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2022 Country Report - Poland

Accompanying the document

Recommendation for a COUNCIL RECOMMENDATION

**on the 2022 National Reform Programme of Poland and delivering a Council opinion on
the 2022 Convergence Programme of Poland**

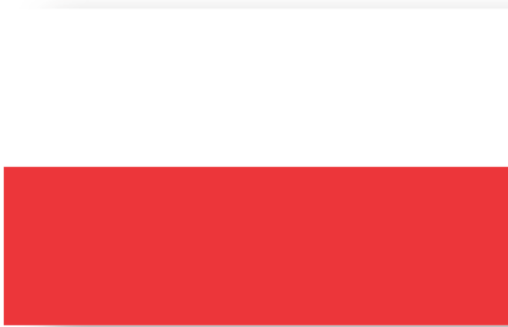
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European
Commission

Poland

2022 Country Report



ECONOMIC AND EMPLOYMENT SNAPSHOT

Poland's economy performs well despite emerging challenges

Poland has been successfully catching up with the rest of the EU. GDP growth averaged 3.6% between 2010 and 2019 (compared with 1.6% in the EU), bringing GDP per capita vis-à-vis the EU average from 63% in 2010 to 73% in 2019. Robust growth was underpinned by deeper integration into global supply chains, a significant inflow of EU funds, and high productivity growth, all of which supported increasing incomes.

Despite the strong economic growth seen in recent years, several challenges could hamper Poland's future economic performance. Increasing unit labour costs are weighing down on Poland's cost-competitiveness growth model. Coupled with low innovation levels, this could hinder the ability of Polish firms to compete internationally and move up global value chains. The low fertility rate of the last 30 years has led to the decline of the population at working age. This, as well as disparities in labour market participation and skill mismatches could further weigh on economic activity and put pressure on public finances. High dependence on fossil fuels is also a significant challenge for the country's ability to develop more sustainably. Thus, well-targeted and comprehensive policy actions will be needed to ensure Poland's long-term growth and resilience.

The pandemic hit the economy hard, but the recession was milder than in the EU. The Polish economy was performing well prior to the crisis, with real GDP growing by 4.7% in 2019 and the unemployment rate reaching all-time lows. In 2020, the pandemic led to a 2.2% drop in GDP, as containment measures disrupted economic activity and global

demand plunged. Nevertheless, sizeable policy support and the country's lower dependence on high-hit sectors meant that the impact of the crisis was much milder than the 6 percent EU-wide contraction. Real GDP recovered strongly in 2021 despite recurring COVID-19 waves and supply chain disruptions, swiftly putting Poland back to its pre-pandemic output path.

Inflation has accelerated strongly in 2021 and 2022. HICP inflation surged from 3.4% at the end of 2020 to 10.2% in March 2022, one of the highest inflation rates in the EU. The acceleration on inflation was partly driven by global factors, particularly rising global prices of commodities and disruptions in supply chains, but domestic factors also played a role. These include booming domestic demand, pervasive labour shortages, and increasing inflation expectations, which prompted the National Central Bank to increase the policy rate from 0.1% in October 2021 to 5.25% in May 2022.

Russia's invasion of Ukraine has clouded the economic outlook

Poland's dynamic economic growth is set to be impacted by the Russian military aggression against Ukraine. Higher uncertainty, trade disruptions and elevated inflation caused by the war are expected to have a sizeable impact on the Polish economy. First, although trade links with Russia and Ukraine are not substantial, the collapse of trade with these countries could exacerbate already existing supply-chain disruptions and increase inflation, especially given that imports include key raw materials and intermediate goods. Coupled with rising commodity prices, this could put further pressure on firms and households, weighing on economic activity.

Lower confidence about the economic outlook might also lead to a postponement of firms' investment decisions and suppress economic growth over the medium term. The latest European Commission forecast projects that real GDP growth will decelerate to 3.7% in 2022 and 3% in 2023 (see Annex 19 for further details on the economic outlook).

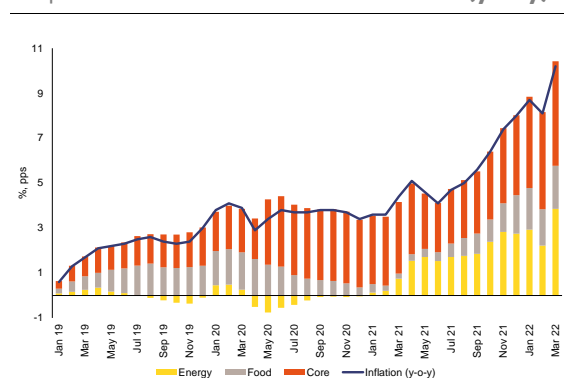
Inflation is set to accelerate further amid rising global commodity prices, a weakening zloty and supply-side pressures. Following Russia's invasion of Ukraine, capital outflows from Poland led to a significant currency depreciation. This is expected to increase import prices, which, coupled with supply-chain disruptions, will put upward pressure on inflation. Increasing global prices of commodities are expected to largely outweigh the reduction in tax rates paid on energy and food goods put forward by the government throughout 2022, as Russia's invasion of Ukraine has further exacerbated supply constraints. Finally, Poland's tight labour market will likely keep supporting wage growth, further feeding into inflation. According to the latest European Commission economic forecast, HICP inflation is expected to reach 11.6% in 2022 and to remain elevated in 2023 at 7.3%.

The heavy reliance on imported fossil fuels contributes to the instability of energy prices. Poland's energy supply heavily relies on foreign suppliers, particularly on Russia. Just 20% of the gas Poland consumes is produced domestically and Russia covers more than half of total imports. Oil consumption is almost entirely reliant on external suppliers, with Russia providing 72% of total imports. This dependency is particularly crucial in light of the growing role played by crude in the Polish mix due to increasing demand from the transport sector. On coal, imports provide just 20% of total supply. However, external dependency has been increasing mainly due to declining domestic production ⁽¹⁾. The decision by Russia to cut gas exports to Poland is expected to further fuel energy inflation. However, Poland's high storage levels and its ability to acquire

⁽¹⁾ Further details provided in the 'Priorities Ahead' section.

gas from alternative sources is expected to limit the impact on gas supplies.

Graph 1.1: **Inflation and contributions (y-o-y)**



Source: Eurostat.

Sizeable policy support cushioned the impact of the COVID-19 crisis on the labour market. During the pandemic, the Polish government introduced (with support from the SURE instrument ⁽²⁾) a series of policy packages aimed at maintaining employment and preventing a rise in bankruptcies. These policy packages amounted to 4.3% of GDP, and helped sustain a favourable performance of the labour market over 2020 and 2021. The employment rate increased steadily after a small contraction in Q2-2020, surpassing the pre-crisis peak already in Q4-2020. The unemployment rate remained broadly stable at a low level over the same period, fuelling labour shortages and wage growth. Overall, total employment is expected to continue increasing as the economy grows and the inflow of displaced persons from Ukraine provides a boost to labour supply.

The humanitarian crisis in Ukraine creates new social, health care and labour market challenges for Poland. As of 9 May, approximately 1.1 million displaced persons from Ukraine have applied for temporary shelter in Poland. Their integration will require significant adaptations in the health and social care systems, as well as in education. Poland has implemented measures

⁽²⁾ Poland has been granted EUR 8.236 billion of financial assistance under the European instrument for temporary support to mitigate unemployment risks in an emergency (SURE) following the COVID-19 outbreak.

under the EU's Temporary Protection Directive. To facilitate integration into mainstream education, it became an immediate priority to provide language courses and psychological support to those fleeing Ukraine, as well as support to teachers. Challenges related to the kindergarten and school capacities, as well as sufficient educational staff will need to be addressed. Support will also be needed to facilitate the labour market integration of people fleeing Ukraine, which would benefit labour supply and alleviate labour shortages and wage growth. Poland will benefit from exceptional flexibilities provided in the framework of CARE Regulation and additional pre-financing under REACT-EU to urgently address reception and integration needs for those fleeing Ukraine as a result of the Russian invasion.

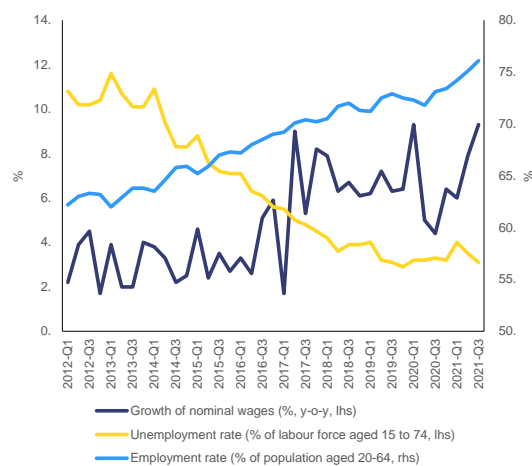
The economy does not present any significant macroeconomic imbalances.

Poland entered the COVID-19 crisis with no identified macroeconomic imbalances, yet with a negative net international investment position involving limited risks. With the COVID-19 crisis, public debt increased but it is expected to decrease significantly to below 50% of GDP in 2023, given the projected strong GDP expansion. House price growth accelerated to 10.5% in 2020, as low interest rates and increased savings from the pandemic led to a spike in the demand for houses. Nevertheless, mortgage growth has remained contained. The banking sector remained stable throughout the pandemic, with considerable improvements of banks' earnings. Challenges exist going forward, including the unresolved problems of Swiss franc mortgage exposures, but vulnerabilities remain low and the banking system is overall regarded as stable and capital generating (see Annex 16).

Poland is progressing moderately well on some United Nations Sustainable Development Goals with slower progress in health, climate, innovation, and reducing inequalities, in line with the European Pillar of Social Rights. The country scores well on indicators related to the share of people at risk of poverty and social exclusion, which have been decreasing steadily

and remain amongst the lowest in the EU (SDG 1). However, strong disparities exist, with old-age poverty being particularly high and increasing, especially for women (SDG 10). Gender pay gap declined in 2019 and 2020 (SDG 5). Large inequalities remain regarding access to healthcare (SDG 3). Poland scores poorly on indicators related to climate action and clean energy. CO₂ emissions have been increasing steadily (SDG 13) and the share of renewable energy in total energy production is low (SDG 7). Finally, innovation performance is poor and has seen little progress (SDG 9) (see Annex 1).

Graph 1.2: **Wages, employment and unemployment**



Unadjusted data.
Source: Eurostat

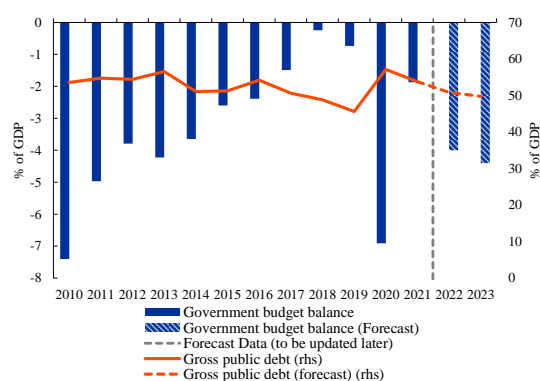
In the period 2021-2027 Poland will be the largest beneficiary of cohesion policy funding. As shown in Annex 3, contributions from cohesions funds substantially contribute to the achievement of SDGs.

The crisis hit public finances

The pandemic strongly hit public finances. On the one hand, the crisis slowed down the dynamics of revenues due to lower economic activity. On the other, it led to a sharp increase in expenditure, including on measures to contain the economic impact of the pandemic. As a result, the fiscal deficit increased abruptly to 6.9% of GDP in 2020. In 2021, the deficit fell to 1.9% of GDP on the back of strong

economic recovery. While the recent rise in interest rates will increase debt servicing costs on new issuances, debt remained at a still relatively low level of 53.8% of GDP in 2021, and it is expected to decrease to 49.8% of GDP in 2023.

Graph 1.3: **Key fiscal indicators**



Source: European Commission

Public finances could have been better prepared for the pandemic.

Poland did not use the solid pre-Covid economic conditions to prepare its public finances for a downturn. These conditions included a booming economy, a best-in-history labour market situation and robust economic growth in its main trading partners. Instead, Poland implemented costly policies that weighted on its public finances not only in the short term but also generated high long-term liabilities (e.g., social benefits targeting families with children and pensioners, independently of their income level, and reversal of previous reforms, including of the working careers’ extension). As a result, while most EU countries generated fiscal surpluses before the pandemic, Poland was running fiscal deficits (although they were low at 0.2% of GDP in 2018 and 0.7% of GDP in 2019, while the general debt fell to 46% by 2019). In the short term, the deficit is set to reach 4.4% of GDP in 2023, on the back of the measures introduced in response to the Russian invasion of Ukraine, including aid to refugees and increased spending on defence.

A major tax overhaul increased uncertainty for taxpayers.

With a stated objective to increase the progressivity of the personal income tax (PIT), Poland implemented a major tax overhaul in 2022. It increased the tax-free allowance and the first tax threshold

in the personal income tax and put an end to the tax deductibility of the health contribution (see Annex 18). The overhaul imposed also some minimum tax for companies reporting low taxable income (thus affecting also entities that operate in low-margin industries). Yet, successive modifications both in the legislative process and in the actual implementation (adding several thresholds, reliefs and rates for taxes and the health contribution) eventually resulted in a more complicated PIT system. The idea of the overhaul was announced mid-2021, while the changes were signed in law mid-November 2021. While the government launched the information campaign taxpayers had only few weeks to adjust to the announced changes. On top of this, an additional change in the PIT system was announced at the end of March, cancelling some changes introduced at the beginning of the year. These developments contribute to the taxpayers’ increased uncertainty regarding the law making and the stability of the tax system. Yet, certainty and stability are crucial for investment rebound needed to strengthen Poland’s economic resilience (see Annex 18).

PRIORITIES AHEAD

Ensuring the sustainability of public finances in light of ageing

Short-term fiscal sustainability is not a source of concern, but ageing entails long-term challenges. Thanks to strong nominal GDP growth and relatively low public debt, fiscal challenges appear to be limited in the coming years. However, in the medium and long term, the impact of demographic trends will intensify. Poland is one of the fastest ageing countries in the EU: in four decades, the number of people above the age of 80 is expected to nearly triple, from 4% in 2019 to 12% in 2060 ⁽³⁾. This will trigger major public spending on healthcare, long-term care and pensions.

Ensuring adequacy of pensions will put the pension system under pressure. The contribution pension system in place (with pensions paid from the capital accumulated over pensioners' work careers) makes the system – in theory – balanced. However, the low effective retirement age, rising life expectancy and other features of the pension system imply that future pension benefits will drop significantly in relation to the final salary: from 54% in 2019 to about 25% in 2060 ⁽⁴⁾. This decline in adequacy would not be sustainable, as a large proportion of pensioners, mainly women, would be at risk of poverty. A European Commission analysis ⁽⁵⁾ shows that Poland would need to spend an additional 6.7% of GDP from its budget in 2070 only to maintain the current level of

benefits. This is more than it spends on healthcare today.

The pension system requires reform. To ensure the sustainability of the system and the future adequacy of pensions, reforms will be necessary (see Annex 12). This concerns mainly the low effective retirement age and the special pension systems that are costly and favour their members as compared with the general system. Still, Poland recently reversed earlier reforms that increased the statutory pension age and had limited some privileges of uniformed services. As a result of the tax reform in 2022, a person who reaches the retirement age (not receiving any old-age or disability pensions) but remains in the labour market will be exempted from the tax (up to PLN 86 thousand per year). This change might contribute to a long-term increase in the level of retirement benefits by extending the real retirement age. On the other hand, the reform risks to disincentivise workers even further from switching from the farmers special pension system to the general pension system, as it does not affect their health contributions, as is the case for other taxpayers.

Initiatives to increase spending efficiency continue amid transparency concerns. The budget system reform continues and, when fully implemented, is expected to increase spending efficiency and address a Council recommendation by tackling long-standing weaknesses in the budget process. These include complex and outdated budget classifications; suboptimal recording of information; lack of genuine medium-term planning, and a lack of direct leverage of spending reviews on the budget process. Yet, during the pandemic, most of the expenditure to contain its impact was channelled via a dedicated fund managed by a development bank and via a financial channel outside the budget. As a result, authorities at first sight avoided breaching the constitutional fiscal

⁽³⁾ Based on Eurostat population projection (proj_19np, baseline projections).

⁽⁴⁾ European Commission, The 2021 Ageing Report: Economic and Budgetary Projections for the EU Member States (2019-2070), Institutional Paper 148, 2021, Brussels.

⁽⁵⁾ See above.

debt rule and had more flexibility and discretion in managing the funds. In turn, this limited the parliamentary scrutiny of expenditure and public access to timely information on the public spending ⁽⁶⁾.

Tackling gender gaps and labour shortages

Low labour market participation of some population groups has exacerbated labour shortages. The gender employment gap has kept increasing over recent years, reaching 15.7% in 2020 (see Annex 12). Care responsibilities for children are one of the key barriers to female employment. Poland has one of the lowest childcare enrolment rates in the EU, with 10.2% of children under the age of 3 in formal childcare. Labour market outcomes are weak and worsening for persons with disabilities, which recorded in 2020 an employment rate of only 46.8% compared with 78.1% for persons without. The employment rate of older workers, despite recording a steady increase, is still 7.8 pps below the EU average (59.6%), with a much bigger gap for older women, at 12.4 pps below the EU average (53.4%). The reversal of the pension reform, bringing the statutory pension age of women to the lowest in the EU, played a major role in this. Also, the low-skilled employment rate of the low skilled remains well below the EU average. Moreover, disparities persist between regions in labour market conditions (see Annex 6).

Skill mismatches further aggravate labour shortages and wage growth. Some 81% of employers reported difficulties filling open positions in 2021 (see Annex 12). This has led to strong wage growth, which reached 9.3% in the third quarter of 2021. Significant skill mismatches are partly to blame. Only 43% of individuals have at least basic digital skills, compared to 54% in the EU (2019). The student drop-out rate is high at 24.8%. The overall share of graduates in science,

technology, engineering and mathematics fell to 20.8%, in contrast to the EU trend (EU 26.0%). Tackling these challenges will be key for Poland and contribute to reaching the 2030 EU headline target on employment.

The pandemic has exacerbated the challenges faced by the education and training system. Despite very good results for 15-year-olds in the latest PISA survey (2018), Poland has reorganised substantially the school system, including by raising the mandatory school age and advancing the age for the orientation between general and vocational paths. Insufficient ICT equipment and connectivity for schools and households with children, and a low level of digital skills among teachers and pupils affect the equal access to and the quality of education. Prolonged periods of distance learning are likely to have caused significant educational losses and weakened the well-being of students and teachers ⁽⁷⁾. Inclusiveness in education requires additional comprehensive efforts. The quality of the initial education received by teachers is insufficient. Additionally, the lack of professional development, combined with the limited financial attractiveness of the teaching profession, contribute to pronounced staff shortages.

To cope with the inflow of people fleeing Ukraine, Poland has implemented measures under the EU's Temporary Protection Directive. It has adapted its legislation to facilitate enrolment to kindergartens, schools and universities, as well as the employment of school support and teaching staff. Dedicated support, including online training materials, has been provided to pupils and teachers. New school and kindergarten branches may have to be established to accommodate all children displaced from Ukraine. In 2022, higher education students and doctoral students will

⁽⁶⁾ This has also been confirmed by the Supreme Audit Office (see *Analiza wykonania budżetu państwa i założeń polityki pieniężnej w 2020 r.*, NIK, 2021).

⁽⁷⁾ See for instance Grzelak, S., Zyro, D. (2021), [Jak wspierać uczniów po roku pandemii. Wyzwania i rekomendacje z obszaru wychowania, profilaktyki i zdrowia psychicznego. Instytut Profilaktyki i Zintegrowanej](#); Najwyższa Izba Kontroli (2021), [Organizacja pracy nauczycieli w szkołach publicznych](#); Evidence Institute (2022), [Policy note 1/2022](#)

be able to continue their studies in Poland and conduct research.

Social spending is not always properly targeted. Poland spends less on social benefits than other EU countries. In recent years, this difference exceeded 4 percentage points of GDP per year. Still, a big part of social expenditure is universal and directed at everyone, independently of the income level. This concerns for instance the universal child benefit and the universal additional pension benefit, which together come at a cost of close to 2.5% of GDP per year. Also, while the child benefit was extended to all children, for over 5 years its amount has not been revised to reflect inflation. At the same time, those working on some civil law contracts do not have access to several social benefits, e.g. unemployment, maternity and invalidity benefits.

The share of the population at risk of poverty has continued to decline, but going forward risk factors grow. The share of the population at risk of poverty or social exclusion decreased from 21% in 2016 to 17% in 2020 and remains among the lowest in the EU. Importantly, an increase in the risk of poverty of older people has occurred over recent years, especially for women due to their shorter careers. Looking forward, risks are building up. According to the available data, in 2060 the numbers of those in the whole population who will have reached statutory retirement age will be nearly two times higher than in 2019⁽⁸⁾. Women are particularly exposed to risks because, due to the pension reform reversal, their careers will be shorter than those of men. It is estimated that without reforms to extend working lives, a substantial part of female pensioners will in four decades receive only the minimum pension benefit (which today amounts to some 290 EUR gross).

⁽⁸⁾ Based on Eurostat population projection (proj_19np, baseline projections).

The health sector under strain and short of resources

The healthcare system was under strain due to the pandemic, while underfinancing persists. In the early stages of the pandemic, the extensive capacity in the hospital sector was a valuable asset, but the health system quickly came under strain when infection rates surged in subsequent waves. The pandemic's drag on resources also adversely affected preventive services, treatment for chronic diseases and serious medical conditions, including cancer and heart diseases. Although the policy response prompted temporary additional funding, overall spending for the health sector in terms of GDP remains low, with only 6.5 % against an average of 9.9 % for the EU-27 in 2019. In terms of per capita expenditure, health funding is also low, amounting to 44% of the EU average in 2019. The long-term care system is underfunded and underdeveloped. The share of population 65+ with long-term care needs exceeds the EU average while public spending on long-term care is below the EU average (0.8% vs 1.7% in the EU in 2019).

The healthcare system faces efficiency and resources availability challenges while remaining excessively hospital-centric. Shifting towards primary and ambulatory care is of particular importance, as healthcare spending is expected to grow considerably in the medium to long term, increasing public expenditure. The primary care system remains understaffed and its services are overstretched. Its potential remains untapped thus overburdening higher levels of care. Some hospitals have run up substantial debts and have low occupancy rates, while many medical procedures currently performed in hospitals could be done at lower levels of care and at lower costs. At the same time, the hospital system faces chronic underfunding and deficiencies in supervisory mechanisms, which all calls for comprehensive reform. Due to unattractive conditions, such as low salaries, medical professions are not popular careers, and there has been a significant 'brain drain' for doctors. The shortage in human

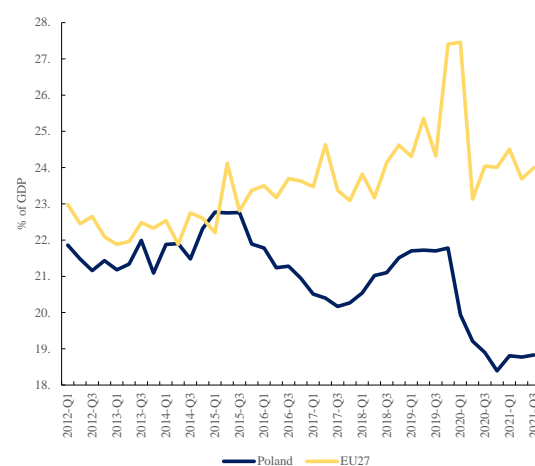
resources is significant compared with other Member States. This makes it necessary to keep professionals working beyond their retirement ages. E-health is progressing and further expansion of digital services in health is planned, but modern management practices are still underused. Access to care and long-term care differs among regions with significant unmet needs (see Annex 14).

Strengthening productivity and boosting private investment

Productivity growth has been robust, supporting Poland's economic convergence to the EU average. Labour productivity has been expanding at one of the fastest rates in the EU for the past several years, growing by 3.6% on average from 2015-2019. There is, nevertheless, significant room for further improvements, as labour productivity is only around 65% of the EU average. In particular, Poland has one of the largest productivity gaps between SMEs and large companies due to low innovation and a weak internationalisation of smaller firms. This hinders productivity, employment, and the ability of firms to increase their export shares and move up global value-chains.

Going forward, low levels of investment could limit further productivity gains and economic growth. Private investment as a percentage of GDP in 2020 was low at 18.5%, well below the EU-wide average (24.6%) and that of regional peers such as Czechia (28.0%) and Hungary (29.8%). Investment is particularly weak in the most productive sectors, such as ICT, where rapid technological progress requires high investment outlays. The share of buildings and infrastructure investment in total investment was 52.1%, while intangible assets (e.g. R&D investment and intellectual property, inter alia) accounted for just 8.8%, which might limit the ability of the economy to move-up the value chain. Overall, increasing capital investments in high productivity sectors will be crucial to sustain Poland's strong economic performance, as increasing unit labour costs will weigh heavily on cost-competitiveness.

Graph 2.1: **Share of private investment in GDP**



Seasonally and calendar adjusted data.

Source: Eurostat.

Regulatory uncertainty and labour shortages remain key investment barriers. The investment climate continues to be hindered by an unpredictable and burdensome regulatory environment. Frequent changes to key laws create uncertainty and leads to compliance costs for businesses, mainly due to poor consultation of social partners and stakeholders during the law-making process. Private investment is also limited by significant skill mismatches in the labour market, which are constraining the economy's ability to restructure towards high expanding and high productive sectors.

A deterioration of the rule of law in Poland has further hindered the investment climate. Judicial independence remains a serious concern, as follows from several rulings of the Court of Justice of the European Union and the European Court of Human Rights. In particular, the Court of Justice of the EU has challenged the functioning of the disciplinary regime applicable to Polish judges and this ruling remains to be implemented. An order for interim measures of July 2021 of the Court of Justice of the EU to protect judicial independence has still not been implemented. In addition, the Commission launched an infringement procedure against Poland following the Polish Constitutional Tribunal ruling, which, according to the Commission,

challenged notably the primacy of EU law⁽⁹⁾. These developments contribute to a perceived lack of adequate judicial protection and judicial independence, impairing the investment climate and the sustainability of economic growth over the medium to long term.

The legal and institutional framework to prevent and combat corruption is largely in place, although with some weaknesses.

The 2021 Rule of Law Report⁽¹⁰⁾ points to several risks regarding the effectiveness of the fight against high-level corruption, including a risk of undue influence on corruption prosecutions for political purposes. Specifically, the Report mentions concerns over the independence of the main anti-corruption bodies, with, for instance, the subordination of the Central Anti-Corruption Bureau to the executive.

Slow take-up of innovative and digital solutions

Despite some progress, Poland lags behind in terms of innovative outputs.

Strengthening the innovative capacity of the economy will enable it to produce more advanced products and services and move away from its cost competitiveness-based growth engine. Numerous efforts were made in recent years and total R&D spending has been steadily increasing, reaching 1.39% of GDP in 2020 (ranking 17th in the EU), up from 0.94% in 2014. Nevertheless, Poland only ranks 25th in the 2021 European Innovation Scoreboard and is classified in the lowest category of emerging innovators (see Annex 8). Moreover, regional disparities in innovation outcomes and R&D expenditures persist (see Annex 15).

The quality of the science base and high fragmentation of the research support

⁽⁹⁾ [European Commission, Rule of Law: Commission launches infringement procedure against Poland for violations of EU law by its Constitutional Tribunal, 22 December 2021.](#)

⁽¹⁰⁾ [EUR-Lex - 52021SC0722 - EN - EUR-Lex \(europa.eu\)](#)

system hamper science-business

cooperation. Poland ranks last in the EU in public-private scientific co-publications as a percentage of the total number of publications. Recent changes in the scientific evaluation system do not properly support the development and internationalisation of Polish research institutions. For example, they disincentivise scientific excellence by being biased towards publications in national scientific journals (see Annex 8). Increasing fragmentation of current research support instruments, often with the remit of various line ministries and with a risk of duplication of support between national and regional agencies, impairs possible synergy gains.

The number of innovative companies remains low and digitalisation is lagging behind.

Only 23.7% of businesses are innovative (second to last in EU against an EU average of 50.3%, Community Innovation Survey 2018) and business R&D expenditure, despite increases, remains below the EU average (0.87% compared with 1.53% in 2020). Low capability in proper management and adoption of technology are among the main constraints to increased innovation and productivity growth. There is a high productivity gap between small and large companies in Poland while R&D support programmes targeting a range of companies, including SMEs, and facilitating for example that acquisition of intangibles remain underdeveloped. Only half of Polish SMEs are ready to take up digital challenges while few businesses make use of advanced digitalised solutions such as big data, artificial intelligence technology and cloud infrastructure (see Annex 7).

While the take-up in fixed broadband is increasing, challenges in the development of 5G remain high.

Poland scores well in the coverage of very high capacity network, with 70% of households, equal to the EU average. Overall fixed broadband take-up is steadily increasing (69% compared with 62% in 2019). In 2020, 43% of households had access to a fixed broadband connection of at least 100Mbps, above the EU average of 41%. However, 5G readiness is not progressing because the harmonised radio spectrum for

5G deployment has yet to be assigned (see Annex 8). More regulatory certainty is needed to ensure timely 5G planning.

Decreasing fossil fuel dependency and embracing the path towards climate neutrality

Poland's energy mix remains heavily reliant on fossil fuels, especially on coal, and decarbonisation efforts need to be stepped up (see Annex 5). In 2020, the share of fossil fuels in total energy supply was around 86%, with coal alone accounting for 40% of it. Poland produces around 70% of its electricity through conventional coal power plants and coal accounted for 59 % of energy-related CO₂ emissions in 2019. The country also features the EU's highest share of coal in heating. The greenhouse gas emissions intensity of the economy stands 54% above the EU average due to the coal-based power generation and the economy's reliance on heavy manufacturing (see Annexes 5 and 6). If left unaddressed, Poland's high carbon intensity could seriously harm its economic competitiveness and undermine efforts to reduce dependence on fossil fuel imports from Russia. Against this backdrop, it is essential to implement timely reforms and investments to accelerate the deployment of renewables in all sectors and rapidly reduce the energy intensity of the economy and the share of fossil fuels in the energy mix taking into account just transition concerns. This would strengthen the climate and environmental sustainability of the Polish energy system as well as the country's security of energy supply.

Poland has increased its coal dependency on Russia in recent years. While it still produces around 80% of the coal it consumes, its imports have been increasing due to declining domestic production. Poland is now a net importer of hard coal and Russia covered in 2020 around 74% of its total coal imports⁽¹¹⁾, which in 2020 amounted to 13.1

⁽¹¹⁾ Eurostat (2020), share of Russian imports over total imports of hard coal. Total imports include intra-EU trade.

million tonnes. Its dependency is even more pronounced when only thermal coal is considered, with imports accounting for 82% of total consumption in 2020 and 90% of these coming from Russia. As 75% of the coal imported by Poland is used in home heating and small district heating plants, reforms and investments to promote decarbonised heat will be crucial to reducing import dependence. Against this backdrop, a solid and accelerated coal-phase out schedule, which takes in due account the social and regional dimensions (see Annex 15), would not only contribute to bringing Poland's energy policy in line with the EU 2030 GHG emissions reduction target but would also strengthen the country's energy security. To ensure the social sustainability of the coal phase-out, Poland can rely on EUR 3.8 billion from the Just Transition Fund (see Annex 3).

Infrastructure investments have increased the diversification of Poland's gas supply. Gas as a whole account for 17% of Poland's energy mix. Total consumption of natural gas is growing and reached 20.1 bcm in 2020, Imports cover more than 80% of total consumption and Russia remains the largest supplier, providing 55% of total imports in 2020⁽¹²⁾. Thanks to the creation of new infrastructure, in particular the EU-funded LNG terminal, Poland has diversified its natural gas imports. Since 2014, gas imports from the east (mostly Russia) have remained broadly stable, while imports from other countries have almost tripled. As new ongoing and planned EU-funded infrastructure projects will come to fruition, especially the interconnectors with neighbouring countries, Poland's reliance on Russian gas is set to decrease substantially. The total import capacity from other sources beyond Russia is expected to increase from 7 bcm currently in place, to additional around 17.6 bcm by the end of 2022, when the current supply contract is set to expire and a further 7.5 bcm approximately in the mid-term when the expansion of the LNG terminal to 8.3bcm per year is finalised and the new

⁽¹²⁾ Eurostat (2020), share of Russian imports over total imports of natural gas. Total imports include intra-EU trade. Total imports include intra-EU trade.

Floating Storage and Regasification Unit (FSRU) is operational. The direct impact of the suspension of supplies of gas to Poland by Gazprom as of April 2022 on Poland's energy security is significantly mitigated by Poland's access to alternative supplies, within and outside the EU. However, the suspension requires an acceleration of ongoing and planned supply diversification projects as well as increased coordination of further actions within the EU. In this context, intensified actions to secure new contracts with diversified suppliers are critical to ensure security of Polish energy supply. New infrastructure and network investments related to gas are recommended to be future-proof where possible, in order to avoid carbon lock-in and stranded assets as well as to facilitate their long-term sustainability through future repurposing for sustainable fuels.

Diversification efforts risk to be undermined by the energy policy's strong focus on natural gas. Based on the Energy Policy of Poland until 2040, Poland intends to almost quadruple its gas-fired generation, which would increase from 14 TWh in 2019 to 53 TWh in 2030. Corresponding investment needs of the gas power generation sector (including heat generation) between 2021-2040 are estimated at close to EUR 9 billion. The strategy, which is based on ETS prices at EUR 60 by 2040, underestimates the impact of higher carbon prices, leaves Poland exposed to gas price volatility, negatively affects its energy security, and risks exposing citizens to energy poverty. Moreover, the unabated use of natural gas will be increasingly incompatible with the EU emissions reduction objectives. Consequently, the strategy should be updated to avoid long-term lock in of natural gas in the energy mix and the creation of stranded assets. The planned large recourse to natural gas for building heating to replace coal burning can be alleviated by connecting more homes to renewables and waste heat based district heating and investing in improving the thermal insulation of buildings and in heat pumps. The REPowerEU Communication has indicated that increasing sustainable biomethane production will contribute to phasing out the EU's dependency on Russian fossil fuels. In this context, Poland has room to exploit the untapped potential of sustainable

biomethane complying with the relevant sustainability criteria through an appropriate strategy for the establishment of a biomethane market and concrete proposals concerning its structure. Sustainable biomethane could be employed in the cogeneration of heat and electricity and of renewable hydrogen, which could be useful to decarbonize hard-to-abate sectors.

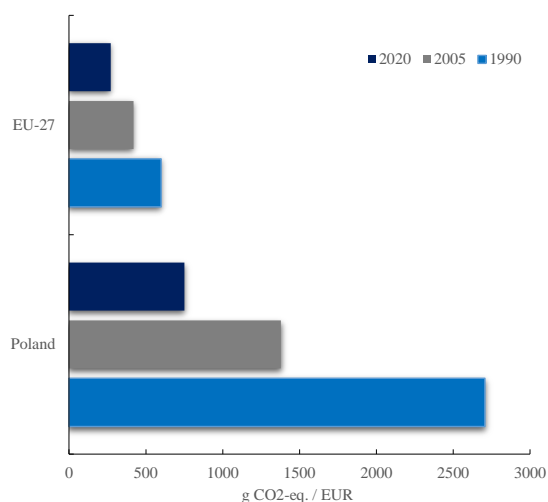
Poland depends on foreign suppliers for the quasi-totality of its oil demand and imports from Russia, albeit declining, represent 72% of total imports⁽¹³⁾. Oil plays a growing role in the Polish energy system with its share in total final energy consumption increasing from 33% to 39% between 2010 and 2020, mainly due to strong demand growth in the transport sector. Today oil represents 28% of the energy mix and 96% of the crude supply is covered by imports. Since 2014 Poland has worked to diversify its oil supply through increasing seaborne imports, mainly from Saudi Arabia. The transport sector is responsible for around 70% of total oil consumption. Accelerated actions to decarbonize mobility, among others by providing regulatory incentives to accelerate deployment of alternative fuel infrastructure, are crucial to reduce oil demand and lessen reliance on Russian imports.

The slow pace of decarbonisation contributes to high electricity prices for households. Poland has been decarbonising at the second slowest rate among all lower income Member States, registering by 2020 only 8% reductions in total GHG emissions compared to 2005. The clean energy transition represents an opportunity for Poland to reduce the exposure of its energy system to fluctuations in the price of fossil fuels, particularly gas, and mitigate the impact of carbon costs on energy prices. The sale of ETS emissions allowances generated EUR 5.6 billion in 2021 alone. Targeting these as well as other EU and national resources to increase energy efficiency and accelerate the green

⁽¹³⁾ Eurostat (2020), share of Russian imports over total imports of crude oil. Total imports include intra-EU trade. Crude oil does not include refined oil products.

transformation across all the economic sectors would ultimately contribute to reducing consumers' electricity bills.

Graph 2.2: **GHG intensity of Poland and EU27**



Source: European Commission, Carbon Action Progress Report 2021

A significant increase of energy production from renewable energy sources is a crucial step to achieve climate neutrality. In 2020, 16% of total energy consumption was generated by renewable sources in Poland, against an EU average of 22%. The current 2030 target of 21 to 23% set out in the National Energy and Climate Plan lacks ambition (see also Annex 5). Moreover, the plan lacks details regarding policies and measures for delivering even this target. Additional measures therefore need to be put in place to incentivise renewables, even more in the light of more ambitious renewable energy targets⁽¹⁴⁾ proposed in July 2021 by the European Commission and the objectives outlined in the REPowerEU Communication⁽¹⁵⁾. This includes adopting a long-term strategic framework consistent with the EU's climate targets, ensuring long-term predictability of support schemes, addressing

⁽¹⁴⁾ Preliminary calculations show a 31% RES share to be achieved by Poland by 2030 under a 40% EU target.

⁽¹⁵⁾ COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, "REPowerEU: Joint European Action for more affordable, secure and sustainable energy", [EUR-Lex - 52022DC0108 - EN - EUR-Lex \(europa.eu\)](#)

infrastructural bottlenecks such as insufficient grid capacity, improving flexibility through deployment of energy storage and demand management, reforming consumer tariffs and removing regulatory barriers to RES deployment, namely reform of distancing rule, support for update of zoning plans and acceleration of permitting process. These measures would accelerate investment in renewable energy sources including in particular onshore wind and solar. Offshore wind investments should be accelerated by participating in joint and hybrid projects and adapting the relevant legal framework, for example allowing projects also in the territorial waters.

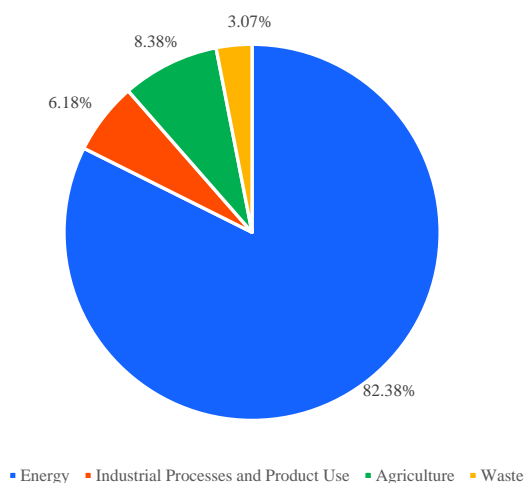
Poland needs to unlock the potential of low and zero-carbon fuels. Accelerated investment in renewables would enable stepping up renewable hydrogen generation to foster decarbonisation of the transport sector and hard-to-abate industrial sectors. Moreover, Poland has an untapped potential to produce sustainable biomethane that could replace natural gas in several applications. However, unlocking this potential requires increasing investments and a more favourable regulatory framework. In this respect, the planned expansion of gas infrastructures should allow for the use of low-carbon and renewable gases.

The high energy intensity of the Polish economy and the poor energy efficiency of buildings generate social and economic costs. These include air pollution, energy poverty, dependency on energy imports, vulnerability to market shocks and economic competitiveness challenges. Public and residential buildings often have low technical standards and approximately 70% of houses are poorly insulated. The energy efficiency efforts outlined in the Polish National Energy and Climate Plan for 2030 remain of modest ambition compared to what would be needed. To step up action on energy efficiency, Poland needs to prioritise energy efficiency objectives in spending plans and investment support schemes, in line with the newly adopted long-term buildings renovations strategy. The support schemes should also be streamlined and better targeted, notably with respect to

low-income households and worst-performing buildings and should incentivise deeper energy efficiency, promote deeper energy savings and faster electrification of heating to avoid natural gas lock-in. A significant reduction of building's energy demand through renovation, higher deployment of energy efficient products, heat pumps and renewable energy for heating and cooling will have an immediate and durable impact in protecting households against the volatility of energy prices, in diminishing inland consumption and import dependency.

Air quality is among the worst in the Union, posing major environmental and health concerns. Available evidence confirms persisting significant number of premature deaths per year in Poland can be associated with air pollution⁽¹⁶⁾. With cleaner air thanks to the energy transformation, Poland can significantly reduce this number. This pollution comes to a large extent from individual heating sources in residential buildings and from road congestion in urban areas. Around 3 million inefficient and polluting boilers need replacement as part of wider measures targeting the energy efficiency of buildings in line with the Renovation Wave strategy.

Graph 2.3: **National emissions of greenhouse gases for 2019 by source categories**



Source: Poland's National Centre for Emissions Management (KOBiZE)

Decarbonising the transport sector will be key for reducing emissions and fossil fuel import dependency on Russia, but challenges remain for the development and use of sustainable modes of transport. GHG emissions from the transport sector have quadrupled between 1990-2019. The sector is the second most polluting after energy production, with road transport responsible for the lion share of the emissions. A modal shift away from private road transport to less polluting modes such as rail and public transport will thus be key for reducing emissions. However, the share of rail transport in the transport of goods continues to decrease. Passenger rail is in many areas not an attractive alternative to private cars due to a low frequency of operations and an insufficient integration with other transport modes. The modernisation of railway lines in Poland to TEN-T standards is still lagging behind due to deficiencies in implementation of investment projects. Public transport outside of urban areas is in decline for recent years, whereas all segments of public transport have suffered from reduced passenger turnover and revenues on a back of the COVID-19 pandemic. Excessive number of road fatalities entails the need for more focus on stricter enforcement, education campaigns, and the safety infrastructure development.

⁽¹⁶⁾ Current EEA figure for PM, O₃ and NO_x
<https://www.eea.europa.eu/media/newsreleases/many-europeans-still-exposed-to-air-pollution-2015/premature-deaths-attributable-to-air-pollution>

KEY FINDINGS

Poland would benefit from measures in the following areas:

- Improving the efficiency of public spending and increasing the transparency of public finance.
- Reforming the pension system in particular by extending the effective retirement age and reforming preferential pension schemes.
- Addressing disparities in labour market participation and fostering quality education and demand-driven skills.
- Improving the resilience, accessibility and effectiveness of the health system, including through increased access to e-health services.
- Strengthening the collaboration between research and business to improve innovation.
- Enhancing further digitalisation of businesses and public administration, including through development of appropriate infrastructure.
- Significantly accelerating investments in decarbonisation, energy transformation and sustainable transport.
- Enhancing the investment climate, in particular by safeguarding judicial independence.
- Ensuring effective public consultations and involvement of social partners in the policy-making process.

ANNEXES

LIST OF ANNEXES

Cross-cutting progress indicators	21
Annex 1: Sustainable Development Goals	21
Annex 2: Recovery and Resilience Plan - implementation	23
Annex 3: Other EU instruments for recovery and growth	24
Annex 4: Progress in the implementation of country-specific recommendations	26
Environmental sustainability	29
Annex 5: Green Deal	29
Annex 6: Employment and social impact of the green transition	33
Productivity	35
Annex 7: Resource efficiency and productivity	35
Annex 8: Digital transition	37
Annex 9: Innovation	39
Annex 10: Industry and single market	41
Annex 11: Public administration	44
Fairness	46
Annex 12: Employment, skills and social policy challenges in light of the European Pillar of Social Rights	46
Annex 13: Education and skills	48
Annex 14: Health and health systems	50
Annex 15: Economic and social performance at regional level	52
Macroeconomic stability	55
Annex 16: Key financial sector developments	55
Annex 17: Taxation	56
Annex 18: Key economic and financial indicators	58
Annex 19: Debt sustainability analysis	59

LIST OF TABLES

Table A1.1:	Progress towards SDGs in Poland in the last five years	22
Table A4.1:	Summary table on 2019, 2020 and 2021 CSRs	27
Table A5.1:	Indicators underpinning the progress on EU Green Deal from macroeconomic perspective	32
Table A7.1:	Selected resource efficiency indicators	36
Table A8.1:	Key Digital Economy and Society Index Indicators	38
Table A9.1:	Key research, development and innovation R&D&I indicators	40
Table A10.1:	Key Single Market and Industry indicators	42

Table A11.1:	Public administration indicators – Poland	45
Table A12.1:	Social Scoreboard for Poland	46
Table A13.1:	EU-level targets and other contextual indicators under the European Education Area strategic framework	49
Table A14.1:	List of key indicators, health	51
Table A15.1:	Poland, selected indicators at regional level	54
Table A16.1:	Financial soundness indicators	55
Table A17.1:	Indicators on taxation	56
Table A18.1:	Key economic and financial indicators	58
Table A19.1:	Debt sustainability analysis for Poland	59
Table A19.2:	Heat map of fiscal sustainability risks for Poland	60

LIST OF GRAPHS

Graph A3.1:	2014-2020 European Investment and Structural Funds - total budget by fund (EUR billion, %)	24
Graph A3.2:	Cohesion policy contribution to the SDGs (EUR billion)	24
Graph A4.1:	Poland's progress on the 2019-2020 CSRs (2022 European Semester cycle)	26
Graph A5.1:	Fiscal aspects of the green transition	29
Graph A5.2:	Thematic – Energy	30
Graph A5.3:	Thematic – Biodiversity	30
Graph A5.4:	Thematic – Mobility	31
Graph A6.1:	Fair green transition challenges	34
Graph A6.2:	Energy poverty by income decile Thematic focus on energy poverty	34
Graph A7.1:	Municipal waste treatment	36
Graph A11.1:	E-government benchmark scores and (lhs) and e-government users (rhs)Graph A11.1: E-government benchmark scores and (lhs) and e-government users (rhs)	44
Graph A11.2:	Scope Index of Independent Fiscal Institutions	44
Graph A13.1:	Figure 13.1. Participation in early childhood education by age, 2015-2019 (%)	48
Graph A14.1:	Life expectancy at birth, years	50
Graph A14.2:	Projected increase in public expenditure on healthcare over 2019-2070 (reference scenario)	50
Graph A15.1:	Territories most affected by the climate transition in Poland	52
Graph A15.2:	Innovation performance in Poland	53
Graph A17.1:	Tax wedge indicators	57

This Annex assesses Poland's progress on the Sustainable Development Goals (SDGs) along the four dimensions of competitive sustainability. 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, 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 SDGs in an EU context.

While Poland is performing very well or well on some SDG indicators related to environmental sustainability (SDG 7, 11) and is improving on others (SDG 9, 12, 13, 15), it still needs to catch up on SDG 2. Poland has untapped potential in reaping the economic opportunities related to innovation and clean energy (SDG 7, 9). In particular, although the proportion of renewable energy has increased from 11.6% to 15.3%, it remains below the EU average of 22.1%. Energy productivity increased slightly more, in absolute terms, than the rest of the EU (from 4.23 to 4.7 EUR/kgoe⁽¹⁷⁾ compared with the EU from 7.8 to 8.6 EUR/kgoe). However, the overall productivity remains significantly below the EU average. Addressing 'Climate action' (SDG 13), Poland has achieved some progress on the proportion of renewable energy in total energy consumption, which increased from 11.9% in 2015 to 16.1% in 2020, but is still outperformed by the EU 2020 average of 22.09% in 2020.

Poland is performing very well on several SDG indicators related to fairness (SDG 1, 4, 8, 10) and is improving on SDG 3, but it still needs to catch up on others (SDG 2, 5). Poland outperforms the EU average and continues to improve in several indicators related to poverty and inequalities (SDGs 1 and 10). These include the proportion of the population at risk of poverty or social exclusion, which decreased from 22.5% in 2015 to 17.0% in 2020, compared with the EU average of 21.9%. Poland is progressing on SDG 3 regarding good health and well-being but remains

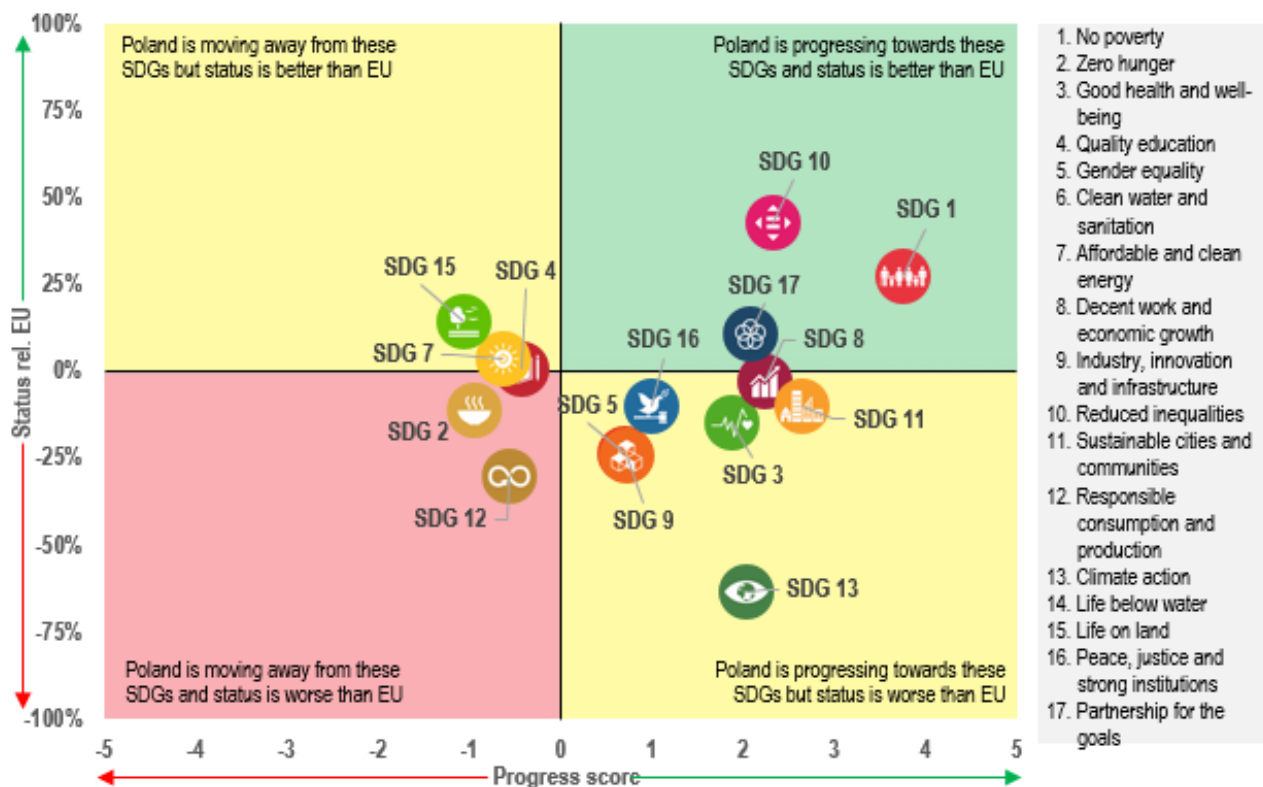
below average, for instance as regards healthy life years at birth (62.5 years in 2019, compared with the EU average of 64.6 years). Some indicators under SDG 5 (gender equality) have worsened, such as the gender employment gap, taking Poland further below the EU average for this SDG.

Poland is performing very well on most indicators related to productivity (SDG 4, 8) and is improving on SDG 9. Poland had real GDP per capita of EUR 12 700 in 2020, well below the EU average of EUR 26 380. Expenditure on R&D has increased since 2015, but remains low (1.39% of GDP in 2020, EU: 2.32%). Despite some progress since 2015, adult participation in learning remains low at only 3.7% compared with 9.2% in the EU. In Poland, the proportion of households with high-speed internet connections in 2020 (64.6 %) is well above the EU average (59.3 %) and represents significant progress on this indicator since 2015 (9.0 % in 2015, EU: 21.9 %). Strengthening digital skills remains a challenge.

Poland is performing very well on some SDG indicators for macroeconomic stability (SDG 8) and is improving on SDG 16. According to indicators related to decent work and economic growth, Poland's status is in line with the EU average, but it is lagging behind on peace, justice and strong institutions. More specifically, real GDP per capita in Poland has been steadily increasing over the past decade, standing at 76% of the EU average in 2020 (up from 63% in 2010). The investment share of GDP declined markedly from 20.1% in 2015 to 16.6% in 2020, which is substantially below the EU average of 22.3%. The employment rate has been increasing steadily, reaching 73.6% of the population aged 20-64 in 2020, and surpassing the EU average (72.4% in 2020). In parallel, the long-term unemployment rate has been falling (to only 0.6% in 2020), considerably below the EU average (2.4% in 2020).

⁽¹⁷⁾ Kilograms of oil equivalent

Table A1.1: Progress towards SDGs in Poland in the last five years



For detailed datasets on the various SDGs see the annual ESTAT report 'Sustainable development in the European Union', <https://ec.europa.eu/eurostat/web/products-statistical-books/-/KS-03-21-096>; Extensive country specific data on the short-term progress of Member States can be found here: [Key findings - Sustainable development indicators - Eurostat \(europa.eu\)](https://ec.europa.eu/eurostat/web/key-findings/-/sustainable-development-indicators).

Source: Eurostat, latest update of 28 April 2022. Data mainly refer to 2015-2020 and 2016-2021.

The Recovery and Resilience Facility (RRF) is the centrepiece of the European Union's efforts to support its recovery from the COVID-19 pandemic, fast forward the twin transition and strengthen resilience against future shocks. Poland submitted its Recovery and Resilience Plan (RRP) on 3 May 2021. The plan amounts to a total of EUR 35.4 billion, of which EUR 23.9 billion in grants, or 4.5% of Poland's GDP in 2019, and EUR 11.5 billion in loans (out of EUR 34.5 billion available).

The Commission is continuing its assessment of the Polish plan and is working constructively with the Polish authorities to ensure it meets the criteria laid down in the Recovery and Resilience Facility Regulation.

The EU's budget of more than EUR 1.2 trillion for 2021-2027 is the investment lever to help implement EU priorities. Underpinned by an additional amount of about EUR 800 billion through NextGenerationEU and its largest instrument, the Recovery and Resilience Facility, it represents significant firepower to support the recovery and sustainable growth.

In 2021-2027, EU cohesion policy funds⁽¹⁸⁾ will support long-term development objectives in Poland by investing EUR 78.9 billion⁽¹⁹⁾, including EUR 3.8 billion from the Just Transition Fund to alleviate the socio-economic impacts of the green transition in the most vulnerable regions. Partnership agreements and programmes under the 2021-2027 cohesion policy funds take into account the 2019-2020 country-specific recommendations and investment guidance provided as part of the European Semester. This will ensure synergies and complementarities with other EU funding. In addition, Poland will benefit from EUR 22.1 billion support for the 2023-27 period from the Common Agricultural Policy, which supports social, environmental and economic sustainability and innovation in agriculture and rural areas, contributing to the European Green Deal, and ensuring long-term food security.

In 2014-2020, the European Structural and Investment Funds (ESI Funds) for Poland are set to invest EUR 90.8 billion⁽²⁰⁾ from the EU budget. Total investment including national financing amounts to EUR 111 billion (Graph 3.1), representing around 3.4% of GDP for 2014-2020 and 64.1% of public investment⁽²¹⁾. By 31 December 2021, 96% of the total was allocated to specific projects and 64% was reported as spent, leaving EUR 40.4 billion to be spent by the end of

⁽¹⁸⁾ European Regional Development Fund (ERDF), European Social Fund+ (ESF+), Cohesion Fund (CF), Just Transition Fund (JTF), Interreg.

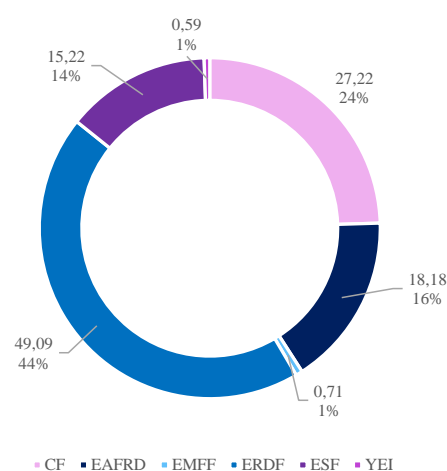
⁽¹⁹⁾ Current prices, source: [Cohesion Open Data](#)

⁽²⁰⁾ ESIF includes cohesion policy funds (ERDF, ESF+, CF, Interreg), European Agricultural Fund for Rural Development (EAFRD) and European Maritime and Fisheries Fund (EMFF). According to the 'N+3 rule', the funds committed for the years 2014-2020 must be spent by 2023 at latest (by 2025 for EAFRD). Data source: [Cohesion Open data](#), cut-off date 31.12.2021 for ERDF, ESF+, CF, Interreg, cut-off date 31.12.2020 for EAFRD and EMFF.

⁽²¹⁾ Public investment is gross fixed capital formation plus capital transfers, general government.

2023⁽²²⁾. Among the 11 objectives, the most relevant ones for cohesion policy funding in Poland are network infrastructure in transport and energy with EUR 27.9 billion, low-carbon economy with EUR 11.8 billion, research and innovation with EUR 9 billion and social inclusion with EUR 10.9 billion.

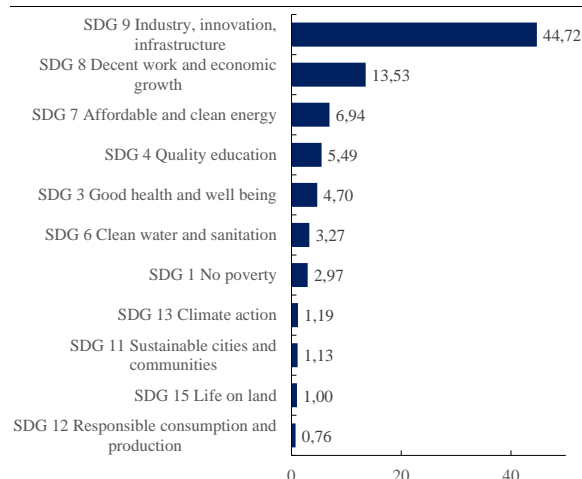
Graph A3.1: **2014-2020 European Investment and Structural Funds - total budget by fund (EUR billion, %)**



(1) Billion EUR in current prices, % of total

Source: European Commission, Cohesion Open Data

Graph A3.2: **Cohesion policy contribution to the SDGs (EUR billion)**



Source: European Commission, DG REGIO

By the end of 2020, cohesion policy investments supported the creation of almost 3 000 new businesses, and over 28 000 new direct jobs. An additional 12 million people benefited from flood protection measures, and production from renewable sources increased by over 2 000MW. In

⁽²²⁾ Including REACT-EU. ESIF data on <https://cohesiondata.ec.europa.eu/countries/PL>

addition, 6.3 million participants were supported in ESF funded projects, under which more than 34 000 gained a qualification and more than 202 000 received a job after taking part in a Youth Employment Initiative (YEI).

Cohesion policy funds already substantially contribute to the Sustainable Development Goals (SDGs). In Poland, cohesion policy funds support 11 of the 17 SDGs with up to 95% of expenditure contributing to the attainment of the goals.

The REACT-EU instrument (Recovery Assistance for Cohesion and the Territories of Europe) under NextGenerationEU provided EUR 1.5 billion of additional funding to Poland's cohesion policy allocations for 2014-2020. This is to ensure a balanced recovery, boost convergence and provide vital support to regions following the coronavirus outbreak. REACT-EU provided support in Poland to bolster healthcare with EUR 461 million, support to SMEs with EUR 351 million, EUR 317 million are devoted to climate relevant investments, representing 20% of the REACT-EU resources for Poland and EUR 305 million (including 2022 tranche) to supporting digital transition. Digital projects focused on support for territorial self-government units (*Digital community*) to improve their IT tools and infrastructure, increase the level of cybersecurity and provide digital training for administrative staff.

The Coronavirus Response Investment Initiative ⁽²³⁾ **provided the first EU emergency support to Poland in relation to the COVID-19 pandemic.** It introduced extraordinary flexibility enabling Poland to re-allocate resources for immediate public health needs (EUR 1.4 billion), for support to businesses (EUR 124 million) and for remote learning (EUR 86 million). For instance, Poland shifted resources to purchase protective equipment and healthcare material with EUR 211 million and 550 000 SMEs received some EUR 493 million in support for working capital. By providing relevant equipment or connections, remote learning projects enabled more than 335 000 pupils from more than 23 000 schools to have access to online learning. Poland also

benefited from the temporary 100% EU financing of incurred measures in cohesion policy, with approximately EUR 1.8 billion in 2021 through 100% co-financing.

Poland received support under the European instrument for temporary support to mitigate unemployment risks in an emergency (SURE) to finance short-time work schemes and similar measures. In September 2020, the Council granted Poland financial assistance under SURE for a maximum of EUR 11.3 billion, 87% of which was disbursed by 29 March 2022. SURE is estimated to have supported approximately 20% of workers and 10% of firms for at least one month in 2020, primarily in wholesale and retail trade, construction, and professional, scientific and technical activities. Poland is estimated to have saved a total of EUR 0.4 billion on interest payments as a result of SURE's lower interest rates.

The Commission provides tailor-made expert support via the Technical Support Instrument, to help Poland design and implement growth-enhancing reforms. Since 2017, Poland has received assistance through 56 technical support projects. Projects delivered in 2021 aimed, for example, at tackling the erosion of the tax base caused by an inaccurate application of transfer pricing rules or implementing Poland's Capital Market Development Strategy. In 2022, new projects will start to support, among others, the competitiveness of Poland's railway sector and green mobility, and the development of digital competences.

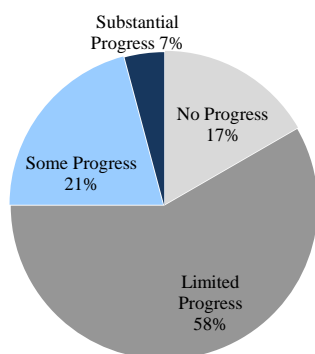
Poland also benefited from other EU programmes. This includes the Connecting Europe Facility, which provided EU funding of EUR 4.3 billion to specific projects on strategic transport and energy networks, such as the gas interconnectors with neighbouring countries, and Horizon 2020, with EU funding of EUR 743.2 million.

⁽²³⁾ Re-allocating ESIF resources according to Regulation (EU) 2020/460 of the European Parliament and of the Council of 30 March 2020, and Regulation (EU) 2020/558 of the European Parliament and of the Council of 23 April 2020.

ANNEX 4: PROGRESS IN THE IMPLEMENTATION OF COUNTRY-SPECIFIC RECOMMENDATIONS

The Commission assessed the 2019-2021 country-specific recommendations (CSRs) ⁽²⁴⁾ addressed to Poland in the context of the European Semester. The assessment takes into account the policy action taken by Poland to date ⁽²⁵⁾. Overall 21% of the CSRs focusing on structural issues in 2019 and 2020 have recorded at least “some progress”, while 75% recorded “limited” or “no progress” (see Graph A4.1).

Graph A4.1: **Poland's progress on the 2019-2020 CSRs (2022 European Semester cycle)**



Source: European Commission

⁽²⁴⁾ 2021 CSRs: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021H0729%2821%29&qid=1627675454457>

2020 CSRs: [EUR-Lex - 32020H0826\(21\) - EN - EUR-Lex \(europa.eu\)](#)

2019 CSRs: [EUR-Lex - 32019H0905\(21\) - EN - EUR-Lex \(europa.eu\)](#)

⁽²⁵⁾ Incl. policy action reported in the National Reform Programme.

Table A4.1: Summary table on 2019, 2020 and 2021 CSRs

Poland	Assessment in May 2022*
2019 CSR1	Some Progress
<i>Ensure that the nominal growth rate of net primary government expenditure does not exceed 4.4% in 2020, corresponding to an annual structural adjustment of 0.6% of GDP.</i>	Not relevant anymore
<i>Take further steps to improve the efficiency of public spending, including by improving the budgetary process.</i>	Some Progress
2019 CSR 2	Limited Progress
<i>Ensure the adequacy of future pension benefits and the sustainability of the pension system by taking measures to increase the effective retirement age and by reforming the preferential pension schemes.</i>	Limited Progress
<i>Take steps to increase labour market participation, including by improving access to childcare and long-term care, and remove remaining obstacles to more permanent types of employment.</i>	Limited Progress
<i>Foster quality education and skills relevant to the labour market, especially through adult learning.</i>	Limited Progress
2019 CSR 3	Limited Progress
<i>Strengthen the innovative capacity of the economy, including by supporting research institutions and their closer collaboration with business.</i>	Limited Progress
<i>Focus investment-related economic policy on innovation</i>	Limited Progress
<i>[Focus investment-related economic policy on] transport, notably on its sustainability</i>	Limited Progress
<i>[Focus investment-related economic policy on] digital [infrastructure]</i>	Some Progress
<i>[Focus investment-related economic policy on] energy infrastructure</i>	Some Progress
<i>[Focus investment-related economic policy on] healthcare</i>	Limited Progress
<i>[Focus investment-related economic policy on] cleaner energy, taking into account regional disparities</i>	Limited Progress
<i>Improve the regulatory environment, in particular by strengthening the role of consultations of social partners and public consultations in the legislative process.</i>	No Progress
2020 CSR1	Limited Progress
<i>Take all necessary measures, in line with the general escape clause of the Stability and Growth Pact, to effectively address the COVID-19 pandemic, sustain the economy and support the ensuing recovery. When economic conditions allow, pursue fiscal policies aimed at achieving prudent medium-term fiscal positions and ensuring debt sustainability, while enhancing investment.</i>	Not relevant anymore
<i>Improve resilience, accessibility and effectiveness of the health system, including by providing sufficient resources and accelerating the deployment of e-health services.</i>	Limited Progress
⌘ ⌘ ⌘ ⌘	⌘ ⌘ ⌘ ⌘
2020 CSR2	Limited Progress
<i>Mitigate the employment impact of the crisis, in particular by enhancing flexible and short time working arrangements.</i>	Some Progress
<i>Better target social benefits and ensure access to those in need.</i>	No Progress
<i>Improve digital skills.</i>	Limited Progress
<i>Further promote the digital transformation of companies and public administration.</i>	Some Progress
2020 CSR 3	Limited Progress
<i>Continue efforts to secure access to finance and liquidity for companies.</i>	Substantial Progress
<i>Front-load mature public investment projects</i>	Limited Progress
<i>and promote private investment to foster the economic recovery.</i>	No Progress
<i>Focus investment on the green and digital transition, in particular on digital infrastructure,</i>	Limited Progress
<i>clean and efficient production and use of energy,</i>	Limited Progress
<i>and sustainable transport,</i>	Limited Progress
<i>contributing to a progressive decarbonisation of the economy, including in the coal regions.</i>	Limited Progress
2020 CSR 4	No Progress
<i>Enhance the investment climate, in particular by safeguarding judicial independence.</i>	No Progress

(Continued on the next page)

Table (continued)

<i>Ensure effective public consultations and involvement of social partners in the policymaking process.</i>	No Progress
2021 CSR1	Limited Progress
<i>In 2022, pursue a supportive fiscal stance, including the impulse provided by the Recovery and Resilience Facility, and preserve nationally financed investment.</i>	Full Implementation
<i>When economic conditions allow, pursue a fiscal policy aimed at achieving prudent medium-term fiscal positions and ensuring fiscal sustainability in the medium term.</i>	Some Progress
<i>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.</i>	Limited Progress
<i>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.</i>	No Progress

Source: European Commission

The European Green Deal intends to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. This annex offers a snapshot of the most significant and economically relevant developments in Poland in the respective building blocks of the European Green Deal. It is complemented by Annex 6 on the employment and social impact of the green transition and Annex 7 for circular economy aspects of the Green Deal.

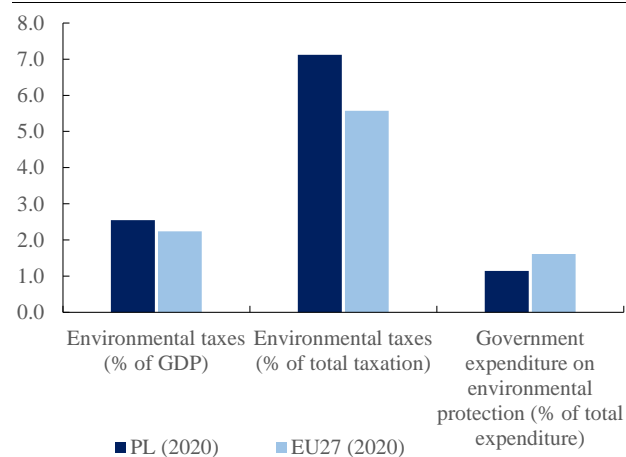
Significant efforts will be needed for Poland to reach its 2030 greenhouse gas emissions reduction target for sector outside the ETS.

In the last two decades, Poland has made limited progress in decarbonising its economy. Compared with 1990 the country's total emissions in 2020 were 21% lower, while compared with 2005 emissions in 2020 were only 8% lower. Emissions falling under the EU Emissions Trading System (ETS) decreased more slowly in Poland than in the EU on average. Aside from a coal-dependent energy system, road transport and inefficient buildings are other sources of high GHG emissions. In the national energy strategy, Poland puts forward an indicative target of 30% reduction in total greenhouse gas emissions by 2030 compared with 1990. The strategy respects the greenhouse gas emissions mitigation laid down in the integrated national energy and climate plan (NECP), which puts Poland on track to meet its 2030 European emissions reduction target only if additional measures are implemented. Further efforts will be needed to reflect the higher ambition under the European Green Deal, the Climate Law and the Fit for 55 package.

While Poland's revenues from environmental taxes are above the EU average, government investment in environmental protection and fossil fuel subsidies are not performing as strong. Poland's tax revenues, both as a share of total tax revenues and a share of GDP, are higher than the EU average, with energy taxes largely driving total environmental taxes. A small percentage also goes to taxes on transport and on pollution. At the same time, however, the Polish government spends a smaller share of its expenditure on environmental protection than in the EU overall. Poland's revenues from the EU ETS

are some of the highest in the EU in absolute terms and per capita and amounted to EUR 5.6 billion in 2021. So far, however, Poland has directed only some 50% of these revenues on average to climate and energy projects, despite ongoing considerations to set up an Energy Transformation Fund, funded by ETS revenues. Meanwhile, fossil fuel subsidies showed a decline in the last couple of years, reversing the previous increasing trend. Budgetary exposure to climate hazards (i.e. the climate risk to public finances due to uninsured assets) is considered low/moderate. For more indicators on taxation (see Annex 18).

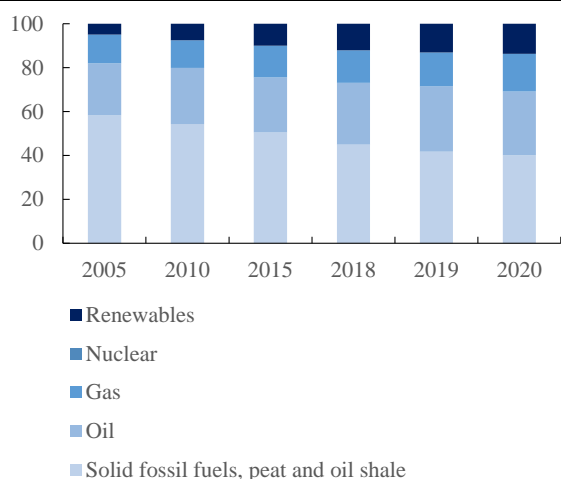
Graph A5.1: Fiscal aspects of the green transition



(1) Taxation and government expenditure on environmental protection

Source: EUROSTAT

Graph A5.2: **Thematic – Energy**



Share in energy mix (solids, oil, gas, nuclear, renewables)
 Share of renewables include waste
 The energy mix is based on gross inland consumption, and excludes heat and electricity. The share of renewables includes biofuels and non-renewable waste.

Source: EUROSTAT

Poland is one of the most energy- and emission-intensive Member States in the EU and its energy mix is still very much reliant on fossil fuels.

Poland has been decarbonising at the second slowest rate among all lower income Member States; it registered only an 8% reduction in total GHG emissions since 2005 compared to 2020. In 2020, gross inland consumption of fossil fuels (coal, oil and natural gas) reached 86%. Poland overachieved its renewables target for the year 2020 (16.1% vs 15%). Renewable sources generate 16.2% of electricity and 22.1% of heat. The NECP puts forward a national contribution of 21-23% from renewable energy, which is below rate set down in Regulation (EU) 2018/1999 of 25%, and was therefore assessed as unambitious. Poland has made internal announcements by which it would gradually phase out hard coal mining by 2049. Poland’s energy policy up to 2040 envisages a gradual transition away from coal with no more than 56% of electricity to be generated from coal in 2030 (in a scenario with high CO₂ price increases, the proportion of coal could fall to 37%).

In terms of biodiversity and ecosystem health, Poland presents a mixed picture.

Considering both Natura 2000 and other nationally designated protected areas, Poland legally protects around 40% of its terrestrial areas and 22.7% of marine areas. At the same time, the share of habitats in bad conservation status has increased to 35% and that of assessments for

species in bad conservation status has remained stable at around 13%. Organic farming is estimated at 3.52%, well below the EU average of 9.07% in 2020.

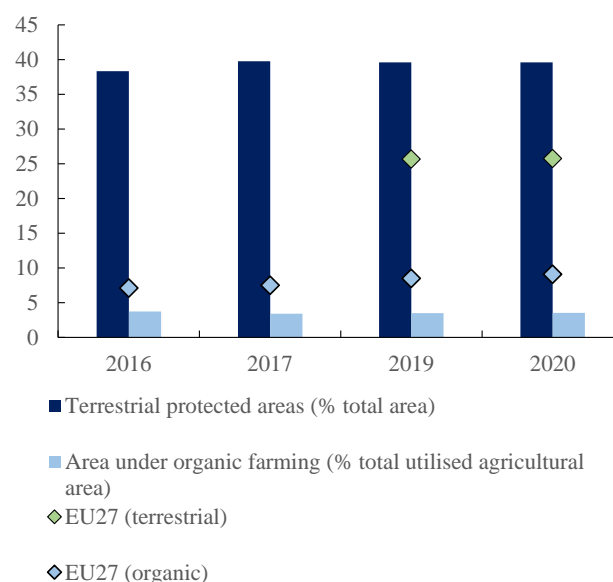
In terms of pollution, air quality in Poland continues to give cause for serious concern.

For the year 2020, exceedances above EU limit values were registered for nitrogen dioxide in two air quality zones and for particulate matter (PM₁₀ and PM_{2.5}) in 16 and 2 zones respectively. Furthermore, for several air quality zones the target values for ozone concentration have not been met. Persistent breaches of air quality requirements, which have severe negative effects on health and the environment, are being followed up by the European Commission through infringement procedures (mainly over PM10 and NO₂ exceedances).

Green mobility faces challenges, especially as regards road passenger transport.

In Poland the market development for zero-emission passenger cars is lagging behind the overall trend in the EU. However, the electrification of the railway network is more advanced than the average in the EU.

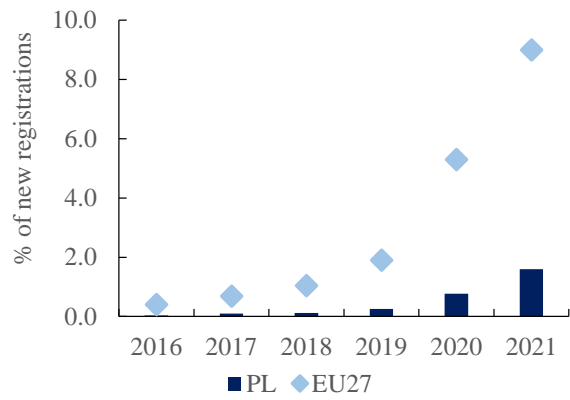
Graph A5.3: **Thematic – Biodiversity**



Terrestrial protected areas and organic farming
 For terrestrial protected areas data for 2018, and data for the EU average (2016, 2017) is lacking

Source: EEA (terrestrial protected areas) and EUROSTAT (organic farming)

Graph A5.4: **Thematic – Mobility**



Share of zero emission vehicles (% of new registrations)
Zero emission vehicles include battery and fuel cell electric vehicles (BEV, FCEV)

Source: European Alternative Fuels Observatory

Table A5.1: Indicators underpinning the progress on EU Green Deal from macroeconomic perspective

			2005	2019	2020	Target 2030	Distance WEM	Distance WAM	Fit for 55'			
									Target 2030	Distance WEM	Distance WAM	
Progress to policy targets	Non-ETS GHG emission reduction target ⁽¹⁾	MTCO2 eq. % pp ⁽²⁾	183.1	16%	12%	-7%	-13	5	-18%	-24	-6	
				2005	2016	2017	2018	2019	2020	National contribution to 2030 EU target		
	Share of energy from renewable sources in gross final consumption of energy ⁽³⁾	%	7%	11%	11%	15%	15%	16%	21-23%			
	Energy efficiency: primary energy consumption ⁽⁴⁾	Mtoe	88.0	94.8	99.1	104.1	100.2	96.9	91.3			
Energy efficiency: final energy consumption ⁽⁴⁾	Mtoe	58.5	66.6	70.9	74.9	73.7	71.1	67.1				
			POLAND						EU			
Fiscal and financial indicators	Environmental taxes (% of GDP)	% of GDP	2.7	2.7	2.7	2.7	2.5	2.6	2.4	2.4	2.2	
	Environmental taxes (% of total taxation)	% of taxation	8.2	8.1	7.9	7.7	7.2	7.1	6.0	5.9	5.6	
	Government expenditure on environmental protection	% of total exp.	1.44	1.02	0.94	1.18	1.26	1.14	1.66	1.69	-	
	Investment in environmental protection	% of GDP ⁽⁴⁾	0.84	0.35	0.34	0.49	-	-	0.42	0.38	0.41	
	Share of green bonds		-	-	-	-	-	-	-	-	-	
	Fossil fuel subsidies	EUR2020bn	1.51	1.85	2.71	2.12	1.67	0.98	56.87	55.70	41.27	
Climate protection gap (5)	score 1-4	1.6 out of 4 (slight increase from historical level of 1.5). This is a low/medium risk category (4 being a high risk).										
Climate	Net GHG emissions	1990 = 100	82	84	88	87	83	84	79	76	69	
	GHG emissions intensity of the economy	kg/EUR 10	0.96	0.96	0.95	0.90	0.82	0.80	0.32	0.31	0.30	
	Energy intensity of the economy	kgoe/EUR 10	0.23	0.23	0.23	0.23	0.21	0.21	0.12	0.11	0.11	
Energy	Final energy consumption (FEC)	2015=100	100.0	106.9	113.8	120.2	118.4	114.2	103.5	102.9	94.6	
	FEC in residential building sector	2015=100	100.0	104.5	105.4	118.5	110.3	110.9	101.9	101.3	101.3	
	FEC in services building sector	2015=100	100.0	108.4	102.6	101.1	99.6	96.7	102.4	100.1	94.4	
Pollution	Smog-precursor emission intensity (to GDP) ⁽⁶⁾	tonne/EUR 10	2.95	2.76	2.76	2.57	2.32	-	0.99	0.93	-	
	Years of life lost caused due to air pollution by PM2.5	per 100,000 inh.	1403	1364	1570	1560	1291	-	863	762	-	
	Years of life lost due to air pollution by NO2	per 100,000 inh.	54	49	54	63	39	-	120	99	-	
	Nitrate in ground water	mg NO3/litre	-	-	-	-	-	-	21.7	20.7	-	
Biodiversity	Terrestrial protected areas	% of total	-	38.3	39.8	-	39.6	39.6	-	25.7	25.7	
	Marine protected areas	% of total	-	-	-	-	-	-	-	-	-	
	Organic farming	% of total utilised agricultural	4.0	3.7	3.4	3.3	3.5	3.5	8.0	8.5	9.1	
			2000-2006	2006-2012	2012-2018	00-06	06-12	12-18				
Net land take			per 10,000 km ²	3.6	15.7	12.9	13.0	11.0	5.0			
Mobility	GHG emissions intensity of transport (to GVA) ⁽⁷⁾	kg/EUR 10	0.85	0.97	0.94	0.87	0.84	0.83	0.89	0.87	0.83	
	Share of zero emission vehicles (8)	% in new registrations	0.0	0.0	0.1	0.1	0.3	0.8	1.0	1.9	5.3	
	Number of plug-in electric vehicles per charging point		2	2	3	4	6	7	6	7	10	
	Share of electrified railways	%	63.6	64.0	63.6	63.7	64.2	-	55.6	56.0	-	
Largest cities' average number of hours spent in rush connection per year, by transport mode				25.3	24.9	25.0	24.4	25.2	28.9	28.8	-	
Digital	Share of smart meters in total metering points ⁽⁹⁾ - electricity	% of total	2018	8.3	35.8							
	Share of smart meters in total metering points ⁽⁹⁾ - gas	% of total	2018	1.3	13.1							
	ICT used for environmental sustainability ⁽¹⁰⁾	%	2021	59.7	65.9							

(1) The 2030 non-ETS GHG target is based on the Effort Sharing Regulation. The F55 targets are based on the COM proposal to increase EU's climate ambition by 2030. Renewables and Energy Efficiency targets and national contributions under the Governance Regulation (Regulation (EU) 2018/1999).

(2) Distance to target is the gap between Member States' 2030 target under the Effort Sharing Regulation and projected emissions, with existing measures (WEM) and with additional measures (WAM) respectively, as a percentage of 2005 base year emissions.

(3) Percentage of total revenues from taxes and social contributions (excluding imputed social contributions). Revenues from the ETS are included in environmental tax revenues. For reference, in 2017 ETS revenues amounted to 1.5% of total environmental tax revenues at the EU level.

(4) Covers expenditure on "gross fixed capital formation" to be used for the production of environmental protection services (i.e. abatement and prevention of pollution) covering all sectors, i.e. government, industry and specialised providers.

(5) The climate protection gap indicator is part of the European adaptation strategy adopted in (February 2021), and is defined as the share of non-insured economic losses caused by climate-related disasters.

(6) Sulphur oxides (SO2 equivalent), Ammonia, Particulates < 10µm, Nitrogen oxides in total economy (divided by GDP).

(7) Transportation and storage (NACE Section H).

(8) Zero emission vehicles include battery electric vehicles (BEV) and fuel cell electric vehicles (FCEV).

(9) European Commission Report (2019) "Benchmarking smart metering deployment in the EU-28".

(10) European Commission (2021). Each year the DESI is re-calculated for all countries for previous years to reflect any possible change in the choice of indicators and corrections to the underlying data. Country scores and rankings may thus differ compared with previous publications.

Source: Source: Eurostat, JRC, European Commission, EEA, EAFO

The green transition not only encompasses improvements to environmental sustainability, but also includes a significant social dimension. While measures in this regard include the opportunity for sustainable growth and job creation, it must also be ensured that no one is left behind and all groups in society benefit from the transition. Poland's green transition can benefit from positive trends, promising recent policy measures and the opportunities offered by the green economy; at the same time energy-intensive sectors are sizeable and, to some extent, lower-income groups are likely to face challenges during the transition.

The economy has slightly reduced its carbon footprint. Though key energy-intensive sectors remain sizeable, the green economy has potential for growth and can provide strong potential for job creation. The greenhouse gas (GHG) emissions intensity of the Polish economy decreased slightly between 2015 and 2020 (in terms of gross value added) and stands at 54%, above the EU average, with an average carbon footprint per worker at 20.93 tonnes of GHG emissions (13.61 tonnes in the EU) (see Graph 1). Coal and lignite and fossil fuels-based energy production have been identified as declining sectors⁽²⁶⁾; no transforming sector could be identified. Poland's energy-intensive industry⁽²⁷⁾, provides jobs for 5.42% of the total employed workforce, a slight increase from 5.33% in 2015, for which up-skilling and reskilling could be particularly important (see Annex 15). The environmental goods and services sector provides jobs to a comparatively small proportion of the employed population (1.4% vs 2.1% in the EU)⁽²⁸⁾. Wind energy potential in Poland is up to 1 635 MWh/km² and solar energy potential up to 1 310 MWh/km². Therefore, energy efficiency improvements could offer further opportunities for green jobs⁽²⁹⁾.

As for the social dimension of the green transition, ensuring access to transport and energy appears overall less of a challenge in Poland. A slightly higher proportion of the population in rural areas is at risk of poverty (22% vs 18.7% in the EU)⁽³⁰⁾. The share of the population being unable to keep their homes adequately warm decreased significantly from 7.5% in 2015 to 3.2% in 2020, which is almost 2.5 times below the EU average (8.2%). All income groups are affected (see Graph 2). Consumption patterns vary across the population: the average carbon footprint of the top 10% of emitters is about 5.1 times higher than that of the bottom 50% of the population (5.3 times in the EU).

Tax systems are key to ensuring a fair transition towards climate neutrality⁽³¹⁾. Poland's revenues from total environmental taxes reduced slightly from 2.6% of GDP in 2015 to 2.5% in 2019, and remained stable in 2020 (2.2% in the EU). The labour tax wedge for low-income earners⁽³²⁾ remained stable at 34.3% between 2015 and 2019 (33.5% in 2021), compared with 31.9% in the EU in 2021 (see Annex 18). Redistributive measures accompanying environmental taxation have the potential to foster progressive measures and to have a positive impact on the disposable income of households, with Poland having (among) the strongest potential positive effects on the first income decile⁽³³⁾.

⁽²⁶⁾ SWD(2021) 275 final

⁽²⁷⁾ 2020 European Semester: Overview of Investment Guidance on the Just Transition Fund 2021-2027 per Member State (Annex D)

⁽²⁸⁾ There is currently no common EU-wide definition of green jobs. Accounts for the environmental goods and services sector only report on an economic sector that generates environmental products, i.e. goods and services produced for environmental protection or resource management.

⁽²⁹⁾ <https://publications.jrc.ec.europa.eu/repository/handle/JRC126047>

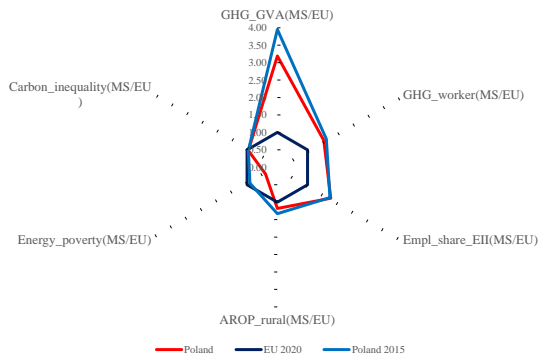
⁽³⁰⁾ Based on COM(2021) 568 final (Annex I) as a proxy for potential transport challenges in the context of the green transition (e.g. due to vulnerability to fuel prices).

⁽³¹⁾ COM(2021) 801 final.

⁽³²⁾ Tax wedge for a single earner at 50% of the national average wage (Tax and benefits database, European Commission/OECD).

⁽³³⁾ SWD(2021) 641 final PART 3/3.

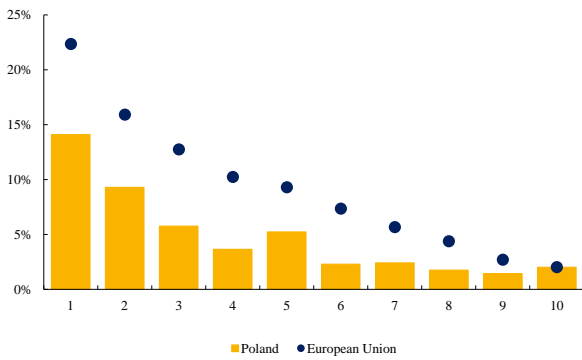
Graph A6.1: Fair green transition challenges



(1) Numbers are the normalised indicator performance, signifying factors relative to the EU27 average. Carbon inequality average emissions per capita 10% vs bottom 50% (2019)

Source: Eurostat, World Inequality Database

Graph A6.2: Energy poverty by income decile
Thematic focus on energy poverty



HH050: Ability to keep home adequately warm
HY020: Total disposable household income

Source: Eurostat EU-SILC survey (2020)

The green transition not only encompasses improvements to environmental sustainability, but also includes a significant social dimension. While measures in this regard include the opportunity for sustainable growth and job creation, it must also be ensured that no one is left behind and all groups in society benefit from the transition.

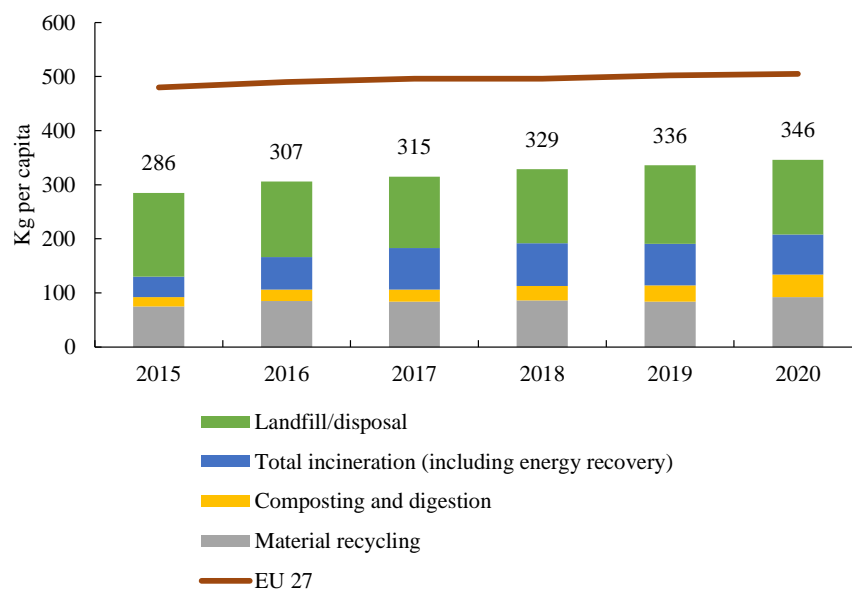
On circular economy Poland has a long way to go. The circular (secondary) use of material was 10.2% in 2016 and 9.9% in 2020. Thus, there has been a decline in secondary material usage over recent years and the gap between Poland's performance and the EU average of 12.8% has widened. In 2019, the Polish Council of Ministers adopted the Roadmap for Transformation to a Circular Economy, but there has been no progress since.

Resource productivity in Poland is below the EU average. Resource productivity expresses how efficiently the economy uses material resources to produce wealth. Improving resource productivity can help minimise negative impacts on the environment and reduce dependency on volatile raw material markets. With 1.31 purchasing power standards (PPS) generated per kg of material consumed in 2020, resource productivity in Poland falls behind the EU average of 2.23 PPS per kg.

Effective waste management has been a challenge for Poland for many decades. After a downward trend, municipal waste generation in Poland has started to increase in recent years, reaching 336 kg per capita in 2019, although this value is still well below the EU average of 501kg per capita. After an initial decrease in the first half of the last decade, Poland's landfill rate has gone up again over the last three years, reaching 43% in 2019 (which is far above the EU average of 24%). This means that landfilling and incineration (23%) remain the predominant forms of waste treatment. Poland is also not on track to meet the EU 2020 and 2025 recycling targets with 38.7% in 2020, below the EU average of 47.8%.

Whilst not being a leader in environmental technology, Poland performs above average as regards employment in the circular economy and value-added at factor cost.

Graph A7.1: **Municipal waste treatment**



Source: Eurostat

Table A7.1: **Selected resource efficiency indicators**

Key indicators - Poland

SUB-POLICY AREA	2015	2016	2017	2018	2019	2020	EU27	Latest year
Circularity								
Resource Productivity (Purchasing power standard (PPS) per kilogram)	1.2	1.2	1.2	1.2	1.3	1.3	2.2	2020
Material Intensity (kg/EUR)	0.8	0.9	0.9	0.9	0.8	0.7	0.4	2020
Circular Material Use Rate (%)	11.6	10.2	9.9	9.8	10.3	9.9	12.8	2020
Material footprint (Tones/capita)	16.5	17.2	18.8	18.8	18.2	-	14.6	2019
Waste								
Waste generation (kg/capita, total waste)	-	4793	-	4612	-	-	5234	2018
Landfilling (% of total waste treated)	-	28.0	-	26.4	-	-	38.5	2018
Recycling rate (% of municipal waste)	32.5	34.8	33.8	34.3	34.1	38.7	47.8	2020
Hazardous waste (% of municipal waste)	-	1.1	-	2.2	-	-	4.3	2018
Competitiveness								
Gross value added in environmental goods and services sector (% of GDP)	2.2	2.4	2.3	2.2	2.6	-	2.3	2019
Private investment in circular economy (% of GDP)	0.2	0.2	0.2	0.1	-	-	0.1	2018

Source: Eurostat

The Digital Economy and Society Index (DESI) monitors EU Member States' digital progress.

The areas of human capital, digital connectivity, the integration of digital technologies by businesses and digital public services reflect the Digital Decade's four cardinal points⁽³⁴⁾. This Annex describes Poland's DESI performance.

The low level of basic digital skills is a key challenge for Poland in the human capital dimension. Poland scores below the EU average in at least basic digital skills and ICT specialists account for a lower percentage of the workforce in Poland than the EU average. The percentage of female ICT specialists is also below the EU average.

Poland has a mixed performance in the indicators for digital connectivity. The very high capacity networks (VHCN) are at the EU average, while 5G technology is available in 34% of the country, scoring considerably below EU average. No harmonised radio spectrum for 5G deployment has yet been assigned.

In the integration of digital technology, Poland is still far below the EU average for most indicators. The proportion of SMEs with at least a basic level of digital intensity is much lower than the EU average. The adoption of advanced digital technologies is also considerably below the EU average for big data solutions, cloud, and artificial intelligence.

Poland is still underperforming in the digital public services dimension of DESI. Poland scores below the EU average on the availability of digital online services, for digital services for citizens even more than for businesses.

⁽³⁴⁾ 2030 Digital Compass: the European Way for the Digital Decade Communication, COM (2021) 118 final

Table A8.1: Key Digital Economy and Society Index Indicators

	Poland			EU	EU top-performance
	DESI 2020	DESI 2021	DESI 2022	DESI 2022	DESI 2022
Human capital					
At least basic digital skills	NA	NA	43%	54%	79%
% individuals			2021	2021	2021
ICT specialists	3.1%	3.4%	3.5%	4.5%	8.0%
% individuals in employment aged 15-74	2019	2020	2021	2021	2021
Female ICT specialists	14%	15%	16%	19%	28%
% ICT specialists	2019	2020	2021	2021	2021
Connectivity					
Fixed Very High Capacity Network (VHCN) coverage	60%	65%	70%	70%	100%
% households	2019	2020	2021	2021	2021
5G coverage*	NA	10%	34%	66%	99.7%
% populated areas		2020	2021	2021	2021
Integration of digital technology					
SMEs with at least a basic level of digital intensity	NA	NA	40%	55%	86%
% SMEs			2021	2021	2021
Big data	8%	8%	8%	14%	31%
% enterprises	2018	2020	2020	2020	2020
Cloud	NA	NA	19%	34%	69%
% enterprises			2021	2021	2021
Artificial Intelligence	NA	NA	3%	8%	24%
% enterprises			2021	2021	2021
Digital public services					
Digital public services for citizens	NA	NA	57	75	100
Score (0 to 100)			2021	2021	2021
Digital public services for businesses	NA	NA	70	82	100
Score (0 to 100)			2021	2021	2021

* The 5G coverage indicator does not measure user's experience, which may be affected by a variety of factors such as the type of device used, environmental conditions, number of concurrent users and network capacity. 5G coverage refers to the percentage of populated areas as reported by operators and national regulatory authorities.

Source: Digital Economy and Society Index

This Annex provides a general overview of the performance of Poland's research and innovation system. Poland is an *emerging innovator* according to the 2021 edition of the European Innovation Scoreboard⁽³⁵⁾. While its innovation performance has improved over the last decade, the gap with the EU average remains significant. R&D intensity reached 1.39% of GDP in 2020, continuing the clear upward trend since 2016 (1% of GDP in 2015), but remains below EU average.

Poland continues to produce scientific outputs of modest quality and struggles to foster science-business cooperation. The proportion of the country's scientific publications among the top 10% most cited scientific publications worldwide has been steadily increasing since 2010 (5.0% in 2018, compared with 2.9% in 2010), but remains below the EU average (9.9% in 2018). The relevant reforms under the 2018 Act on Higher Education are expected to further influence this development. Similar patterns are also visible regarding public-private scientific co-publications as percentage of the total number of publications (5% in 2020 compared with the EU average of 9.05% in 2020 and 4% for Poland in 2015).

The framework conditions for businesses to innovate and invest in R&D require further improvement. R&D expenditure of businesses rose to 0.87% of GDP in 2020 compared with 0.47% in 2015, while remaining significantly below the EU average (1.53%). Public sector support for private R&D investment has increased consistently, reaching 0.17% of GDP in 2019 (EU average 0.196%), compared with 0.082% in 2015, driven to a small extent by increases in R&D tax incentives (foregone revenues as percentage of GDP). The availability of venture capital has increased to 0.016% of GDP (EU average 0.054%), in line with the positive development of previous years. On the downside, skills shortages are visible in the numbers of new graduates in science and engineering which decreased in recent years (13.8 in 2019 compared with 16.5 in 2015 - per thousand population aged 25-24). Skills shortages and other factors might further hamper the take-up of innovations, as can already be seen in the

decreasing number of Patent Cooperation Treaty (PCT) patent applications (per billion GDP in PPS), which decreased between 2017 and 2019.

⁽³⁵⁾ 2021 European Innovation Scoreboard, Country profile: Poland
<https://ec.europa.eu/docsroom/documents/45914/attachment/1/translations/en/renditions/native>

Table A9.1: Key research, development and innovation R&D&I indicators

Poland	2010	2015	2018	2019	2020	Compound annual growth 2010-20	EU average
Key indicators							
R&D Intensity (GERD as % of GDP)	0.72	1.00	1.21	1.32	1.39	6.88	2.32
Public expenditure on R&D as % of GDP	0.53	0.53	0.41	0.49	0.51	-0.2	0.78
Business enterprise expenditure on R&D (BERD) as % of GDP	0.19	0.47	0.80	0.83	0.87	16.4	1.53
Quality of the R&I system							
Scientific publications of the country within the top 10% most cited publications worldwide as % of total publications of the country	2.9	4.2	5.0	:	:	7.2	9.9
PCT patent applications per billion GDP (in PPS)	0.4	0.7	0.5	:	:	1.0	3.5
Academia-business cooperation							
Public-private scientific co-publications as % of total publications	3.2	4.0	4.6	4.8	5.0	4.4	9.05
Human capital and skills availability							
New graduates in science & engineering per thousand pop. aged 25-34	15.9	16.5	14.6	13.8	:	-2.6	16.3
Public support for business enterprise expenditure on R&D (BERD)							
Total public sector support for BERD as % of GDP	0.030	0.082	0.157	0.170	:	21.2	0.196
R&D tax incentives: foregone revenues as % of GDP	:	:	0.015	0.018	:	104.3	0.100
Green innovation							
Share of environment-related patents in total patent applications filed under PCT (%)	11.7	14.0	8.2	:	:	-4.3	12.8
Finance for innovation and Economic renewal							
Venture Capital (market statistics) as % of GDP	0.07	0.06	0.09	0.012	0.016	9.0	0.054
Employment in fast-growing enterprises in 50% most innovative sectors	6.3	5.8	6.8	6.7	:	0.8	5.5

Source: DG Research and Innovation - Common R&I Strategy and Foresight Service - Chief Economist Unit
Eurostat, OECD, DG JRC, Science-Metrix (Scopus database and EPO's Patent Statistical database), Invest Europe

Productivity growth is a critical driver of economic prosperity, well-being and convergence over the long run. A major source of productivity for the EU economy is a well-functioning single market, where fair and effective competition and a business friendly environment are ensured, in which small and medium enterprises (SMEs) can operate and innovate without difficulty. Businesses and industry rely heavily on robust supply chains and are facing bottlenecks that bear a negative impact on firms' productivity levels, employment, turnover and entry/exit rates. This may impact the Member States' capacity to deliver on Europe's green and digital transformation.

The business environment in Poland is characterized by high uncertainty and instability, leading to low levels of investment. Fostering a stable and predictable regulatory framework by diminishing burdensome administrative requirements and procedures and frequent changes to key laws (in e.g., taxation, social security contributions, energy policies) would build a more resilient economy. According to the latest edition of the Survey on the Access to Finance of Enterprises (SAFE), 18 % of respondents indicated regulation as the most important problem that their business is facing (versus only 11 % in the EU).

The low private investment rate can negatively influence Poland's economic recovery and its ability to transition into a more knowledge-based economy. Poland's share of investment in GDP (18.5%) is systematically low, not only in comparison to the EU average (24.6%), but also against neighbouring, peer countries (CZ, HU, and SK). In addition, much investment is devoted to infrastructure investment (in Poland 70%, EU average 43 %) rather than intangible assets weighing on productivity and decreasing future growth potential. As a percentage of GVA, Poland invests in intangible assets less than a half of what is invested by Hungary and around a third compared to the Czech Republic. Ensuring equal treatment of economic operators by an independent judiciary is essential for a solid investment climate. Its lack thereof poses a risk. As shown in the graph below, in 2021 just 25% of Polish companies were confident that their investments were protected by national law and courts vs an EU average of 56%. The absence of a Recovery and Resilience Plan only worsens future

perspectives for investment. Uncertainty also affects public procurement procedures: Poland registers the highest proportion of contracts awarded to a single bidder (51%) in the EU, a sign of low competition.

Poland offers multiple instruments to support SMEs' access to finance, both at the national and at the regional level. The Polish banking system is characterized by high stability and safety. However, according to the last SAFE study 2021, 14% of the loans were rejected, one of the highest ratios in the EU and the share of SMEs experiencing late payments in the past six months increased to 65.5%, well above the EU average of 45%. Venture capital markets are still underdeveloped.

Table A10.1: Key Single Market and Industry indicators

HEADLINE INDICATORS										
Economic structure	Value added by source (domestic)	VA that depends on domestic intermediate inputs, % [source: OECD (TiVA), 2018]	65.58					62.6%		
	Value added by source (EU)	VA imported from the rest of the EU, % [source: OECD (TiVA), 2018]	17.97					19.7%		
	Value added by source (extra-EU)	% VA imported from the rest of the world, % [source: OECD (TiVA), 2018]	16.5					17.6%		
Cost competitiveness	Producer energy price (industry)	Index (2015=100) [source: Eurostat, sts_inppd_a]	130.1	111.6	116.7	112.1	105	23.9%	127.3	
RESILIENCE										
Shortages/supply chain disruptions	Material Shortage using survey data	Average (across sectors) of firms facing constraints, % [source: ECFIN CBS]	17	9	12	12	12	42%	26%	
	Labour Shortage using survey data	Average (across sectors) of firms facing constraints, % [source: ECFIN CBS]	36	35	47	50	38	-5%	14%	
	Sectoral producer prices	Average (across sectors), 2021 compared to 2020 and 2019, index [source: Eurostat]						5.3%	5%	
Strategic dependencies	Concentration in selected raw materials	Import concentration a basket of critical raw materials, index [source: COMEXT]	0.19	0.18	0.18	0.2	0.2	-5%	17%	
	Installed renewables electricity capacity	Share of renewable electricity to total capacity, % [source: Eurostat, nrg_inf_epc]	20.5		21.2	20.7	20.3	1%	47.8%	
Investment dynamics	Net Private investments	Change in private capital stock, net of depreciation, % GDP [source: Ameco]	2.9		5.1	4.5	4.6	-37%	3%	
	Net Public investments	Change in public capital stock, net of depreciation, % GDP [source: Ameco]	2.1		1.9	2.4	1.5	40%	0%	
SINGLE MARKET										
Professional services integration	Intra-EU trade	Ratio of Intra-EU trade to Extra-EU trade, index [source: Ameco]	2.62	2.41	2.36	2.43	2.48	6%	2.00	
	Regulatory restrictiveness indicator	Restrictiveness of access to and exercise of regulated professions (professions with above median restrictiveness, out of the 7 professions analysed in SWD (2021)185 [source: SWD (2021)185; SWD(2016)436 final])	3					3	0.0%	3.4%
	Recognition decisions w/o compensation	Professionals qualified in another EU MS applying to host MS, % over total decisions taken by host MS [source: Regulated professions database]	65					45.0%		
Compliance - cooperation EC and MS	Transposition - overall	5 sub-indicators, sum of scores [source: Single Market Scoreboard]	Below average		On average	On average	Below average			
	Infringements - overall	4 sub-indicators, sum of scores [source: Single Market Scoreboard]	Below average		Below average	Below average	Below average			
Investment protection	Confidence in investment protection	Companies confident that their investment is protected by the law and courts of MS if something goes wrong, % of all firms surveyed [source: Flash Eurobarometer 504]	25							56.0%
BUSINESS ENVIRONMENT - SMEs										
Business fragility	Bankruptcies	Index (2015=100) [source: Eurostat, sts_rb_a]	71.7	78.5	79.9	69.7	2.90%		70.1	

(Continued on the next page)

Table (continued)

Busi- demo	Business registrations	Index (2015=100) [source: Eurostat, sts_rb_a]	92.1	105.1	108.2	101.2	-9.0%	105.6
	Late payments	Share of SMEs experiencing late payments in past 6 months, % [source: SAFE]	65.5	66.3	71.8	n.a.	n.a.	-8.90%
Access to finance	EIF Access to finance index - Loan	Composite: SME external financing over last 6 months, index from 0 to 1 (the higher the better) [source: EIF SME Access to Finance Index]	0.72	0.64	0.81	0.69	4.20%	0.56 (2020)
	EIF Access to finance index - Equity	Composite: VC/GDP, IPO/GDP, SMEs using equity, index from 0 to 1 (the higher the better) [source: EIF SME Access to Finance Index]	0.21	0.1	0.07	0.23	-9.00%	0.18 (2020)
	% of rejected or refused loans	SMEs whose bank loans' applications were refused or rejected, % [source: SAFE]	13.9	24.9	16.7	7.5	7.4	89.00%
Public procurement	SME contractors	Contractors which are SMEs, % of total [source: Single Market Scoreboard]	59	61	62	57	3.5%	63%
	SME bids	Bids from SMEs, % of total [source: Single Market Scoreboard]	64	67	68	67	-4.5%	70.8%

(*) latest available

Source: See above in the table the respective source for each indicator in the column "description"

Good administrative capacity enables economic prosperity, social progress, and fairness. Public administrations at all government levels deliver crisis response, ensure the provision of public services, and contribute to building the resilience for the sustainable development of the EU economy.

Overall, public administration in Poland is among the least effective in the EU27 ⁽³⁶⁾.

The quality of law making is affected by limited public consultations and the use of fast-track procedures. While consultation mechanisms are regulated, they are not mandatory for legislative proposals submitted by Members of Parliament. Expedited law-making procedures often result in low legislative quality, with laws frequently requiring amendments soon after adoption. Some 77% of businesses found that fast-changing legislation and policies were a problem when doing business domestically ⁽³⁷⁾.

Poland has made some progress in the delivery of digital services.

The numbers of e-government users has increased (from 49 % in 2020 to 55% in 2021) partly due to a significant expansion of document e-submission options because of COVID-19 restrictions. However, the proportion remains clearly below the EU average, as is the overall performance on e-government benchmark indicators (see Graph 1).

The justice system faces challenges as regards its efficiency and independence.

Unlike for administrative cases, the length of civil and commercial litigious cases was above the EU average in 2020 and increased compared with 2019 (317 days in 2020 in first instance compared with 270 days in 2019). The quality of the justice system is overall good: digital tools are widely used in courts. However, concerns on judicial independence remain ⁽³⁸⁾.

Limited participation of civil servants in adult learning could undermine Poland's administrative capacity. While gender parity in senior civil service management positions is above

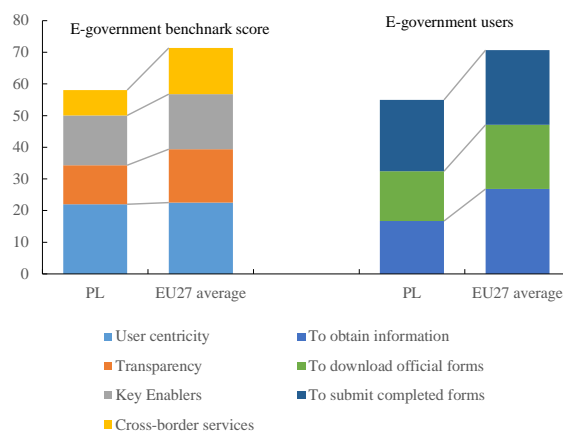
⁽³⁶⁾ Worldwide Governance Indicators, 2020.

⁽³⁷⁾ European Commission, Flash Eurobarometer 482, 2019

⁽³⁸⁾ For more detailed analysis of the performance of the justice system in Poland, see the 2022 EU Justice Scoreboard (forthcoming) and the country chapter for Poland in the Commission's 2022 Rule of Law Report (forthcoming).

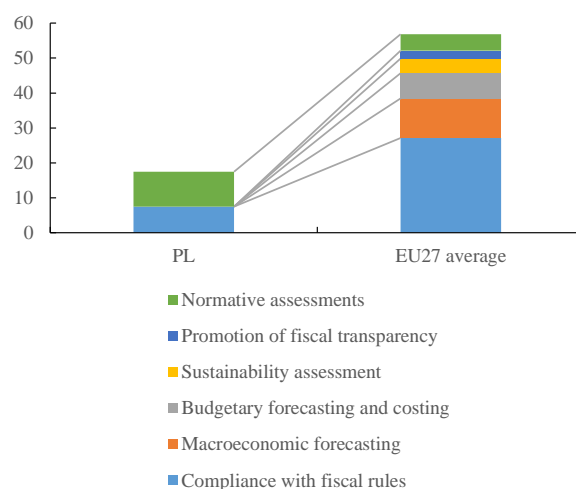
the EU average, it decreased significantly in 2019. The proportion of public sector workers between 55 and 74 years increased only slightly and remains below EU average.

Graph A11.1: **E-government benchmark scores (lhs) and e-government users (rhs)**



Source: Eurostat (ICT use survey), E-government benchmark report

Graph A11.2: **Scope Index of Independent Fiscal Institutions**



Source: EC (Fiscal Governance Database)

Poland's overall performance on public procurement is below the EU average. This is primarily due to the relatively high numbers of contracts awarded where there was just a single bidder and a relatively low use of centralised procurement. In addition, the scope of activities of its independent fiscal institution is much narrower than that of the average European country (see Graph 2). Most notably, activities could still be expanded upon in the areas of monitoring of fiscal rules and budgetary forecasting.

Table A11.1: Public administration indicators – Poland

PL	Indicator (*)	2017	2018	2019	2020	2021	EU27
E-government							
1	Share of individuals who used internet within the last year to interact with public authorities (%)	40.0	45.0	49.0	49.0	55.0	70.7
2	E-government benchmark 's overall score (**)	na	na	na	58.0	na	71.4
Open government and independent fiscal institutions							
3	Open data and portal maturity index	na	na	77.7	90.1	94.5	81.1
4	Scope Index of Fiscal Institutions	17.5	17.5	17.5	17.5	na	56.8
Educational attainment level, adult learning, gender parity and ageing							
5	Share of public administration employees with tertiary education (levels 5-8, %)	67.0	67.6	67.9	69.4	na	54.4
6	Participation rate of public administration employees in adult learning (%)	8.2	na	9.0	7.5	na	14.9
7	Gender parity in senior civil service positions	3.5	9.2	17.5	17.5	17.5	34.8
8	Share of public sector workers between 55 and 74 years (%)	16.5	15.7	15.9	17.3	na	21.2
Public Financial Management							
9	Medium term budgetary framework index	0.48	0.48	0.38	0.38	na	0.72
10	Strength of fiscal rules index	1.3	1.3	1.3	1.3	na	1.5
11	Public procurement composite indicator	3.3	0.7	0.7	1.0	na	-0.7
Evidence-based policy making							
12	Index on the degree of stakeholder engagement in the development of new regulations and in ex ante and ex-post evaluation of primary and secondary laws	1.72	na	na	1.76	na	1.7

This table shows a selection of indicators measuring country performance in policies that improve administrative capacity. The indicators fall into five main categories: i) e-government; ii) accountability; iii) civil service; iv) fiscal framework and v) evidence-based policy making. In dark grey are indicators below or at 20th percentile, meaning that performance is at the bottom of the distribution. In lighter grey are the indicators below the average but above the 20th percentile.

(1) High values stand for good performance barring indicators #7 and #8.

(2) Measures the user centricity (including for cross-border services) and transparency of digital public services as well as the existence of key enablers for the provision of those services.

(3) Break in the series in 2021. Also, for indicator #6, break in the series in 2018.

(4) Defined as the absolute value of the difference between the share of men and women in senior civil service positions.

Source: ICT use survey, Eurostat (# 1); E-government benchmark report (# 2); Open data maturity report (# 3); Fiscal Governance Database (#4 4, 9, 10); Labour Force Survey, Eurostat (# 5, 6, 8), European Institute for Gender Equality (# 7), Single Market Scoreboard public procurement composite indicator (# 11); OECD Indicators of Regulatory Policy and Governance (# 12).

ANNEX 12: EMPLOYMENT, SKILLS AND SOCIAL POLICY CHALLENGES IN LIGHT OF THE EUROPEAN PILLAR OF SOCIAL RIGHTS

The European Pillar of Social Rights provides the compass for upward convergence towards better working and living conditions in the EU. The implementation of its twenty principles on equal opportunities and access to the labour market, fair working conditions, social protection and inclusion, supported by the 2030 EU headline targets on employment, skills and poverty reduction, will strengthen the EU’s drive towards a digital, green and fair transition. This annex provides an overview of Poland’s progress in achieving the goals under the European Pillar of Social Rights.

Table A12.1: Social Scoreboard for Poland

Equal opportunities and access to the labour market	Early leavers from education and training (% of population aged 18-24) (2021)	5.9				
	Individuals' level of digital skills (% of population 16-74) (2021)	43.0				
	Youth NEET (% of total population aged 15-29) (2021)	13.4				
	Gender employment gap (percentage points) (2021)	14.0				
	Income quintile ratio (S80/S20) (2020)	4.1				
Dynamic labour markets and fair working conditions	Employment rate (% population aged 20-64) (2021)	75.4				
	Unemployment rate (% population aged 15-74) (2021)	3.4				
	Long term unemployment (% population aged 15-74) (2021)	0.9				
	GDHI per capita growth (2008=100) (2020)	145.3				
Social protection and inclusion	At risk of poverty or social exclusion (in %) (2020)	17.0				
	At risk of poverty or social exclusion for children (in %) (2020)	16.1				
	Impact of social transfers (other than pensions) on poverty reduction (% reduction of AROP) (2020)	36.8				
	Disability employment gap (ratio) (2020)	31.3				
	Housing cost overburden (% of population) (2020)	4.9				
	Children aged less than 3 years in formal childcare (% of under 3-years-olds) (2020)	11.2				
	Self-reported unmet need for medical care (% of population 16+) (2020)	1.9				
Critical situation	To watch	Weak but improving	Good but to monitor	On average	Better than average	Best performers

Update of 29 April 2022. Members States are classified on the Social Scoreboard according to a statistical methodology agreed with the EMCO and SPC Committees. It looks jointly at levels and changes of the indicators in comparison with the respective EU averages and classifies Member States in seven categories. For methodological details, please consult the Joint Employment Report 2022. Due to changes in the definition of the individuals' level of digital skills in 2021, exceptionally only levels are used in the assessment of this indicator; NEET: neither in employment nor in education and training; GDHI: gross disposable household income.

Source: European Commission

While the labour market is recovering, there remain challenges related to the labour market participation of women and vulnerable groups. The Polish Labour market bounced back quickly after the pandemic-related shock. By the fourth quarter of 2020, the employment rate surpassed its pre-COVID-19 crisis peak reaching 75.4%. However, the gender

employment gap has continued to increase for the last 5 years (reaching 14.00 pps in 2021, as compared to 10.8 pps in the EU). Care responsibilities for children, but also for family members with disabilities, are a barrier to female employment. Poland has one of the lowest childcare enrolment rates in the EU, with 11.2% of children under the age of 3 in formal childcare (EU: 32.3% in 2020), decreasing from 11.6% in 2017. The childcare system lacks a quality framework ensuring quality educational guidelines. There are challenges also related to labour market segmentation. More than half of young people work under temporary contracts, as do 40.6% of third-country nationals (2020). For vulnerable groups, labour market outcomes are weak and worsening. The employment rate of persons with disabilities in 2020 was 46.8%, compared to 78.1% for persons without (a disability employment gap of around 31.3 pps, higher than the EU average). The employment rates of older workers, especially women, and of low-skilled people lag behind the respective EU averages. The European Social Fund Plus (ESF+) will support measures to improve access to employment, in particular for youth, the long-term unemployed and disadvantaged groups, childcare, as well as flexible upskilling and reskilling opportunities. Social dialogue remains uneven. At 13%, the coverage of collective bargaining is among the lowest in the EU⁽³⁹⁾. Tackling these challenges is key for Poland to contribute to reaching the 2030 EU headline target on employment.

Low level of individuals’ digital skills, low adult learning participation rates as well as skills shortages are challenges to be addressed, also in light of the green and digital transitions. Only 43% of individuals had at least basic digital skills in 2021, compared to 56% in the EU. Poland still lacks a national digital competences strategy as well as a comprehensive digital strategy for schools. After some fluctuations, adult participation in learning fell in

⁽³⁹⁾ OECD and AIAS (2021), Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts, OECD Publishing, Paris, [OECD/AIAS ICTWSS database - OECD](https://www.oecd.org/tiu/).

2020 to its 2016 level (of 3.7%), far below the EU average of 9.2% ⁽⁴⁰⁾.

The share of early leavers from education and training is, at 5.9% in 2021, significantly below the EU average of 9.7%, but it is particularly high among persons with disabilities. Poland is experiencing skills shortages. On average, 81% of employers had difficulties filling open positions in 2021 ⁽⁴¹⁾; teacher shortages are particularly pronounced.

The share of people at risk of poverty or social exclusion has decreased, but some challenges remain. The share of the population at risk of poverty or social exclusion has been steadily decreasing and remains amongst the lowest in the EU (17% compared with 22% in the EU in 2020). However, in-work poverty remains high and above the EU average. Older people are at a higher risk of poverty, especially women. Moreover, fast population aging, combined with the low statutory and effective retirement age, will likely decrease pension benefits, raising concerns on pension adequacy, especially for women. Despite recent improvements, 7.9% of the population still faces severe housing deprivation. Social security schemes are improving, in spite of persisting gaps. Other categories of workers (for example trainees, contracts of mandate or nannies) still lack access to branches of social protection. Only 26% of short-term unemployed people received benefits in 2020 (vs 56% in the EU). The share of population aged 65+ with long-term care (LTC) needs exceeds the EU average (35.9% vs 26.6% in the EU in 2019), while public spending on LTC is well below the EU average (0.8% vs 1.7% in the EU in 2019). Only 18.8% of the population aged 65+ with LTC needs use home care, compared to 28.6% in the EU in 2019. A focus on increasing psychiatric and long-term care services, including their deinstitutionalisation, may contribute to addressing these issues. Dedicated actions to attract and retain staff may also be warranted in view of the understaffing of both the health and long-term care sectors. Overall, there is scope for reinforced policy action in these domains in order for Poland to contribute to reaching the

2030 EU headline target on poverty reduction. The ESF+ will support the modernisation and promotion of access to social protection as well as improvement of accessibility.

⁽⁴⁰⁾ The indicator 'adult participation in learning' (previously named 'lifelong learning') refers to persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the survey.

⁽⁴¹⁾ ManpowerGroup Employment Outlook Survey Q3 2021 Poland Results

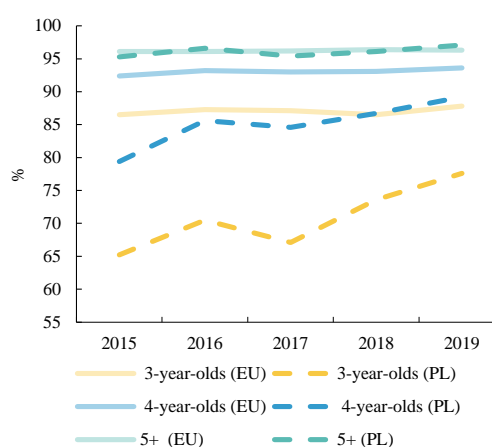
This Annex outlines the main challenges for Poland's education and training system in light of the EU-level targets of the European Education Area strategic framework and other contextual indicators, based on the analysis from the 2021 Education and Training Monitor. Poland's education system faces challenges related to its reorganisation and the pandemic. Gaps in the accessibility of early childhood education and care (ECEC) persist. Decreased investment in education affects teachers' salaries and shortages are pronounced.

Participation in early childhood education and care (ECEC) continues to grow, however gaps in provision persist. In 2019, the enrolment rate of children between 3 and the starting age of compulsory primary education was below the EU average. Since 2017/2018, children aged 3-5 are legally entitled to pre-school education (while pre-school education is obligatory for 6-year-olds), however, the participation of 3-year-olds is at estimated 77.6% and 4-year-olds at estimated 89.2%. The regional disparities and the urban-rural gap leave some groups of children at educational disadvantage (see Graph 1).

While the basic skills of Polish 15-year-olds are above the EU average, the school system was reorganised leading to organisational and financial challenges, further aggravated by COVID-19. Polish schools continue struggling with the implementation of the reorganisation, which was launched in 2016⁽⁴²⁾. The new core curriculum requirements and long periods of distance learning due to COVID-19 posed further challenges. First evidence on the situation in Warsaw shows that there is a decline in students' achievements⁽⁴³⁾. Additional overcrowding of secondary schools and classes expected in 2022, due to an increased cohort completing primary schools, may further affect the learning and

working conditions. The comprehensive impact of the introduced reform measures and COVID-19 on students' achievements is still to be assessed. Significant gaps in digital education, concerning in particular quality digital teaching methodologies and online materials, as well as ICT equipment and connectivity require a comprehensive strategic approach. To foster inclusive education, evidence shows⁽⁴⁴⁾ that there is still a need to ensure sufficient support specialists, new co-operation models and teacher education focussing on quality and equity improvements.

Graph A13.1: Participation in early childhood education by age, 2015-2019 (%)



Source: UOE, educ_uae_enra18, educ_uae_enra19, educ_uae_enra20

⁽⁴²⁾ The reform of lower and upper secondary schools introduced by the Law on School Education of December 2016 for implementation between 1 September 2017 and the school year 2022/2023. The reform increased the starting age of compulsory primary education to 7, advanced the tracking of students between general and vocational paths by one year, phased out lower-secondary schools, and introduced a new core curriculum.

⁽⁴³⁾ Achievement of secondary school students after the pandemic lockdown and structural reforms of education system, Policy note 1/2022, Evidence Institute, 2022 (<https://www.evidin.pl/en/publications/educational-publications/>)

⁽⁴⁴⁾ Podgórska-Jachnik, D. (2021) Raport merytoryczny. Edukacja włączająca w Polsce - bilans otwarcia 2020. Warszawa: Ośrodek Rozwoju Edukacji.

Table A13.1: **EU-level targets and other contextual indicators under the European Education Area strategic framework**

Indicator	Target	2015		2021			
		Poland	EU27	Poland	EU27		
Participation in early childhood education (age 3+)	96%	84.3%	91.9%	90.3% ^{2019, e}	92.8% ²⁰¹⁹		
Low achieving 15-year-olds in:	Reading	< 15%	14.4%	20.4%	14.7% ²⁰¹⁸ 22.5% ²⁰¹⁸		
	Mathematics	< 15%	17.2%	22.2%	14.7% ²⁰¹⁸ 22.9% ²⁰¹⁸		
	Science	< 15%	16.3%	21.1%	13.8% ²⁰¹⁸ 22.3% ²⁰¹⁸		
Early leavers from education and training (age 18-24)	Total	< 9%	5.3%	11.0%	5.9% 9.7%		
	<i>By gender</i>	<i>Men</i>		7.2%	12.5%	7.2%	11.4%
		<i>Women</i>		3.2%	9.4%	4.4%	7.9%
	<i>By degree of urbanisation</i>	<i>Cities</i>		4.5%	9.6%	6.0%	8.7%
		<i>Rural areas</i>		6.1%	12.2%	5.6%	10.0%
		<i>Native</i>		5.3%	10.0%	5.9%	8.5%
	<i>By country of birth</i>	<i>EU-born</i>		: ^u	20.7%	: ^u	21.4%
		<i>Non EU-born</i>		: ^u	23.4%	: ^u	21.6%
		Total	45%	43.2%	36.5%	40.6%	41.2%
	Tertiary educational attainment (age 25-34)	<i>By gender</i>	<i>Men</i>		34.0%	31.2%	31.3%
<i>Women</i>				52.8%	41.8%	50.3%	46.8%
<i>By degree of urbanisation</i>		<i>Cities</i>		58.2%	46.2%	58.8%	51.4%
		<i>Rural areas</i>		30.0%	26.9%	27.4%	29.6%
		<i>Native</i>		43.1%	37.7%	40.4%	42.1%
<i>By country of birth</i>		<i>EU-born</i>		: ^u	32.7%	76.1%	40.7%
		<i>Non EU-born</i>		66.9% ^u	27.0%	63.5%	34.7%
		Share of school teachers (ISCED 1-3) who are 50 years or over		29.0%	38.3%	35.6%	38.9%

Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series, e = estimated, u = low reliability: = not available. Data is not yet available for the remaining EU-level targets under the European Education Area strategic framework, covering underachievement in digital skills, exposure of vocational educational training graduates to work based learning and participation of adults in learning.

Source: Eurostat (UOE, LFS); OECD (PISA)

Investment in education is low at all levels, affecting also teachers' salaries. In real terms, during 2015-2019, public expenditure on education rose by 9.8%, however, the rise was only for pre-primary and primary education (by 47.6%). This included the high costs for reorganising the school system launched in 2016. At the secondary and post-secondary non-tertiary level, expenditure dropped by 18.5%, and in higher education by 2.5%. Local governments face challenges in maintaining the school network due to increased costs. The salaries of teachers are comparatively low ⁽⁴⁵⁾, which aggravates teacher shortages. Recruiting qualified teachers for many subjects is difficult ⁽⁴⁶⁾ and children's right to education is at risk ⁽⁴⁷⁾.

⁽⁴⁵⁾ OECD (2021), "Poland", in Education at a Glance 2021: OECD Indicators, OECD Publishing, Paris. DOI: <https://doi.org/10.1787/9399a67a-en>

⁽⁴⁶⁾ Najwyższa Izba Kontroli (2021), Organizacja pracy nauczycieli w szkołach publicznych (part 1 and 2) (8.07.2021) https://www.nik.gov.pl/plik/id,24597_vp,27344.pdf

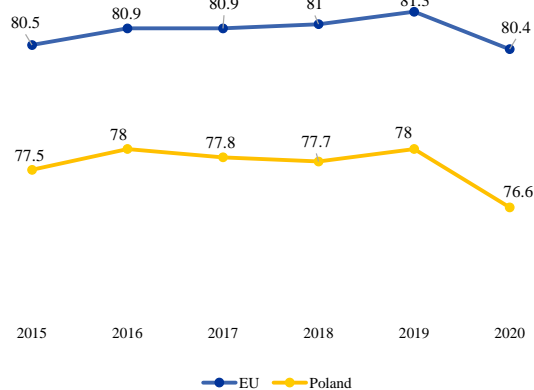
⁽⁴⁷⁾ Rzecznik Praw Obywatelskich (2021), Brakuje nauczycieli - prawo do nauki zagrożone. Letter to the Minister of Education and Science of 14.09.2021.

Tertiary educational attainment fell slightly below the EU average, and the gender gap continues to be wide. The gender gap at 19 pps in favour of women has remained wide, being close to double the EU average (11.1 pps). In 2020, the overall proportion of graduates in science, technology, engineering and mathematics (STEM) fell to 20.8%, below the EU level of 26%.

Higher education institutions are implementing the reform aimed at improving quality; however, recent decisions undermine its objective. In 2022, higher education institutions will undergo a new evaluation of their scientific achievements in line with the Law 2.0 reform. However, ad-hoc changes, made without the consultation of the Commission for Scientific Evaluation, increased the uncertainty about the process and there is lack of transparency of the assessment procedures.

Especially relevant in light of the ongoing COVID-19 pandemic, resilient healthcare is a prerequisite for a sustainable economy and society. This Annex provides a snapshot of the healthcare sector in Poland.

Graph A14.1: Life expectancy at birth, years



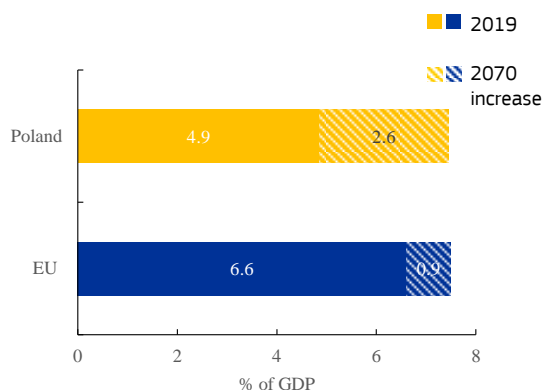
Source: Eurostat database

Life expectancy in Poland is lower than the EU average, and fell further in 2020 by 1.5 years (2nd highest drop in the EU) due to COVID-19. As of 17 April 2022, Poland reported 3.06 cumulative COVID-19 deaths per 1 000 inhabitants and 158 confirmed cumulative COVID-19 cases per 1 000 inhabitants. Both preventable mortality - deaths that can be mainly avoided through public health and primary prevention interventions - and treatable mortality were substantially higher than the EU average in 2019. Improvements in treatable mortality rates over the last decade at least partly reflect investments in cardiology care.

Health spending relative to GDP in Poland (6.5%) was below the EU average (9.9%) in 2019. Moreover, in per capita terms, health expenditure amounted to EUR 1 582 (adjusted for differences in purchasing power), among the lowest amounts in the EU. Public funding was 71.8% of the total expenditure in 2019 (EU average 79.8%). Out-of-pocket spending accounted for 20.1% of all health spending, with the bulk spent on outpatient medicines. Public expenditure on health is projected to increase by 2.6 percentage points (pp) of GDP by 2070 (0.9EU)⁽⁴⁸⁾, raising long-term fiscal sustainability concerns.

⁽⁴⁸⁾ The 2021 Ageing Report: Economic and Budgetary Projections for the EU Member States (2019-2070)",

Graph A14.2: Projected increase in public expenditure on healthcare over 2019-2070 (reference scenario)



Source: European Commission/EPC (2021)

Poland faces a shortage as well as an uneven distribution of health workers, which contributes to long waiting times for publicly funded services. With doctors numbering 2.4 per 1 000 population and the nurses 5.1 per 1 000 population Poland ranks amongst the Member States with the lowest staffing levels in the EU. The health care system remains overly hospital-based. At the same time, the hospital system suffers from a series of problems, such as a deteriorating financial situation, lack of quality assurance and mismanagement. The primary care system is underfunded, understaffed and overstretching its services. A substantial reinforcement in primary care could help to build resilience in the health system.

European Commission (ECFIN) and Ageing Working Group (EPC).

Table A14.1: List of key indicators, health

	2016	2017	2018	2019	2020	EU average (latest year)
Treatable mortality per 100 000 population (mortality avoidable through optimal quality healthcare)	129.8	132.0	133.1	133.7		92.1 (2017)
Cancer mortality per 100 000 population	297.4	290.5	291.2	283.4		252.5 (2017)
Current expenditure on health, % GDP	6.5	6.6	6.3	6.5		9.9 (2019)
Public share of health expenditure, % of current health expenditure	69.9	69.3	71.5	71.8		79.5 (2018)
Spending on prevention, % of current health expenditure	3.1	2.4	2.3	2.1		2.8 (2018)
Acute care beds per 100 000 population	491.8	485.1	473.5	435.4		387.4 (2019)
Doctors per 1 000 population *	2.4	2.4	2.4	0.0		3.8 (2018)
Nurses per 1 000 population *	5.2	5.1	0.0	0.0		8.2 (2018)
Consumption of antibacterials for systemic use in the community, daily defined dose per 1 000 inhabitants per day **	20.7	23.8	23.0	22.2	17.2	14.5 (2020)

Doctors' density data refer to practising doctors except for FI, EL, PT (licensed to practice) and SK (professionally active). Nurses' density data refer to practising nurses (imputation from year 2014 for FI) except for IE, FR, PT, SK (professionally active) and EL (nurses working in hospitals only). More information: https://ec.europa.eu/health/state-health-eu/country-health-profiles_en

Source: Eurostat Database, except: *Eurostat Database and OECD, **ECDC.

The regional dimension is an important factor when assessing economic and social developments in a Member State. Taking into account this dimension enables a well-calibrated and targeted policy response that fosters cohesion and ensures sustainable and resilient economic development across all regions.

All Polish regions with the exception of the capital region Warszawski Stołeczny remain below the EU average in terms of GDP per capita (PPS), despite continued convergence to the EU average. Internal disparities between the capital region and the least developed regions are increasing, driven mainly by lack of skilled workforce and low investment in R&D and entrepreneurship, contributing to the labour productivity gap, as well as lower accessibility to public services in particular in the rural areas in the least developed regions.

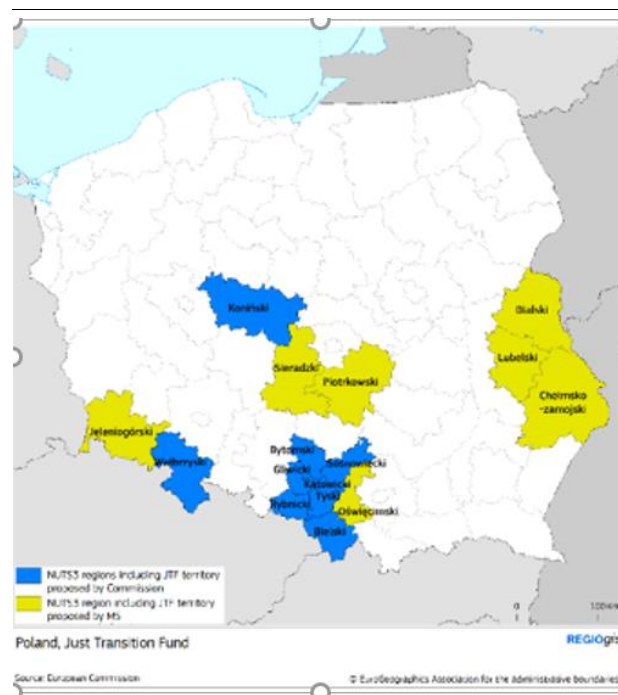
Regional disparities in GDP per head have continuously increased in Poland during the last decade, with the GDP per head in the capital city region of 160% of the EU average while in other regions with the GDP per head ranging from 80% (Dolnośląskie and Wielkopolskie) to 50-52% in Lubelskie, Warmińsko-Mazurskie, Podkarpackie, Świętokrzyskie and Podlaskie.

The labour productivity varies within the country. In the capital city region, productivity was at 145% of the EU average while in the least developed regions of Lubelskie, Podlaskie, Świętokrzyskie, Warmińsko-Mazurskie and Podkarpackie at 53-58%.

In Poland, coal is the main source of electricity production and heating thus contributing to the high greenhouse gas emissions. Transport also contributes heavily to the greenhouse gases emissions which, without additional measures, are projected to increase till 2030 due to a poor accessibility of public transport outside big cities⁽⁴⁹⁾ and an ageing fleet of cars. Decarbonisation of the coal-based economy is a major challenge, taking into account the social dimension of the transition in the mining

sector. Currently, around half of all miners in the EU are employed in Poland. Close to 25 000 direct and indirect jobs are estimated to be lost by 2030 as result of the phasing out of the mining and related activities in the NUTS3 areas proposed by the Commission for the JTF support, in addition to over 300 000 jobs lost as result of over 45 mines closed since 1989.

Graph A15.1: Territories most affected by the climate transition in Poland

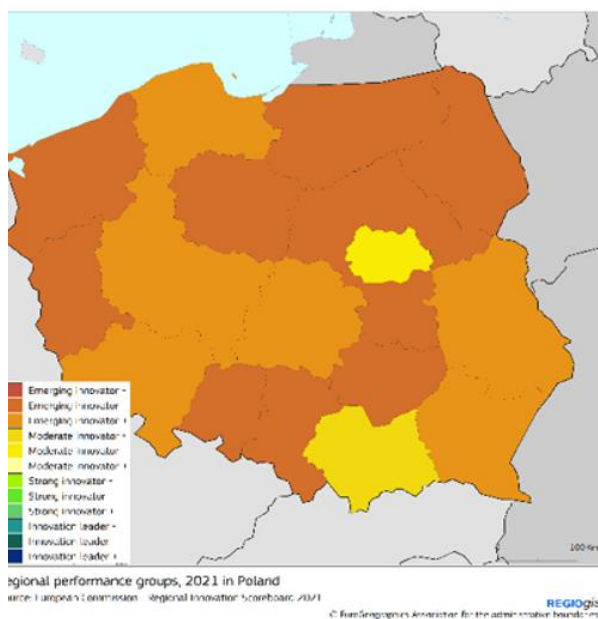


Source: European Commission

The digital performance of Poland is improving, but remains one of the lowest in the EU. In 2020, 42% of the population used internet for interaction with public authorities against 56% on average in the EU. Dispersion of e-services at regional level together with sometimes a complex navigation structure contribute to the low take-up, which ranges from 29% in Opolskie to 52% in Mazowieckie. At the same time, in 2020 the usage of e-services speeded up due to the COVID-19 lockdown, but it is not yet visible in data. The main authentication service 'Trusted Profile' doubled the number of active profiles to 4 million in comparison to 2019.

⁽⁴⁹⁾ Analysis of the functional and spatial relations between urban centres and their surroundings, Polish Academy of Sciences, p. 8 and 84, ref: https://psme.pomorskie.eu/documents/512265/2677695/Raport_og%C3%B3lnopolski_18102019_na+www.pdf/9fcdca0e-1f13-4705-a32e-1120b81cc737 ;

Graph A15.2: **Innovation performance in Poland**



Source: European Commission

Investment in R&D and innovation performance is much lower in the less developed regions, except Małopolska and Warszawskie Stołeczne. In the Warszawskie Stołeczne, R&D expenditure was at 2.44% of GDP in 2018, and around 50% of employment was in knowledge-intensive services. In several less developed regions, R&D expenditure is lower than 0.5% of GDP, and less than 30% of workers were employed in knowledge-intensive services. The Regional Competitiveness Index - which measures the major factors of competitiveness in EU regions - varies from over 68.3 in the capital region to less than 35 in several less developed regions. The share of population with high educational attainment (aged 30-34) is also much higher in the capital region (over 70%) than in all regions in Poland (between 35%-50%) and compared to the EU average. Outside the capital region, emerging growth poles are located around regional capitals of Wielkopolska, Lower Silesia, Małopolska and Pomorskie in less developed regions.

Disparities between regions remain significant. Some regions suffer from a severe loss in their population. Between 2000 and 2019, Świętokrzyskie, Łódzkie and Opolskie lost more than 3.5% of their population. The population increased in moderately developed regions like Pomorskie and Małopolskie (+2 to 3%) and the capital region (+7%). Some disparities in labour market conditions remained in 2020. The

employment rate ranged from 82% in the capital region to 70% in the least developed regions of Podkarpackie, Warmińsko-Mazurskie and Lubelskie. The gender employment gap is above EU average in all regions except for Warszawski stołeczny, reaching 20.2 percentage points in Wielkopolskie. There are big regional disparities in youth unemployment (15-29) ranging in 2020 between 6% in Pomorskie and Lubuskie and over 17% in the regions of Lubelskie, Podkarpackie, Świętokrzyskie.

While Poland as a whole has been severely affected by the COVID pandemic in terms of high excess mortality, the regional impact varies with the lowest in Łódzkie and the highest in Podkarpackie. All regional labour markets slowed due to the COVID pandemic that restrained the economic growth in 2020. The share of the population at risk of severe material deprivation continued to decrease in 2020 in most regions but increased in Pomorskie, Podlaskie and Opolskie.

Table A15.1: Poland, selected indicators at regional level

NUTS 2 Region	GDP per head (PPS)	Productivity (GVA (PPS) per person employed)	Employment rate	Population with high educational attainment	R&D expenditure	Employment in high-technology sectors	Employment in knowledge-intensive services	Regional Competitiveness Index	CO ₂ emissions from fossil fuels per head	Innovation performance
	EU27=100, 2019	EU27=100, 2018	% of pop. aged 20-64, 2020	% of population aged 30-34, 2017-2019	% of GDP, 2018	% of total employment, 2020	% of total employment, 2020	Range 0-100, 2019	tCO ₂ equivalent, 2018	RIS regional performance group
European Union	100	100	72.3	39.4	2.19	4.5	40.01	57.3	7.2	
Polska	73	75	73.6	46.0	1.21	3.4	32.19	42.8		
Małopolskie	67	71	73.6	49.7	2.14	4.2	32.92	47.4	8.7	Moderate innovator -
Śląskie	74	81	70.2	44.8	0.72	3.1	31.16	49.0	12.7	Emerging innovator
Wielkopolskie	79	76	75.4	41.8	0.75	2.0	25.67	40.7	6.9	Emerging innovator +
Zachodniopomorskie	60	66	71.3	40.3	0.55	1.7	33.19	35.8	8.3	Emerging innovator
Lubuskie	59	66	72.5	36.4	0.48	2.5	30.72	34.2	5.9	Emerging innovator
Dolnośląskie	80	84	75.1	48.5	1.09	4.9	34.89	43.8	7.8	Emerging innovator +
Opolskie	57	65	73.1	39.1	0.63	1.7	28.74	39.0	20.4	Emerging innovator
Kujawsko-pomorskie	58	63	71.3	36.8	0.65	2.6	27.95	34.6	7.4	Emerging innovator
Warmińsko-mazurskie	50	58	69.6	35.7	0.56	1.4	30.69	28.6	5.0	Emerging innovator
Pomorskie	71	73	75.7	48.0	1.40	3.9	34.71	43.9	6.4	Emerging innovator +
Łódzkie	69	65	75.9	44.0	0.95	4.0	28.24	41.2	13.8	Emerging innovator +
Świętokrzyskie	52	57	72.2	45.3	0.57	1.0	28.04	34.4	10.4	Emerging innovator
Lubelskie	50	53	70.5	42.2	1.02	2.1	33.37	34.7	6.8	Emerging innovator +
Podkarpackie	51	58	70.0	42.9	1.11	2.2	28.82	35.0	6.2	Emerging innovator +
Podlaskie	52	56	73.4	46.5	0.72	1.4	28.71	34.5	5.8	Emerging innovator
Warszawski stołeczny	160	145	81.7	71.6	2.44	8.6	50.49	68.3	4.9	Moderate innovator
Mazowiecki regionalny	63	60	72.9	40.2	0.45	1.7	25.97	42.8	12.6	Emerging innovator

Opolskie, Warmińsko-mazurskie, Świętokrzyskie, Podlaskie - Employment in high-technology sectors reference year: 2019

Source: Eurostat, EDGAR database

This Annex provides an overview of key developments in Poland's financial sector.

Poland has a modern and well-diversified banking system. The domestic banking sector's total assets are equivalent to the country's economic output. The top five lenders own 54.3% of the total assets. The sector is well diversified with both big commercial banks present in the market along with a network of smaller cooperative lenders. Most banks (57.9%) are controlled by Polish capital, in stark contrast to the situation from a decade ago when the sector was dominated by foreign subsidiaries. The intermediation ratio (loan-to-deposit) has been decreasing for a number of years, down to 74.6% in 2021. Polish firms rely mostly on bank credit to finance their investments – the market funding ratio remained mostly stable at around 48% since 2017. Banks managed the pandemic driven recession well, supporting the private sector through credit payment moratoria while continuing to provide credit to the economy.

Banks have solid fundamentals but profitability remains weak. Domestic banks are well capitalised (capital adequacy ratio of 18.6%)

and asset quality has improved over 2021 – the non-performing loans ratio dropped to 5.4% in Q3 2021. Back in 2020, banks heavily provisioned their loan books against expected credit losses. Some of these provisions have been subsequently released in 2021. Credit growth in 2021 (5.4% year on year growth) has almost reached pre-pandemic levels as the economy is rapidly recovering from the pandemic shock. The sector has been struggling with relatively low profitability (5.9% in 2021) for a number of years on the back of low interest rates and uncertainties related to legacy FX mortgages. The legal risk associated with FX mortgages remains the main risk to domestic financial stability, and at the same time one of the key sources of low profitability given the sizeable provisions for legal risks booked by lenders over 2020-2021. Profitability is expected to improve as interest rates in Polish zloty continue to rise but credit risk may also increase.

Table A16.1: **Financial soundness indicators**

	2017	2018	2019	2020	2021
Total assets of the banking sector (% of GDP)	95.1	92.7	92.1	102.6	103.3
Share (total assets) of the five largest bank (%)	47.5	49.5	49.8	54.3	-
Share (total assets) of domestic credit institutions (%)¹	54.8	53.3	54.0	56.6	57.9
Financial soundness indicators:¹					
- non-performing loans (% of total loans)	6.6	6.2	6.1	6.0	5.4
- capital adequacy ratio (%)	18.0	17.9	17.8	19.6	18.6
- return on equity (%)	6.9	7.0	6.9	3.1	5.9
NFC credit growth (year-on-year % change)	8.6	6.6	2.9	-6.4	4.5
HH credit growth (year-on-year % change)	6.4	5.6	6.5	1.5	5.0
Cost-to-income ratio (%)¹	57.2	56.7	56.0	54.2	53.4
Loan-to-deposit ratio (%)¹	93.7	93.2	91.9	80.3	74.6
Central bank liquidity as % of liabilities	0.0	0.4	0.0	0.0	-
Private sector debt (% of GDP)	76.9	76.8	73.9	75.8	-
Gross external debt (% of GDP)¹					
Gross external debt (% of GDP) - public¹	26.1	22.8	19.2	18.6	17.0
Gross external debt (% of GDP) - private¹	29.7	28.8	28.8	28.4	28.8
Long-term interest rate spread versus Bund (basis points)	310.3	280.2	260.0	200.8	232.0
Market funding ratio (%)	48.8	46.6	45.4	48.5	-
Green bond issuance (bn EUR)	-	1.0	2.2	-	1.0

¹ Last data: Q3 2021.

Source: ECB, Eurostat, Refinitiv.

This Annex provides an indicator-based overview of Poland's tax system. It includes information on the tax structure, i.e. the types of tax that Poland derives most revenue from, the tax burden for workers, and the progressivity and redistributive effect of the tax system. It also provides information on tax collection and compliance and on the risks of aggressive tax planning activity.

Poland's tax system relies relatively heavily on consumption and capital taxation while the revenue from labour taxation is comparatively low. The total tax revenue in Poland (35.7% of GDP in 2020) is below the EU average (40.2%). Tax revenue from labour taxation explains the difference (14.4% of GDP in Poland as compared to 21.5% in the EU average), while tax revenue from other types of taxes is close to the EU average or even above, as in the case of consumption and capital taxes.

Poland's tax burden on labour is relatively low, especially at high-income levels. The labour tax wedge in Poland was close to the EU average at low earnings (i.e. for single taxpayers earning 50% or 67% of the average wage), but it was significantly below the EU average at higher earnings (e.g. at 100% and 167% of the average wage), as well as for second earners (see Graph 18.1). By reducing the deductibility of health contributions and making the personal income tax

schedule more progressive, the tax reform adopted in the Autumn of 2021 is expected to increase the tax burden on higher earners, while possibly reducing it for low earners. In 2020, the ability of the Polish tax and benefit system to reduce income inequality (measured by its ability to reduce the GINI coefficient) was comparatively low.

Poland is relatively advanced in implementing the digital transformation of the tax administration, which can help reduce tax arrears. Today, outstanding tax arrears account for around one third of total tax revenue (corresponding to the EU average). The process of digitalising the Polish tax administration started in 2016 when Poland implemented SAF-T, the international standard for the electronic exchange of accounting data. The corresponding reporting obligation started with large companies but was extended successively to small firms. 2019 saw the mandatory introduction of split payments (by which vendors pay to suppliers' account and a VAT account in parallel), and a modernisation of VAT reporting. In 2021, a system of structured e-invoices was introduced that allows issuing and receiving electronic structured invoices via the National Invoice System. The obligation to issue invoices through that system only is foreseen for 2023. It will allow for the preparation of pre-filled VAT tax returns (this needs approval by the European Commission).

Table A17.1: Indicators on taxation

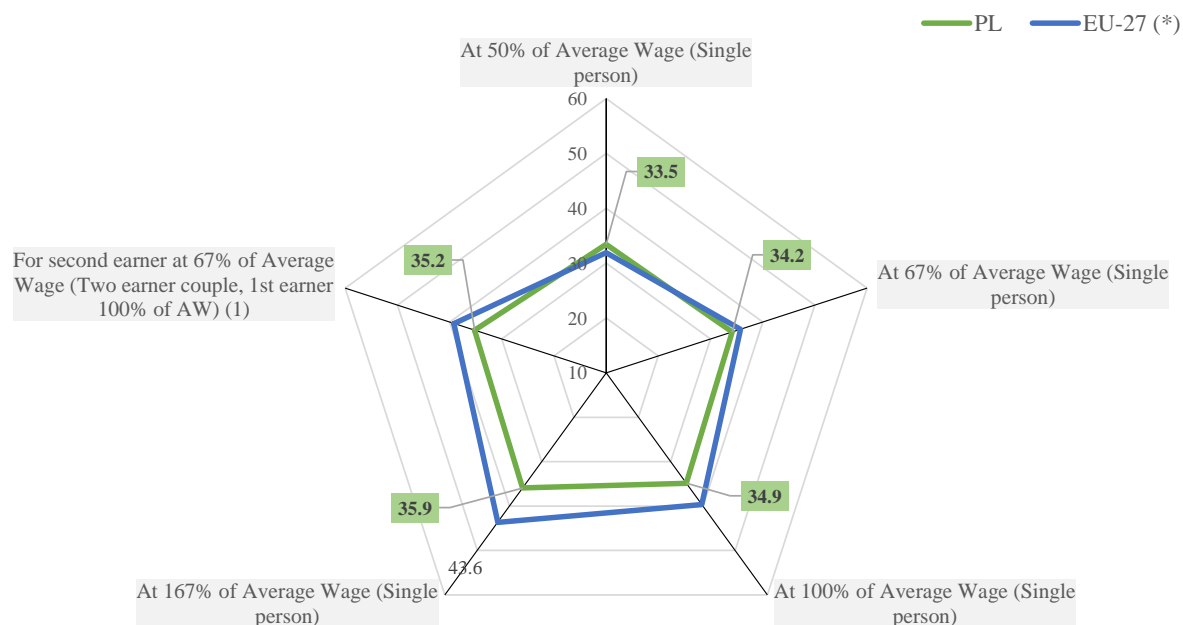
		Poland					EU-27				
		2010	2018	2019	2020	2021	2010	2018	2019	2020	2021
Tax structure	Total taxes (including compulsory actual social contributions) (% of GDP)	31.3	35.1	35.1	35.7		37.9	40.1	39.9	40.1	
	Labour taxes (as % of GDP)	11.8	14.1	14.2	14.4		20.0	20.7	20.7	21.5	
	Consumption taxes (as % of GDP)	12.4	12.5	12.3	12.4		10.8	11.1	11.1	10.8	
	Capital taxes (as % of GDP)	7.1	8.5	8.6	8.9		7.1	8.2	8.1	7.9	
	Total property taxes (as % of GDP)	1.4	1.7	1.7	1.7		1.9	2.2	2.2	2.3	
	Recurrent taxes on immovable property (as % of GDP)	1.1	1.1	1.1	1.1		1.1	1.2	1.2	1.2	
	Environmental taxes as % of GDP	2.7	2.7	2.5	2.5		2.4	2.4	2.4	2.2	
Progressivity & fairness	Tax wedge at 50% of Average Wage (Single person) (*)	32.3	34.5	34.3	33.3	33.5	33.9	32.4	32.0	31.5	31.9
	Tax wedge at 100% of Average Wage (Single person) (*)	34.2	35.8	35.6	34.8	34.9	41.0	40.2	40.1	39.9	39.7
	Corporate Income Tax - Effective Average Tax rates (1) (*)		18.0	15.5	15.5			19.8	19.5	19.3	
	Difference in GINI coefficient before and after taxes and cash social transfers (pensions excluded from social transfers)	4.7	5.5	5.3	4.6		8.4	7.9	7.4	8.3	
Tax administration & compliance	Outstanding tax arrears: Total year-end tax debt (including debt considered not collectable) / total revenue (in %) (*)		31.3	31.0				31.9	31.8		
	VAT Gap (% of VTTL)		11.6	11.3				11.2	10.5		
Financial Activity Risk	Dividends, Interests and Royalties (paid and received) as a share of GDP (%)		3.2	2.9	2.6			10.7	10.5		
	FDI flows through SPEs (Special Purpose Entities), % of total FDI flows (in and out)		0.0	0.2	0.5			47.8	46.2	36.7	

(1) Forward-looking Effective Tax Rate (OECD)

(*) EU-27 simple averages there is no aggregated EU-27 value

Source: European Commission and OECD

Tax wedge 2021 (%)



The tax wedge measures the difference between the total labour cost of employing a worker and the worker's net earnings: sum of personal income taxes and employee and employer social security contributions, net of family allowances, expressed as a percentage of total labour costs (the sum of the gross wage and social security contributions paid by the employer)."

(1) The second earner average tax wedge measures how much extra personal income tax (PIT) plus employee and employer social security contributions (SSCs) the family will have to pay as a result of the second earner entering employment, as a proportion of the second earner's gross earnings plus the employer SSCs due on the second earner's income. For a more detailed discussion see OECD (2016), "Taxing Wages 2016", OECD Publishing, Paris. http://dx.doi.org/10.1787/tax_wages-2016-en

(*) EU-27 simple average as there is no aggregated EU-27 value

Source: European Commission

ANNEX 18: KEY ECONOMIC AND FINANCIAL INDICATORS

Table A18.1: Key economic and financial indicators

	2004-07	2008-12	2013-18	2019	2020	2021	forecast	
							2022	2023
Real GDP (y-o-y)	5.4	3.4	3.7	4.7	-2.2	5.9	3.7	3.0
Potential growth (y-o-y)	3.8	4.0	3.2	4.0	3.6	3.9	3.6	3.4
Private consumption (y-o-y)	4.1	3.2	3.3	3.9	-2.8	6.0	4.8	3.7
Public consumption (y-o-y)	4.0	1.7	2.8	6.5	4.9	3.4	1.3	1.8
Gross fixed capital formation (y-o-y)	12.3	2.5	3.2	6.1	-4.9	3.8	4.1	3.9
Exports of goods and services (y-o-y)	10.0	5.0	7.7	5.2	0.0	11.8	5.5	3.9
Imports of goods and services (y-o-y)	12.0	2.8	7.3	3.0	-1.1	15.9	5.7	3.8
Contribution to GDP growth:								
Domestic demand (y-o-y)	5.7	2.8	3.0	4.5	-1.6	4.7	3.6	3.1
Inventories (y-o-y)	0.7	-0.3	0.3	-1.0	-1.1	2.4	0.0	-0.2
Net exports (y-o-y)	-1.0	0.8	0.3	1.3	0.6	-1.2	0.1	0.1
Contribution to potential GDP growth:								
Total Labour (hours) (y-o-y)	0.4	0.5	0.2	0.6	1.0	1.3	1.1	0.9
Capital accumulation (y-o-y)	1.2	1.8	1.4	1.4	1.1	1.1	1.1	1.2
Total factor productivity (y-o-y)	2.2	1.7	1.6	2.0	1.6	1.5	1.4	1.4
Output gap	-0.3	1.3	-0.3	3.2	-2.5	-0.6	-0.5	-0.9
Unemployment rate	15.7	9.3	7.1	3.3	3.2	3.4	4.1	3.9
GDP deflator (y-o-y)	3.2	3.0	0.9	3.2	4.2	5.8	10.0	7.8
Harmonised index of consumer prices (HICP, y-o-y)	2.4	3.7	0.5	2.1	3.7	5.2	11.6	7.3
Nominal compensation per employee (y-o-y)	3.0	5.8	4.1	7.3	5.6	5.0	9.5	8.0
Labour productivity (real, hours worked, y-o-y)	2.7	3.3	3.0	5.1	-1.4	0.9	1.6	1.5
Unit labour costs (ULC, whole economy, y-o-y)	0.4	2.8	1.4	2.4	7.9	0.6	6.0	5.1
Real unit labour costs (y-o-y)	-2.7	-0.2	0.5	-0.7	3.5	-4.9	-3.7	-2.5
Real effective exchange rate (ULC, y-o-y)	3.0	-1.5	0.2	-1.5
Real effective exchange rate (HICP, y-o-y)	3.6	-1.2	-0.2	-1.0	1.1	-0.4	.	.
Net savings rate of households (net saving as percentage of net disposable income)								
	2.0	0.9	0.4	0.7	6.9	.	.	.
Private credit flow, consolidated (% of GDP)	6.5	6.8	3.9	3.6	1.6	3.8	.	.
Private sector debt, consolidated (% of GDP)	46.3	70.4	78.2	73.9	75.6	71.1	.	.
of which household debt, consolidated (% of GDP)	17.3	33.0	35.6	34.4	34.6	32.3	.	.
of which non-financial corporate debt, consolidated (% of GDP)	29.0	37.3	42.6	39.6	41.0	38.7	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (2)	3.9	5.7	5.1	4.5	4.0	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	0.7	4.6	5.4	4.5	8.8	3.7	3.2	3.4
Corporations, gross operating surplus (% of GDP)	22.4	23.7	24.4	24.0	25.1	23.8	24.2	24.5
Households, net lending (+) or net borrowing (-) (% of GDP)	-1.9	-2.6	-2.3	-1.7	2.8	1.0	1.7	1.9
Deflated house price index (y-o-y)	.	-5.5	1.3	6.1	7.1	.	.	.
Residential investment (% of GDP)	3.4	3.3	2.5	1.9	1.9	2.0	.	.
Current account balance (% of GDP), balance of payments	-4.9	-5.2	-1.3	0.5	2.9	-0.6	-2.4	-2.0
Trade balance (% of GDP), balance of payments	-2.6	-2.4	2.6	4.8	6.7	4.5	.	.
Terms of trade of goods and services (y-o-y)	1.5	-0.5	0.9	1.2	2.8	-1.5	-3.7	0.7
Capital account balance (% of GDP)	0.6	1.7	1.9	2.0	2.3	1.6	.	.
Net international investment position (% of GDP)	-44.2	-61.2	-63.2	-49.8	-44.3	-39.9	.	.
NENDI - NIIP excluding non-defaultable instruments (% of GDP) (1)	-10.4	-24.0	-23.3	-12.5	-6.2	0.4	.	.
IIP liabilities excluding non-defaultable instruments (% of GDP) (1)	36.8	51.9	56.3	46.3	47.2	43.4	.	.
Export performance vs. advanced countries (% change over 5 years)	69.0	36.2	14.6	22.7	37.6	.	.	.
Export market share, goods and services (y-o-y)	8.8	0.1	4.9	3.8	12.9	1.7	0.8	-0.4
Net FDI flows (% of GDP)	-3.5	-1.9	-1.7	-2.0	-2.1	-3.6	.	.
General government balance (% of GDP)	-3.6	-5.4	-2.4	-0.7	-6.9	-1.9	-4.0	-4.4
Structural budget balance (% of GDP)	.	.	-2.2	-2.3	-5.9	-1.8	-4.0	-4.0
General government gross debt (% of GDP)	45.9	51.8	52.1	45.6	57.1	53.8	50.8	49.8

(1) NIIP excluding direct investment and portfolio equity shares.

(2) Domestic banking groups and stand-alone banks, EU and non-EU foreign-controlled subsidiaries and EU and non-EU foreign-controlled branches.

Source: Eurostat and ECB as of 2022-05-02, where available; European Commission for forecast figures (Spring forecast 2022)

ANNEX 19: DEBT SUSTAINABILITY ANALYSIS

This annex assesses fiscal sustainability risks for Poland over the short, medium and long term. It follows the same multi-dimensional approach as the 2021 Fiscal Sustainability Report, updated on the basis of the Commission 2022 spring forecast.

Table 1 presents the baseline debt projections. It shows the projected government debt and its breakdown into the primary balance, the snowball effect (the combined impact of interest payments and nominal GDP growth on the debt dynamics) and the stock-flow adjustment. These projections assume that no new fiscal policy measures are taken after 2023, and include the expected positive impact of investments under Next Generation EU.

Graph 1 shows four alternative scenarios around the baseline, to illustrate the impact of changes in assumptions. The ‘historical SPB’ scenario assumes that the structural primary balance (SPB) gradually returns to its past average level. In the ‘lower SPB’ scenario, the SPB is permanently weaker than in the baseline. The

‘adverse interest-growth rate’ scenario assumes a less favourable snowball effect than in the baseline. In the ‘financial stress’ scenario, the country temporarily faces higher market interest rates in 2022.

Graph 2 shows the outcome of the stochastic projections. These projections show the impact on debt of 2 000 different shocks affecting the government’s budgetary position, economic growth, interest rates and exchange rates. The cone covers 80% of all the simulated debt paths, therefore excluding tail events.

Table 2 shows the S1 and S2 fiscal sustainability indicators and their main drivers. S1 measures the consolidation effort needed to bring debt to 60% of GDP in 15 years. S2 measures the consolidation effort required to stabilise debt over an infinite horizon. The *initial budgetary position* measures the effort required to cover future interest payments, the *ageing costs* component accounts for the need to absorb the projected change in ageing-related public expenditure such as pensions, health care and

Table A19.1: Debt sustainability analysis for Poland

Table 1. Baseline debt projections	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Gross debt ratio (% of GDP)	45.6	57.1	53.8	50.8	49.8	48.0	46.8	46.1	47.4	48.3	49.3	50.6	52.2	53.9
Change in debt	-3.2	11.5	-3.4	-3.0	-1.0	-1.8	-1.2	-0.6	1.3	0.8	1.0	1.3	1.6	1.7
of which														
Primary deficit	-0.6	5.6	0.8	2.6	2.7	1.8	1.6	1.6	2.5	2.5	2.5	2.5	2.5	2.5
Snowball effect	-2.3	0.4	-5.1	-5.1	-3.3	-3.7	-2.8	-2.2	-1.2	-1.6	-1.4	-1.2	-0.9	-0.8
Stock-flow adjustment	-0.3	5.5	0.9	-0.4	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross financing needs (% of GDP)	4.6	15.6	7.5	7.4	8.3	8.0	7.6	7.6	8.5	8.7	8.9	9.1	9.4	9.6

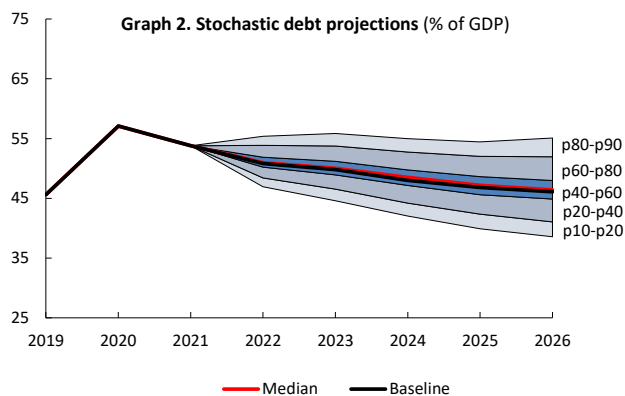
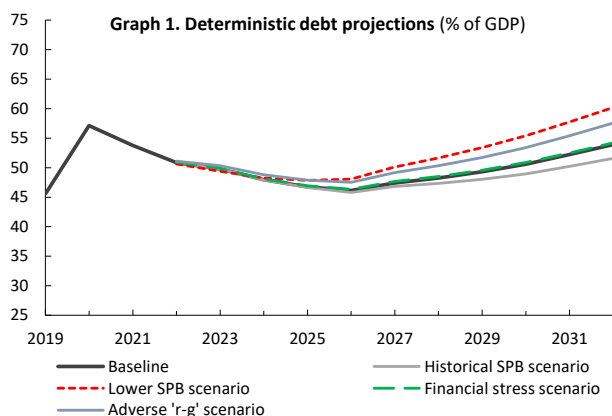


Table 2. Breakdown of the S1 and S2 sustainability gap indicators

	S1	S2
Overall index (pps. of GDP)	0.5	4.4
of which		
Initial budgetary position	1.1	2.6
Debt requirement	-0.7	
Ageing costs	0.2	1.8
of which		
Pensions	-0.6	-0.9
Health care	0.4	1.3
Long-term care	0.3	1.3
Others	0.0	0.0

Source: European Commission

Table A19.2: Heat map of fiscal sustainability risks for Poland

Short term		Medium term						Long term				
Overall (S0)	Overall (S1+DSA)	S1	Overall	Debt sustainability analysis (DSA)						S2	Overall (S2+DSA)	
				Deterministic scenarios					Stochastic projections			
				Baseline	Historical SPB	Lower SPB	Adverse 'r-g'	Financial stress				
LOW	MEDIUM	MEDIUM	LOW	Overall	LOW	LOW	MEDIUM	LOW	LOW	LOW	MEDIUM	MEDIUM
				Debt level (2032), % GDP	54	52	60	58	54			
				Debt peak year	2032	2021	2032	2032	2032			
				Fiscal consolidation space	81%	78%	86%	81%	81%			
				Probability of debt ratio exceeding in 2026 its 2021 level								
Difference between 90th and 10th percentiles (pps. GDP)						17						

(1) *Debt level* in 2032: green: below 60% of GDP, yellow: between 60% and 90%, red: above 90%. (2) The *debt peak year* indicates whether debt is projected to increase overall over the next decade. Green: debt peaks early; yellow: peak towards the middle of the projection period; red: late peak. (3) *Fiscal consolidation space* measures the share of past fiscal positions in the country that were more stringent than the one assumed in the baseline. Green: high value, i.e. the assumed fiscal position is plausible by historical standards and leaves room for corrective measures if needed; yellow: intermediate; red: low. (4) *Probability of the debt ratio exceeding in 2026 its 2021 level*: green: low probability, yellow: intermediate, red: high (also reflecting the initial debt level). (5) The *difference between the 90th and 10th percentiles* measures uncertainty, based on the debt distribution under 2000 different shocks. Green, yellow and red cells indicate increasing uncertainty.

Source: European Commission (for further details on the Commission's multi-dimensional approach, see the 2021 Fiscal Sustainability Report).

long-term care, and the *debt requirement* measures the additional adjustment needed to reach the 60% of GDP debt target.

Finally, the heat map presents the overall fiscal sustainability risk classification (see Graph 2). The short-term risk category is based on the S0 indicator, an early-detection indicator of fiscal stress in the upcoming year. The medium-term risk category is derived from the debt sustainability analysis (DSA) and the S1 indicator. The DSA assesses risks to sustainability based on several criteria: the projected debt level in 10 years' time, the debt trajectory ('peak year'), the plausibility of fiscal assumptions and room for tighter positions if needed ('fiscal consolidation space'), the probability of debt not stabilising in the next 5 years and the size of uncertainty. The long-term risk category is based on the S2 indicator and the DSA.

Overall, short-term risks to fiscal sustainability are low. The Commission's early-detection indicator (S0) does not signal major short-term fiscal risks (see Graph 2). Moreover, gross financing needs are expected to remain moderate in the short term (see Table 1).

Medium-term risks to fiscal sustainability are medium. On the one hand, the debt sustainability analysis (DSA) points to low risks. In the baseline, government debt is projected to remain below 60% of GDP until 2032 (see Table 1). This debt path is fairly robust to possible shocks to fiscal, macroeconomic and financial variables, as illustrated by alternative scenarios

and stochastic simulations, most of which point to low risks (see Graphs 1 and 2). On the other hand, the sustainability gap indicator S1 signals medium risks, as a consolidation effort of 0.5 pp. of GDP would be needed to prevent debt from exceeding 60% of GDP in 15 years' time (see Table 2). Overall, the medium risks mainly reflect the initial primary deficit and the projected increase in public expenditure on health care and long-term care.

Long-term risks to fiscal sustainability are medium. Over the long term, the sustainability gap indicator S2 (at 4.4 pps. of GDP) points to medium risks, while the DSA points to low risks, leading to the overall medium risk assessment. The S2 indicator suggests that, to stabilise debt over the long term, it will be necessary to address budgetary pressures stemming from long-term care and health care (see Table 2).