimed at improving the interoperability of health data and facilitating the implementation of the European Health Data Space.

This Annex assesses Estonia'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.

Estonia is performing well and improving on one SDG on *competitiveness* (Quality education, SDG 4) but the country still needs to catch up with the EU average on SDG 9 (Industry, innovation and infrastructure). Furthermore, Estonia is falling behind and needs to catch up with the EU average on SDG 8 (Decent work and economic growth). The country is performing well and improving on adult learning (SDG 4; participation in learning in the past four weeks is up from 19.6% of the active population aged 25-64 in 2019 to 23.3% in 2024; EU average of 13.3%). While gross domestic expenditure on R&D (SDG 9) increased from 1.4% of GDP in 2018 to 1.8% in 2023, it is still below the EU average of 2.2%. The share of buses and trains in passenger transport (SGD 9) fell from 19.8% of inland passenger-km in 2017 to 14.4% in 2022, to below the EU average of 16.6%. The

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



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.

share of households with high-speed internet connection (SDG 9) increased from 57.4% of households in 2019 to 76.9% in 2023 (the EU average: 78.8%). The Estonian recovery and resilience plan (RRP) includes significant reforms and investments to boost innovation and digital transition in businesses. However, there is still room for improvement in addressing the remaining challenges.

While Estonia performs well and is improving on several of the SDGs related to *sustainability* (SDGs 2, 6, 7 and 15), the country needs to catch up with the EU average on SDGs 9, 12, 13 and 14. Furthermore, Estonia performs well but is moving away from SDG 11 (Sustainable cities and communities). The area under organic farming (SDG 2) increased from 20.0% of utilised agricultural area in 2017 to 23.4% in 2022 (the EU average: 10.5). The country is also performing well and has made progress on most of the affordable and clean energy indicators (SDG 7), including on the share of renewable energy in gross final energy consumption, from 30.0% in 2018 to 41.0% in 2023 (EU average 24.6%). However, while Estonia's material footprint (SDG 12) decreased from 30.6 tonnes per inhabitant in 2018 to 29.9 in 2023, it is still above the EU average of 14.2 tonnes per inhabitant. Similarly, while the country's air emissions intensity of fine particulate matter from industry (SDG 9) has fallen from 0.37 grams per euro in 2017 to 0.14 in 2022, it is still above the EU average of 0.06 grams per euro. On the other hand, population living in households suffering from noise (SDG 11) increased from 8.6% of population in 2018 to 9.6% in 2023 (EU average: 18.2%).

Estonia is moving away from and still needs to catch up on three SDG indicators (1, 3 and 8) related to *social fairness*. But the country is improving on SDG 5 (Gender equality) and performs well and is also improving on three other *fairness*-related SDG indicators (4, 7and 10). Estonia is moving away from the SDGs and needs to catch up with the EU average on poverty reduction (SDG 1), including on people at risk of poverty or social exclusion (up from 23.6% of the population in 2018 to 24.2% in 2023; EU average: 21.3%). While there is an improvement on the self-reported unmet needs for medical care (SDG 3), falling from 16.4% of the population aged 16 or over in 2018 to 12.9% in 2023, this is still above the EU average of 2.4%. The in-work at-risk-of-poverty rate (SDG 8) increased from 9.3% of the population aged 18 or over in 2018 to 10.3% in 2023 (EU average: 8.3%). Furthermore, Estonia still needs to catch up on some gender equality indicators (SDG 5). The average gross hourly earnings of women went from being 21.8% lower than men in 2018 to 16.9% lower in 2023 but this is still above the EU average of 12.0%. However, compared to 2019, tertiary educational attainment (SDG 4) increased from 40.6% of the population aged 25 to 34 to 42.7% in 2024 (EU average: 44.2%). Similarly, EU/non-EU citizenship gap for employment rate (SDG 10) decreased from 6.8 pp difference (% of population aged 20 to 64) in 2018 to 6.6 pp difference in 2024 (EU average: 12.5). The Estonian RRP includes measures to address challenges in primary healthcare and long-term care.

Estonia is moving away from SDGs and still needs to catch up on one SDG indicator related to *macroeconomic stability* (SDG 8). But the preforms well and is improving on SDG 17 (Partnerships for the goals). Real GDP per capita (SDG 8) has declined (contracted from EUR 21 650 in 2019 to EUR 21 020 in 2024) and remains below the EU average of EUR 33 530.([216]) The general government gross debt (SDG 17) grew from 9.0% of the GDP in 2019 to 23.6% of the GDP in 2024, but it remains below the EU average of 81.0%. The general government total expenditure on law courts (SDG 16) has also increased from EUR 58.2 per capita in 2018 to EUR 81.3 in 2023

([216]) Adjusted for inflation using a chain-linked methodology and with 2020 serving as the reference point.

but remains below the EU average of EUR 121.7.

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

Estonia 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 the accessibility and affordability of healthcare and long-term care, research and innovation, access to finance for SMEs, labour productivity and skills, energy efficiency, investment into renewable energy and storage, bio-based innovation, sustainable transport, increasing social protection including broader coverage of unemployment benefits.

The Commission has assessed the 2019-2024 CSRs considering the policy action taken by Estonia to date and the commitments in its recovery and resilience plan (RRP). At this stage, Estonia has made at least 'some progress' on 91% of the CSRs ([217]) , and 'limited progress' on 9% (Table A16.2).

EU funding instruments provide considerable resources to Estonia 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 953 million funding from the Recovery and Resilience Facility (RRF) in 2021-2026, EU cohesion policy funds ([218]) are providing EUR 3.4 billion to Estonia (amounting to EUR 5.2 billion with national co-financing) for 2021-2027 ([219]) to boost regional competitiveness and growth. Support from these instruments combined represents around 11.3% of 2024 GDP ([220]). 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 Estonia under the 2014-2020 multiannual financial framework, which financed projects until 2023 and has had significant benefits for the economy and Estonian society. Project selection under the 2021-2027 cohesion policy programme is advanced, while implementation of selected projects has also gained momentum, enabling substantial investment.

The Estonian RRP contains 28 investments and 17 reforms to stimulate sustainable growth, enhance social fairness and support the green and digital transitions of the economy. Implementation is well on its way with 66% of the funds disbursed. At present, Estonia has fulfilled 49% of the milestones and targets in its RRP ([221]). Efforts are needed to ensure completion of all RRP measures by 31 August 2026. Public investment is hampered by the difficulties of investing in outlying and Eastern border regions where skills may be lacking, and the limited availability of private finance makes public investment all the more important.

Estonia also receives funding from several other EU instruments, including those listed in table A16.1. Most notably, the common agricultural policy (CAP) provides Estonia with an EU contribution of EUR 1.4 billion under the CAP strategic plan for 2023-2027 ([222]). Furthermore, operations amounting to EUR 101.3 million ([223]) have been signed under the

([217]) 11% of the 2019-2024 CSRs have been fully implemented, 15% substantially implemented, and some progress has been made on 65%.

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

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

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

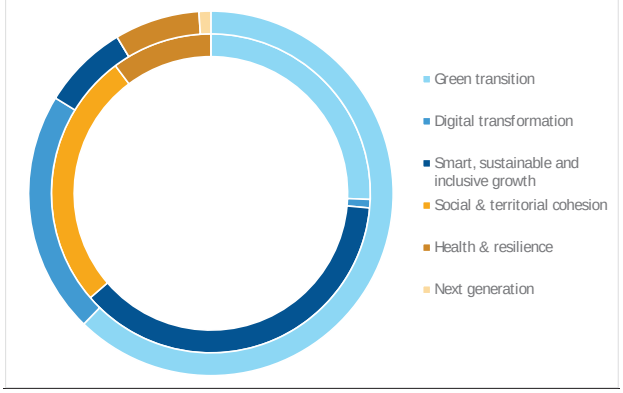
([221]) As of mid-May 2025, Estonia has submitted 3 payment requests.

([222]) An overview of Estonia'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/estonia_en

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

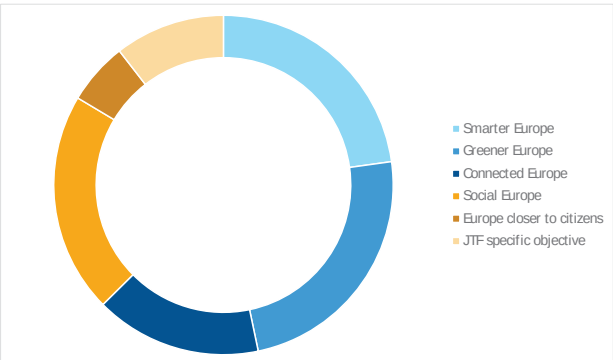
InvestEU instrument backed by the EU guarantee, improving access to financing for riskier operations in Estonia.

Graph A16.1: **Distribution of RRF funding in Estonia 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.

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



Source: European Commission

Cohesion policy funds aim to increase the productivity and competitiveness of Estonian firms and improve the business environment. For example, the European Regional Development Fund (ERDF) and the Just Transition Fund (JTF) will provide support to over 12 000 businesses, focusing on boosting innovation and ERDF will enable nearly 800 businesses to invest in new skills relevant for smart specialisation, industrial transition and entrepreneurship. ESF+ allocates EUR 132 million to better match vocational and higher education with labour market needs, with a focus on labour market gaps and including digital skills. Alongside furthering digital skills, ESF+ actions focus on key competencies, future skills, science, technology, engineering and mathematics. Interventions also include EUR 82.2 million in support of high-quality flexible non-formal upskilling and reskilling that takes into account the forecasted skills demand on the labour market. Adults with low education or skill level are able to continue their studies in non-stationary formal education. It is estimated that nearly 62 000 adults will participate in non-formal learning supporting upskilling and reskilling.

Other funds are contributing to competitiveness in Estonia, for instance through open calls. The Connecting Europe Facility has financed strategic investments in rail transport such as the Rail Baltica, the development of alternative fuel infrastructure in the air and maritime sectors, the integration of the energy market including the synchronisation of the Baltic States with the EU's electricity system and in 5G connectivity along transport corridors, along Via Baltica. Horizon Europe has supported research and innovation, from scientific breakthroughs to scaling up innovations, with Climate, Energy and Mobility as top priorities in Estonia. The Technical Support Instrument (TSI) in Estonia is focused on the development of a national strategy for critical entities and enhancing capabilities for managing crisis and on promoting the uptake of strategic public procurement.

Estonia'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, Estonia supported the digitalisation of companies, focusing on small and medium-sized enterprises as well as training programmes to reinforce the digital skills of ICT experts and managers. In addition, Estonia took steps to improve the competitiveness of Estonian

companies in the foreign markets. Estonia adopted a new legislation that streamlines planning, permitting and environmental impact assessment processes for wind energy projects. To help Estonia implement its RRP, in 2024 the TSI assisted with measures to strengthen the skills governance system.

EU funds are playing a significant role in promoting environmental sustainability and green transition in Estonia during the current seven-year EU budget (multiannual financial framework). The JTF is instrumental in supporting: (i) efforts to phase out oil shale in the energy sector, essential for reducing greenhouse gas emissions in Estonia; and (ii) the creation of job opportunities in the mining region of Ida-Virumaa. Cohesion policy funds also make a substantial contribution to improving energy efficiency, improving separate waste collection and promoting clean transport. For example, the funds are supporting the electrification of 450 km of TEN-T railway track and solutions for clean urban transport. The CAP strategic plan allocates 40% of its rural development budget (EUR 174 million) to environmental and climate objectives, and 28% of its direct payments budget (EUR 279 million) to eco-schemes. This support is focused on carbon sequestration, biodiversity and valuable grasslands, and increasing knowledge about sustainable production.

Estonia's RRP, including the REPowerEU chapter, has a comprehensive set of reforms and investments for the green transition. A Green technologies Development Programme has been set up by Estonia to support the development and uptake of green technologies by businesses. Works have been progressing towards expanding the electricity network and increasing its capacity by 160 megawatts. Moreover, Estonia has been supporting the increase in production capacity of biomethane thus accelerating the integration of renewable energy in the system.

Promoting fairness, social cohesion and improving access to basic services are among the key priorities of EU funding in Estonia. For instance, the ERDF supports the integration of healthcare and social services through the setting-up of integrated service and wellbeing centres. In addition, ESF+ supports the development of a comprehensive long-term care system that prevents, reduces and helps address care needs, promotes independent living and livelihoods, and supports carers. Over EUR 43 million are dedicated to measures that improve access to long-term care. It is estimated that 70% of participating care givers will benefit from a reduced care burden. ESF+ also supports active inclusion with a view to promoting equal opportunities, non-discrimination and active participation, and improving employability, in particular for disadvantaged groups. Over EUR 33.5 million will be spent on addressing child poverty. Interventions for children and young people focus on improving access services, supporting integrated active inclusion measures and preventing risk-taking behaviour through the involvement of local communities and civil society.

Estonia's RRP contains several reforms and investments related to fairness and social policies. Reforms aiming at reducing the gender pay gap include the roll out of a digital tool supporting employers to implement the principle of equal pay. Furthermore, reforms in the health sector are bearing fruit: a new reimbursement system has been established for nurses to incentivise them to work in remote areas covering advanced practice nurses, in primary health care and hospitals. This is complemented by a further increase of the admissions to nursing training. To help Estonia implement its RRP, in 2024 the TSI assisted with measures to improve the primary health system.

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)	953.2		627.1
RRF loans	0		0
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)	3 702.1	3 369.3	2 107.7
European Regional Development Fund (ERDF)	2 051.2	1 701.6	1 095.8
Cohesion Fund (CF)	1 061.5	779.7	587.2
European Social Fund (ESF, ESF+)	589.3	534.2	282.1
Just Transition Fund (JTF)		353.9	142.6
Fisheries			
European Maritime, Fisheries and Aquaculture Fund (EMFAF) and the European Maritime and Fisheries Fund (EMFF)	101.0	97.4	50.7
Migration and home affairs			
Migration, border management and internal security - AMIF, BMVI and ISF (4)	68.7	91.4	34.0
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	1 448.7		434.1
European Agricultural Guarantee Fund (EAGF)	1 008.6		391.3
European Fund for Agricultural Development (EAFRD)	440.1		42.8

(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:

Estonia	Assessment in May 2025	Relevant SDGs
2019 CSR 1	**Substantial progress**	
Ensure that the nominal growth rate of net primary government expenditure does not exceed 4.1% in 2020, corresponding to an annual structural adjustment of 0.6% of GDP.	Not relevant anymore	SDG 8, 16
Ensure effective supervision and the enforcement of the anti-money laundering framework.	Substantial progress	SDG 8, 16
2019 CSR 2	**Some progress**	
Address skills shortages and foster innovation by improving the capacity and labour market relevance of the education and training system.	Some progress	SDG 4
Improve the adequacy of the social safety net and access to affordable and integrated social services.	Some progress	SDG 1, 2, 10
Take measures to reduce the gender pay gap, including by improving wage transparency.	Some progress	SDG 8, 10
2019 CSR 3	**Some progress**	
Focus investment-related economic policy on sustainable transport and energy infrastructure, including interconnections, on fostering research and innovation, and on resource and energy efficiency, taking into account regional disparities.	Some progress	SDG 7, 9, 10, 11, 13
2020 CSR 1	**Some progress**	
In line with the general escape clause, take all necessary measures to effectively address the 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.	Not relevant anymore	SDG 8, 16
Improve the accessibility and resilience of the health system, including by addressing the shortages of health workers, strengthening primary care and ensuring the supply of critical medical products.	Some progress	SDG 3
2020 CSR2	**Some progress**	
Strengthen the adequacy of the social safety net, including by broadening the coverage of unemployment benefits.	Some progress	SDG 1, 2, 10
2020 CSR 3	**Some progress**	
Front-load mature public investment projects	Some progress	SDG 8, 16
and promote private investment to foster the economic recovery.	Substantial progress	SDG 8, 9
Focus investment on the green and digital transition, in particular on digitalisation of companies,	Some progress	SDG 9
research and innovation,	Some progress	SDG 9
clean and efficient production and use of energy,	Some progress	SDG 7, 9, 13
resource efficiency, and	Limited progress	SDG 6, 7, 12, 15
sustainable transport, contributing to a progressive decarbonisation of the economy.	Limited progress	SDG 11
Support the innovation capacity of small and medium-sized enterprises,	Substantial progress	SDG 8, 9
and ensure sufficient access to finance.	Some progress	SDG 8, 9
2020 CSR 4	**Substantial progress**	
Step up the efforts to ensure effective supervision and enforcement of the anti-money laundering framework.	Substantial progress	SDG 8, 16

(Continued on the next page)

Table (continued)

2021 CSR 1	**Not relevant anymore**	
In 2022, maintain a supportive fiscal stance, including the impulse provided by the Recovery and Resilience Facility, and preserve nationally financed investment.	Not relevant anymore	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.	Not relevant anymore	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.*	Not relevant anymore	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.	Not relevant anymore	SDG 8, 16
2022 CSR 1	**Not relevant anymore**	
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.	Not relevant anymore	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.	Not relevant anymore	SDG 8, 16
For the period beyond 2023, pursue a fiscal policy aimed at achieving prudent medium-term fiscal positions.	Not relevant anymore	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 29 October 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	**Some progress**	
Strengthen social protection, including by extending the coverage of unemployment benefits, in particular to those with short work spells and in non-standard forms of work.	Some progress	SDG 1, 2, 10
Improve the affordability and quality of long-term care, in particular by ensuring its sustainable funding and integrating health and social services.	Some progress	SDG 3
2022 CSR 4	**Some progress**	
Reduce overall reliance on fossil fuels and diversify imports of fossil fuels	Some progress	SDG 7, 9, 13
by accelerating the deployment of renewables, including through further streamlining of permitting procedures	Some progress	SDG 7, 8, 9, 13
ensuring sufficient capacity of interconnection	Substantial progress	SDG 7, 9, 13
and strengthening the domestic electricity grid.	Some progress	SDG 7, 9, 13
Increase energy efficiency, including of buildings, to reduce energy consumption.	Some progress	SDG 7
Intensify efforts to improve the sustainability of the transport system, including through electrification of the rail network and by increasing incentives to encourage sustainable and less polluting transport, including the renewal of the road vehicle stock.	Some progress	SDG 11

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Table (continued)

2023 CSR 1	**Substantial 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 such support measures are targeted at protecting vulnerable households and firms, are fiscally affordable and preserve incentives for energy savings.	Full implementation	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 4,9%.	Full implementation	SDG 8,16
Preserve nationally financed public investment and ensure the effective absorption of grants under the Facility and of other Union funds, in particular to foster the green and digital transitions.	Substantial 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, in order to achieve a prudent medium-term fiscal position.	Full implementation	SDG 8,16
2023 CSR 2		
Proceed with the steady implementation of its recovery and resilience plan including its REPowerEU chapter. 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	**Some progress**	
Strengthen social protection, including to address old-age poverty, and by extending the coverage of unemployment benefits, in particular for those with short work spells and in non-standard forms of work.	Some progress	SDG 1,2,10
Improve access to and the affordability of healthcare and	Limited progress	SDG 3
long-term care, in particular by ensuring their sustainable funding.	Some progress	SDG 3
2023 CSR 4	**Some progress**	
Reduce overall reliance on fossil fuels,	Some progress	SDG 7,9,13
accelerate the deployment of renewable energy sources, including by strengthening the domestic electricity grid capacity.	Some progress	SDG 7,9,13
Ensure sufficient capacity of electricity interconnections to increase the security of supply and continue the synchronisation with the Union electricity grid.	Substantial progress	SDG 7,9,13
Strengthen energy efficiency through new financing and support measures to meet the targets of the long-term renovation strategy.	Some progress	SDG 7
Continue efforts to increase the share of sustainable transport by electrifying the rail network and through taxation that incentivises the gradual renewal of the vehicle stock towards zero or low-emission vehicles.	Some progress	SDG 8, 10, 11, 12
Step up policy efforts aimed at the provision and acquisition of skills and competences needed for the green transition.	Some progress	SDG 4
2024 CSR 1	**Some progress**	
Submit the medium-term fiscal-structural plan in a timely manner.	Full implementation	SDG 8, 16
In line with the requirements of the reformed Stability and Growth Pact, limit the growth in net expenditure in 2025 to a rate consistent with, inter alia, reducing the general government deficit below the 3% of GDP Treaty reference value and keeping the general government debt at a prudent level over the medium term.	Full implementation	SDG 8, 16
Broaden the tax base and	Some progress	SDG 8, 10, 12
improve access to and financing of healthcare and	Limited progress	SDG 3
long-term care.	Some progress	SDG 3

(Continued on the next page)

Table (continued)

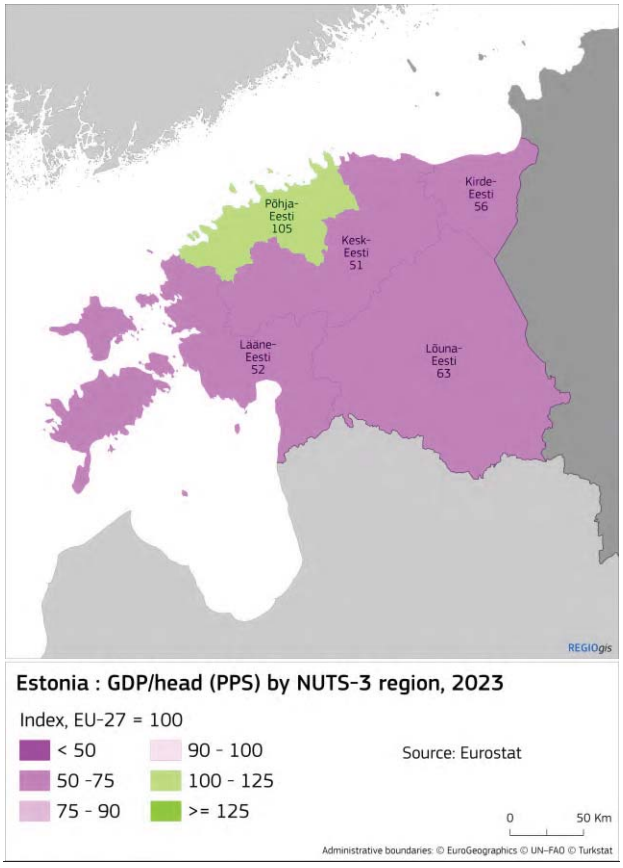
2024 CSR 2		
Continue with the swift and effective implementation of the recovery and resilience plan, including the REPowerEU chapter, ensuring completion of reforms and investments by August 2026. Accelerate the implementation of the cohesion policy programme. In the context of the mid-term review, continue focusing on the agreed priorities, taking action to better address the needs in the long-term care sector, 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. Progress with the cohesion policy is monitored in the context of the Cohesion Policy of the European Union.	
2024 CSR 3	Some progress	
Strengthen social protection, inter alia to address old-age poverty and by extending the coverage of unemployment benefits, in particular to those with short work spells and in non-standard forms of work.	Some progress	SDG 1, 2, 10
2024 CSR 4	Some progress	
Reduce the share of oil shale in the energy mix and raise resource productivity through bio-based innovation.	Some progress	SDG 6, 12, 15
Improve labour productivity and skills supply through reskilling and upskilling, and by better attracting and retaining talent.	Some progress	SDG 4

Source: European Commission

While Estonia scores well on quality of government and ease of doing business, it remains important for the country to boost productivity and entrepreneurship outside the main economic centres to address disparities in regional development.

Estonia's regional outlook continues to be characterised by significant disparities between its capital region – Põhja-Eesti – and the rest of the country. In 2023, GDP per head (purchasing power standard (PPS) in Põhja-Eesti stood at 105% of the EU average. In the remaining four NUTS 3 regions, GDP per head ranged from 51% in Kesk-Eesti to 63% in Lõuna-Eesti (Map A17.1).

Map A17.1: **GDP per head (in purchasing power standard PPS), NUTS 3, 2023**



Source: Eurostat

Competitiveness

In 2022, Estonia's score in the EU Regional Competitiveness Index exceeded the EU average with a score of 106.5 (EU average = 100). A deeper analysis of the index's components reveals that Estonia outperformed the EU average in the *basic* pillar, which includes factors such as transport infrastructure and population health, and in the advanced pillar, related to innovation outputs and inputs. However, Estonia lagged behind the EU average in the efficiency pillar, which evaluates factors linked to labour market efficiency and human capital.

Entrepreneurial activity and innovation are highly concentrated in two counties, although other regions also have competitive advantages. 71% of companies are registered in Harju (Põhja-Eesti) and Tartu (in Lõuna-Eesti) counties and they produce 68% of Estonian goods and 84% of services exports. While the relative ease of doing business in Estonia provides favourable conditions, particularly for starting a business ([224]), and there are cases of businesses successfully scaling up, larger tech-based companies are generally concentrated in Tallinn and the second biggest city of Tartu in the south of the country. Innovation activity is also concentrated in these two cities, clustering around major universities. These cities host various innovation ecosystems and clusters in areas such as health and medicine, defence (dual-use technologies), ICT, logistics and aviation. These cities hold the biggest potential for creating and scaling up tech-based companies. The county of Ida-Viru (Kirde-Eesti) is transitioning out of an economy relying largely on oil shale mining and energy production. The existing industrial base provides opportunities for developing new industries. However, this transition also presents economic and labour market challenges (see Annex 11). The existence of a university branch in the city of Kohtla-Järve that is already geared towards a just transition both in terms of education and applied research can help ensure that skills

([224]) World Bank ease of doing business ranking.

development matches future needs. The higher GDP and gross value added in Põhja-Eesti is largely based on service-sector exports. The economies of Lääne-Eesti, Kesk-Eesti and Lõuna-Eesti (except Tartu County) are largely based on forestry, agriculture, wood and food processing, which have less added value

Table A17.1:**Selection of indicators at regional (NUTS 3) level in Estonia**

	GDP per head (PPS)	Real GDP per head growth	Productivity - GDP per person employed (PPS)	Real productivity growth (per person employed)	Productivity - GDP per hour worked (PPS)	Real productivity growth (per hour worked)
	Index EU-27 = 100	Average annual % change	Index EU-27 = 100	Average annual % change	Index EU-27 = 100	Average annual % change
	2023	2014-2023	2023	2014-2023	2022	2013-2022
European Union (27 MS)	100	1.6	100	0.6	100	0.9
Estonia	80	1.8	78	0.8	70	1.8
Põhja-Eesti	105	0.8	90	0.1	80	0.9
Lääne-Eesti	52	1.9	59	1.4	52	1.8
Kesk-Eesti	51	2.8	63	2.1	58	3.7
Kirde-Eesti	56	2.4	69	1.8	71	4.9
Lõuna-Eesti	63	3.4	65	1.8	60	2.7

Source: Eurostat and JRC

The significant disparities in GDP per capita across Estonia's NUTS 3 regions are linked to substantial gaps in labour productivity. In 2022, productivity measured as GDP per hour worked in purchasing power standard was below the EU average (100) in all Estonian regions. It ranged from 52% of the EU average in Lääne-Eesti to 71% in Kirde-Eesti and 80% in the capital region, Põhja-Eesti. Labour productivity in every Estonian region was also below the average for the EU's transition regions, which stood at 93% of the EU average. Increasing productivity across the board, especially outside the better-performing capital area, remains one of Estonia's key challenges for the coming years.

Additional bottlenecks that hinder Estonia's competitiveness are low resource productivity, knowledge gaps in technology-intensive business and low clarity in government priorities and policies ([225]). Strengthening long-term strategic planning by adapting to changing economic reality, with fully integrating the green and digital transition, increasing resource efficiency, and with stronger focus on strategic new sectors like defence, could help bring the economy back to growth.

While Estonia ranks well as regards the quality of government, the capacity of municipalities can vary, and local planning processes can take time. The quality of government in Estonia, as measured by the European Quality of Government Index ([226]) exceeds the EU average but trust in regional and local authorities has decreased, which could be due to regional disparities and underfunding (see Annex 6). Even though the administrative reform of 2017 reduced the number of municipalities from 213 to 79, many of them remain relatively small. Local planning processes can act as barriers to investments, where they are lengthy. Estonia has launched changes to planning legislation to speed up and streamline planning processes. Quick adoption of relevant legislation could boost economic development and attract new investment, especially at local level.

In some areas such as water management, fragmented public service provision raises issues of financial sustainability. The fragmentation of the water management sector ([227]) and the limited size of the many service providers hinder the industry's financial capacity to operate, maintain and renew existing assets. Estonia currently lacks a

([225]) Eesti majanduse olukord ja väljavaated: konkurentsivõime eksperdikogu raport Riigikogule, June 2024

([226]) European Quality of Government Index 2024 | University of Gothenburg

([227]) 135 water companies were operating in Estonia at the start of 2024, of which 90 were water companies designated by municipalities and approx. 45 were various non-profit organizations that meet the characteristics of a water company. Source: Inception report on the implementation of the action plan towards sustainable water services, 2023.

sustainable funding strategy for the long-term operation and maintenance of infrastructure that provides drinking water and wastewater treatment services but work on this has started ([228]). The road map for water sector services reform is expected to be completed by June 2025.

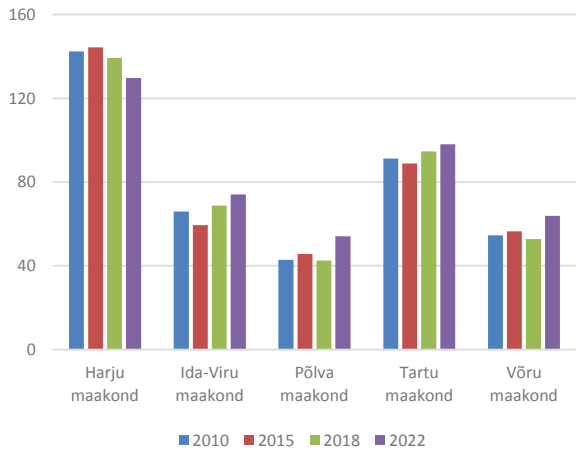
Significant socio-economic disparities persist between urban and rural areas. The weaker performance of rural areas is further exacerbated by low levels or lack of human capital and access to services. The share of the working-age population with a tertiary education is at its lowest in rural regions, underperforming urban areas by approximately 15 percentage points. In addition, in comparison to rural areas, as well as towns and suburbs, urban areas have lower rates of young people not in employment, education, or training, as well as those who have prematurely left education or training (Table A17.2) (see also Annex 10).

Table A17.2:**Socio-demographic indicators by degree of urbanisation, 2024**

	Cities	Towns and suburbs	Rural areas
Population with high educational attainment (% of population aged 25-64)	49.3	36.9	34.4
Early leavers from education and training (% of population aged 18-24)	9.7	11.8	14.2
NEET: Neither in employment nor in education or training (% of population 15-34)	20.9	24.7	22.6
At-risk-of-poverty or social exclusion (% of total population)	9.3	10.1	12.5
Housing cost overburden (% of total population)	8.4	10.3	7.9

Source: Eurostat

Graph A17.1: **GDP per capita in 2010-2022 in capital region (Harjumaa) and counties at EUs external border (% of Estonian average)**



Source: Statistics Estonia

The change in the GDP per capita in 2010-2022 in counties on the EUs external border shows convergence towards the national average. However, close monitoring of developments on the impact of the Russian war of aggression in Ukraine on border regions is still warranted. In some border counties such as Põlva and Võru, GDP per capita remains well below the national average and the convergence has been relatively slow (Graph A17.1).

Social fairness

Like its Baltic neighbours, Estonia is experiencing depopulation in non-capital regions. While the country's overall population grew by 4.3% between 2014 and 2023, mainly due to influx of refugees from Ukraine, there are significant regional disparities. The population in the capital region grew substantially by 12%, whereas Kirde-Eesti experienced a sharp decline of 12%. In contrast, population declines in the remaining NUTS 3 regions were relatively modest, at less than 2% ([229]).

([228]) OECD Study 'Towards Sustainable Water Services in Estonia', 2022.

([229]) Average annual change per 1 000 residents.

Housing cost overburden used to be highest in urbanised areas of the country ([230]). However, due to increases in 2023 and 2024, approximately 10% of the population in towns and suburbs and around 8% in cities and rural areas live in households burdened by housing costs.

The relatively low population density in rural areas translates into more challenges in physical access to basic services, which may be exacerbated by the trend of depopulation. Access to healthcare infrastructure in Estonia is at its lowest in rural areas, where only 13% of the population lives within a 10-minute drive of a hospital ([231]). This is well below the average for rural areas in transition regions in the EU (34.6%) and below the average for rural areas in the EU's less developed regions (15.8%). While travel time is not is not the main reason for the relatively high unmet needs for healthcare in Estonia (see also Annex 14), it is a more significant factor than in most other Member States. Similarly, access to primary school facilities is significantly lower in rural areas, with only 21% of rural residents having access to a primary school within a 15-minute walk compared to an average of 63% in urbanised areas ([232]). More remote municipalities have started to close and downsize smaller schools, partly as depopulation reduces demand and therefore the viability of schools.

Sustainability

The county of Ida-Viru faces the additional challenges of phasing out production of energy from oil shale and dealing with the consequences of the transition as well as the Russian war of aggression in Ukraine. Nevertheless, the use of oil shale in energy production is decreasing again after the world energy crises. In 2023, Estonia's average greenhouse gas (GHG) emissions per capita of 10.5 tonnes of CO_2 equivalent were well above the EU average of 7.1 tonnes and 7.7 tonnes in transition regions. The energy production using oil shale, which contributed substantially to the country's GHG emissions ([233]), is fully concentrated in the county of Ida-Viru on the eastern border. The Just Transition Fund investments are starting to mitigate the impact of the energy transition and will create up to 1 000 jobs. They are also helping reduce CO_2 emissions.

Untapped potential in solar and wind power in the Estonia's NUTS 3 regions is relatively high. In 2023, the share of renewable energy in the country's gross final energy consumption was 38.5%, and there is potential for a more extensive uptake of renewable energy sources. In addition to coastal areas, which already exploit wind energy to an extent, there is untapped potential in inland NUTS 3 regions ([234]). Exploiting the potential and increasing the supply of renewable energy could benefit not only Estonia, but economic cohesion in the EU.

Access to alternative fuel infrastructure ([235]) is relatively limited in Estonia. In 2022, the average number of electric vehicle charging points within a 10 km drive from people's homes was 30, which is below the average for EU transition regions (89) and far from the EU average (287). In addition, infrastructure for charging electric vehicles is concentrated in the

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

([231]) This figure is not based on the official definition of degree of urbanisation.

([232]) This figure is not based on the official definition of degree of urbanisation.

([233]) JRC regional emissions data (EDGAR database)

([234]) JRC data: 9th Report on economic, social and territorial cohesion, Map 4.5.

([235]) 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.

capital region of Põhja-Eesti where the number of charging points within 10 km is 58. In all remaining NUTS 3 regions this number is below 10.