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Foreword

This Survey is published on the responsibility of the Economic and Development Review Committee of the OECD, which is charged with the examination of the economic situation of member countries.

The economic situation and policies of Poland were reviewed by the Committee on 14 December 2022, with participation of representatives of the Polish authorities. The draft report was then revised in the light of the discussions and given final approval as the agreed report of the whole Committee on 8 February 2023.

The Secretariat's draft report was prepared for the Committee by Zuzana Smidova and Srdan Tatomir under the supervision of Sebastian Barnes. Statistical research assistance was provided by Damien Azzopardi, editorial assistance by Stephanie Henry and Michelle Ortiz and communication assistance by Nathalie Bienvenu. Support from the government of Poland is gratefully acknowledged.

The previous Survey of Poland was issued in December 2020.

Information about the latest as well as previous Surveys and more information about how Surveys are prepared is available at https://www.oecd.org/eco/surveys/.

Abbreviations and Acronyms

AES	Adult Education Survey
ALMP	active labour market programmes
BKL	study of Human Capital survey
BUR	database of development services
DESI	EU Digital Economy and Society Index
ELA	graduate tracking portal
ERDF	European Regional Development Fund
ESIF	European Structural and Investment Funds
EU	European Union
HPWP	High Performance Work Practices
KFS	National Training Fund
ICT	Information and Communication Technology
KKZ	*kwalifikacyjny kurs zawodowy* (qualifying vocational course)
KUZ	*kurs umiejętności zawodowych* (vocational skills course)
MEiN	Ministry of Education and Science
MRiT	Ministry of Economic Development and Technology
MRiPS	Ministry of Family and Social Policy
ORE	Centre for Education Development
PARP	Polish Agency for Enterprise Development
PFR	Polish Development Fund Group
RPL	recognition of prior learning
RRF	Recovery and Resilience Facility
SME	small and medium size businesses
TFP	total factor productivity
UKNF	Polish Financial Supervision Authority
UOKiK	the Office of Competition and Consumer Protection
VET	vocational education and training
ZSK	integrated qualifications system

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Basic Statistics of Poland, 2021[1]

(Numbers in parentheses refer to the OECD average)[2]

LAND, PEOPLE AND ELECTORAL CYCLE					
Population (million)	37.7		Population density per km²	123.3	(38.7)
Under 15 (%)	15.4	(17.4)	Life expectancy at birth (years, 2020)	76.6	(79.0)
Over 65 (%)	18.8	(17.7)	Men (2020)	72.6	(76.2)
International migrant stock (% of population, 2019)	1.7	(13.2)	Women (2020)	80.8	(82.0)
Latest 5-year average growth (%)	-0.1	(0.5)	Latest general election	Oct-2019	
ECONOMY					
Gross domestic product (GDP)			Value added shares (%)		
In current prices (billion USD)	680.2		Agriculture, forestry and fishing	2.6	(2.6)
In current prices (billion PLN)	2 623.9		Industry including construction	32.0	(26.6)
Latest 5-year average real growth (%)	4.0	(1.6)	Services	65.4	(70.8)
Per capita (thousand USD PPP)	38.1	(50.8)			
GENERAL GOVERNMENT Per cent of GDP					
Expenditure	44.2	(46.4)	Gross financial debt	68.2	(111.9)
Revenue	42.4	(38.8)	Net financial debt	37.6	(70.7)
EXTERNAL ACCOUNTS					
Exchange rate (PLN per USD)	3.86		Main exports (% of total merchandise exports)		
PPP exchange rate (USA = 1)	1.82		Machinery and transport equipment	36.4	
In per cent of GDP			Manufactured goods	18.7	
Exports of goods and services	57.9	(29.8)	Miscellaneous manufactured articles	17.9	
Imports of goods and services	54.5	(29.9)	Main imports (% of total merchandise imports)		
Current account balance	-1.5	(0.2)	Machinery and transport equipment	34.7	
Net international investment position	-37.6		Manufactured goods	18.1	
			Chemicals and related products, n.e.s.	14.4	
LABOUR MARKET, SKILLS AND INNOVATION					
Employment rate (aged 15 and over, %)	55.3	(56.2)	Unemployment rate, Labour Force Survey (aged 15 and over, %)	3.4	(6.1)
Men	63.5	(64.1)	Youth (aged 15-24, %)	11.9	(12.8)
Women	47.8	(48.7)	Long-term unemployed (1 year and over, %)	0.9	(1.7)
Participation rate (aged 15 and over, %)	57.2	(60.3)	Tertiary educational attainment (aged 25-64, %)	33.2	(39.9)
Average hours worked per year	1,830	(1,716)	Gross domestic expenditure on R&D (% of GDP, 2020)	1.4	(3.0)
ENVIRONMENT					
Total primary energy supply per capita (toe)	2.9	(3.8)	CO2 emissions from fuel combustion per capita (tonnes)	7.7	(7.9)
Renewables (%)	11.8	(11.6)	Water abstractions per capita (1 000 m³, 2020)	0.2	
Exposure to air pollution (more than 10 g/m³ of PM 2.5, % of population, 2019)	100.0	(61.7)	Municipal waste per capita (tonnes, 2020)	0.3	(0.5)
SOCIETY					
Income inequality (Gini coefficient, 2018, OECD: latest available)	0.281	(0.315)	Education outcomes (PISA score, 2018)		
Relative poverty rate (%, 2018)	9.8	(11.7)	Reading	512	(485)
Median disposable household income (thousand USD PPP, 2018)	19.1	(25.5)	Mathematics	516	(487)
Public and private spending (% of GDP)			Science	511	(487)
Health care (OECD: 2020)	6.6	(9.7)	Share of women in parliament (%)	28.3	(32.4)
Pensions (2019)	11.0	(9.5)	Net official development assistance (% of GNI, 2017)	0.1	(0.4)
Education (% of GNI, 2020)	4.4	(4.4)			

[1] The year is indicated in parenthesis if it deviates from the year in the main title of this table.

[2] Where the OECD aggregate is not provided in the source database, a simple OECD average of latest available data is calculated where data exist for at least 80% of member countries.

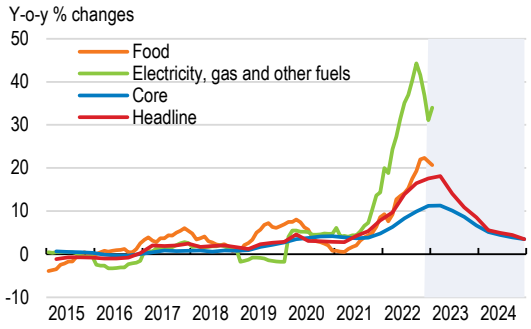
Source: Calculations based on data extracted from databases of the following organisations: OECD, International Energy Agency, International Labour Organisation, International Monetary Fund, United Nations, World Bank.

Executive Summary

The impact of Russia's war of aggression against Ukraine is overshadowing the outlook

Poland recovered quickly from the COVID-19 pandemic, but economic growth is stalling following Russia's war of aggression against Ukraine. Inflation has soared against the backdrop of high global energy and food prices and domestic labour market pressures (Figure 1). While Poland's energy supply remains reliant on coal and use of gas is limited, imports of both Russian coal and gas have been replaced and overall trade links with Russia and Belarus are relatively small. Inflation has been rising in the course of 2022 largely driven by higher energy prices, but also reflecting domestic factors, with consumer price inflation up 17.2% in January.

Figure 1. Inflation has soared



Source: OECD MEI database; Statistics Poland; and OECD Economic Outlook database.

StatLink https://stat.link/hf0wo3

The labour market enjoyed a strong recovery from the COVID-19 pandemic. With skill shortages and strong wage growth already prior to the pandemic, labour market tightness has increased markedly. The employment and unemployment rates have regained pre-pandemic levels and have now posted their best performances in the past three decades.

Poland has successfully managed a large inflow of refugees. Around one and a half million refugees are living in Poland, mostly women with children, following Russia's war against Ukraine. A substantial amount of both public and private resources has been mobilised and the refugees are well-supported. Many have integrated into the labour market with some 60% working already, although often taking up temporary and low skilled jobs. In contrast, only around one-third of Ukrainian children attend local classes, the rest most likely following Ukrainian curricula on-line. The uncertainty about the duration of the conflict complicates the appropriate policy response. Nevertheless, the experience of OECD countries has shown that early interventions have large payoffs in terms of integration.

Table 1. Economic growth will slow

(Annual growth rates, %, unless specified)

	2021	2022	2023	2024
Gross domestic product (GDP)	6.8	4.9	0.9	2.4
Private consumption	6.3	3.0	2.0	2.5
Gross fixed capital formation	2.1	4.6	1.2	3.5
Exports	12.5	4.8	1.2	1.5
Imports	16.1	6.4	1.8	1.5
Unemployment rate (%)	3.4	2.9	3.5	3.8
Consumer price index	5.1	14.4	12.7	4.6
Current account balance (% of GDP)	-1.5	-2.9	-3.5	-2.8
Government fiscal balance (% of GDP)	-1.8	-3.5	-4.9	-4.0
Government gross debt (% of GDP)	53.8	51.8	53.2	54.9

Source: OECD Economic Outlook database.

The economy is expected to remain weak over the first half of 2023 due to high energy prices, weak domestic demand and high uncertainty. Economic growth is expected to slow to 0.9% this year before it recovers to 2.4% in 2024. Inflation is anticipated to peak in early 2023 and fall to 3.5% at the end of 2024, still above the central bank's target. After a small increase, the unemployment rate should stabilise at 3.8% in 2024. Consumption and investment growth should recover in 2024, but the high level of energy prices is likely to lead to a permanent loss of output (Table 1).

The downturn would be deeper in case of an escalation of Russia's war against Ukraine or further disruptions to energy supply. A more sustained increase in underlying prices could hamper the recovery and lead to higher interest rates. Another downside risk is the impact of tighter global financial conditions. While new COVID-19 cases remain limited so far, the arrival of a more virulent and harmful coronavirus variant remains a risk.

Macroeconomic policy needs to strike a fine balance

Both monetary and fiscal policies should ensure that higher inflation does not become

entrenched. Monetary policy has tightened considerably since October 2021, with the key policy interest rate raised to 6.75% by September 2022. Given the sustained rise in both headline and core inflation in 2022, there are risks that this becomes entrenched in higher domestic inflation. The central bank should continue to ensure that currently elevated inflation expectations do not become entrenched and stand ready to increase interest rates further if necessary.

Fiscal policy continues to support the economy in managing higher energy prices. Following comprehensive pandemic-related packages in 2020-21, substantial policy support is being provided to manage the current cost of living crisis. In 2022, households and businesses benefitted from a temporary lowering of VAT taxes on energy and food, as well as energy allowances. This year, electricity and gas price caps and zero VAT rate on food are in place. Temporary policy support softening the blow of the energy crisis should continue as needed. There is scope to improve targeting of any future supports to avoid adding to inflationary pressures.

Long-term fiscal pressures need to be addressed. A structural budget deficit has opened up and spending pressures from population ageing, healthcare and increased defence spending weigh on long-term fiscal sustainability, although the public debt-to-GDP ratio remains at around 50%. The low replacement rate envisaged for the public pension system could lead to additional fiscal pressures. To this end, working lives should be extended, including by aligning gradually male and female statutory retirement ages and increasing the pension age in line with life expectancy gains in good health.

Broadening the revenue base and improving spending efficiency would help improve fiscal sustainability. Reduced VAT rates and exceptions can be streamlined further and property taxation increased. Both the healthcare system and infrastructure are receiving considerable new public financing, so ensuring efficient spending will be key.

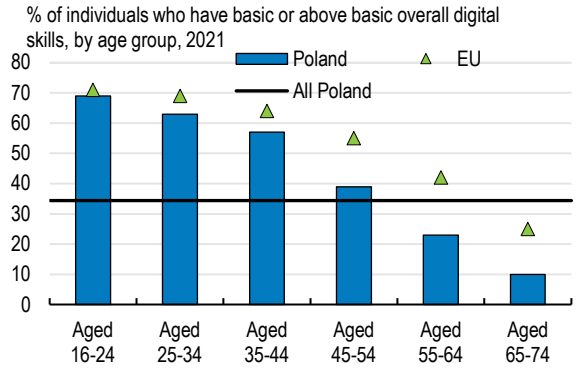
The government is making frequent use of off-budgetary funds and special vehicles to fund temporary support programmes. These funds are part of the general government sector but are not included in the state budget that is at the centre of the fiscal policy debate and approved by Parliament. Strengthening the budgetary framework by reviewing the fiscal rules in the context of European Union (EU) governance reforms and establishing a fiscal council could help maintain fiscal credibility and support better and more transparent management of public finances.

Reforms are needed for living standards to improve further in an ageing society

Digitalisation offers new growth opportunities but requires adequate skills. Prior to the pandemic, Poland made rapid economic progress, with living standards reaching around 80% of the OECD average. This was largely thanks to labour productivity gains, which averaged 3% per year from 2010 to 2020. The Polish economy has benefited significantly from inward investment and strong participation in global value chains. It is increasingly shifting towards higher valued-added activities and digitalisation provides valuable opportunities to advance productivity convergence.

Further digitalising the economy can help unleash the entrepreneurial potential of Polish businesses at home and in global markets. This requires the government to take a comprehensive approach across several policy areas. Adoption of digital technologies is relatively low among firms, particularly small to medium-sized enterprises (SMEs), and could be facilitated through expanded and proactive consultancy and technical support. Managerial skills, key to implementing digitalisation in firms, are often lacking. Information and communications technology (ICT) innovation has been growing and should be supported further. Lower regulatory barriers in services could spur more competition and innovation. Digital skills, essential to ensuring an inclusive digital transition, can be improved, particularly among older adults (Figure 2). The authorities should focus on addressing skills gaps among the working age population, while further education can be made more practical and flexible. Targeted awareness campaigns and scholarships could encourage more women in ICT.

Figure 2. Digital skills lag behind



Source: Eurostat.

StatLink https://stat.link/71kexy

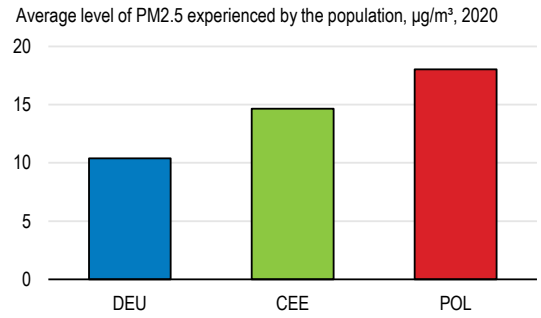
In an ageing society and in the current context of a very tight labour market, increasing the skills of workers and better integration of vulnerable groups into the labour market are key. Encouraging longer working lives, facilitating migration and removing barriers to young parents working would all help draw more people into the workforce. Expansion of childcare capacities is under way and should enable more women to participate in the labour market. The authorities are incentivising pensioners to work, which is welcome.

Well-designed policies are needed to reduce greenhouse gas emissions

Poland has made progress in transitioning to net zero emissions by 2050, but the rate of decarbonisation needs to accelerate significantly. With improvements in industrial energy efficiency and continued expansion of services, energy demand and economic growth have decoupled since 2010. Nevertheless, the carbon intensity of the economy remains high – Poland remains the fifth most carbon intensive economy in the OECD- and people continue to suffer from poor local air quality (Figure 3).

Poland remains heavily reliant on coal. The long-term strategy, *Energy Policy of Poland to 2040*, adopted in 2021, provides welcome policy direction for the energy sector. Gas was to play a major role in the green transition, with a gradual build-up of renewables and nuclear. Given the recent developments, the authorities are reviewing the strategy, adding energy security as a key objective. The revised policy should continue to accelerate the development of renewables, diversify technologies and improve energy efficiency, while minimising the increased reliance on coal in the near term.

Figure 3. The population is heavily exposed to air pollution



Source: OECD Environmental risks and health database.

StatLink https://stat.link/7dlcgy

Setting out a clear long-term path for carbon prices would provide more clarity to households and businesses. Over time, price signals should be strengthened and the regulatory framework improved to foster a faster deployment of renewables. Investments in the electricity grid should be expedited and scaled up. Stepping up efforts to save energy in the housing sector would help to decrease air pollution, carbon emissions and energy poverty. Planned vehicle taxation reforms should be brought forward and reflect carbon content and environmental impact.

A just energy transition requires supporting the most affected workers and regions. Poland's hard coal mines, which employ the bulk of the miners, are scheduled to close by 2049. A social contract agreed in 2021 is welcome, even though greater emphasis should be put on re-skilling. Such an agreement is also needed for workers in lignite coal mines, with complementary policies provided for the wider coal value chain. Given the improved state of the labour market compared to earlier transitions, the social costs of this transition are likely to be lower than in the past.

MAIN FINDINGS	KEY RECOMMENDATIONS
Macroeconomic and fiscal policies	
Substantial policy support is being provided to manage the current cost of living crisis.	Ensure that energy-related support measures to households and firms remain temporary and that fiscal policy does not add to inflationary pressure. Any future supports should be better targeted to the most vulnerable.
Inflation is high and price pressures are broadening.	Continue to ensure that currently elevated inflation expectations do not become entrenched and stand ready to increase interest rates further if necessary.
Poland is hosting over 1 million refugees from Ukraine. While adult Ukraine migrants have quickly integrated into the labour market, children participate less in formal education.	Continue efforts to support and integrate refugees and prepare in case of a further influx.
The coronavirus pandemic and energy crisis have increased public debt, while ageing and other spending pressures such as increased defense spending weigh on long-term fiscal sustainability.	To improve fiscal credibility, consider long-term changes to the numerical fiscal rules, taking into account the outcome of the EU economic governance reforms, and establish an independent fiscal council. In the medium-term, undertake fiscal consolidation. Broaden the revenue base by reforming or phasing out ineffective and regressive tax expenditures and revising property taxation. On the expenditure side, improve targeting of social supports and conduct a comprehensive spending review.
Future low pension adequacy increases the risk of old-age poverty and long-term spending pressures.	Extend working lives, including by aligning gradually male and female statutory retirement age and increasing it in line with life expectancy gains in good health.
The health of many Poles remains subpar. Considerable disruptions in healthcare provision during the pandemic and the large influx of Ukrainian migrants have added to the strain in the healthcare system.	Make the healthcare strategy better integrated across the various actors in the system. Over time, increase the remuneration of health workers.
Unleashing the digital potential of the economy and increasing competition	
The adoption of digital technologies is relatively low among SMEs.	Expand consultancy services that offer expert technical advice to facilitate investment in digital technologies among SMEs.
ICT innovation is low.	Increase direct funding for ICT R&D.
Digital skills are low among adults, particularly among older or less educated, while managerial skills, which are key to advancing digitalisation, are often lacking.	Increase the flexibility of formal and non-formal education through more modular training, making use of recognition of prior learning and micro-credentials. Adopt individual training accounts and make training rights portable from job to job. Promote lifelong learning, particularly among those working in SMEs and the less educated, the inactive and the older population.
Digital skills among graduates with upper secondary education could be higher.	Provide ICT equipment in schools and training for vocational education and training teachers to teach digital skills.
The share of women in ICT is 15%, below the EU average of 19%.	Continue increasing the number of women studying ICT through targeted awareness campaigns and scholarships.
Regulatory barriers hinder competition in services.	Reduce regulatory barriers to competition for lawyers, notaries, architects and engineers, as well as in occupational licensing.
Public trust in government and business perceptions of effectiveness of investment protection are low. The previous public integrity strategy did not achieve important objectives and no new strategy has been adopted.	Building on the previous anti-corruption strategy, strengthen public integrity by delivering on its past priorities, addressing remaining issues and involving the non-governmental sector in the formulation and evaluation of the new strategy.
Strengthening green and sustainable growth	
Poland's planned transition away from coal relied in part on natural gas. Given the current geopolitical situation and volatile energy prices the Government is reviewing the strategy.	Implement the updated principles of the energy strategy with an emphasis on accelerating development of renewables, diversifying technologies and improving energy security and efficiency, while minimising the increased reliance on coal in the near term.
Increases in renewable energy are hindered by capacity and connection constraints of the electricity grid and the regulatory framework.	Expedite and scale up investments in the electricity grid, while reviewing regulations and other policy constraints hindering further expansion of renewables.
The pricing of the environmental costs of fossil fuels is uneven across the economy.	Set out a clear long-term path for carbon pricing. In the medium term, increase the national emissions fee and eventually align it with the European Union Emissions Trading System (EU ETS).
Poland agreed on the closure of hard coal mines in 2049.	Ensure a just transition through well-targeted retraining, a hiring freeze and inter-sectoral upskilling for the hard and lignite coal sectors. Complementary policies are needed for the wider coal value chain.

1 Key policy insights

Continued convergence in living standards requires bold policy decisions

Prior to the COVID-19 pandemic and Russia's large-scale war of aggression against Ukraine, Poland was one of the fastest growing economies in Europe, expanding on average at 3.7% per annum over the 2010s. This strong convergence was based on sound macroeconomic policies that included inflation targeting, a flexible exchange rate and a solid fiscal framework. The pandemic hit Poland hard, but the economy recovered quickly thanks to effective policy support. With Russia's invasion of Ukraine, more than 1 million refugees fleeing the war are living in Poland. Both the government and the population have undertaken considerable efforts to receive them. At the same time, global energy prices have soared, and activity, confidence and investment have declined.

Poland stands at a critical juncture, where today's decisions will shape the economy and society for decades to come. Inflation has reached double digits, increasing pressure on households and businesses. The geopolitical situation highlights the need for an energy transition that factors in energy security and the role that renewables can play in achieving a challenging net zero emissions goal by 2050. Improvements in productivity, including through digitalisation, will be key to continued convergence of living standards. Effective integration of refugees will be needed to ensure good social outcomes. The health prospects of the population, which continues to suffer from considerable levels of pollution, need to be improved. These issues come on top of the longstanding challenges of population ageing and the low labour force participation of older workers.

Against this backdrop, the main messages of this Survey are:

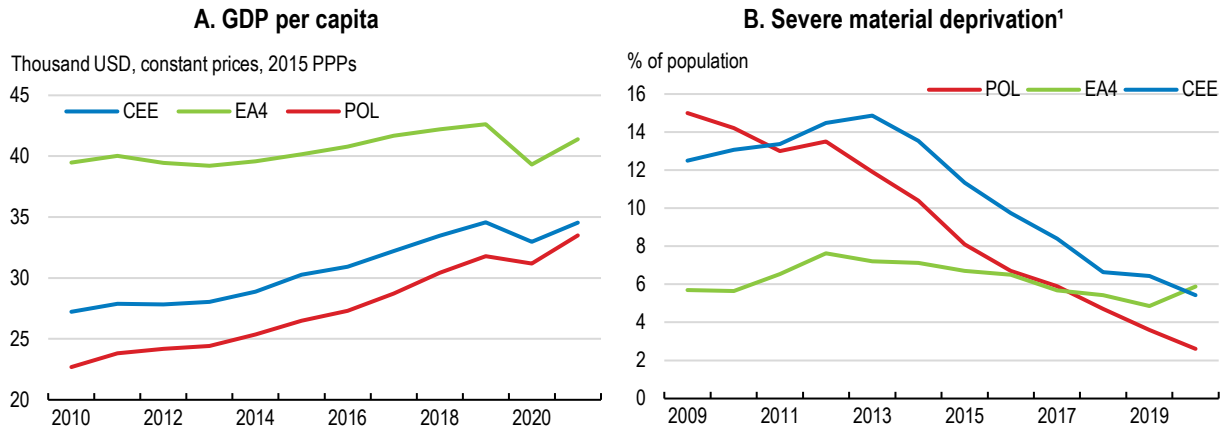
- Policy support that softens the blow of the energy crisis and accommodates the inflow of refugees should continue, but there is scope to improve targeting of energy and food supports in the future. Both monetary and fiscal policies should ensure that higher inflation does not become entrenched.
- In the face of an ageing population, raising growth potential is a priority. Long-term fiscal pressures need to be addressed by broadening the revenue base, raising the effective retirement age and improving spending efficiency, in areas such as health and infrastructure. Given its continued reliance on coal and changes in energy supply, a revision of plans on how to achieve the transition to climate neutrality is needed. Setting out a clear path for carbon prices would provide clarity to households and businesses.
- Further digitalising the economy can help unleash the entrepreneurial potential of Polish businesses at home and in global markets. Adoption of digital technologies is relatively low among Polish firms, particularly SMEs, as are the digital skills of certain population groups such as older adults. Successful digitalisation requires a comprehensive policy approach. More measures are needed to help SMEs adopt digital technologies. The authorities should continue promoting life-long learning and increase flexibility of formal and non-formal education.

Russia's invasion of Ukraine has darkened the economic outlook

Inflation has reached high levels and growth is slowing

Prior to the pandemic, Poland enjoyed uninterrupted economic growth since 1992. It has successfully integrated into global supply chains, not least thanks to its increasing role as an outsourcing destination for business services. The catch-up with average living standards in other OECD countries was impressive (Figure 1.1, Panel A). Rising household incomes contributed to gains in inclusiveness, with material deprivation and inequality declining (Figure 1.1, Panel B).

Figure 1.1. Recent decades brought income convergence and lower poverty



Note: CEE is the average of the Czech Republic, Hungary, Slovak Republic. EA4 is the average of Germany, France, Italy and Spain.
1. Severe material deprivation rate is defined as the enforced inability to pay for at least four items that are considered by most people to be desirable or even necessary to lead an adequate life.
Source: OECD National accounts database; and Eurostat "Severe material deprivation rate" database (tespm030).

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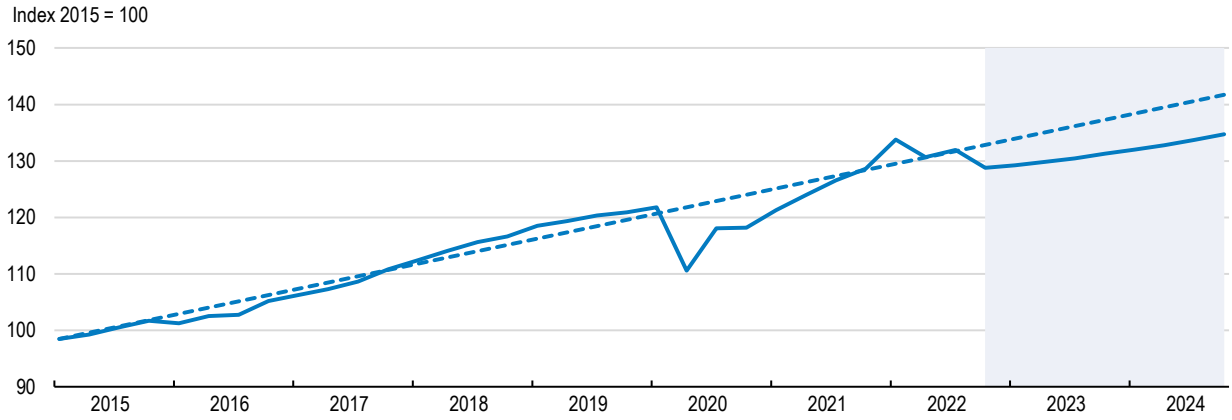
The COVID-19 pandemic resulted in a recession with GDP falling by 2% in 2020. Boosted by comprehensive fiscal support, the economy recovered strongly in 2021, growing by 6.8%. Economic growth slowed to 4.9% last year (Figure 1.2). The impact of Russia's war of aggression against Ukraine is overshadowing the economic outlook. As Poland imports around half its fuels, the terms-of-trade deteriorated by an estimated 3.7% in 2022 on the back of higher import prices. Consequently, the growth of real disposable incomes and consumption have slowed down considerably, after a relatively strong post-pandemic recovery.

Figure 1.2. A quick recovery from the pandemic but a weaker outlook ahead



Source: OECD Economic Outlook database.

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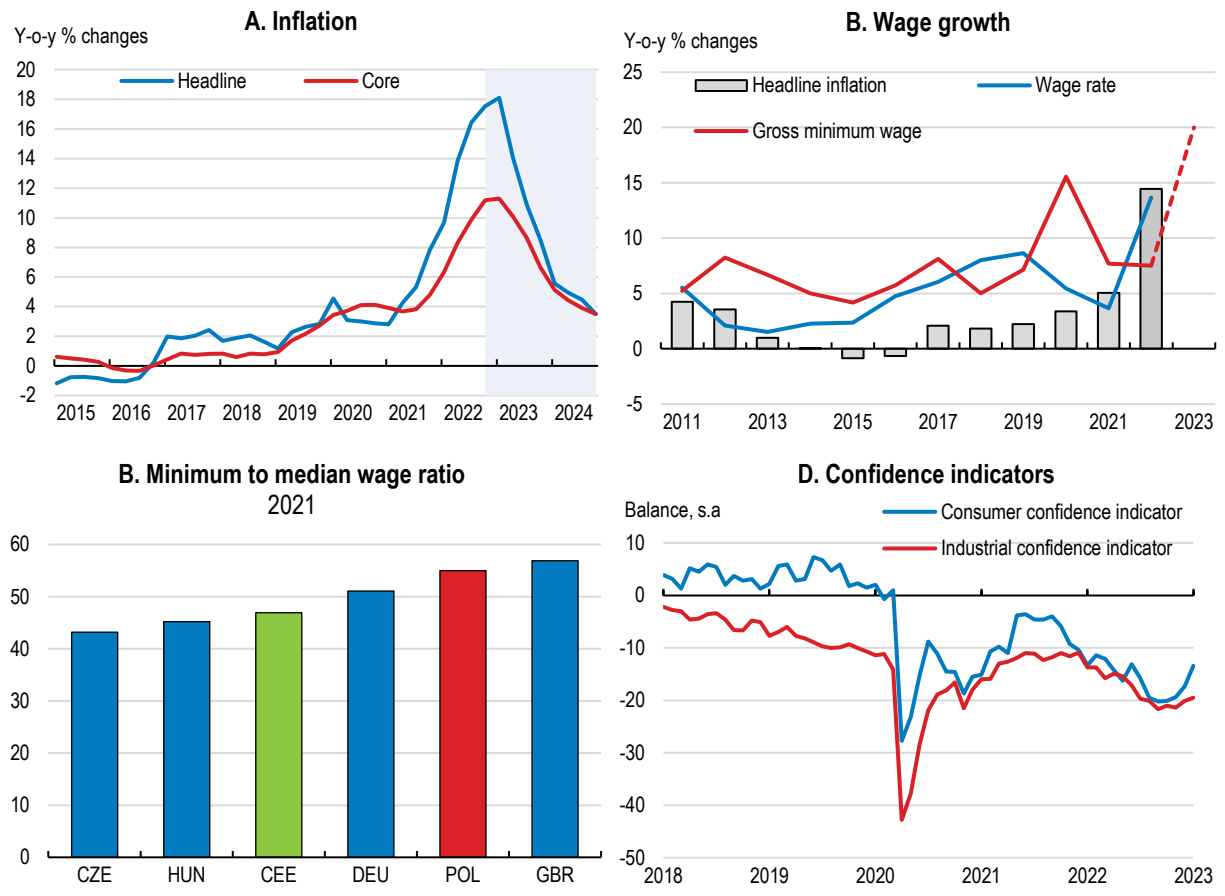
Direct trade with Russia, Belarus and Ukraine before the war was relatively small. Exports to these countries accounted for 3.7% and imports for 5% of GDP in 2020, slightly above the Central and Eastern European (CEE) countries' average (Czech Republic, Hungary and Slovak Republic). With Poland's energy production and supply heavily skewed towards coal, gas was used for some 17% of energy supply in 2020, mainly for industrial consumption, electricity generation and residential heating. Poland has long been planning to reduce its reliance on Russia and has diversified its gas supplies with new pipelines and gas terminal capacity. Nevertheless, it has been affected by the global and European surge in coal and gas prices, complicating the management of energy transition while trying to ensure energy security.

Inflation rose rapidly in 2022. This was due to the energy price shock, largely driven by Russia's invasion of Ukraine, global supply chain disruptions, strong growth in global commodity prices and a tight labour market in Poland. Annual consumer price inflation reached 17.2% in January this year and core inflation stood at 11.5% in December 2022. Domestically generated inflation remains significant, and much will now depend on the extent of second-round effects. Headline inflation is projected to ease to 12.7% this year as energy prices moderate and fall to 4.6% in 2024, still above the central bank's target (Figure 1.3). Core inflation is expected to peak on an annual basis at 9.1% in 2022 and fall to around 4.2% in 2024, but there are risks that price and wage inflation could remain persistently high for a longer period of time (OECD, 2022a).

Figure 1.3. Inflation and wages have grown fast, while confidence has fallen



Note: In panel B wage rate for 2022 refers to 2022Q3.
Source: OECD Economic Outlook database; Eurostat (ei_bsco_m, ei_bsin_m_r2), European Commission Business and consumer surveys; and OECD Earnings database.

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GDP growth is projected to slow to 0.9% in 2023 amid high inflation, elevated uncertainty and decelerating private consumption (Table 1.1). Weaker demand growth in Poland's major trading partners is projected to moderate export growth. Fiscal policy will support growth but interest rates are now higher. Inflation is expected to decline as energy price growth moderates and spare capacity exerts downward pressure on inflation. GDP growth should recover gradually to 2.4% in 2024 as the economy adjusts to higher energy prices and inflation falls, but output is likely to be permanently lower due to the higher cost of energy (Figure 1.2).

Major downside risks overshadow these projections. An escalation of the Russian war against Ukraine and an additional disruption of energy supplies could further impact the Polish and European economies, leading to higher inflation and lower activity, as well as an additional inflow of refugees. Other potential shocks to the economy would alter the outlook further (Table 1.2). On the upside, public and private investments supported by European Union (EU) funds could be deployed faster than projected. Moreover, expansionary fiscal policy may prolong high inflation and require additional monetary tightening.

Table 1.1. Macroeconomic indicators and projections

	2019	2020	2021	2022	2023	2024
	Current prices PLN billion	Annual percentage change, volume (2015 prices)				
GDP at market prices	2 288.5	-2.0	6.8	4.9	0.9	2.4
Private consumption	1 322.3	-3.4	6.3	3.0	2.0	2.5
Government consumption	412.4	4.9	5.0	1.9	3.0	2.1
Gross fixed capital formation	432.9	-2.3	2.1	4.6	1.2	3.5
Final domestic demand	2 167.6	-1.6	5.2	3.0	2.0	2.6
Stockbuilding[1]	36.1	-1.1	3.0	4.4	-1.9	0.0
Total domestic demand	2 203.8	-2.8	8.3	8.8	0.3	2.4
Exports of goods and services	1 217.4	-1.1	12.5	4.8	1.2	1.5
Imports of goods and services	1 132.7	-2.4	16.1	6.4	1.8	1.5
Net exports[1]	84.7	0.6	-1.0	-0.7	-0.3	0.0
Memorandum items index						
GDP deflator		4.3	5.1	11.7	10.1	4.2
Consumer price index		3.4	5.1	14.4	12.7	4.6
Core inflation index [2]		3.8	4.1	9.0	9.1	4.2
Unemployment rate (% of labour force)		3.2	3.4	2.9	3.5	3.8
Household saving ratio, net (% of disposable income)		7.3	0.4	-0.1	-0.5	-0.5
General government financial balance (% of GDP)		-6.9	-1.8	-3.5	-4.9	-4.0
General government debt, Maastricht definition[3] (% of GDP)		57.2	53.8	51.8	53.2	54.9
Current account balance (% of GDP)		2.5	-1.5	-2.9	-3.5	-2.8

1. Contributions to changes in real GDP, actual amount in the first column.
2. Consumer price index excluding food and energy.
3. The Maastricht definition of general government debt includes only loans, debt securities, and currency and deposits, with debt at face value rather than market value.
Source: OECD Economic Outlook database.

Table 1.2. Possible further shocks to the economy

Shock	Likely impact	Policy response
Intensification of the Russian aggression against Ukraine.	Renewed inflow of Ukrainian refugees and an increase in military spending. These factors could push inflation higher and increase the pressure on public finances.	Make appropriate contingency plans. Develop strategies to maintain supply-chains based on various conflict scenarios.
Large-scale cyber attack.	A cyber-attack could disrupt business operations or shut down domestic infrastructure vital for the functioning of the economy.	Invest further in cybersecurity, with the central government playing a co-ordinating role.
A more virulent COVID-19 resurgence or another pandemic.	Economic activity would fall as people avoid activities that put them at risk and are restricted by containment measures.	Bolster the resilience of the healthcare system.

Poland has successfully managed a large inflow of refugees

An estimated 1.6 million Ukrainian refugees have settled in Poland (Box 1.1). From the first days of the war those fleeing the conflict have been met with unprecedented support from the Polish population, non-governmental organisations, and local authorities. Public and private spending during the first three months of the conflict has been estimated at close to 1% of GDP, while estimates of public spending for 2022 put the cost at 0.4-0.6% of GDP (Baszczak et al., 2022; NBP, 2022d). In line with EU policy the initial response was to offer temporary protection permits for 18 months, immediate working rights and, access to

education, housing, healthcare, financial support, vocational training, and job search assistance. Digital platforms and hotlines were launched to inform the newly arrived of their rights and reception conditions. While some Ukrainians returned after the initial surge, many remain. Given the tightness of the Polish labour market prior to the war, many of the newly arrived adults found jobs quickly and it is estimated that around 60% of them are working already (Gromadzki and Lewandowski, 2023).

Overall, the management of such a large inflow of refugees in such a short period of time has been effective, meeting the needs of this vulnerable population without overwhelming the capacity of the state. Much of the responsibility for providing reception policies so far has been on local governments. There has been strong support from the non-governmental sector as well (Duszczyk and Kaczmarczyk, 2022). The sudden increase in population, however, adds to housing needs that were considerable already prior to the war, with lack of affordable housing and widespread overcrowding (OECD, 2020a). Urban populations between February and April 2022 grew by as much as 15% in Warsaw, 23% in Krakow and 53% in Rzeszow, which is close to the Ukrainian border (Wojdat and Cywiński, 2022).

The healthcare system has also come under additional strain. The refugees have a higher need for psychological consultations and need to overcome the language barrier (Duszczyk and Kaczmarczyk, 2022). The authorities set up medical evacuations of patients, both civilians and soldiers, to provide specialised treatment and rehabilitation in medical entities, as well as a voluntary relocation mechanism of patients to other EU countries, in particular for children requiring oncological treatment. A pilot project of setting up trauma consultations is under way. Certain vaccines and medicine shortages were solved by drawing on international co-operation and a vaccination campaign is to be launched in co-operation with UNICEF to increase routine childhood vaccination coverage. Ukrainian medical personnel that have come to Poland are helping to ease some pressures in the healthcare sector, supported by simplified rules for their employment that have been in place since 2021.

Box 1.1. Ukrainian refugees in Poland

Russia's war against Ukraine resulted in significant inflows of war refugees. While almost 9 million Ukrainians crossed the Polish border, official estimates show that by January 2023 around 1.6 million stayed, equivalent to 4% of the Polish population. Half of the war refugees settling in Poland during 2022 are adults, largely women of working age (Duszczyk and Kaczmarczyk, 2022).

The Ukrainian refugees benefit from long-standing flows of migrants to Poland. Ukrainian migrants were already the largest foreign-born population in the country in 2020, with some 1.3 million living in Poland and many more coming for seasonal work. Traditionally, the majority of the labour migrants were men working in industries such as construction, manufacturing, and farming, mostly under the age of 45. Following general mobilisation in Ukraine, many of them returned home.

Data between February and April 2022 show that new arrivals went to regions with higher incomes and lower unemployment, a higher presence of Ukrainians before the war, and available accommodation (Gromadzki and Lewandowski, 2023). Geographically, refugees concentrated in the Western areas of the country and in large metropolitan areas such as Warsaw, Krakow, and Wrocław.

Given the decline in Poland's working-age population that started in 2011, skilled migrants can help to ease some labour market pressures. Indeed, around half of the adult refugees have tertiary education (Chmielewska-Kalinska et al., 2022). While estimates show that as many as 60% of those settled in Poland were working by April 2022, over half of them found jobs in so-called elementary occupations (e.g., cleaners, food preparation assistants, and labourers), pointing to considerable skills-mismatch. Similarly to the pre-war economic migrants, most found jobs in service sectors.

Source: Chmielewska-Kalińska et al., 2022; Duszczyk and Kaczmarczyk, 2022; Gromadzki and Lewandowski, 2023.

The experience of OECD countries illustrates that early intervention to integrate migrants provides strong payoffs (OECD, 2014). Despite the uncertainty about the number of those who will eventually settle in Poland, comprehensive policies addressing availability of housing, healthcare, and education are needed. Social, educational, and spatial integration are essential, including for children. Their chances of doing well in school, and later in the labour market, hinge on the ability to speak Polish (OECD, 2016). While over half a million Ukrainian refugees are children of school age, only 185 000 had enrolled in Polish kindergartens and schools by last September. Others are likely to be continuing online remote learning following the Ukrainian curriculum. Many children could be integrated in the education system via participation in sports activities or having a dedicated space for online study with all necessary equipment in schools (Duszczyk and Kaczmarczyk, 2022).

Moving from temporary emergency response to medium and long-term policies requires mainstreaming support measures and addressing secondary flows (OECD, 2022b). Part of the funds for immediate reception support and medium-term integration measures have been provided by various EU instruments. However, longer-term financing, such as expanding school capacities and follow-up healthcare are borne by the state budget. A comprehensive approach to integrating migrants is needed. Addressing the current migration wave through such an approach should include close co-ordination across levels of government, as it is often local governments that deliver these policies. Building on disaggregated data to get an accurate picture of the evolving situation, the authorities should carry out needs assessments and situation reports.

Macroeconomic policy needs to strike a fine balance

Monetary policy has been tightened

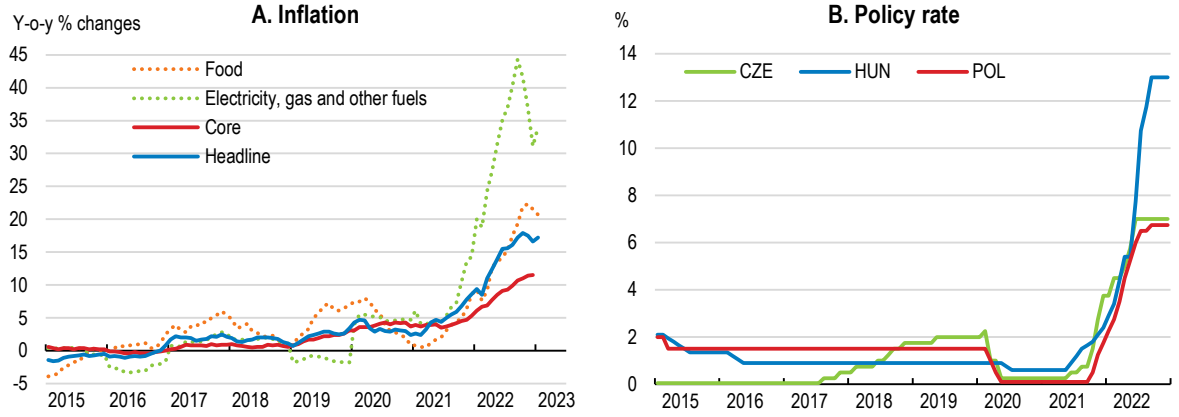
With interest rates having been cut to near zero during the pandemic, the central bank started to tighten monetary policy in October 2021, earlier than many other central banks. The asset purchase programme ended in November 2021 (Figure 1.4). Policy interest rate rose to 6.75% by September 2022. Asset prices have fallen and the growth of both consumer and housing loans has come to a halt (NBP, 2022a). As with currencies of certain other CEE countries, the zloty (PLN) weakened for much of last year, largely on the back of an appreciating dollar, although since October 2022 this trend has to some extent reversed (Figure 1.5). Up to two-thirds of headline inflation came from food and energy prices in 2022. Surveys of professional forecasters report inflation expectations around 10% a year ahead and around 6% two years ahead, and consumers' and firms' inflation expectations remain elevated (NBP, 2022b).

Some of the rise in inflation is domestically generated. The labour market was already tight prior to the pandemic and recovered strongly with the unemployment rate at a record low of 2.6% during the third quarter of last year. This is well below estimates of non-accelerating wage inflation rate of unemployment of around 4.3% (NBP, 2022a). The employment rate has recovered too, reaching 76.5% of the resident working age population in the third quarter of 2022 (Eurostat, 2022). Nominal wage growth in the third quarter reached 14.6%, although real wages declined by 1.5% year-on-year. More recent survey data indicate a slight weakening of labour demand, but the relatively high nominal wage growth is expected to continue (NBP, 2022a). The minimum wage, at around 50% of the median wage in 2021 and paid to some 13% of employees, will increase by almost 20% in this year (Figure 1.3).

Due to lags in the monetary policy transmission, the full impact of the tightening is expected over the course of this year and 2024. The central bank's target is headline inflation of 2.5% in annual terms with a tolerance band of +/- 1 percentage point, and the targeting horizon has now been extended from 2 to 3 years ahead. Under the assumptions of a gradual decline in commodity prices, increased interest rates in major economies, subdued domestic demand, and a broadly neutral fiscal stance in 2023, the central bank's November Inflation Report forecast implied no need for further monetary tightening (NBP, 2022b). However, inflation remains high with fiscal support in place, and there is considerable uncertainty about

future wages and prices. This could require further increases in interest rates, if it proves necessary to achieve the inflation target in the medium term (OECD, 2022a). The authorities should continue to ensure that currently elevated inflation expectations do not become entrenched and stand ready to increase interest rates further if necessary.

Figure 1.4. Monetary policy has tightened but core inflation is rising



Note: Preliminary data for January 2023.
Source: OECD Main Economic Indicators (MEI) database; Statistics Poland; and OECD Analytical Database.

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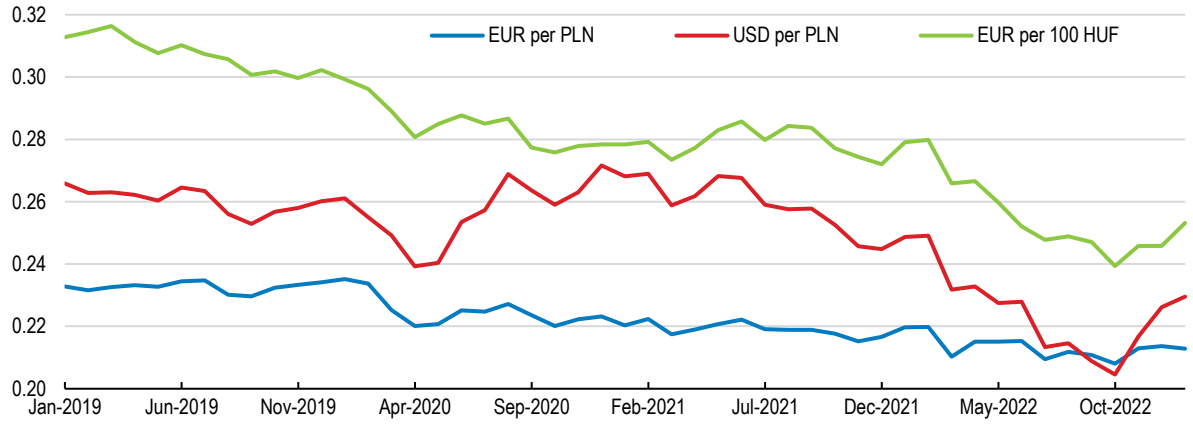
Figure 1.5. The zloty weakened during much of 2022

Monthly exchanges rates



Source: National Bank of Poland; and Refinitiv.

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A policy of blanket mortgage payments relief put in place August 2022 is potentially weakening the transmission of monetary policy. Mortgage service holidays allow for a postponement of four mortgage instalments in the second half of 2022 and four instalments in 2023. Assuming a full take up of the scheme, the cost is estimated at around PLN 20 billion or around 0.8% of GDP. So far, take-up has varied between 65% and 70% across banks (estimated at PLN 13 billion). The scheme should not be extended any further beyond 2023. Providing help across the board sends the wrong signals to borrowers. Using an already

existing tool, the borrowers support fund, would have been a better option, as it targets people who lose their jobs or whose monthly payments exceed 50% of household monthly income.

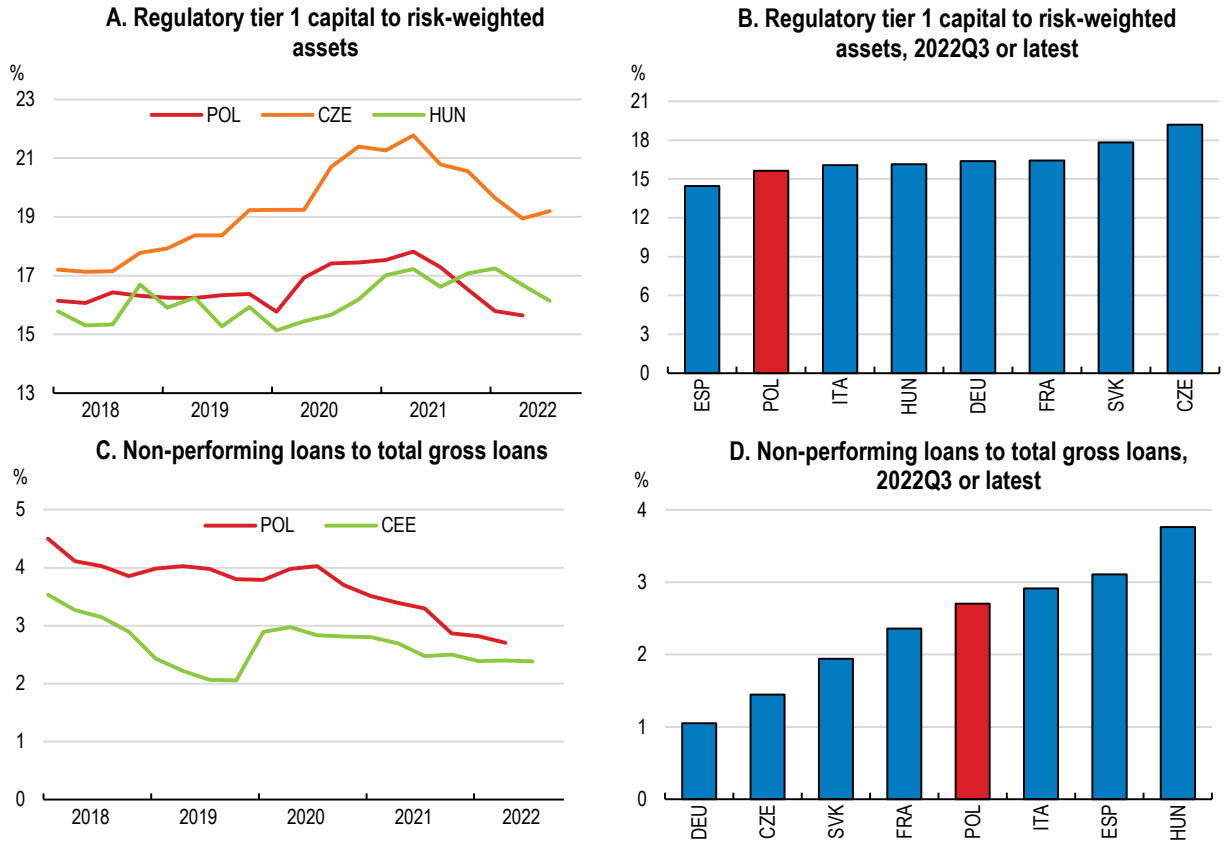
The financial sector is stable but there are domestic and global risks

The banking sector has significant capital resources (Figure 1.6). The direct exposure of the financial sector to Ukrainian, Russian, and Belarussian entities is low. However, the slowdown of economic growth, high inflation and increasing interest rates could have a negative effect on the strength of the financial sector (NBP, 2022b). Household debt stood at 30% of GDP and non-financial corporates' debt at 42% of GDP (of which 13% in the banking sector) in the second quarter of 2022 (BIS, 2022). At the end of 2021, mortgages with a variable interest rate accounted for around 90% of the stock of housing loans. Many loans granted after 2020 have relatively high loan-to-income ratios, although credit risk should be limited as borrowers can currently benefit from blanket mortgage payments relief or call upon the borrowers' support fund.

Another risk to financial stability comes from continued legal uncertainty on foreign-currency (FX) housing loans. These loans, mainly denominated in Swiss francs, were granted before 2012, as large interest differentials and favourable exchange rate meant lower servicing costs than borrowing in domestic currency. Today, these loans represent around EUR 20 bn of outstanding credit, and at the end of 2021 accounted for around 4% of the assets of the banks that granted them. Subject to Polish and European court rulings, the indexation or foreign exchange risk clauses have been often found abusive and thus cancelled. Some 20% of these loans (circa 100 000) are currently being disputed in courts. The Financial Supervisory Authority advocated a voluntary conversion of the FX loans at original exchange rates, applying the same terms as for PLN loans at the time, that would have cost 19% of own funds of the affected banks, depending on the exchange rate. Five banks (two of which are controlled by the state) have formally launched such programmes, while 13 banks offer voluntary conversion settlements according to their own rules. Altogether, around 40 000 settlements have been reached so far. While the net interest margin of the banking sector has been improving, profitability has come under pressure, as the sector has increased provisions for the legal risk of FX loans portfolios and due to the cost of the blanket mortgage payments relief (NBP, 2022c).

The latest round of stress tests, based on April 2022 data, suggests that the capital of banks should be sufficient for absorbing losses from both an adverse macroeconomic scenario and increasing provisions for the legal risk of FX housing loans, and, for a majority of the banks, to cover minimum requirements for their own funds and eligible liabilities and combined buffer requirements (NBP, 2022c).

Figure 1.6. The banking sector is well capitalised



Note: A blanket mortgage payment relief is in place until December 2023, distorting the data on and assessment of non-performing loans.
Source: IMF, Soundness Indicators Database.

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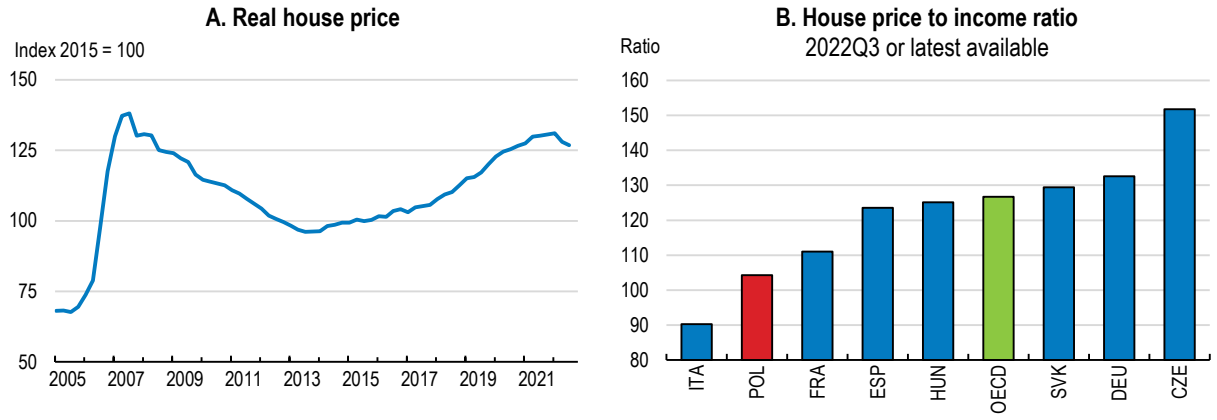
The housing market recovered quickly to robust pre-pandemic conditions in 2022 but is facing challenges (IMF, 2022) (Figure 1.7). The large majority of the population lives in owned dwellings and there is only a small rental market (4.2% of dwellings at market price). The housing stock in Poland has grown almost exclusively thanks to private construction and a considerable share of new flats has been built in the few largest cities and their suburbs, where prices are the highest (OECD, 2020a). Both housing starts and mortgage lending has returned to pre-pandemic levels supported by historically low mortgage lending rates for much of 2021.

Nevertheless, with increasing interest rates and the worsening economic outlook demand for and issuance of new housing loans to households dropped markedly in the second half of 2022. As mentioned earlier, in major metropolitan areas the housing market has come under considerable pressure from the large influx of refugees. Moreover, the lack of affordable housing and poor-quality infrastructure constrain labour mobility within the country, preventing the efficient matching between workers and jobs and giving rise to local employment shortages (OECD, 2020a).

Figure 1.7. The housing market recovered quickly



Source: OECD Analytical house price indicators database.

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Table 1.3. Past recommendations on financial stability and actions taken

Past OECD policy recommendations	Policy actions since the 2020 Economic Survey
Strengthen the process for nominating board members of the financial supervision authority.	No action taken.

Fiscal policy is supporting activity at the risk of fuelling inflation

Fiscal policy continues to support economic activity. Following comprehensive pandemic-related packages in 2020-21, last year the government introduced so-called “Anti-Inflation Shields” and other measures to soften the impact of high inflation (Box 1.2). Estimated at around 1.5% GDP, these reduced taxes on energy and food and introduced various allowances for households and energy-intensive businesses. This year, these measures were largely replaced with electricity and gas price caps for households and businesses up to an amount based on average energy consumption. The zero VAT rate on food is maintained and so are subsidies to energy-intensive companies. Net fiscal cost of the support measures is estimated around 0.9-1.4% of GDP, as they will be partly financed by revenues cap and a levy on energy companies (Box 1.2).

These measures are temporary, which is sensible given the uncertainty. While cushioning the impact of higher energy prices on households and firms is warranted, most of the measures so far have not been targeted, distort price signals, thereby reducing incentives to lower energy use and switching to more carbon-neutral energy sources. The use of price caps with an upper limit improves targeting. Any future support measures beyond the current period should be better targeted to those in greatest need to improve the trade-off between providing support and preventing second-round effects on inflation. This could include making more use of the tax and benefit system to provide supports or providing a fixed amount rather than linking it to energy consumption.

Other fiscal measures are helping to cushion the impact of high inflation. Pensions were increased in 2022, both by annual indexation and by supplementary one-off payments, at a cost of 0.6% GDP, while personal income taxes (PIT) were lowered at a cost of 1% of GDP (NBP, 2022d). Public support for Ukrainian refugee has been estimated at 0.4% of GDP (NBP, 2022d). All in all, the 2022 government deficit is estimated at 3.5% of GDP and 4.5% in 2023 but is expected to narrow gradually in the medium term (Ministry of Finance, 2022).

Box 1.2. Measures addressing the current cost-of-living crisis

The Polish authorities have adopted a number of measures aimed at shielding households and businesses from elevated energy and food prices.

In 2022, two packages ("Anti-Inflation Shields") temporarily lowered VAT rates on energy, food, and fertilisers, froze natural gas tariffs, introduced means-tested subsidies to low-income households and universal subsidies for heating. Energy-intensive industries could apply for compensation for high electricity and gas prices.

This year, these measures have been replaced by a system centred on electricity and gas price caps:

- Electricity price and distribution fees for households are kept at the 2022 level for first 2 MWh (around average household consumption), with higher thresholds for large families, households with disabled and farmers. The electricity price for consumption over 2MWh is capped at PLN 693 (EUR 147)/MWh.
- SMEs, public entities, and the non-governmental sector benefit from a price cap at PLN 785 (EUR 167)/MWh.
- For households, gas prices are capped at PLN 202 (EUR 43)/MWh.
- The zero VAT rate on food continues to apply.
- The price of coal for residential heating is also regulated.
- Energy companies are subject to a cap on revenues from the electricity market and a levy on gas production (estimated revenue around 1-1.5% of GDP).

Table 1.4. Fiscal supports to address the cost-of-living crisis

	Estimated fiscal cost	Targeted	Temporary	Energy-saving incentives
0% VAT rate on food	0.28% GDP	No	Yes	NA
Partial freeze on electricity price and a gas price cap	2% GDP	Partly	Yes	Partly
Subsidies to energy intensive companies	0.1% GDP	Yes	Yes	Partly

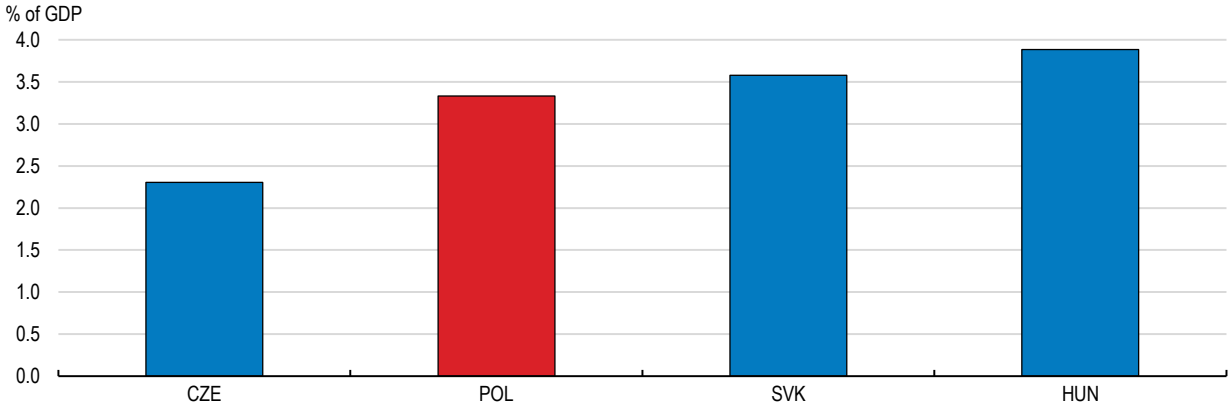
Source: National Bank of Poland (2022a) and Ministry of Finance.

Other expansionary fiscal measures include increases in defence and healthcare spending, alongside public investment from EU funds. Defence spending is expected to rise from 2.2% of GDP in 2022 to 3% of GDP this year and remain at that level in the following years. Public healthcare spending is set to increase gradually from 4.7% of GDP in 2020 - one of the lowest levels in the European Union - to 6% in 2024. EU funds could contribute up to 3.3% of annual GDP, on average, over this decade if all funds that have been earmarked are drawn down (Figure 1.8). However, actual spending will depend on the capacity to implement eligible projects. So far, Poland has been successful in drawing on these funds, with a so-called absorption capacity at around 70%. Disbursement to Poland of the funds estimated at EUR 23.9 billion in grants and EUR 11.5 billion in loans under the Recovery and Resilience Facility (RRF), the centrepiece of Next Generation EU, the EU's recovery plan, is currently uncertain and depends on the resolution of issues around the implementation of reforms to improve the rule of law. Over half of these funds is set for projects advancing the energy transition, and a third for advancing digitalisation. The

authorities expect to release the funds in the second half of this year. Meanwhile, some projects are being pre-funded via public development funds.

Figure 1.8. EU funds can provide substantial funding for public projects

Annual average over 2021-2027, % GDP



Note: Includes funding available to countries under the following EU instruments: Recovery and Resilience Facility, European Agricultural and Guarantee Fund, European Agricultural Fund for Rural Development, Cohesion Policy and Just transition Fund.
Source: European Commission Budget pre-allocations.

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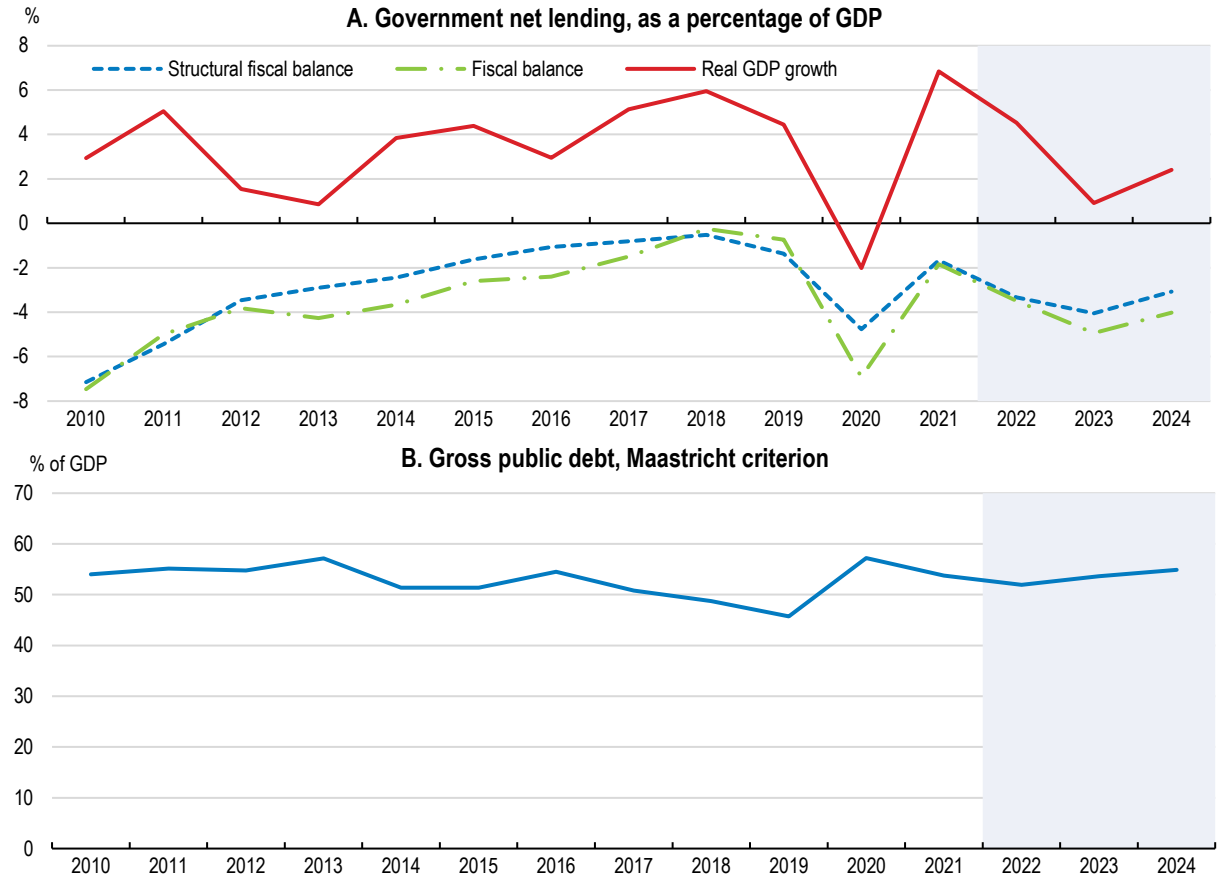
In terms of fiscal balance, the general government headline deficit had largely closed in the years just before the pandemic, but a structural deficit now appears to have opened up. While most spending measures related to the pandemic and the energy crisis are temporary, the 2022 tax package and the increases in health and defence spending, in combination with previous generous expansions of social benefits are expected to widen the underlying structural deficit (Figure 1.9) (IMF, 2022; OECD 2020a). Uncertainty about the medium-term economic outlook and future ageing costs warrants prudent fiscal policy and measures to improve the fiscal balance when circumstances improve.

In this context, the Family 500+ programme, and the 2017 reversal of the minimum retirement age reform, estimated to cost in total more than 2% of GDP annually, should be reviewed (OECD, 2020a). In addition to means-tested family allowances, the Family 500+ programme introduced in 2016 a new child benefit of PLN 500 (EUR 100) per month and per child. This was made universal in 2019. In view of medium-term ageing fiscal pressures and efficiency of poverty prevention, universal coverage of this child benefit programme should be reviewed. Social safety net replacement rates for lowincome earners in households with no children remain modest (OECD, 2022h). Only around 15% of the child benefit programme is estimated to go to households in the poorest income quintile (Myck and Trzcinski, 2019).

Figure 1.9. The underlying fiscal position has weakened since 2019



Note: the structural fiscal balance is expressed in percentage of potential GDP.
Source: OECD Economic Outlook 112 database.

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Further strengthening the fiscal framework would help to ensure sustainability over the longer term (OECD, 2020a). The current system is based on a constitutional requirement to keep public debt below 60% of GDP based on a national definition of debt. There are two thresholds that trigger corrective action, at 43% and 48% of GDP, and a restriction is applicable when debt exceeds 55% of GDP. In 2020, the first threshold was crossed, but the exceptional circumstances of the pandemic led to the suspension of this mechanism during 2020-22, as was the case under the EU fiscal governance framework. The government has resorted to making frequent use of off-budgetary funds in the form of special vehicles and financing from development banks to fund additional pandemic and inflation relief measures. While this approach is justified by the urgent need to take action, it reduces fiscal transparency and increases the risk of fiscal mismanagement in the future.

Poland should modernise and strengthen its fiscal framework over time, taking into account current reforms to EU economic governance. While the constitutional debt rule has proved helpful in the past, its operation will become difficult with debt approaching the ceiling and this may lead to overreliance on workarounds. A new numerical framework based on general government accounting principles should be introduced depending on the outcome of EU fiscal governance reforms, although it would require a constitutional change and need to be carefully designed, including considerations of future ageing costs. Poland remains the only EU Member State without a fiscal council (EC, 2019a). The experience of other countries suggests that it would be helpful to have an independent institution make ex-ante assessments of the government's

fiscal plans and conduct long-term fiscal sustainability analyses (OECD, 2016), even if the central bank's Monetary Policy Council issues opinions about the draft budget and the Supreme Audit Office (NIK) conducts ex-post reviews. A fiscal council could, in the near term, help bring more transparency into the fiscal policy debate, while boosting the credibility of fiscal plans.

Given the structural deficit and long-term spending pressures, future governments will need to develop a long-term strategy for rebalancing public finances and maintaining them on a sustainable path. This would be supported by a review of options to raise taxation in an efficient and fair way, and by strengthening the process for spending reviews. Poland has carried out a number of spending reviews since 2015, but these have not been integrated into the budget process and have had little impact on outcomes (Wiczewski, 2020). An enhanced approach that is better integrated with the budget cycle could be implemented, either through targeted annual or cyclical reviews, with the aim over time to look at the efficiency of how all public services are delivered and whether resources are best allocated across different areas (Box 1.3) (OECD, 2017 and 2021a).

Box 1.3. Government spending reviews in OECD countries

Government spending reviews have two main purposes: to give the government improved control over the level of aggregate expenditure, and to improve expenditure prioritisation. Countries with a longer experience of using spending reviews have demonstrated that it can focus governments to improve expenditure prioritisation and to find fiscal space for new spending priorities. Given the difficult fiscal context facing many OECD governments, such a tool could prove invaluable, particularly if it becomes a more permanent feature of the budget process.

Following the global financial crisis, the use of spending reviews increased across OECD countries. In 2020, 31 OECD countries reported conducting spending reviews. Twenty do so annually and 11 periodically. Historically there are two models of spending reviews: targeted annual reviews (Netherlands and Denmark), and cyclical comprehensive reviews (United Kingdom). A targeted spending review focuses on a specific list of review topics decided at the outset. By contrast, a comprehensive spending review is not constrained by any such *ex-ante* list of review topics.

Political ownership and commitment are crucial to the effectiveness of spending reviews, both to ensure co-operation across government throughout the process, and to take decisions on the objectives and scope of reviews and the recommendations to adopt. The spending review governance model determines how and when each institution is involved in a spending review. With respect to roles and responsibilities in the spending review process, firm political oversight and direction of the process is critical. The most common approach is for spending reviews to be primarily led by the central budget authority (Belgium, Canada, France, Finland, Ireland, Latvia, Mexico, New Zealand, Switzerland and the United Kingdom). A smaller number of OECD countries have opted for a review led by the president or prime minister's office (Italy and Luxembourg) with mixed results. Other OECD countries tend to have a mixed model of spending review governance, where a number of government actors have significant responsibilities. In Japan, experts outside the government have primary responsibility for spending review procedures.

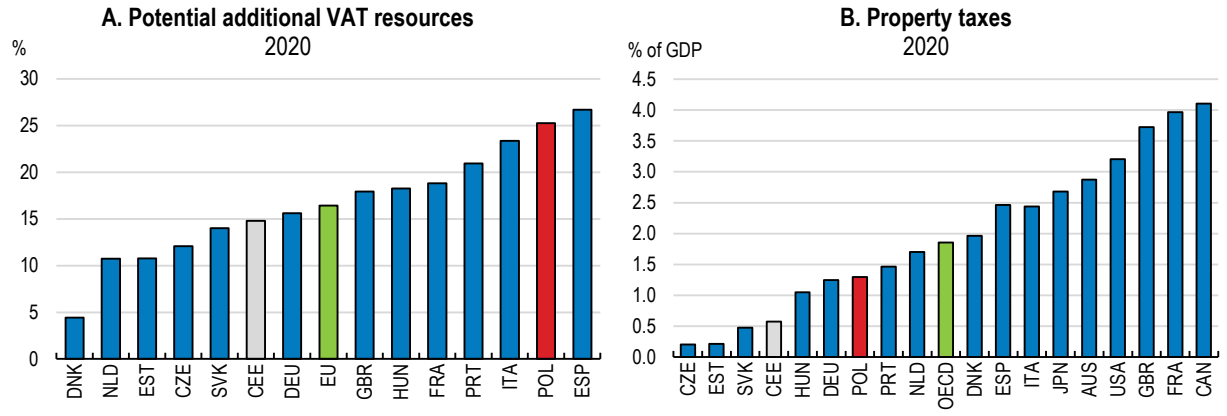
Despite their growing popularity, spending review outcomes are not always clear. Better tracking of spending review implementation and effectiveness represents an area for potential improvement. Drawing on the experience of OECD countries, Tryggvadottir (2022) identifies the following features as best practices: setting out clear objectives and scope, identification of distinct political and public service roles, setting up clear governance arrangements, ensuring integration with the budget process, implementation of the recommendations in an accountable and transparent manner, full transparency of the review reports and framework, and a regular update of the review framework.

Source: OECD (2017), OECD (2021a), Tryggvadottir (2022).

At 36% of GDP, the tax-to-GDP ratio is above the OECD average of 33.5% but low compared to European norms. Recent tax reform measures have decreased the lowest rate of the PIT from 17% to 12% as of 2022, increasing progressivity and reducing marginal tax rates for lower-income workers. Other notable recent tax policy measures include a cancellation of tax deductibility of healthcare insurance, that has been replaced by a ten-fold increase in the tax-free allowance. A further streamlining of the high number of reduced VAT rates and exemptions would help increase revenues as would alignment of various environmental taxes with the goal of transitioning to net zero emissions by 2050 (OECD, 2020a).

Redesigning and increasing property taxation should also be on the agenda as taxation of property has been shown to be among the least economically distortive forms of taxation. Currently, the revenue from recurrent taxes on immovable property is close to the OECD average of 1.1% of GDP (Figure 1.10), but this reflects low tax rates on property in many countries. Reliance on these taxes is to some extent correlated with income levels as more advanced OECD countries tend to rely more on immovable property taxation than developing ones. In most OECD countries, property taxes depend on the estimated market value of the property, but Poland uses an area-based system where the tax liability is primarily based on the size of the property. For business properties, the depreciated value is used. The actual rates are set by local governments and upper limits for increasing the rates are indexed to inflation (OECD, 2022c).

Figure 1.10. VAT and property taxation offer potential for new revenues



Note: Panel A - % of theoretical VAT liabilities. So-called "actionable VAT gap" takes into account reduced rates and exemptions but exclude exemptions on services that cannot be taxed in principle, such as imputed rents or the provision of public goods by the government.
Source: OECD tax revenues statistics; European Commission (2021).

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Table 1.5. Past recommendations on fiscal policy and actions taken

Past OECD policy recommendations	Policy actions since the 2020 Economic Survey
If economic conditions weaken rapidly, ease fiscal and monetary policies further, by ensuring that additional fiscal spending supports the most affected households and firms and considering further asset purchases.	This has occurred, largely through additional expenditures related to Russia's war against Ukraine and fiscal supports in response to increased energy prices.
Bring forward green and digital investment to kick-start the recovery.	Much of the Recovery and Resilience projects focus on green and digital transition, but the implementation of these projects has not yet started.
When the recovery is firmly underway, pursue fiscal consolidation to decrease the public debt-to-GDP ratio.	Public finances posted a deficit of 1.8% in 2021 and the public debt to GDP ratio fell to 53.8% from 57.2% in 2020.
Task an independent institution to conduct ex-ante assessment of the government's fiscal plans and long-term fiscal sustainability analyses.	No action taken.
When the recovery is firmly underway, increase recurrent taxes on property, notably on vacant properties and land in urban areas.	No action taken.
Limit the use of reduced VAT rates and exemptions over the medium term.	Implementation of EU Directive is under way.
Envisage an income-tax-credit and/or subsidise social security contributions for low-income workers.	The lowest PIT rate has been decreased from 17% to 12% and the tax-free allowance has increased considerably. At the same time, healthcare insurance is no longer deductible from the PIT.

Ageing is reducing room for manoeuvre

Fiscal sustainability could ultimately come under pressure from implicit liabilities related to pensions. Current policies imply a gradual but considerable decline in the replacement rates for future pensioners (European Commission, 2021). A worker entering the labour market today, working a full career at around the average wage will receive less than 40% of the pre-retirement income when retired, one of the lowest replacement rates in the OECD (OECD, 2021b). This poses a risk of old-age poverty, for women in particular, who tend to leave the labour market early but live longer (OECD, 2020a). It could add to fiscal pressures in the future through higher social benefits for retired people or public demand for pensions to be increased.

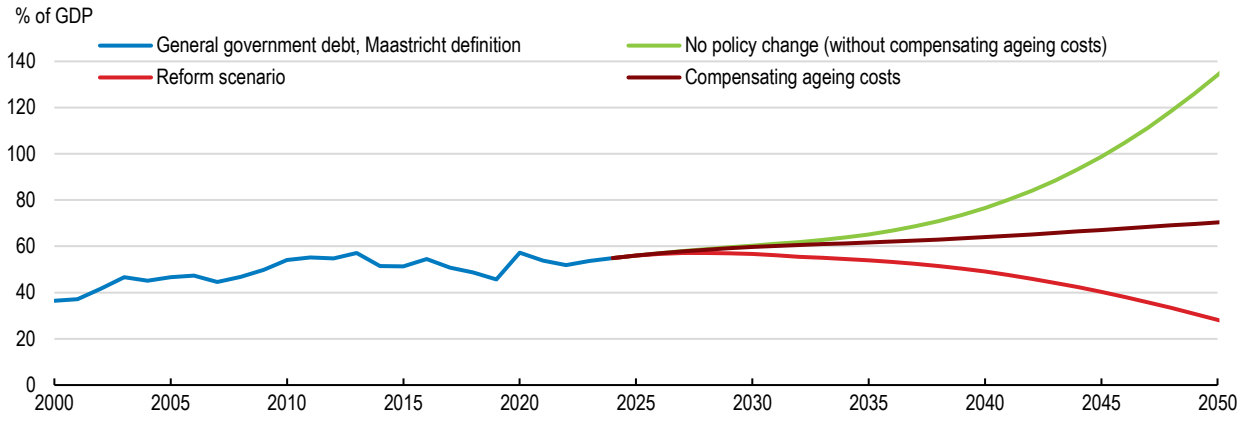
To encourage people to work longer, pensions are increased if they defer retirement beyond the statutory age. The recent introduction of the "PIT-0" scheme creates a new tax allowance for men over 65 and women over 60 who do not claim a pension and continue to work on earnings up to PLN 85 528 (1.2 times the average wage). Labour market participation among older workers has increased with the effective retirement age reaching 60.6 for women and 65.2 for men in 2021, slightly above the statutory retirement ages. While encouraging people to work longer, the fiscal savings are reduced under these measures by the cost of the incentives provided. Working lives should be extended, including by gradually aligning male and female statutory retirement ages and increasing them in line with life expectancy gains in good health. Reviewing early retirement allowances and aligning special pension regimes with the overall system can also improve fiscal sustainability of the pension system.

Private occupational pensions can further help improve replacement rates. The authorities introduced voluntary occupational schemes with auto-enrolment in large companies in 2019 ("*Employee Capital Plan*", PKK), with a gradual increase in coverage to smaller companies and public entities. So far, participation is low, with only 31% of eligible employees enrolled and low contribution rates (up to 4.5% between the employee and employer). As of this year, participation will be based on auto-enrolment. Past policy reversals of private pension savings could be undermining incentives for participation in the voluntary pension pillar, so maintaining regulatory stability will be key to rebuilding its reputation and avoiding old-age poverty.

To ensure debt sustainability, rising ageing costs would have to be offset and additional growth-enhancing reforms implemented. Illustrative OECD simulations suggest that Poland's public debt (Maastricht definition) would be on an ultimately unsustainable upwards path under a "No policy change" scenario, driven by rising ageing costs and constant primary spending in other areas (Figure 1.11). This scenario assumes that the government will need to finance replacement ratios at the current level, which may provide an upper-bound estimate of these risks, unlike official projections from the EU Ageing Working Group that assume this risk does not materialise. Assuming that the government fully compensates ageing costs by offsetting tax or spending changes, the debt-to-GDP ratio will rise more modestly ("compensating ageing costs scenario"). The small rise in the ratio is partly due to a current structural primary deficit although this decreases over time. Implementing structural reforms such as raising the pension age as well as reforms to accelerate digitalisation, increase spending on active labour market policies (ALMP) and ease restrictive product market regulations could boost growth and reduce the public debt to GDP ratio by 15 percentage points by 2040 relative to the no policy change in the "Reform scenario" in Figure 1.11.

Figure 1.11. Ageing will put further pressure on public debt

General government debt, Maastricht definition



Note: The key long-term assumptions assume a long-term potential growth declining from 2.5% in 2023 to 1.3% in 2050 in line with Guillemette and Turner (2020). In the "no policy change" scenario, primary spending is held fixed as a share of national income but ageing-related public expenditures (pensions, long-term care, health and education) are allowed to rise. Pension expenditures increase also as a result of a stable benefit replacement ratio, an assumption that differs substantially from the national and EU Ageing Working Group projections. In the "compensating ageing costs" scenario, ageing costs are offset and the primary balance remains at its end-2024 level in structural terms throughout the projection period. In the "reform scenario", the following recommended reforms are implemented: funding of active labour market increases to the level of top OECD performers, retirement age rises gradually to 67 years of age, various measures to enhance digitalisation of the economy and a decrease of product markets regulation to a lower PMR score by 0.25. Government gross financial assets are kept constant as a share of GDP.
Source: OECD calculations based on OECD (2019), OECD Economic Outlook: Statistics and Projections (database), November; OECD (2018), Long-term baseline projections.

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Table 1.6. Key assumptions underlying long-term public debt projections

	2000-07	2008-2020	2021-2030	2031-2050
Potential GDP per capita growth (per cent)	4.2	3.6	2.8	2.0
Trend labour efficiency growth (per cent)	4.0	2.3	2.5	2.2
Capital per worker growth (per cent)	2.9	2.8	2.7	2.8
Potential employment rate (pp change)	0.1	0.6	0.3	-0.1
Share of active population (pp change)	0.4	-0.1	-0.2	-0.2
Primary balance (as a % of GDP)	-1.9	-2.1	-2.0	-1.0
Implicit average interest rate paid on debt (pp)	5.7	3.4	3.3	4.7
Interest receipts (as a % of GDP)	0.4	0.3	0.3	0.9
Interest payments (as a % of GDP)	2.7	2.0	2.2	3.4

Note: The assumptions refer to the baseline scenario. Data until 2021 and projections thereafter. Numbers represent multi-year averages based on annual figures. The population refers to ages 15-74.
Source: Guillemette and Turner (2021).

Box 1.4. Quantifying the impact of proposed structural reforms

Reforms proposed in the Survey are quantified where possible in the table below. These estimates are based on empirical relationships between past structural reforms and productivity, employment and investment. They do not necessarily reflect detailed Polish institutional settings. As such, these quantifications are illustrative. This exercise suggests that the main policy levers are measures to raise productivity, notably through intensifying digitalisation, and reforms to increase the labour supply of older workers.

Table 1.7 Potential impact of structural reforms on GDP

Reform	Long-run effect on the level of GDP per capita (2050)
Labour market policies	
Increase in retirement age for both women and men to 67 years of age	3.9%
Increase in spending on active labour market policies to that of top OECD performers	0.6%
Productivity enhancing measures	
A 0.25 reduction in OECD Product Market Regulation Indicator	3.7%
Implementation of various digitalisation policies	5.9%

Note: Immediate fiscal costs are not considered.
Source: OECD calculations based on Guillemette and Turner (2020) and Egert et al. (2017)

General government contingent liabilities, at over 47% of GDP in 2020 (Eurostat, 2021), are an additional risk weighing on public finances. Poland's government guarantees and liabilities related to Public Private Partnerships are low in international comparison, at 0.6% of GDP at the end of 2019 (IMF, 2022). However, the liabilities of state-owned enterprises (SOEs) in the financial sectors were 34% of GDP.

Public ownership of firms is more extensive than in most other OECD countries and it extends beyond the sectors in which SOEs generally operate. State-owned or controlled entities include a number of entities in mining, energy and petrochemical production as well as two banks and an insurance company. There is a growing trend towards centralisation of state ownership functions among OECD countries, but the governance of Polish SOEs relies largely on a decentralised model. This means that several line-ministries set and monitor corporate objectives and exercise ownership rights with a limited co-ordinating role for the Prime Minister. There are no specific requirements for SOEs to put in place internal audit functions, unless otherwise specified by a listing or other requirement, and the government only produces ad-hoc reports to Parliament on SOE performance.

The monitoring of state-owned enterprises and their governance should be better aligned with international good practice as identified in the *OECD Guidelines on Corporate Governance of State-Owned Enterprises* (EC, 2019a, OECD, 2020a). The coordination can be further strengthened by the state publishing an aggregate annual report about its SOE portfolio, by establishing non-partisan appointment committees for selecting candidates for management and supervisory boards and regularly reviewing the necessity of state ownership (OECD, 2020a). The process of selling state assets could also be simplified as each transaction is currently subject to high-level political approval from the Council of Ministers.

Estimates of the fiscal impact of the reforms proposed in this Survey suggest that measures to broaden the tax base, reform the pension system and targeting of certain social benefits would be sufficient to achieve a primary surplus and potentially generate some fiscal space, either to reduce the debt burden more quickly or fund new initiatives (Table 1.5). This quantification is illustrative and does not allow for behavioural responses. A number of measures for advancing digitalisation assume EU funding, so do not have a direct fiscal cost.

Table 1.8 Potential fiscal impact of structural reforms

Fiscal savings (+) and costs (-), % current year GDP

Reform	% of GDP
Increasing VAT revenues and reform recurrent taxes on immovable property	+ 0.85%
Increase in retirement age for both women and men to 67 years of age, align special pensions regimes with the general rules	+ 0.9%
Better target of family benefits	+ 0.6%
Provide continued financial support to new digital firms including finance and development at later stage	-0.05%
Increase direct funding for ICT R&D	-0.05%
Total	+2.25%

Table 1.9. Past recommendations on inclusiveness, labour market and health and actions taken

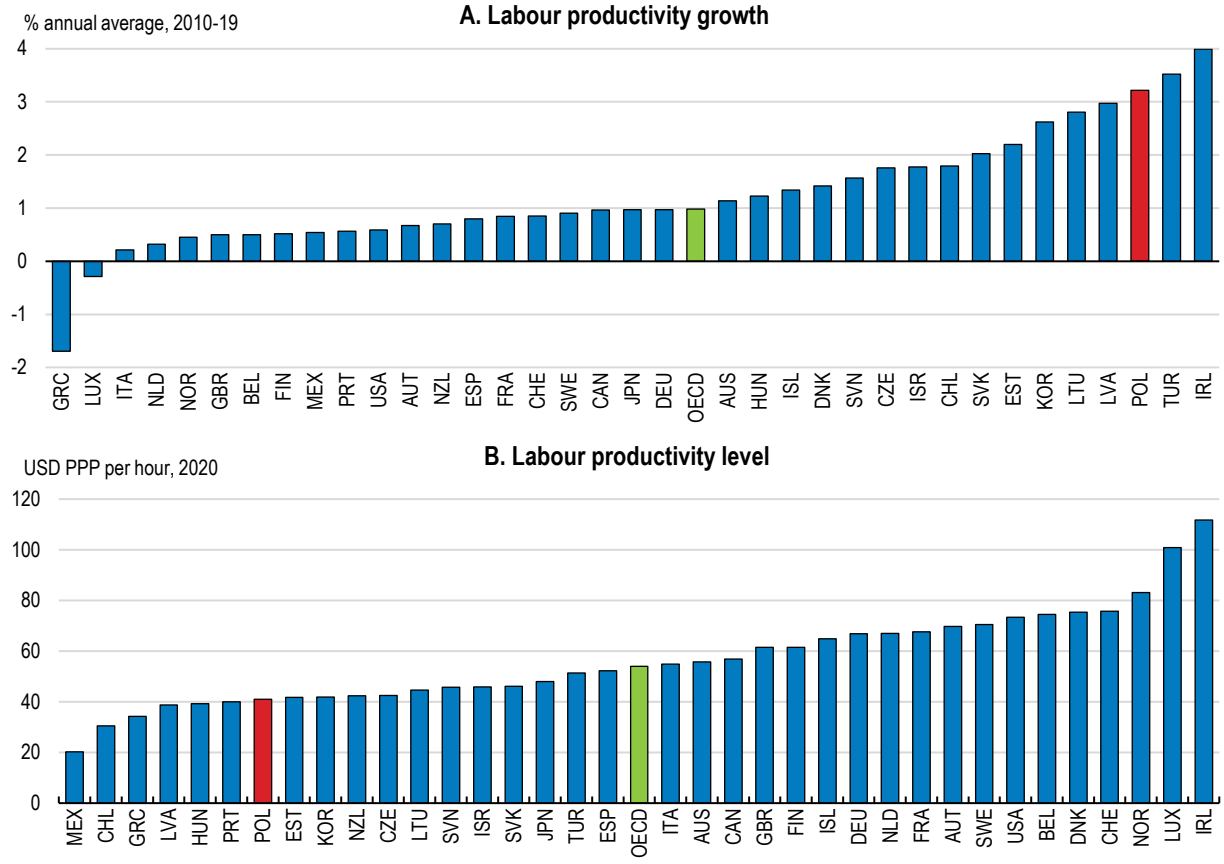
Past OECD policy recommendations	Policy actions since the 2020 Economic Survey
Progressively align male and female statutory retirement ages and increase retirement age in line with life expectancy gains in good health.	No action taken.
Strengthen labour law enforcement, and further align contributions on civil and labour law contracts.	As of January 2021, a register of contracts for specific works is kept by the Social Insurance Institution (ZUS). It should be notified within seven days of concluding such a contract.
Develop a migration policy strategy to better monitor integration of foreigners in line with labour market needs, the protection of their rights and access to education and training for them.	A draft of migration strategy for 2021-22 was adopted by the Standing Committee of the Council of Ministers prior to the conflict in Ukraine, but needs an update given the change of circumstances. Some recent measures have simplified integration into the labour market: extension of work allowed under simplified procedure from six to 24 months; simplification of checking the comparability of salaries. Further measures aimed at third-country nationals are foreseen in the Recovery and Resilience Plan.
Harmonise employment protection for all age groups.	No action taken.
Ensure sufficient incentives and training to boost the effective retirement age.	Workers and entrepreneurs who continue to work even after reaching retirement age and defer drawing pension pay do not pay PIT on work income up to PLN 85 528 annually. National Training Fund currently focuses on employees over 50 years old.
Progressively align special pension schemes arrangements with the general rules.	No action taken.
Continue to expand the supply of childcare and long-term care facilities, targeting low-income households and disadvantaged areas.	Child-care capacity is under expansion. Additional benefits have been adopted, thought these are not targeted.
Use the planned increase in health spending to strengthen primary care and prevention.	The National Health Programme for 2021-25 puts among other priorities (e.g. mental health, suicide prevention, environmental health and infectious diseases, demographic challenges) emphasis on prevention of overweight and obesity. Financial incentives introduced for strengthening primary care and co-ordinated care.

Continued improvements in productivity are needed to boost living standards

In the years before the pandemic, Poland made rapid progress in raising living standards, with GDP per capita reaching around 80% of the OECD average, thanks to labour productivity gains that averaged 3.2% per year from 2010 to 2019 (Figure 1.12). With low unemployment and high employment rates, getting more people to work only would achieve relatively modest future gains in living standards, although removing barriers to the labour market participation of older workers and women would help. Much of the future improvement in living standards will have to continue to take place through a growing capital stock and improvements in efficiency. There is a welcome shift towards activities with higher added value, including pharmaceuticals and digital services. But progress is held back by labour shortages and regulatory barriers impeding the growth of small and dynamic firms. The green transition will provide a valuable opportunity to move to a more sustainable energy mix.

The following sections review the main policy challenges to continued improvements of living standards. Chapter 2 focusses on advancing digitalisation as a source of continued catch-up. It examines policy levers to advance adoption of digital technologies in firms and to upgrade digital and managerial skills by increasing flexibility of adult education and training.

Figure 1.12. Despite fast productivity growth, substantial scope for catch-up remains



Source: OECD Productivity database.

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Regulatory barriers to competition can be lowered further

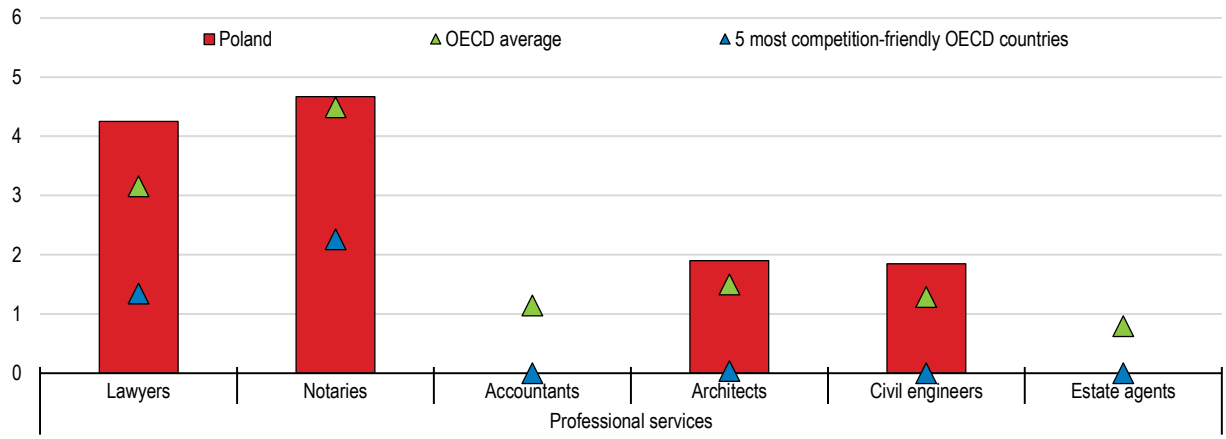
Regulatory barriers to competition remain slightly above the OECD average, as measured by the 2018 edition of the OECD Product Market Regulation (PMR) indicator. While barriers to foreign direct investment are low, regulations of services - that account for around half of the value-added exports - have significant room for improvement, in particular when compared to OECD best performers (Terrero and Vitale, 2023, *forthcoming*) (Figure 1.13). This is the case for lawyers, notaries, architects and engineers, as well as general occupational licensing. For example, lawyers cannot advertise their services, their fees are regulated, and they cannot set up a practice with other professionals. Notaries are restricted by territorial limits and their fees are regulated.

Empirical research has shown that reducing regulatory barriers in these professional services can foster entry and bring about greater quality and prices competition (Paterson et al., 2007; Monteagudo et al., 2012; Kleiner and Soltas, 2019). Moreover, weak regulatory transparency and complex administrative procedures tend to add to firms' operational expenses, weighing particularly on SMEs and potential exporters and affecting their productivity (OECD, 2020a). Recent reforms have among other changes simplified establishing a business and lowered the corporate income tax rate for SMEs from 15% to 9%.

Reviewing competition barriers in services and networks could ultimately improve the competitiveness of Polish exporters by lowering domestic prices.

Figure 1.13. Regulatory barriers can be lowered, particularly for services

Index scale 0 to 6 from most to least competition-friendly regulatory framework



Note: When comparing the indicators across countries, it should be kept in mind that the activities undertaken by specific professions may vary between countries. For instance, in civil law countries, notaries exercise administrative and judicial tasks by virtue of power delegated by the state; hence, they play a special role in the legal services market in the concerned countries and in this aspect, they are different from the other professions included in the OECD's PMR indicator. Information refers to laws and regulation in force on 1 January 2018, except for Costa Rica, Estonia and the United States, for which the information refers to 1 January 2019. If the red bar for one or more indicators does not appear on the chart, it means that its value is 0.
Source: OECD 2018 PMR database.

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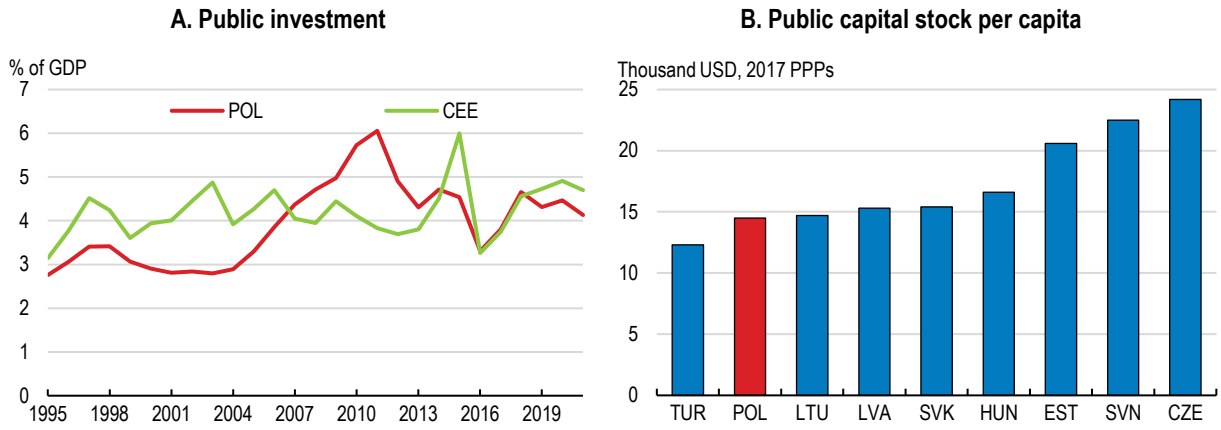
Substantial investment needs require improvements of the public investment framework

Major investment needs include road and energy infrastructure, to improve regional connectivity and advance the transition to net zero emissions. Poland's total investment has been broadly stable over the last decade, with public investment contributing about one fifth of the total. Public investment remained largely stable, despite significant consolidation efforts, in part due to the offsetting role of EU funds (Figure 1.14). Around half the investment is carried out by sub-national governments and there are also several extra-budgetary funds, such as the National Road Fund. So far, Poland has made only limited use of public-private partnerships (IMF, 2022).

Over the medium and longer run, public infrastructure investment can have a positive effect by raising the productivity of existing assets – physical and human capital – but this effect is far from "guaranteed". About one-third of public investment spending in Poland did not result in the increase in the level or quality of infrastructure that would have been achieved by the most efficient comparator country (IMF, 2022). This so-called efficiency gap is higher than the EU average.

Figure 1.14. A lower capital stock per capita than in peer countries, but similar public investment



Source: OECD Analytical Database; and IMF (2022).

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A recent review of the public investment management framework praised strong institutions for national and sectoral planning, budgeting, procurement, project implementation, and monitoring of public assets (IMF, 2022). Nevertheless, most of these tend to be stronger on paper than in practice. The review highlighted that coordination between entities, budget comprehensiveness and unity, maintenance funding, project selection, and portfolio oversight and management remain weak and should be improved.

Addressing the tight labour market by drawing on existing labour resources

In the current context of low unemployment and high employment, scope to raise living standards through labour reform seems limited. Population ageing is weighing on growth of the workforce. However, there is scope to bring more older workers into the labour force though reforms of the pension system, to increase skills and facilitate migration. While Poland experienced large net outflows of workers in the early 2000s, these have eased, and since 2018 there has been net inward migration as Poles have come more likely to stay or to return, and due to inflows from neighbouring countries. Poland has access to workers from other EU countries but could benefit from a comprehensive migration strategy to address economy-wide skill shortages.

In addition, removing barriers to young parents working could help (OECD, 2020a). Low availability of affordable childcare has been an obstacle to combining work and family. The public programme “Toddler plus” is increasing the capacity of childcare by a factor of four between 2011 and 2026, which is welcome as prior to the pandemic enrolment rate in education and childcare was 11% for the under 2-year-olds and 82 % for 3 to 5-year-olds, both below the OECD averages (OECD, 2022d). Several public programmes are in place to help families with childcare costs (such as family care capital, a subsidy for nursery care, 550+ family benefit).

Healthcare should remain a reform priority

Poland was lagging in terms of healthcare outcomes already prior to the pandemic (Figure 1.15) (OECD, 2020a). Poor health affects not only wellbeing but economic activity, as it reduces productivity and the ability and willingness to work. COVID-19 took a considerable toll as illustrated by elevated excess mortality rates in 2020 and 2021. Public spending on health has been low and there are important inefficiencies in the healthcare system (OECD, 2020a). Health care provision continues to rely on expensive in-patient

care, access to quality healthcare is difficult notably in rural areas, there is an acute shortage of doctors and nurses, and inequalities in self-reported health and prevalence of chronic conditions are considerable.

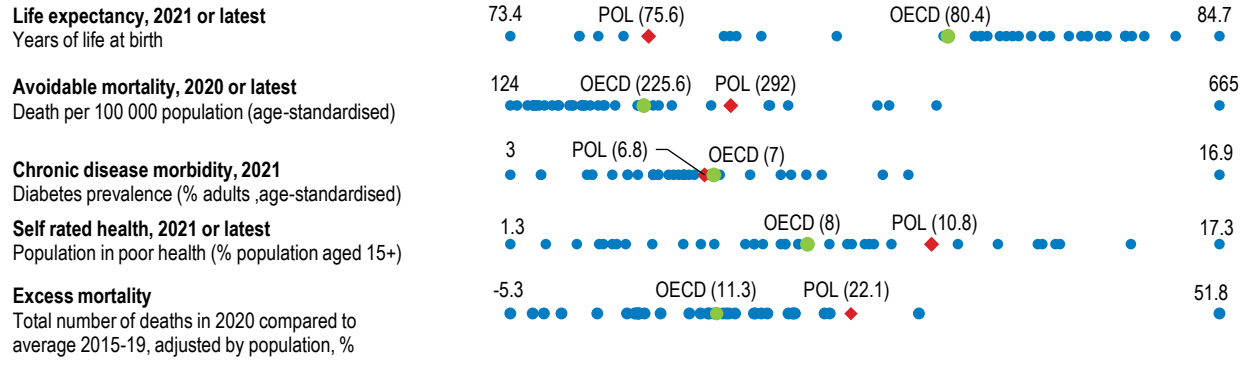
Preventable mortality remains higher than the EU average, while cancer survival rates have improved but are still relatively low (OECD, 2021a, 2021b). In 2019, nearly 92% of all deaths were attributable to so-called non-communicable or chronic diseases, for which unhealthy lifestyles are a major contributor and which are pervasive in Poland. Overweight and obesity affected more than half of the adult population. More than 17% of Poland's adult population smoked daily in 2019, and nearly 35% reported binge drinking at least once a month (OECD, 2021c).

The pandemic disrupted the delivery of most healthcare services in Poland, affecting routine childhood vaccinations, cancer care, scheduled surgeries and increasing already long waiting times (OECD, 2022e). It is important to offset pandemic disruptions such as postponed diagnosis and preventive care. On the positive side, teleconsultations picked up strongly, with 62% of the population having used telehealth services in the first year of the pandemic, twice as much as the EU average (OECD, 2021a). This was possible due to pre-existing infrastructure, such as the Patient's Internet Account, e-prescriptions and other platforms. The large influx of Ukraine refugees has also added new challenges.

In response to the pandemic, the authorities are increasing public funding from 4.5% in 2019 to 6.3% GDP by 2024. Any increase in funding should be underpinned by a stable financing source and an integrated healthcare strategy that focuses on prevention and co-ordinated care to reduce the high prevalence of risky behaviours and costly hospital care (OECD, 2020). A second edition of the National Health Programme (2021-25) aims to increase the number of healthy years and reduce social inequalities. The emphasis on prevention activities is welcome. Achieving healthcare improvements can be challenging as coordination across the system is hampered by fragmented governance, divided between the ministry and three levels of territorial self-governance (OECD, 2021b).

Salaries of healthcare workers will need to rise. In 2020, salaried general practitioners (GP) earned double the average wage, in line with the OECD average. However, remuneration of salaried specialists was 1.4 times the average wage, much lower than in many OECD countries. Furthermore, there were 3.3 practicing doctors per 1 000 inhabitants, one of the lowest ratios in the OECD (OECD, 2022e). Remuneration incentives can be set up to address wider strategic objectives, and as planned, for instance by linking a part of GP funding to prevention activities.

Figure 1.15. Health outcomes remain subpar



Source: OECD Health statistics; and International Diabetes Federation (IDF) Atlas 2021.

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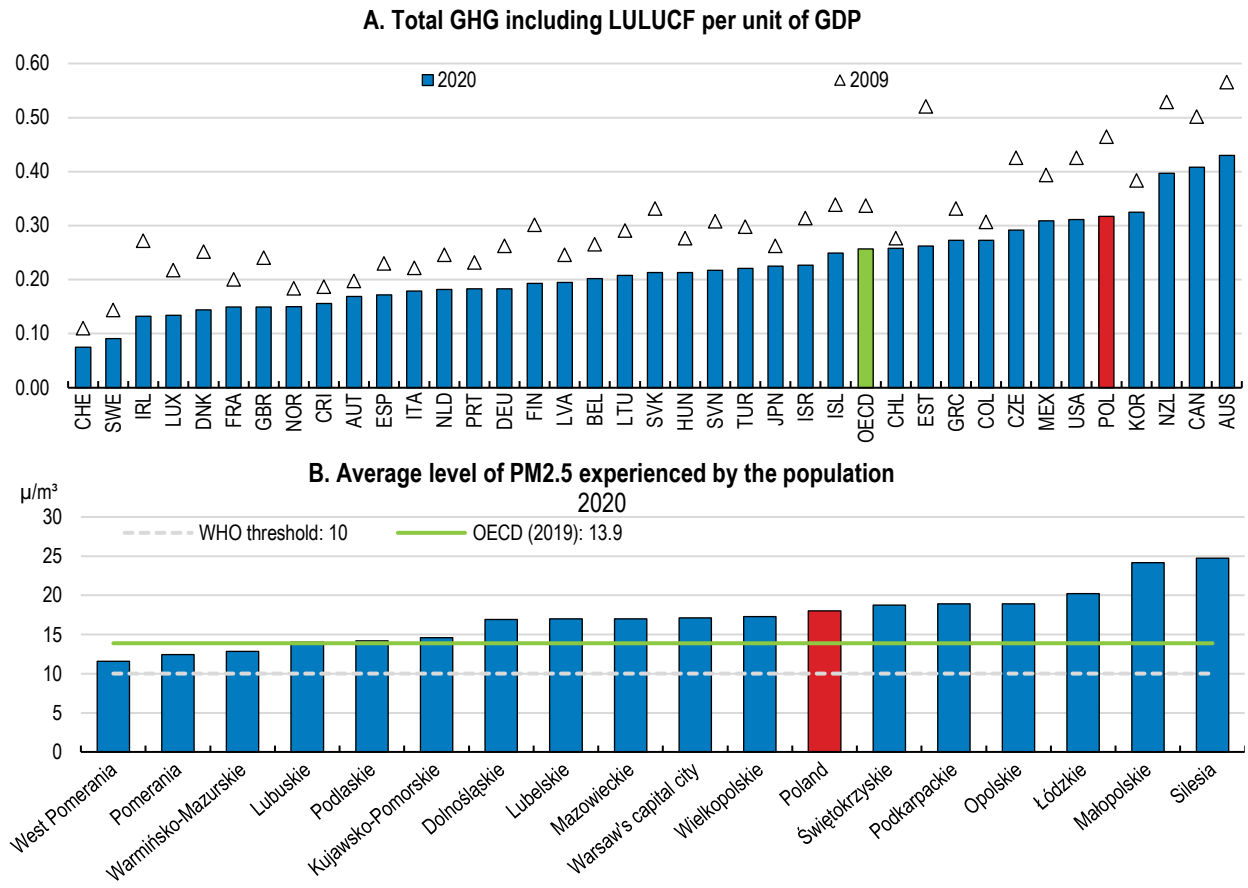
Stronger measures are needed to ensure emissions reduction

Poland has made considerable progress in making economic growth more sustainable. With improvements in industrial energy efficiency and continued expansion of services, energy demand and economic growth have decoupled since 2010. Nevertheless, the carbon intensity of the economy remains high. Poland is the fifth most carbon-intensive economy in the OECD, and the country remains heavily reliant on coal, while the population continues to suffer from poor local air quality (Figure 1.16).

Figure 1.16. Greenhouse gas emissions remain high, and the population is exposed to pollution



Source: OECD Greenhouse Gas Emissions database.

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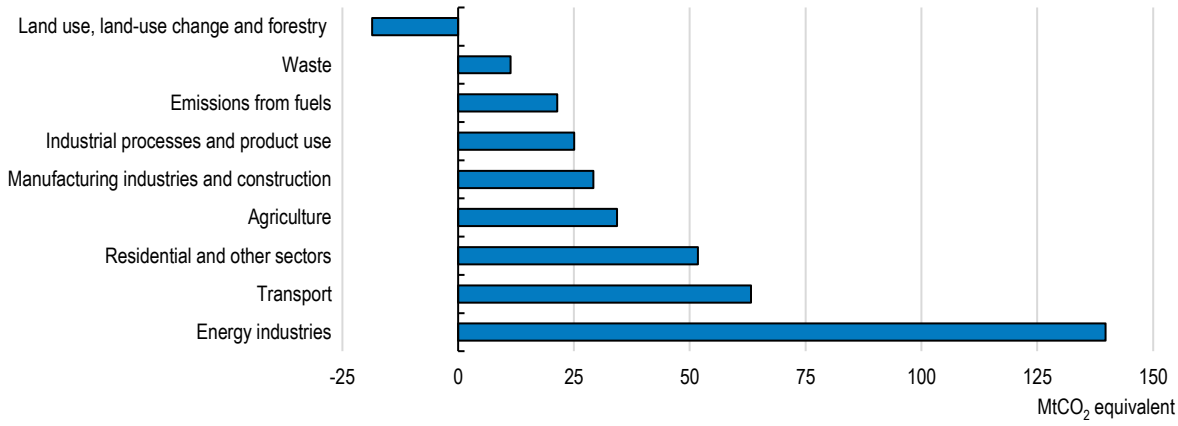
To achieve net zero emissions by 2050, the rate of decarbonisation needs to accelerate by a factor or four in the next decade compared to that of the preceding three decades (Figure 1.19). The current policy plans risk missing the EU's 2030 and 2050 targets (IEA, 2022a). Furthermore, growing demand for energy in the decades ahead will make reaching those emissions objectives more challenging. With increasing economic activity and further electrification, electricity demand is expected to increase substantially by 2050 (McKinsey, 2020). A failure to address the required decrease in emissions adequately will necessitate more forceful policies in the future, making the green transition potentially more challenging for both the economy and the population.

Around 40% of GHG emissions come from energy production that continues to rely heavily on coal, including forms of 'dirty' coal that have particularly high CO_2 (Figure 1.17). Coal plays a significant role also in household heating, with the ensuing negative impact on local air pollution levels (Box 1.6). Numerous programmes have been put in place to replace coal as a source of heating and energy in industry. Most of Poland's fossil fuel subsidies, estimated at around 1.8 billion euros annually (0.3% of GDP), go to coal in the form of compensations for decommissioning of coal mines, termination of long-term power purchase agreements signed with power plants and restructuring in the coal sector (OECD, 2020b).

Figure 1.17. Sectoral breakdown of greenhouse gas emissions

2020



Source: OECD Greenhouse Gas Emissions database.

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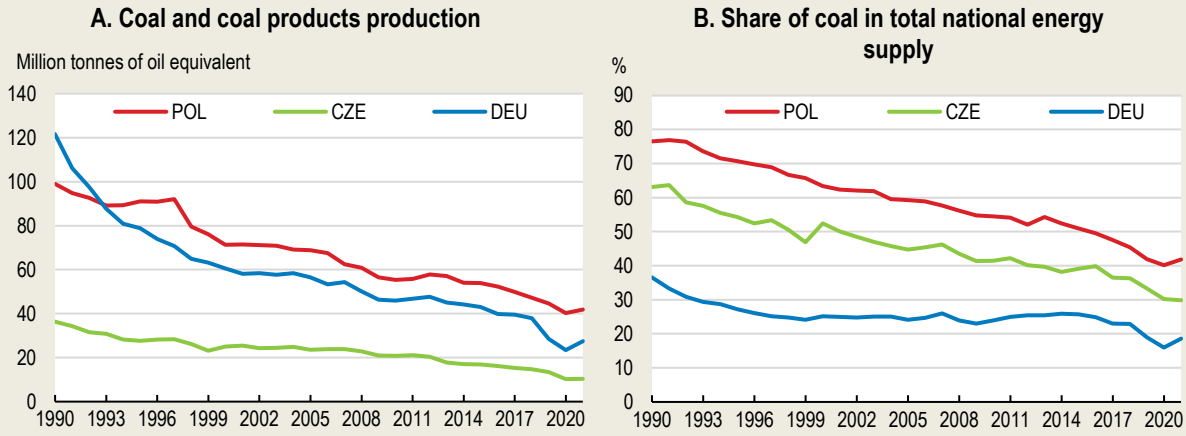
Box 1.5. Coal in Poland

Poland was the eighth largest coal producer in the world and the largest in the EU in 2021 (IEA, 2022). The country remains reliant on coal for electricity and heat generation. Around 70% of the electricity is generated from coal. Both hard coal and cheaper but more emission-intensive lignite coal can be found in the country.

Coal production has been declining: hard coal production dropped from 76 Mt in 2010 to 55 Mt in 2021, while lignite production declined from 56 Mt to 52 Mt over the same period (Figure 1.18). The contribution of mining and extraction to the country's GDP has also decreased sharply over time from 6.6% in 1990 to 1.7% in 2018 (Sokolowski et al, 2021). Traditionally, Poland has been a net exporter of hard coal, but since 2017 imports have been increasing and now account for around a tenth of its overall coal consumption. Much of these imports came from Russia until these were halted in 2022.

Figure 1.18. The role of coal has been declining



Source: IEA World Energy Balances.

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Over 20 hard coal mines are still active, mainly in the Silesia and Lubelskie regions. Lignite mining takes place in open cast mines near power plants in the Dolnośląskie, Wielkopolskie and Łódzkie regions. The current employment in mining is estimated at around 80 000, with a large majority in hard coal mines. Major coal mining companies are state-owned. Employment in the sector has undergone a substantial downsizing since the 1990s, with around 200 000 mining jobs disappearing. The restructuring of the mining sector coincided with structural shocks in a wide range of other industries, with much of the adjustment taking place prior to 2005 (Sokolowski et al., 2021).

Most of the coal demand comes from electricity, co-generation and heat plants, which in 2020 accounted for 76% of the coal demand. The authorities plan to lower coal demand mainly by reducing coal-fired electricity generation from around 70% in 2020 to 11% to 28% in 2040. There are 30 coal power plants, most of which were built between 1960-80, with average age of 33 years. Given the age and state of the existing plants they are expected to become obsolete by 2035. Coal also plays an important role in district heating and individual building heating systems. It is a source for around a half of residential heating in individual houses, predominantly in rural areas. Some industries, such as iron and steel production also rely on coal, although this represents only around 4% of coal demand and Poland is not heavily specialised in these industries.

The profitability of coal mining activity in Poland depends on coal prices and costs. Estimates of public subsidies to the coal value chain and the long-term trend of EU ETS price put its long-run economic viability in question with higher carbon prices lowering the demand for coal (IEA, 2022). Moreover, coal mining companies are not required to cover the cost of decommissioning, clean up and reclamation of coal mines once they end production. Instead, these sites are usually transferred to a state-owned enterprise.

Source: International Energy Agency (2022), Sokolowski et al., (2021).

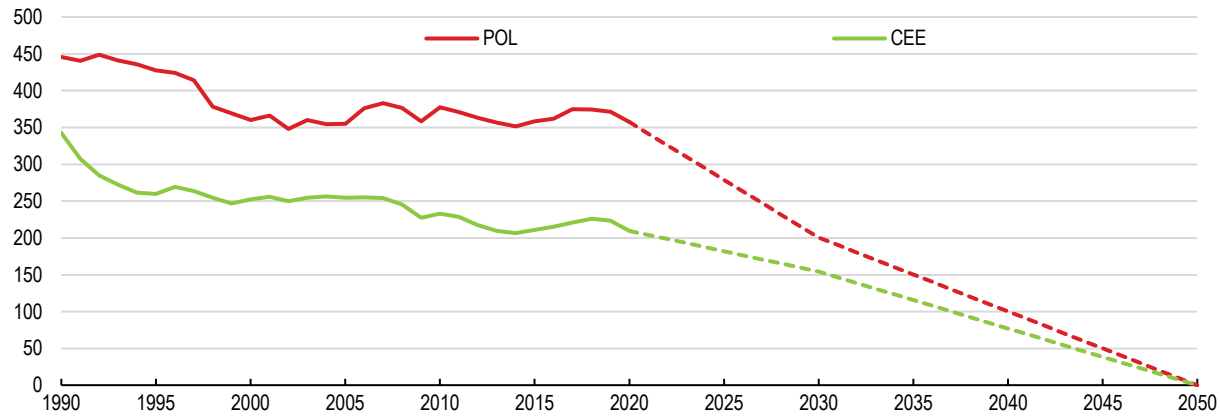
The long-term strategy, *Energy Policy of Poland to 2040*, adopted in 2021, provides welcome policy direction for the energy sector. The strategy sets out a reduction of the share of coal and lignite in electricity generation from 80% in 2021 to 56% in 2030 and 11% to 28% by 2040. With the introduction of nuclear power and expansion of district heating, further development of renewable sources (largely offshore and

onshore wind) is expected to supply around a half of the energy supply. The role of natural gas, liquefied fuels and crude oil is assumed to help reduce emissions during the transition.

The strategy has been criticised as lacking ambition and clarity on specific elements such as renewables (EC, 2022; IEA, 2022a). Indeed, in some respect the most recent strong take-up of renewables has made some of the targets obsolete. The recent changing geopolitical environment and volatile energy prices prompted a review of the strategy in 2022, adding energy security concerns as one of the key objectives. The review is ongoing and scheduled to be completed in this year. The authorities should ensure that additional reliance on coal due to energy security concerns in the near term is minimised. Decreasing policy uncertainty has been shown to lower firm investment in polluting sectors, particularly in large and carbon-intensive sectors that are most exposed to climate policies, and to help avoid the stranding of assets (Berestycki et al., 2022).

Figure 1.19. To reach the net zero target, greenhouse gas emissions need to decline considerably

GHG millions of tons CO_2 equivalent including LULUCF



Note: The dotted line depicts the path to reduce GHG emissions by (at least) 55% in 2030 compared to 1990 level; and reach net 0 by 2050.
Source: OECD GHG database.

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Electricity grid investment is crucial for taking full advantage of renewables

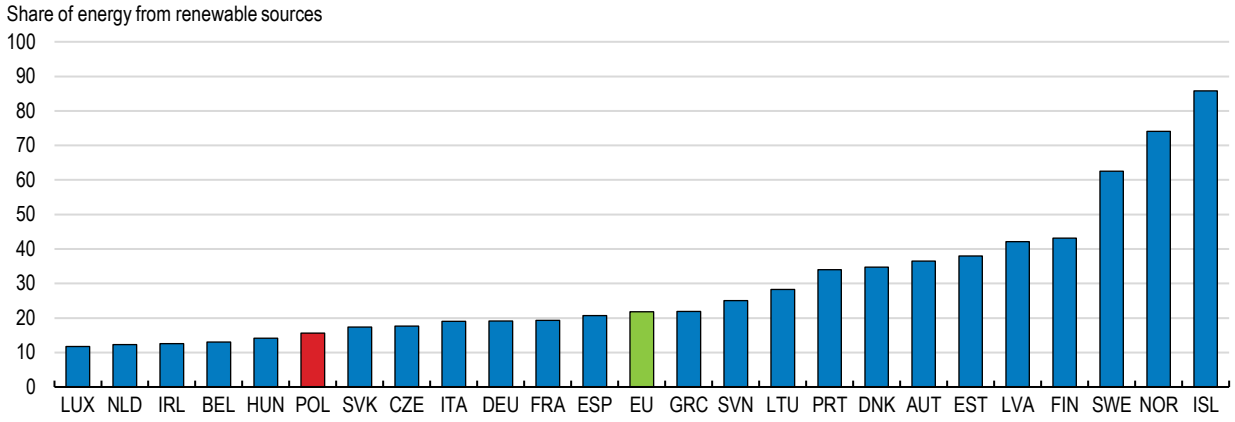
The share of renewables has expanded strongly over the past decade, reaching 16% of total final energy consumption in 2020 and continuing to rise, although Poland is coming from a low base (Figure 1.20). Increases in solar installations added around 3.2 GW of capacity in 2021, helped by subsidies for households introducing micro-photovoltaic installations. As a result, the 2030 national goal for solar has already been achieved. In the initial energy strategy, half of the energy production was planned to come from renewables by 2040 (Ministry of Climate and Environment, 2022a and 2022b). Currently, further increases in renewable capacity are hindered by lack of capacity for the grid to accept additional connections and manage the challenges of fluctuating production associated with renewables. While upgrades of the grid are underway, this process needs to be accelerated through higher investments.

Off-shore wind is expected to play a significant role as the Baltic Sea offers good conditions, given its shallow waters and high wind speed. A new regulation was adopted in 2021 (Offshore Wind Act), setting out rules and regulations. Some 6 GW are receiving state support via “contracts for difference” and further capacity is to be allocated by competitive auctions in 2025, 2027 and 2028, totalling up to 11 GW by 2040 (19% of generated electricity).

A recent auction support scheme contracted around 5 GW of onshore wind energy capacity over 2021-26, of which almost 1.5 GW has been already installed and connected to the power grid. Further development of onshore wind is currently hindered by legislation restricting the distance between the installations and houses and/or protected areas to "no less than 10 times the turbine height". Relaxing such limits – while respecting the rights of residents in the process of granting building permissions – could accelerate further the deployment of wind energy. Legislative changes to this end have been proposed by the government and are under discussion in the Parliament.

Figure 1.20. The share of renewables has been lagging

2021 or the latest available



Source: Eurostat.

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According to the long-term strategy, nuclear could provide up to 16% of the energy mix by 2040. A first nuclear reactor is foreseen by 2033, with five others in operation by 2043, and small modular reactors have been envisaged. There is broad-based political and public support for this policy, including in the municipalities of the potential sites. Technology provider has been selected for the first three nuclear reactors. Upfront financing costs are estimated at EUR 20 billion, but no clear financing plan has yet been decided (IEA, 2022a).

Industry needs stronger incentives to decarbonise

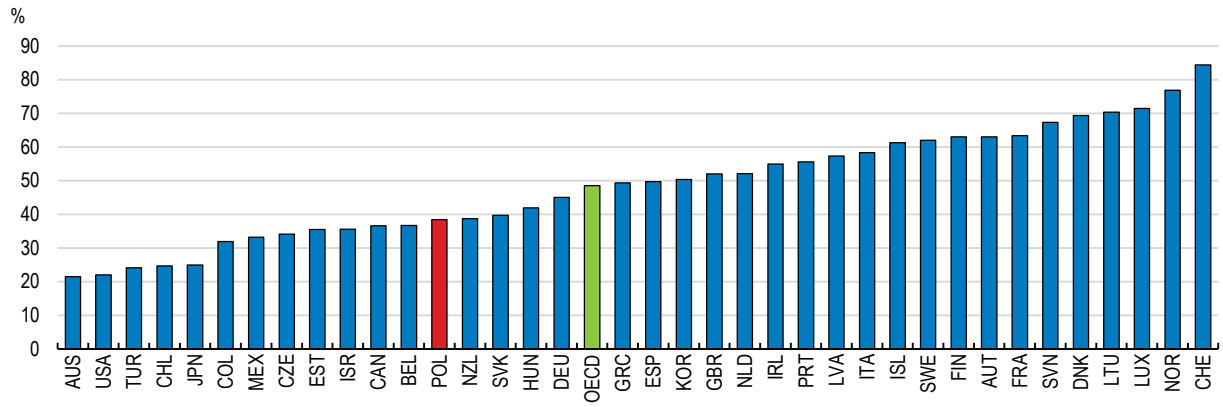
Industry accounts for around 22% of the country's emissions. The EU ETS covers only half of these emissions, which includes energy-intensive companies (Figure 1.21). A national fee paid on GHG emissions covers the rest of these emissions but is currently well below the ETS rate (0.07 euros/tonne of CO_2 in 2021) and well below the EUR 30 or EUR 60 thresholds, thus providing very little incentives for energy efficiency and decarbonisation. This policy creates distortions by incentivising businesses to invest in smaller units to remain outside the EU ETS and limits possible economies of scale (IEA, 2022a). Over the medium term, as the current energy prices fall, the national emissions fee should be increased and eventually aligned with the EU ETS. Adequate price signals are important for the private sector to avoid stranding of assets in unviable activities. Furthermore, energy audits, required by European legislation, could be used for mandating companies to implement measures with a short pay-back, as is done for instance in the Netherlands (IEA, 2022a).

Tradable (so-called white) certificates allocated for implementing efficiency projects have been encouraging energy efficiency in industry. In recent years, these certificates traded at 330-380 euro/tonnes.

However, current long delays in processing applications by the Energy Regulator Office have undermined these incentives (IEA, 2022a). The authorities plan to revise the scheme to allow for the introduction of more innovative solutions, which is welcome. The regulatory office should receive adequate resources to operate this scheme effectively.

Figure 1.21. A large share of carbon emissions is underpriced

Carbon pricing score, EUR 60/tCO_2 (2018)



Note: The carbon pricing score measures the extent to which countries have achieved the goal of pricing all energy related emissions for carbon costs, at certain benchmark values. For example, a CPS of 100% against a benchmark of EUR 60 per tonne of CO_2 means that the country prices all energy related carbon emissions in its territory at EUR 60 or more. In practice, EUR 60 is a midpoint estimate for carbon costs in 2020. Pricing all emissions at least at EUR 60 in 2020 shows that a country is on track to reach the goals of the Paris Agreement to decarbonise by mid-century.
Source: OECD Effective Carbon Rates 2021 database.

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Growing passenger car emissions undermine the ongoing policy efforts

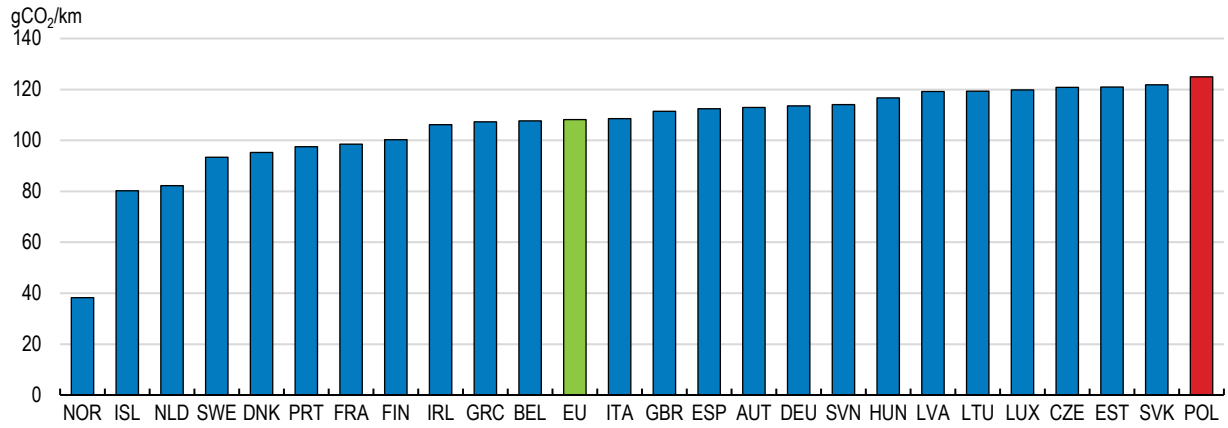
The transport sector is responsible for around 15% of GHG emissions. Setting aside the pandemic years, energy demand in the transport sector has been increasing in recent years, with passenger cars accounting for just over half of that demand. The energy intensity of road freight transport has improved to below the level of Germany, an important step due to Poland's large share of the EU fleet. However, the passenger car fleet has seen a notable decline in efficiency, in contrast with the trend of increasing efficiency seen in most IEA countries (IEA, 2022a). Poland manufactures electric buses and is currently the largest e-bus exporter in the EU. Given this comparative advantage, it has the potential to have one of the largest e-bus fleets in Europe (Guzik et al., 2021).

With nearly 30 million registered cars for the population of 38 million, Poland is one of the most motorised EU countries (Eurostat, 2021). The decline in the efficiency of passenger cars is largely due to imports of older and less efficient cars. Moreover, new cars have also high emissions (Figure 1.22). Electric vehicles (EV) are still rare: 0.12% of the passenger car fleet compared to the EU average of 1.55%. In 2021, the authorities launched a support programme providing subsidies for the purchase of an EV up to EUR 4 100 (and up to EUR 6 000 for a family with at least three children). Furthermore, EVs are exempt from excise duty. Given that most new cars are company cars, the programme includes companies and other legal persons too. There are also various other programmes for increasing the use of electric vehicles in the public sector, and in public transport, and the co-financing of charging infrastructure.

Current vehicle taxation is not in line with best practices and should be based on emissions and environmental impact. Introducing an annual vehicle tax is planned for 2026 and a higher car registration fee is foreseen in 2024. These measures are welcome and should be introduced sooner. They should also include imported used cars (IEA, 2022a). Revenues from these taxes could be used for improving public transport to achieve changes in travel modes and discourage car ownership altogether where feasible. Currently, for around half of the inhabitants of urbanised areas the average distance to public transport is 2km and 65% of the rural population has no public transport option (EC, 2022a). To address transport-related emissions, urban congestion and quality and coverage of public transport services the authorities should work across levels of government.

Figure 1.22. Emissions of new cars are the highest in Europe

Average emissions of new passenger cars, gCO_2/km (2020)



Source: Eurostat (t2020_rk330).

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Housing offers substantial potential for energy savings

Buildings account for around 10% of the country's GHG emissions, most of which comes from the residential sector with coal heating as the main culprit. The potential for energy savings in buildings is substantial, with up to 70% of houses currently poorly insulated (Castelazzi et al., 2019; Zangheri et al., 2021). Individual heating supplies about 76% of the heat, with the rest coming from district heating networks. Both still rely on coal, leading to poor air quality. The energy strategy plans no more coal use in households in urban areas by 2030 and in rural areas by 2040. Current high energy prices have added to the challenge, even more so as regulatory standards for residential heating have been temporarily lowered recently, which risks undoing years of progress in terms of lowering local pollution.

Changing heating systems to more efficient and less polluting options should go together with thermal renovations and an extension of the energy certificates that currently cover only about 10% of buildings (IEA, 2022a). The Polish population is particularly supportive of mandatory and subsidised insulation of buildings (Dechezleprêtre et al., 2022). As recommended in 2020 *Economic Survey*, tightening of regulation on energy consumption in buildings would help (OECD, 2020a).

Given high upfront costs, subsidies that combine thermal and heating system renovations should become a priority. The existing Clean Air Programme needs to focus on heating systems with the lowest emissions and highest efficiency to minimise the deployment of natural gas boilers, which push the decarbonisation issue to future generations (IEA, 2022a). Moreover, to maximise take-up, public support programmes should be streamlined and targeted at low-income households. The authorities are currently reviewing the programmes with a view to introducing some of these features, which is welcome.

A just transition should target existing support and focus on retraining

Prior to the current energy price increases, some 10% of households faced difficulties in paying their energy bills. Current price caps and extraordinary measures (e.g. VAT decreases, one-off subsidies) will eventually be phased out. A more comprehensive tool for addressing energy poverty needs to deal with poorly insulated homes and inefficient heating systems, especially since the authorities aim to reduce the share of households facing energy poverty to 6% by 2030. Leveraging low-cost distributed generation and energy communities can help lower the energy bills of vulnerable consumers further, while giving them an active and empowered role (IEA, 2022a).

Poland's hard coal mines are scheduled to close by 2049. Phasing out coal is a complex process and requires multiple policy levers (Box 1.6). To ensure a just transition, a social contract agreed in May 2021 between the government and several coal trade unions guarantees workers a job until retirement, an early retirement scheme or a severance package (IEA, 2022a). This covers around 60 000 workers employed in the hard coal mining sector. Coal value chain is estimated to employ around 0.5% in the country, in the Silesia region around 4.5% of local employment (IEA, 2022). In addition to EUR 580 million in regular funds for regional development under the 2021-2027 EU financing framework, the region of Silesia may benefit from around EUR 520 million under the Just Transition Fund (Sniegocki et al., 2022).

The impact of the mine closures on local labour market is likely to be milder than those in the early 1990s and mid-2000s as labour market conditions have improved markedly (Sokolowski et al., 2021). Projections of labour market developments in the region of Silesia, where most of the mines are located, point to a considerable decrease in the number of workers in construction, manufacturing, energy, and logistics due to ageing by 2030. Moreover, around 40% of the currently employed miners will have retired by 2030 (Sokolowski et al., 2021). Often, workers in the coal industry have many of the mechanical and technical skills needed to fill positions in growing clean energy (IEA, 2022b). Well-targeted retraining, a hiring freeze (in the mainly state-owned coal mining sector) as well as inter-sectoral upskilling can help in ensuring a just transition. The social contract should be extended to all coalmines, including the lignite sector, with complementary policies provided for the wider coal value chain.

Box 1.6. Coal phase-out strategies in other OECD countries

Five of G20 member countries aim to fully phase out coal: Canada, France, Germany, Italy and the United Kingdom. Among the G20 only Australia uses a comparable share of coal in electricity generation (55% compared to 70% in Poland) but has no coal phase-out commitment.

A planned phase-out in **Germany**, where coal provides 18% of the energy mix, is scheduled for 2030. Germany designed a regional support programme offering compensation for losses faced by workers and companies. The federal government has pledged EUR 40 billion (1.2% of 2019 GDP) in support of affected coal mining regions up until 2038, focusing on infrastructure, innovation and jobs, as well as up to EUR 5 billion (0.1% of 2019 GDP) for early retirement. The authorities have also put in place a mechanism that provides tenders that compensate plant owners in exchange for retiring coal capacity. Over the course of three auctions, regulators awarded around EUR 670 million for the closure of more than 8 GW of hard coal and small lignite capacity in Germany by 2022 (based on publicly available data

for the first and third auctions, and on an IEA estimate for the second). The tender mechanism targets hard coal and small lignite power plants. Another mechanism to provide direct compensation for the early closure of lignite-fired power plants is subject to a state aid review by the European Commission. The affected regions will also benefit from the EU wide funding mechanism for a just transition.

While the **United States** have an economy wide net zero emissions target, there is no coal phase-out plan. Coal is used for 20% of electricity generation. Regulators have allowed accelerated depreciation schedules, backed by ratepayers, to support faster cost recovery for some assets; some utilities are now looking to refinance coal plants through asset-backed bond issuance and reinvest the proceeds in renewables.

Chile, where some 30% of electricity is generated using coal, has a phase-out strategy to close all coal-fired power plants by 2030. It is supported by blended finance. The country established a phase-out schedule and introduced a carbon tax together with a carbon price floor, supported by a concessional loan from the Inter-American Development Bank; this was instrumental in bringing about the early retirement of two coal-fired units.

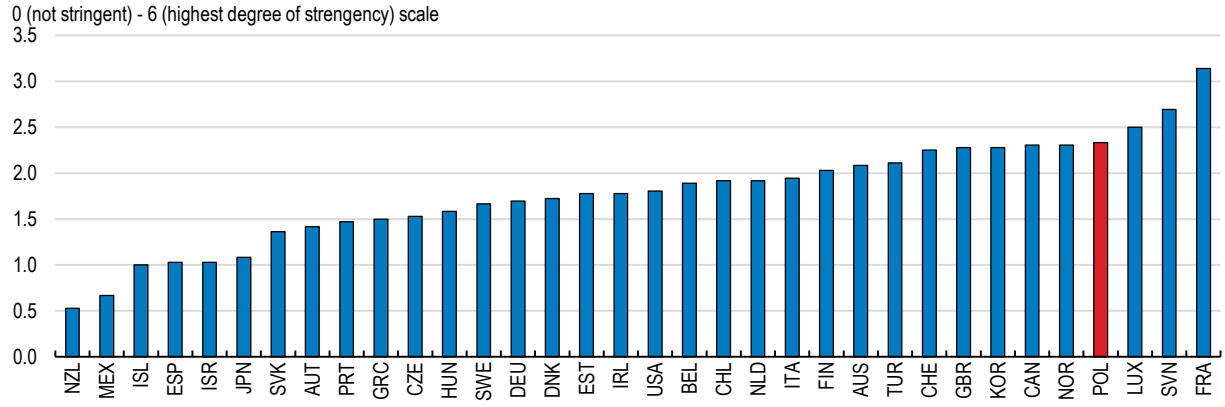
Source: IEA (2021), World Energy Outlook 2021 – Phasing out Coal; IEA (2021), Phasing out unabated coal, IEA (2022c): Coal in net zero transitions. OECD (2022f).

The current policy mix should rely more on price signals

Poland has made important progress in terms of environmental policies, as reflected by the latest OECD's Environmental Policy Stringency Index (EPS), which measures predominately stringency of policies to regulate carbon emission and air pollution (Figure 1.23). Environmentally related taxes bring around 7% of the total tax revenue, some 2.4% of GDP in 2020 (OECD, 2022f). Nevertheless, some 60% of carbon emissions are underpriced (Figure 1.21). Current EU discussions are likely to result in an expansion of the EU ETS, to include the housing and transport sectors. Taking into account policy advances at the EU level, the authorities should set out a clear long-term path of carbon taxation. As the current high energy prices subside, the national emissions fee should increase and eventually become aligned with the EU ETS. Due to the complexity caused by several market failures, contrasting policy objectives and political constraints imply that a well-designed policy mix for the green transition needs to combine non-market and market signals and compensatory policies (OECD, 2021f).

Figure 1.23. The stringency of the environmental policies has increased over the past decade

Absolute change in EPS between 2000 and 2020



Source: OECD Environmental Policy Stringency Index database.

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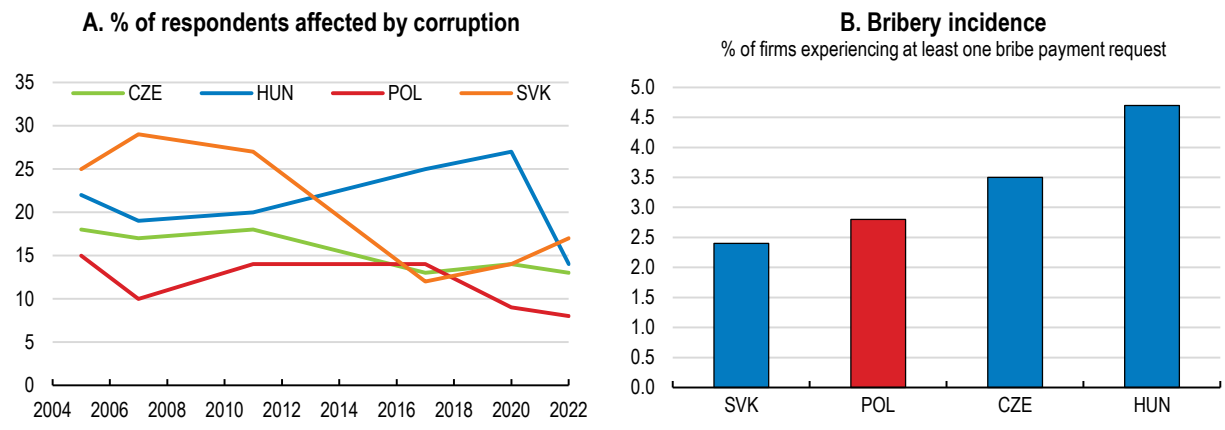
Table 1.10. Past recommendations on climate-change related policies

Past OECD policy recommendations	Policy actions since the 2020 Economic Survey
Implement stable climate-change policies aligned with European and international objectives.	A strategy for the transformation of the energy sector was adopted in 2021 (Energy Policy of Poland until 2040). It is currently under review given the heightened energy security concerns.
Once the economy recovers, increase road pricing and introduce CO2- based vehicle taxation, together with redistribution targeted towards poorer households.	No progress on aligning vehicle taxation with OECD best practice.
Tighten regulations on energy consumption in buildings.	A review of possibilities to tighten the regulations is in progress.
Ease eligibility conditions to energy efficiency programmes for low-income households.	Rules of the Clean Air programme have been adjusted to increase accessibility of all income groups; the programme is under further review.
Provide incentives for the use of smart meters.	Policy goal is to outfit 100% of end users with smart meters by 2031 and utility companies are obliged to install remote reading meters by law.
Evaluate and scale up effective pilot information for SMEs on the benefits of energy efficiency savings and strengthen related energy-efficiency programmes.	No action taken.
Continue to strengthen integrated local spatial plans, by making their coverage mandatory in functional urban areas and increasing their coherence with other spatial plans.	A reform of planning and spatial development is foreseen, under the Recovery and Resilience Plan.

Strengthening public integrity to improve the investment climate and public trust

Strong governance and institutions matter for productivity, the investment climate and spending efficiency. With under 10% of surveyed people having experienced or witnessed a case of corruption in the past 12 months, Poland ranks somewhat better than its regional peers and close to the EU average (European Commission, 2022a). In the business sector, around 2.5% of firms experienced at least one bribe payment request in 2019 (World Bank, 2019) (Figure 1.24). Nevertheless, a considerable share of businesses does not see investment protection as very effective (European Commission, 2022d). Expert views of corruption place Poland among its regional peers, and close to Italy and Spain (Figure 1.26). And, in 2021, public trust in government was among the lowest in the OECD (Figure 1.25).

Figure 1.24 Experience of petty corruption is lower than in regional peers



Note: Share of respondents experiencing or witnessing a bribe request and/or payment over past 12 months.
Source: Eurobarometer, 2022; Enterprise Survey 2019.

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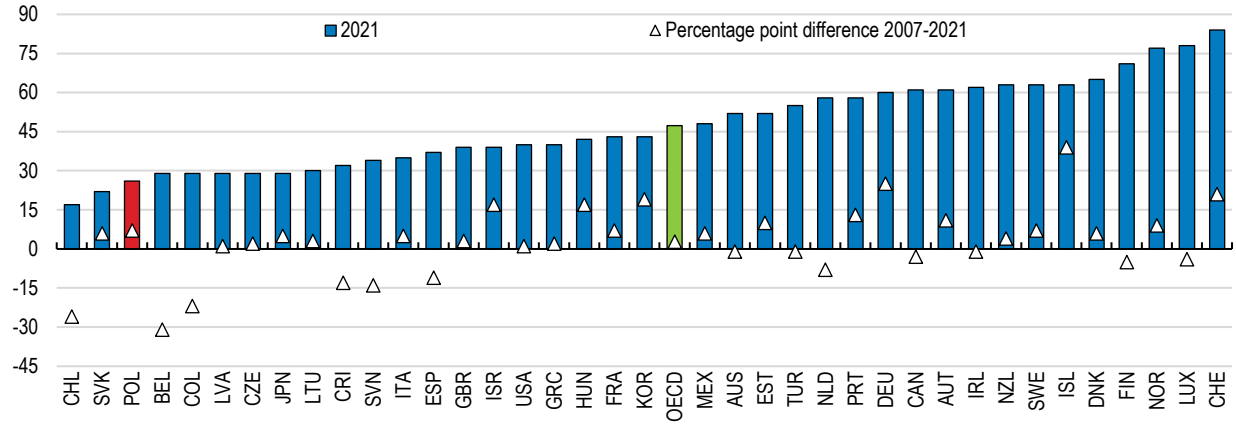
The Anti-corruption Strategy, in place during 2018-20, scored well on OECD's new Public Integrity Indicators, notably in terms of prior analysis of risks and outcome-level indicators (Smidova et al., 2022). However, certain important objectives (e.g., standardisation and digitalisation of various systems of asset declarations for public officials, lobby register) have not been achieved and no new strategy has been put in place. Building on the previous strategy, the government should strengthen public integrity by delivering on its past priorities, addressing remaining issues and involving the non-governmental sector in the formulation and evaluation of the new strategy.

Figure 1.25 Public trust in government is among the lowest in OECD

Confidence in national government and its change since 2007



Note: Share of respondents who responded "Yes" to the question "Do you have confidence in the national government?"
Source: World Gallup Poll.

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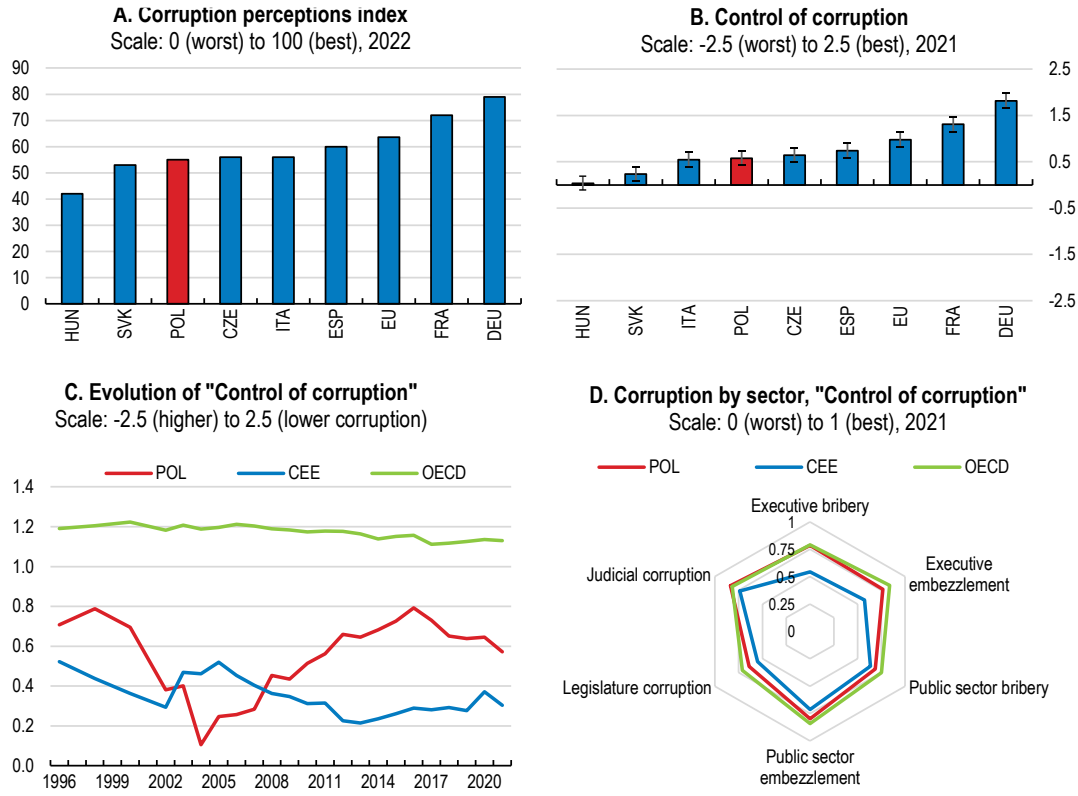
The overall performance of courts has improved with a shortening of the estimated time needed to resolve litigious civil and commercial cases. However, perceived judicial independence among the public and companies has been declining since 2016, due to the perception of interference or pressure from the government and politicians (European Commission, 2022e). Several European institutions have raised concerns about the independence of the judiciary, notably of the National Council of the Judiciary, a public body responsible for nominating judges and reviewing ethical complaints against sitting jurists, although the Polish authorities do not share these concerns. Ensuring judiciary independence is key to a good climate investment. It is thus welcome that the authorities committed to improving judicial independence (European Commission, 2022f).

Figure 1.26 Various expert perceptions of corruption in Poland are broadly in line with each other



Note: Panel B shows the point estimate and the margin of error. Panel D shows sector-based subcomponents of the "Control of Corruption" indicator by the Varieties of Democracy Project.
Source: Panel A: Transparency International; Panels B & C: World Bank, Worldwide Governance Indicators; Panel D: Varieties of Democracy Project, V-Dem Dataset v12.

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Public procurement and infrastructure projects are generally at high-risk of corruption. Poland is carrying out significant public investments in the area of defence and infrastructure, and state-owned enterprises continue to play a considerable role in the economy, raising the importance of a well-functioning public procurement framework. Over 2017-20, nearly half of public tenders analysed in a study were awarded in tenders where only one bidder participated (World Bank, 2022). Also, in around 70% of procedures, the registration number of the seller and buyer was missing, decreasing transparency, and understanding of who is involved in the procurement process (European Commission, 2022b).

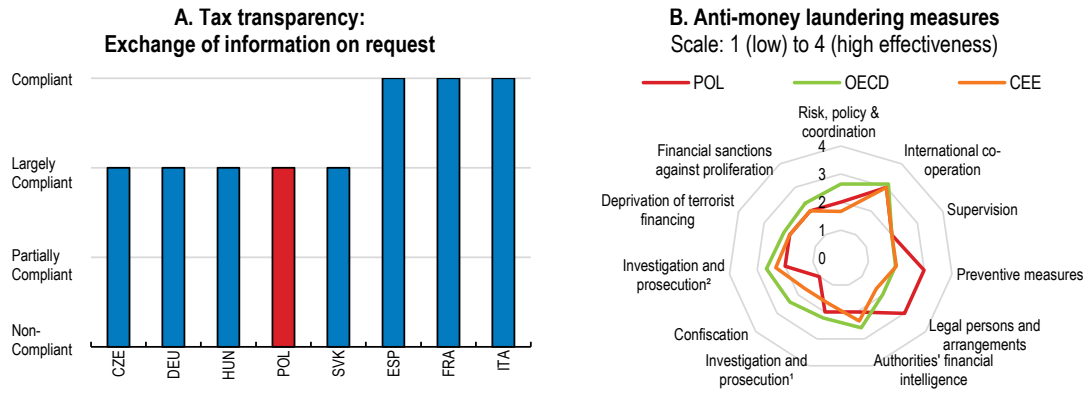
To make the most out of competition among potential providers an even playing field and transparency is key. Recent analysis of public procurement contracts over 2010-20 shows several areas for improvement that could bring about 5% of savings per year, i.e. PLN 24 billion (World Bank, 2022). Increasing the number of bidders can bring the biggest pay-offs. Procuring authorities should become more efficient. Bid evaluations and contract awards could be made faster and less cumbersome, for instance by adopting electronic procedures, in particular when inter-agency approvals and clearances are needed. For high-value and complex projects, where a large number of bidders is expected, bid evaluation teams could be strengthened. Decreasing the number of non-open procedures can also help, as these resulted in higher relative prices during the review period (World Bank, 2022).

Enforcement of the *OECD's Anti-Bribery Convention* has been weak. Efforts to detect foreign bribery allegations are inadequate, fines remain too low to be effective and dissuasive (OECD, 2022g and 2018h).

There have been no investigations or convictions of legal entities under the Convention and only one conviction of foreign bribery of a natural person in 2012. Poland continues to require the conviction of an individual before holding a company liable for foreign bribery. A so-called impunity provision, under which a briber can escape liability if (s)he discloses all substantive circumstances of the crime to a law enforcement authority, has been used on average 460 times annually in cases of domestic bribery and other offences over 2016-21. While this feature can incentivise detection of domestic corruption, where a local public official can be prosecuted, in cases of foreign bribery, it is unlikely that Poland would prosecute foreign officials. Moreover, because it prevents the conviction of the natural person, it prevents the liability of the legal entity (OECD, 2022g).

Poland ranks close to its peers in terms of exchange of information as assessed by the Global Forum on Transparency and Exchange of Information for Tax Purposes. Implementation of the Financial Action Task Force recommendations regards anti-money laundering and terrorist financing can be improved (Figure 1.27).

Figure 1.27 Tax transparency and anti-money laundering measures are largely compliant



Note: Panel A summarises the overall assessment on the exchange of information in practice from peer reviews by the Global Forum on Transparency and Exchange of Information for Tax Purposes. Peer reviews assess member jurisdictions' ability to ensure the transparency of their legal entities and arrangements and to co-operate with other tax administrations in accordance with the internationally agreed standard. The figure shows first round results; a second round is ongoing. Panel B shows ratings from the Financial Action Task Force (FATF) peer reviews of each member to assess levels of implementation of the FATF Recommendations. The ratings reflect the extent to which a country's measures are effective against 11 immediate outcomes. "Investigation and prosecution¹" refers to money laundering. "Investigation and prosecution²" refers to terrorist financing.
Source: OECD Secretariat's own calculation based on the materials from the Global Forum on Transparency and Exchange of Information for Tax Purposes; and OECD, FATF.

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Table 1.11. Past recommendations on preventing corruption and economic crimes

Past OECD policy recommendations	Policy actions since the 2020 Economic Survey
Amend the disciplinary procedures applicable to judges, in particular by excluding the possibility for the executive to intervene in these proceedings	The EU Recovery and Resilience Plan foresees strengthening the independence and impartiality of courts, as well as remedying the situation of judges affected by earlier decisions in disciplinary cases and judicial immunity cases.
Provide members of the Parliament with clear guidance on conflicts of interest. Develop a clearly defined mechanism to declare potential conflicts of interest of parliamentarians.	No action taken.
Improve protective measures for employees who report suspected acts of foreign bribery.	No action taken. An online portal offering information on the topic created.

Table 1.12. Overview of main findings and recommendations

Main findings	Recommendations (key recommendations in bold)
Striking a balance in macroeconomic policy	
Substantial policy support is being provided to manage the current cost of living crisis.	**Ensure that energy-related support measures to households and firms remain temporary and fiscal policy does not add to inflationary pressure. Any future supports should be better targeted to the most vulnerable.**
Inflation is high and price pressures are broadening.	**Continue to ensure that currently elevated inflation expectations do not become entrenched and stand ready to increase interest rates further if necessary**.
A blanket mortgage payments relief is in place since August 2022 to end of 2023 and is potentially weakening the transmission of monetary policy.	Do not extend the scheme any further beyond 2023.
Poland is hosting over 1 million refugees from Ukraine. While adult Ukraine migrants have quickly integrated to the labour market, children participate less in formal education.	**Continue efforts to support and integrate refugees and prepare in case of a further influx.** Ensure burden-sharing of both short- and long-term integration policies across levels of government. Build on disaggregated data to get an accurate picture of the evolving situation, carry out needs assessments and situation reports.
The coronavirus pandemic and energy crisis have increased public debt, while ageing and other spending pressures such as increased defense spending weigh on long-term fiscal sustainability.	**To improve fiscal credibility, consider long-term changes to the numerical fiscal rules, taking into account the outcome of EU governance reforms, and establish an independent fiscal council.** **In the medium-term, undertake fiscal consolidation. Broaden the revenue base, by reforming or phasing out ineffective and regressive tax expenditures and revising property taxation. On the expenditure side, improve targeting of social supports and conduct a comprehensive spending review.**
Future low pension adequacy increases the risk of old-age poverty and long-term spending pressures.	**Extend working lives, including by aligning gradually male and female statutory retirement age and increasing it in line with life expectancy gains in good health.**
The health of many Poles remains subpar. Considerable disruptions in healthcare provision during the pandemic and the large influx of Ukrainian migrants have added to the strain in the healthcare system.	**Make the healthcare strategy better integrated across the various actors in the system. Over time, increase the remuneration of health workers.**
Strengthening green and sustainable growth	
Poland's planned transition away from coal relied in part on natural gas. Given the current geopolitical situation and volatile energy prices, the Government is reviewing the strategy.	**Implement the updated principles of the energy strategy with an emphasis on accelerating development of renewables, diversifying technologies and improving energy security and efficiency, while minimising the increased reliance on coal in the near term.**
Increases in renewable energy are hindered by capacity and connection constraints of the electricity grid and the regulatory framework.	**Expedite and scale-up investments in the electricity grid, while reviewing regulations and other policy constraints hindering further expansion of renewables.**
Substantial investment needs across the economy persist, notably for the green transition.	Improve the public investment framework by strengthening project selection, portfolio oversight, maintenance funding and budget comprehensiveness for ongoing and planned investment.

The pricing of the environmental costs of fossil fuels is uneven across the economy.	**Set out a clear long-term path of carbon pricing. In the medium-term, increase the national emissions fee and eventually align it with the EU ETS.**
Prior to the current energy increases, some 10% of households had difficulty paying their energy bills.	Develop a comprehensive tool for addressing energy poverty that deals with poorly insulated homes and inefficient heating systems, as well as energy bills.
Poland agreed on closure of hard coal mines in 2049.	**Ensure a just transition through well-targeted retraining, a hiring freeze and inter-sectoral upskilling for the hard and lignite coal sectors. Complementary policies are needed for the wider coal value chain.**
Energy audits are required by the European legislation, but its recommendations are not binding.	Mandate companies to implement measures suggested in energy audits with short pay-back, as done in other OECD countries.
Tradable (white) certificates allocated for implementing efficiency projects have been encouraging energy efficiency in industry. Understaffing of the Energy Regulator Office implementing the programme hinders its efficiency.	Allocate adequate resources to the Energy Regulator Office.
The potential for energy savings in buildings is substantial, with up to 70% of houses currently poorly insulated.	Changing of heating systems to more efficient and less polluting options should go together with thermal renovations. Energy certificates should cover more of the building stock.
The transport sector is responsible for increasing greenhouse gas emissions and air pollution.	Bring forward the planned update of vehicle taxation, ensuring that it reflects emissions and environmental impact.
Regulatory barriers to competition in services can be lowered.	**Reduce regulatory barriers to competition for lawyers, notaries, architects, and engineers as well as in occupational licensing .**
Strengthening public integrity to improve investment climate	
Public trust in government and business perceptions of effectiveness of investment protection are low. The previous public integrity strategy did not achieve important objectives and no new strategy has been adopted.	**Building on the previous anti-corruption strategy, strengthen public integrity by delivering on its past priorities, addressing remaining issues and involving the non-governmental sector in the formulation and evaluation of the new strategy.**
Public procurements often attract too few bidders and can be lengthy and complex, due to low capacity of procuring bodies.	Make procuring authorities more efficient by faster and less cumbersome bid evaluations and contract awards. Decrease the number of non-open procedures.
Implementation of OECD's Anti-Bribery Convention is weak. Fines remain too low to be effective and dissuasive.	Increase corporate fines for foreign bribery offenses and ensure that legal entities can be held accountable without a prior conviction of a natural person.

References

Baszczak, L. et al. (2022), How Polish Society has been helping refugees from Ukraine, Polish Economic Institute, Warsaw.

Berestycki, C. et al. (2022), "Measuring and assessing the effects of climate policy uncertainty", OECD Economics Department Working Papers, No. 1724, OECD Publishing, Paris.

Bank for International Settlements (2022), BIS statistics Explorer – Credit to the Non-financial Sector, accessed Jan 17, 2023.

Castellazzi, L. et al., (2019), Assessment of second long-term renovation strategies under the Energy Efficiency Directive, EUR 29605 EN, Publications Office of the European Union, Luxembourg.

Chmielewska-Kalinska, I. et al. (2022), The living and economic situation of Ukrainian refugees in Poland, Report of the Questionnaire survey conducted by NBP Regional Branches, Central Bank of Poland, Warsaw.

Dechezleprêtre, A. et al. (2022), Fighting Climate Change: Attitudes toward climate change policies in Poland, Supplement for "fighting Climate Change: International Attitudes Toward Climate change policies. OECD Economics Department Working Papers, No 1714, OECD Publishing, Paris.

Duszczyk M. and Kaczmarczyk P. (2022), Poland and War Refugees from Ukraine – Beyond Pure Aid, CESifo Forum, July 2022.

Égert, B. and P. Gal (2017), "The quantification of structural reforms in OECD countries: A new framework", *OECD Economics Department Working Papers*, No. 1354, OECD Publishing, Paris.

Elcano Royal Institute (2021), The Polish Recovery Plan: a careful step toward energy transition, ARI 87/2021, accessed on September 18, 2022.

European Commission (2022a), Special Eurobarometer No 523, 2022, Publications Office of the European Union, Luxembourg.

European Commission (2022b), 2022 Rule of Law Report – Country Chapter on the Rule of Law Situation in Poland, Publications Office of the European Union, Luxembourg.

European Commission (2022c), Single Market Scoreboard, accessed on Sept 15, 2022, Publications Office of the European Union, Luxembourg.

European Commission (2022d), EU Justice Scoreboard 2022, Publications Office of the European Union, Luxembourg.

European Commission (2022e), Flash Eurobarometer 503 – perceived independence of the national justice systems in the EU among the general public, Publications Office of the European Union, Luxembourg.

European Commission (2022f), Analysis of the recovery and resilience plan for Poland, Commission Staff Working Document, Publications Office of the European Union, Luxembourg.

European Commission, Directorate-General for Taxation and Customs Union, Poniatowski, G. Bonch-Osmolovskiy, M., Smietanka A., et al. (2021), VAT GAP in the EU - Report 2022, Publications Office of the European Union, Luxembourg.

European Commission (2021), The 2021 Ageing Report, Economic and Budgetary Projections for the EU Member States (2019-2070), Institutional paper 148, Publications Office of the European Union, Luxembourg.

Eurostat (2021), Contingent liabilities and non-performing loans – statistics, accessed Nov 20, 2022, Publications Office of the European Union, Luxembourg.

Eurostat (2022), Employment and activity by sex and age – quarterly data, accessed on December 19, 2022.

Gal, P. et al. (2019), "Digitalisation and productivity: In search of the holy grail – Firm-level empirical evidence from EU countries", OECD Economics Department Working Papers, No. 1533, OECD Publishing, Paris.

Guillemette, Y. and D. Turner (2021), "The long game: Fiscal outlooks to 2060 underline need for structural reform", OECD Economic Policy Papers, No. 29, OECD Publishing, Paris.

Gromadzki, J. and P. Lewandowski (2023), Refugees from Ukraine and the Polish labour market, Ubezpieczenia Społeczne. Teoria i praktyka, Vol. 1 (156).

IEA (2022a), *Poland 2022 - Energy Policy Review*, International Energy Agency, Paris.

IEA (2022b), *World Energy Employment*, International Energy Agency, Paris.

IMF (2020), Well spent: How Strong Infrastructure Governance Can End Waste in Public Investment, International Monetary Fund, Washington.

IMF (2022), Selected Issues Paper – Post-pandemic potential growth and scarring, Country Report No. 2022/059, Washington.

Kleiner M. M. and E. J. Soltas (2019) "A Welfare Analysis of Occupational Licensing in U.S. States"

Kruse, T. et al. (2022), "Measuring environmental policy stringency in OECD countries: An update of the OECD composite EPS indicator", OECD Economics Department Working Papers, No. 1703, OECD Publishing, Paris.

McKinsey and Company (2020), *Carbon-neutral Poland 2050 – Turning a challenge into opportunity*, McKinsey and Company.

Ministry of Climate and Environment (2022a), Energy Policy of Poland until 2040 – Extract, Ministry of Climate and Environment, accessed Sept 20, 2022.

Ministry of Climate and Environment (2022b), Principles for the update of the Energy Policy of Poland until 2040, Ministry of Climate and Environment, accessed Sept 20, 2022.

Ministry of Finance (2022), Fiscal notifications – October 2022, Ministry of Finance, Warsaw.

Monteagudo, J. et al. (2012), "The economic impact of the Services Directive: A first assessment following implementation", No 456, European Economy - Economic Papers., June 2012, Brussels.

Myck M., and K. Trzcinski (2019), "From Partial to Full Universality: The Family 500+ Programme in Poland and its Labour Supply Implications", ifo DICE Report, Vol 17, Issue 0.3, pp 36-44, Munich.

NBP (2022a), *Inflation Report – July 2022*, Central Bank of Poland, Warsaw.

NBP (2022b), *Inflation Report – November 2022*, Central Bank of Poland, Warsaw.

NBP (2022c), *Financial Stability Report - June 2022*, Central Bank of Poland, Warsaw.

NBP (2022d), *Opinion on the 2023 draft budget*, Central Bank of Poland, Warsaw.

OECD (2014), "Labour market integration of immigrants and their children: Developing, activating and using skills", in *International Migration Outlook 2014*, OECD Publishing, Paris.

OECD (2016), Making Integration Work: Refugees and others in need of protection, Making Integration Work, OECD Publishing, Paris.

OECD (2017), Government at a Glance 2017, OECD Publishing, Paris.

OECD (2018), *OECD Economic Surveys: Poland 2018*, OECD Publishing, Paris.

OECD (2019), Pensions at a Glance 2019 – How does Poland compare?, OECD Publishing, Paris.

OECD (2020a), *OECD Economic Surveys: Poland 2020*, OECD Publishing, Paris.

OECD (2020b), Fossil fuel support – Poland country note, OECD Publishing, Paris.

OECD (2021a), Government at a Glance 2021, OECD Publishing, Paris.

OECD (2021b), Pensions at a Glance 2021, OECD Publishing, Paris.

OECD (2021c), Health at a Glance 2021, OECD Publishing, Paris.

OECD (2021d), Poland: Country Health Profile 2021, in State of Health in the EU: Country Health Profiles, OECD Publishing, Paris.

OECD (2021e), Preventing Harmful Alcohol Use – Poland, OECD Publishing, Paris.

OECD (2021f), A framework to decarbonise the economy, OECD Economic Policy Paper no 31, OECD Publishing, Paris.

OECD (2022a), Economic Outlook, OECD Publishing, Paris.

OECD (2022b), International Migration Outlook 2022, OECD Publishing, Paris.

OECD (2022c), Housing Taxation in OECD Countries, OECD Publishing, Paris.

OECD (2022d), Family Database, accessed on Nov 17, 2022.

OECD (2022e), Health at a Glance: Europe 2022, OECD Publishing, Paris.

OECD (2022f), Fighting Climate Change: International Attitudes Toward Climate Policies, OECD Publishing, Paris.

OECD (2022g), Implementing the OECD Anti-Bribery Convention, OECD Publishing, Paris.

OECD (2022h), The OECD tax-benefit data portal, accessed 15 November 2022, OECD Publishing, Paris.

Paterson, I. et al (2007), "Economic Impact of Regulation in the Field of Liberal Professions in Different Member States", WP Institute for Advanced Studies, Vienna, and ENEPRI WP.

Smidova, Z. et al. (2022), "Anti-corruption and public integrity strategies – insights from new OECD indicators", OECD Economics department working papers no 1725, OECD Publishing, Paris.

Sniegocki, A. et al. (2022), Just Transition in Poland: A review of public policies to assist Polish Coal Communities in transition, Resources for the Future, accessed 15 November 2022.

Sorbe, S. et al. (2019), "Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies", OECD Economic Policy Papers, No. 26, OECD Publishing, Paris.

Terrero J., and C. Vitale (2023, *forthcoming*), Assessment of the Recovery and Resilience Plan – Poland, OECD Economics Department Working Papers, OECD Publishing, Paris.

Tryggvadottir A. (2022), OECD Best Practices for Spending Review, in OECD Journal on Budgeting, OECD Publishing, Paris.

Wiczewski B. (2020), Budget system in Poland: Challenges and ongoing reforms, European Economy Economic Brief, November 2020.

Wojdat, M. and P. Cywiński (2022), "Urban hospitality: Unprecedented growth, challenges and opportunities", Union of Polish Metropolises, Warsaw.

World Bank (2019), World Bank Enterprise Survey, 2019.

World Bank (2022), Poland Public Finance Review, World Bank, Washington.

Zangheri, P. et al. (2021), Progress of the Member States in implementing the Energy Performance of Building Directive, Publications Office of the European Union, Luxembourg.

2 Digitalising the Polish Economy

Srdan Tatomir, OECD

Increasing digitalisation can further boost Poland's productivity but successful digitalisation requires governments to take a comprehensive policy approach. Adoption of digital technologies is relatively low among firms, particularly SMEs. Expanded consultancy and technical support would help, as would accelerating the deployment of 5G networks. Although ICT innovation has been growing, it is relatively low and should be supported further. Skills are essential to ensuring an inclusive digital transition. Digital skills are particularly low among older adults. There are shortages of ICT specialists. Managerial skills, key to implementing digitalisation in firms, could also be higher. Skills gaps should be addressed by encouraging more students, especially women, to study ICT. Schools need to be better equipped with technology and links between education institutions and industry should be stronger. Effective implementation of the new migration programmes could raise the supply of ICT specialists. Moreover, there is a need to expand training and to make further education more practical and flexible to encourage lifelong learning. The government has been rapidly digitalising, which can facilitate the digital transition in the wider economy. It should continue to do so, and to enhance cybersecurity.

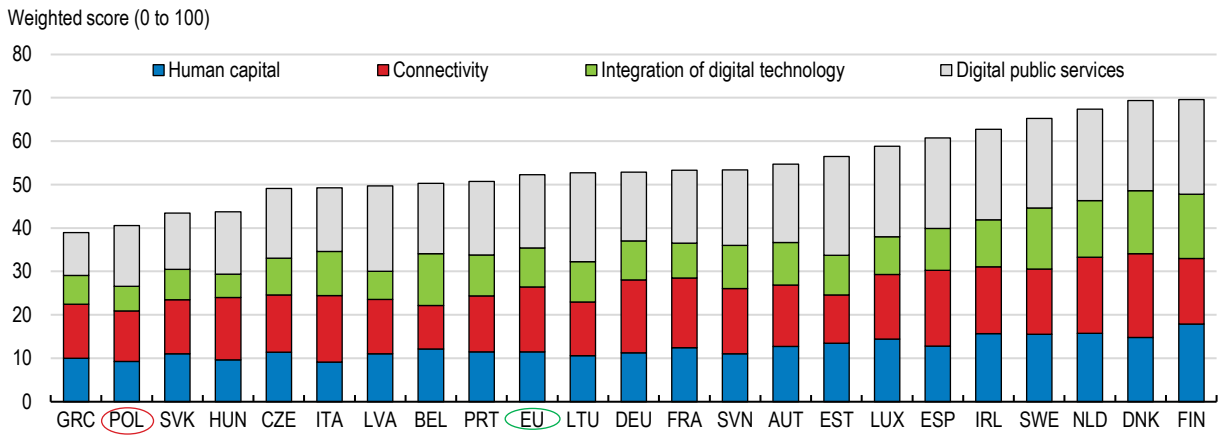
Introduction

Digital technologies have the potential to improve productivity, leading to higher wages and living standards, better public services, and greater well-being (OECD, 2019d; Gal et al., 2019). Successful digitalisation requires a comprehensive approach across a range of structural policy areas because many factors are complementary to each other. A widespread and fast communications infrastructure underpins digitalisation, while advanced managerial and worker skills are essential to the successful adoption of digital technology. A supportive regulatory environment can incentivise digitalisation by increasing returns to investment in technologies and skills. Innovation and e-government can further support and facilitate this process.

Despite significant progress in recent years, Poland is less digitalised than other peer countries. Based on a composite measure of digital skills, digital technology adoption, communication networks, and digital government, Poland ranked 24th out of 27 EU countries in 2022, although it has been catching up over the past five years (Figure 2.1). Digital skills are below average and the level of firms' integration of Information and Communication Technology (ICT) is behind most advanced economies. Overall, digital innovation is low, but the number of new firms has been growing and finance for digital investment has steadily become more available. Digitalisation within government has improved, but has not yet caught up with OECD best performers and remains below average. Thus, there is substantial scope to further digitalise the economy and increase productivity.

Figure 2.1. Poland is less digitalised than the EU average

Digital Economy and Society Index (DESI), 2022



Note: the DESI is an equally weighted index of four dimensions: human capital (internet user skills and advanced digital skills and development), connectivity (fixed broadband take-up and coverage, mobile broadband, and broadband prices), integration of digital technology (ICT adoption among firms and e-Commerce) and digital public services (development of e-Government services).
Source: European Commission DESI 2022.

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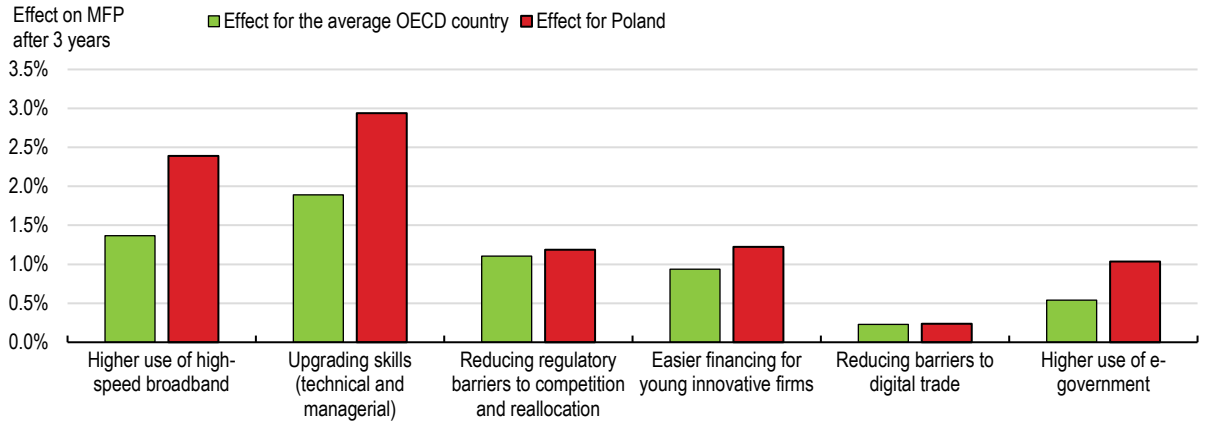
A range of policies can boost digitalisation and increase productivity. For Poland, upgrading managerial and technical (digital) skills could provide a significant boost to productivity. Investing in ICT adoption in firms, notably through higher use of high-speed broadband, would also help. Other factors could further contribute, such as lowering regulatory barriers and increasing competition and providing easier access to finance. Higher use of digital government services is likely to facilitate digitalisation. Estimates based on Sorbe et al. (2019) suggest that closing a quarter of the gap with the best performing countries in these

policy areas could increase Poland's productivity levels by up to 9% after three years (Figure 2.2). Policies specifically boosting digitalisation could raise the long-run level of GDP by around 6%. Complementarities between different factors could increase productivity further.

The digitalisation of the Polish economy should be driven by the private sector, but public policies can support and facilitate the digital transformation. The positive returns to digital investment should provide strong market incentives to firms and workers to digitalise, but it is not always easy in practice for firms to reap the benefits. The government can support this process by providing a regulatory framework that enables investment in communications infrastructure and digital technologies. It can facilitate ICT adoption by boosting the development of general digital and management skills. It can provide basic research and development as well as finance to support innovation. Finally, digitalisation in the private sector can be facilitated by digitalising the public sector.

Figure 2.2. A range of policies can boost digitalisation and increase productivity

Effect of improving digital adoption on firm productivity by closing a quarter of the gap with best performing countries



Notes: Estimated effect on multi-factor productivity (MFP) of the average firm from closing one-fourth of the gap to best-performing countries across a range of policy and structural factors (see Box 1 in Sorbe et al., 2019). "Reducing regulatory barriers to competition and reallocation" includes lowering administrative barriers to start-ups, relaxing labour protection on regular contracts and enhancing insolvency regimes. "Easier financing for young innovative firms" covers the development of venture capital markets and the generosity of R&D tax subsidies. "Upgrading skills" covers participation in training, quality of management schools and adoption of High Performance Work Practices. The effect of "Higher use of high-speed broadband" on productivity combines the direct and indirect effects presented in Figure 6 in Sorbe et al. (2019). High-speed broadband refers to broadband connections with least 30 Mbit/sec data transfer speed. "Reducing barriers to digital trade" includes lowering barriers to cross-border data flows and online sales and enhancing regulatory regimes for data privacy and security.
Source: Sorbe et al. (2019), "Digital dividend: policies to harness the productivity potential of digital technologies", OECD Economic Policy Papers, No. 26.

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Notwithstanding the substantial benefits it can bring, digitalisation can entail significant disruptions and costs. Technical changes within firms are likely to favour highly skilled workers whose skills can be complementary in implementing and working with digital technologies (OECD, 2019d). Less skilled workers, particularly those who do routine manual tasks that can easily be automated, are likely to be negatively affected by new technologies such as automation. This can lead to lower wages for less skilled workers and fewer jobs. Consequently, in the absence of policy intervention, income inequality and unemployment could rise, at least in the short term (OECD, 2019d). Regional inequalities could increase as digital activities may concentrate in some regions, although digital technologies can also help people work remotely. The digitalisation of firms and markets can increase competition within countries and between countries for firms and workers. However, the best firms are likely to thrive, while less competitive

firms might lag far behind, and competition issues can arise in winner-takes-all markets (OECD, 2019d). To address the impact on workers, flexible learning systems are needed that upgrade and develop digital skills in order to minimise the effects on employment and wages. To ensure vibrant markets, this involves supporting innovation within new and existing firms to boost competitiveness, while ensuring enough flexibility for an efficient allocation of capital and labour resources.

This chapter looks at key digitalisation challenges and associated policies in Poland. It develops policy recommendations to leverage the productive potential of digital technologies and promote a sustainable and inclusive digital society. First, it discusses ICT adoption in firms, innovation and finance while also emphasising the role of infrastructure and the regulatory framework. Second, it covers digital skills and the role of education, both formal and adult learning, in the digital transition. Finally, it describes the importance of digital government in facilitating digitalisation. The chapter draws on the OECD's Going Digital Policy framework (OECD, 2019d) and previous OECD work on productivity (Gal et al., 2019; Sorbe et al., 2019; Andrews et al., 2018), the OECD Skills Outlook (OECD, 2019c; 2021d) and the OECD Skills Strategy for Poland (OECD, 2019a).

Supporting the adoption of digital technologies in firms

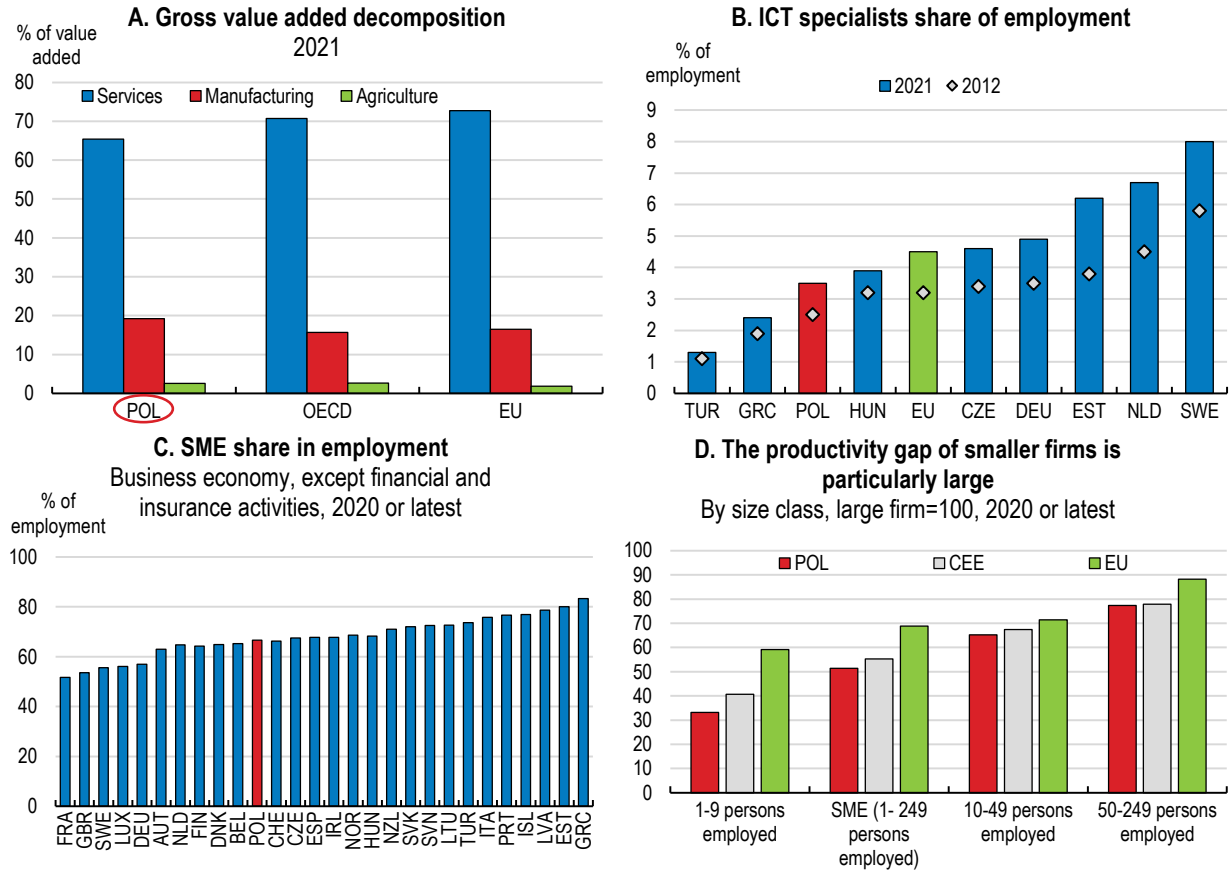
Firms increasingly need to adopt new digital technologies

Aggregate GDP growth in the past was mostly driven by capital accumulation but the capital-driven growth model may be reaching its limits (World Bank, 2021). Given diminishing returns to capital and a decreasing labour force due to an ageing population, productivity growth will be increasingly important in driving long-term growth.

Around two thirds of the Polish economy is based on services while manufacturing accounts for almost a fifth of economic activity (Figure 2.3, Panel A). Most of the manufacturing total factor productivity (TFP) growth in 2009-19 was due to productivity improvements within firms. In services, TFP growth was due to a combination of individual firms becoming more productive, more productive firms entering the market and less productive firms exiting and, to a lesser extent, more productive firms gaining market share (World Bank, 2022). This suggests that policies that boost productivity within firms are the most relevant but ensuring good conditions for new firms and competitive markets is important as well.

Digitalisation has become increasingly important in the economy and for Polish firms. The ICT industry accounts for 3.5% of total employment, below the EU average, but this has been growing (Panel B). Digitally intensive sectors of the economy accounted for half of all jobs and 60% of GDP growth in 2018 (OECD, 2023). Trade has boosted technological adoption. Foreign-owned firms, important drivers of Polish exports in industries such as automotive, transport equipment but also computer programming services and pharmaceuticals, tend to be large and more technologically advanced (World Bank, 2022; OECD, 2020b). Domestic small and medium-size enterprises (SMEs) act as suppliers to foreign affiliates and, as a result, they tend to be more digitally developed (Cadestin et al., 2019). Polish SMEs could benefit from more digitalisation. They account for two thirds of all employment (Panel C) and half of all output. However, they are less productive than in neighbouring European countries and than the OECD average. This is mostly because Poland has a higher share of micro firms, those that hire 9 employees or less (OECD, 2020b).

Figure 2.3. Digitalisation could boost productivity especially in SMEs



Note: CEE is the average of the Czech Republic, Hungary and Slovak Republic.
Source: OECD National Accounts at a Glance; Eurostat (isoc_sks_itspt); and OECD SDBS Structural Business Statistics.

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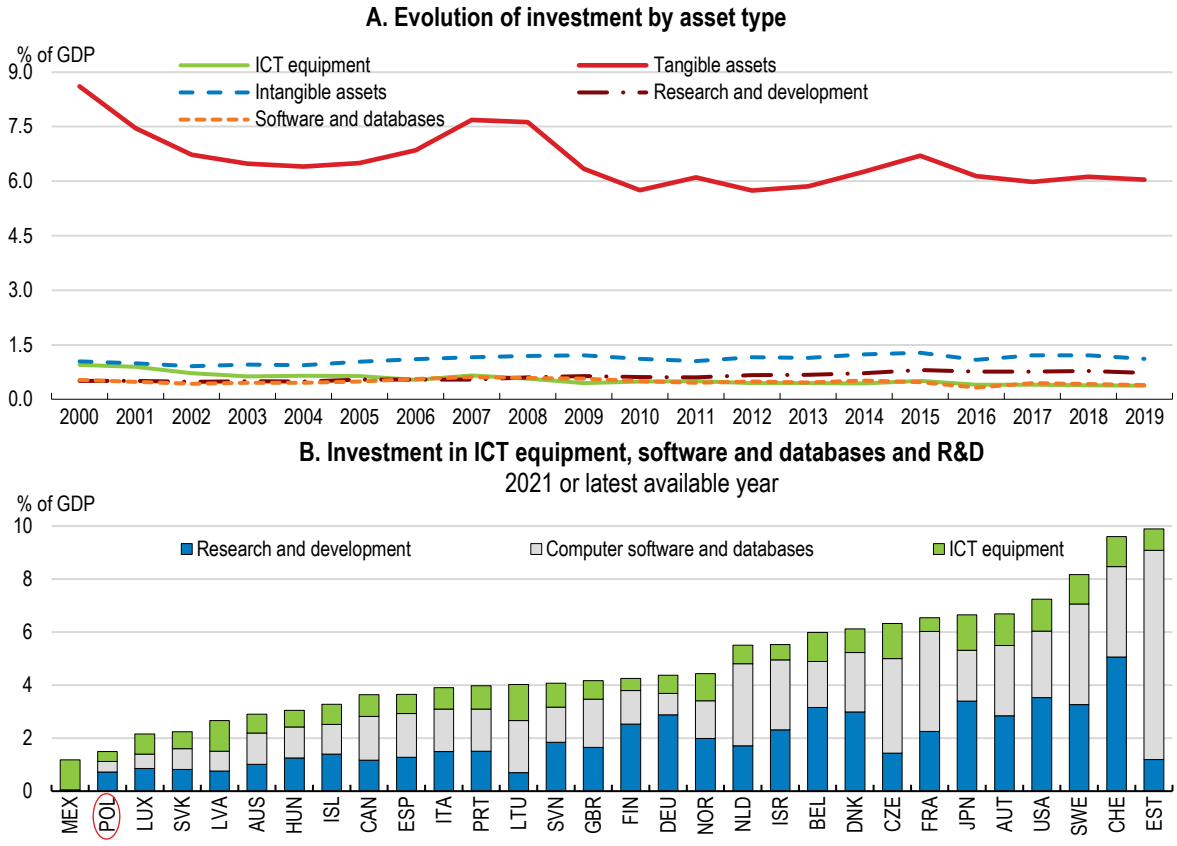
The diffusion of new technologies depends on both firms' capabilities and incentives. Organisational capital such as management skills is key to recognising the benefit of new technologies and implementing them in firms. Management quality in Poland is average and it is lower in domestic firms than in foreign-owned firms (see Section Supporting the adoption of digital technologies in firms). Available and effectively employed digitally skilled workers are necessary to operate new technologies successfully (Andrews et al., 2018). Digital skills among older adults still lag well behind other countries and could improve (see Section Supporting the adoption of digital technologies in firms). But dynamic labour and product markets also matter. Greater competition incentivises firms to invest more, subject to good communications infrastructure and freely available capital to finance new ICT investment. Poland could further liberalise some professions (see Section Regulatory barriers to competition can be lowered further). Its communications infrastructure is well developed although it could upgrade to 5G to prepare for the adoption of the latest digital technologies. Direct participation in international trade or integration in global supply chains can lead to higher digital technology adoption.

Figure 2.4. Intangible investment and ICT investment are relatively low



Note: Investment is based on gross fixed capital formation.
Source OECD National Accounts Statistics.

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ICT intensity and adoption is relatively low in Poland, although it is increasing. Total investment in ICT is well below the OECD average (Figure 2.4). Almost all Polish businesses have a broadband connection and the speeds of those connections have improved over time. Around 70% of those businesses have a website and half of their employees have used a computer with internet access. However, only a minority of firms buy and sell online and work with e-invoices. Digital adoption for Polish SMEs appears to be lower than the EU average. Micro enterprises tend to be the least digitally advanced as their skills largely depend on the digital skills of the owner (Lewiatan, 2016). Many smaller Polish firms are online, use computers and operate websites, but they are much less likely to employ advanced technologies or hire dedicated ICT staff than larger firms. Online platforms can help firms find customers in a variety of sectors such as personal transport, accommodation, food services, retail trade, finance, entertainment, and personal services. They can help SMEs export by reducing the sizable entry costs of exporting related to finding foreign buyers and establishing distribution channels (Melitz, 2003). OECD evidence suggests that a strong platform presence can boost productivity, especially in service sectors and for small and medium enterprises (Pisu and von Rüden, 2021; Bailin Rivares et al., 2019).

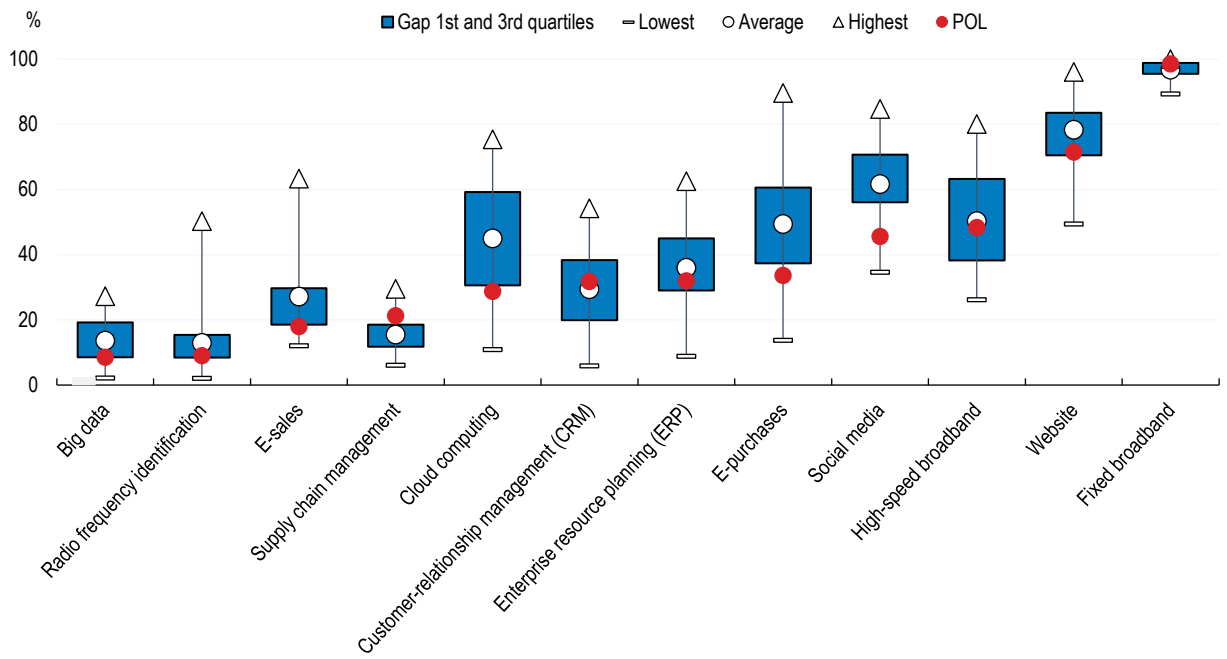
Adoption of more advanced digital technologies is slightly below the OECD average. Around 30% of firms use Enterprise Resource Planning software, Customer Relations Planning software and cloud computing. The use of big data and artificial intelligence is also somewhat below most other OECD countries (Figure 2.5). Most of the variation in technology adoption occurs within rather than between firms. Most

firms tend to use a combination of technologies for different business functions but to varying degrees of intensity (World Bank, 2022). This suggests that digital technology gaps are specific to each firm rather than common within sectors or across the economy.

The level of digitalisation varies by sector. Retail trade, media and professional and business services are some of the most digitally advanced sectors while transportation exhibits lower levels of ICT adoption (CASE, 2020). Even within sectors there can be significant variation. For example, within manufacturing more advanced sub-sectors have digitalised to levels similar to Western European countries while manufacturers of basic goods are much less digitalised and instead prefer to rely on lower cost labour. The appropriate digital technology might also vary by sector. E-commerce may be relevant for firms selling directly to many consumers. For some manufacturing companies, focusing on a small set of customers and selling larger volumes, robotisation and specialised production technology might be more appropriate (CASE, 2020).

Figure 2.5. Digital technology adoption is relatively low in Poland

Diffusion of selected ICT tools and activities in enterprises, 2021 or latest
Share of enterprises with ten or more persons employed



Note: ERP systems are software-based tools that can integrate the management of internal and external information flows, from material and human resources to finance, accounting, and customer relations. Here, only sharing of information within the firm is considered. Cloud computing refers to ICT services used over the Internet as a set of computing resources to access software, computing power, storage capacity and so on. Supply chain management refers to the use of automated data exchange applications. Big data analysis refers to the use of techniques, technologies, and software tools for analysing big data. This, in turn, relates to the huge amount of data generated from activities that are carried out electronically and from machine-to-machine communications. Social media refer to applications based on Internet technology or communication platforms for connecting, creating, and exchanging content online with customers, suppliers, or partners, or within the enterprise. Radio frequency identification (RFID) is a technology that enables contactless transmission of information via radio waves.
Source: OECD ICT Access and Usage by Businesses Database, http://oe.cd/bus.

StatLink https://stat.link/ic4n3l

The level of robotisation tends to be relatively low. Within the European Union, Poland had 42 robots per 10,000 industry workers, lower than the level of around 130 robots in Czech Republic and Slovakia and below the best performers such as Sweden with 262 robots per 10,000 industry workers (Leśniewicz and Święcicki, 2021). While industrial composition and lower relative wages can partly explain the lower density of robotisation, there is scope for a higher adoption of industrial robots in production.

The use of teleworking has accelerated with the pandemic. This can partly boost productivity as it allows for more efficient and intensive work, although teleworking can have drawbacks as well (Criscuolo et al., 2021). In 2019, around 4.6% of employed people aged 15-64 in Poland reported usually working from home, but this rose to around 8.9% in 2020 (Eurostat, 2022a). Teleworking increased strongly in ICT and knowledge-intensive sectors, but the overall rise was smaller than in most European countries as these sectors account for a comparatively smaller share of total employment (Milasi, Gonzalez-Vazquez and Fernandez-Macias, 2021). Teleworking is likely to persist as the share of advertised vacancies including teleworking has remained higher even as pandemic restrictions have eased (Adrjan et al., 2021). Three quarters of workers who had worked remotely would like to combine remote work with office work (Radziukiewicz, 2021). Teleworking should be encouraged where feasible as it can catalyse digitalisation within firms, particularly SMEs, and it can also widen the pool of workers available to firms, potentially easing local skill shortages.

There are multiple drivers of comparatively lower ICT adoption in Poland. One of the key reasons is firms overestimating their own technological sophistication. According to the Technology Adoption Survey, most Polish firms think they are more advanced than their competitors and the difference between perceptions and actual levels of technological adoption is most pronounced for the least technologically advanced firms (World Bank, 2022). Polish firms tend to overestimate the costs of new technologies and to undervalue the benefits. This is consistent with other studies which suggest that many firms perceive no need for ICT investment. When they do invest in ICT, the main obstacles include insufficient funds and a lack of time (Orłowska and Żołądkiewicz, 2018; Lewandowski and Tomczak, 2017). A study focused on the manufacturing sector suggests insufficient capital expenditure, weak administrative capacity and a lack of skills as driving lower adoption of more advanced technologies. For some firms a perceived lack of government support is also an obstacle (Jankowska et al., 2022).

The government has mostly focused on demand-side policies and introduced various programmes to support digitalisation. In 2019, the “Future Industry Platform” foundation was set up by the Ministry of Economic Development and Technology (MRiT). It is run with the goal of accelerating the digital transformation of industry through promotion of and technical support for new technology adoption. Five digital innovation hubs have been set up to support firms under a pilot programme in 2019-21 in Gdańsk, Kraków, Poznań, Warsaw and Wrocław and some will continue as European digital innovation hubs in 2023. In 2022, the authorities introduced tax relief allowing firms to additionally deduct up to 50% of their robotisation costs. Currently, the Polish Agency for Enterprise Development (PARP) is running several pilot programmes to support digitalisation. One of them offers grants up to EUR 180,000 to help SMEs in the furniture industry to invest in robots. PARP also runs programmes such as “Vouchers for digitalisation”, covering 700 firms, and “Digital Manager”, covering around 850 firms, that provide financial support, training and advisory support to companies investing in digital technology.

To facilitate digital investment in firms further, the authorities should consider expanding targeted technical and advisory support. While many ICT investments can be profitable, SMEs often lack the knowledge and skills to choose the appropriate ICT tools, which results in low demand for ICT investment (World Bank, 2022). There is a need for proactive consultancy and advisory services to stimulate demand. Unfortunately, only a few consultancies focus on smaller firms and, to the extent these exist, SMEs might be financially unable to finance such services. In the manufacturing sector, the Future Industry Platform programme tries to raise awareness by promoting Industry 4.0 technologies, while also offering advisory and technical support for implementing new technology. PARP is another agency that offers advice and support to both new and existing firms, and its programmes often support product or process innovation. One option would

be for agencies such as PARP, to expand and broaden stand-alone consulting services to advise SMEs on how to digitalise and provide financial and technical support to those firms that invest in ICT. Another complementary option could be for the Future Industry Platform to widen its reach across sectors and promoted technologies. Given the heterogeneity across and within sectors, such support should be tailored and customised to firms' specific circumstances. In this respect, widespread use of assessments that determine firms' ICT needs would be useful. Box 2.1 sets outs different approaches OECD countries have taken to help SMEs digitalise.

Box 2.1. OECD countries use a wide range of policies to help SMEs digitalise

OECD countries offer a wide range of policies to help SMEs digitalise, ranging from grants that subsidise investments in digital technologies to training to help firms implement investments at their own cost.

Australia's Small Business Digital Champions project supports 100 small businesses. The project has a total budget of AUD 8.9 million and provides up to AUD 18 500 in assistance, with additional support from partner firms. Of these small businesses, 15 were chosen as Digital Champions and received mentoring from high-profile business people to guide them through the digital transformation. This process is then documented and showcased online. The programme is complemented by the "Digital Solutions" programme of the Small Business Advisory Service. SMEs pay a (subsidised) fee for advice on implementing digital technologies, such as websites, e-commerce, social media, and small business software. The programme also offers advice on online security and data privacy.

In **Denmark**, the Danish Business Authority distributes grants (valued at approximately EUR 1300) to 2000 SMEs under the SMV:Digital programme. The grants are used for private consultancy to help the SMEs identify digital opportunities with a special focus on e-commerce, prepare business cases for digital transformation and implement digital solutions.

Portugal also has a grant scheme to assist SMEs with the use of digital technologies in fields such as e-commerce, online marketing, website development and big data. The grant covers 75% of eligible expenses up to EUR 7 500 for projects that take up to one year to implement.

Austria helps SMEs digitalise through the KMU Digital programme. The programme includes: 1) an online tool to allow firms to assess their level of digital maturity; 2) an individual consultation to examine what can be improved and how; 3) a consultation focused on the specific needs of the firm (in areas such as e-commerce, IT security, data protection and digitalisation of internal processes); and 4) digital skills training courses for entrepreneurs and employees.

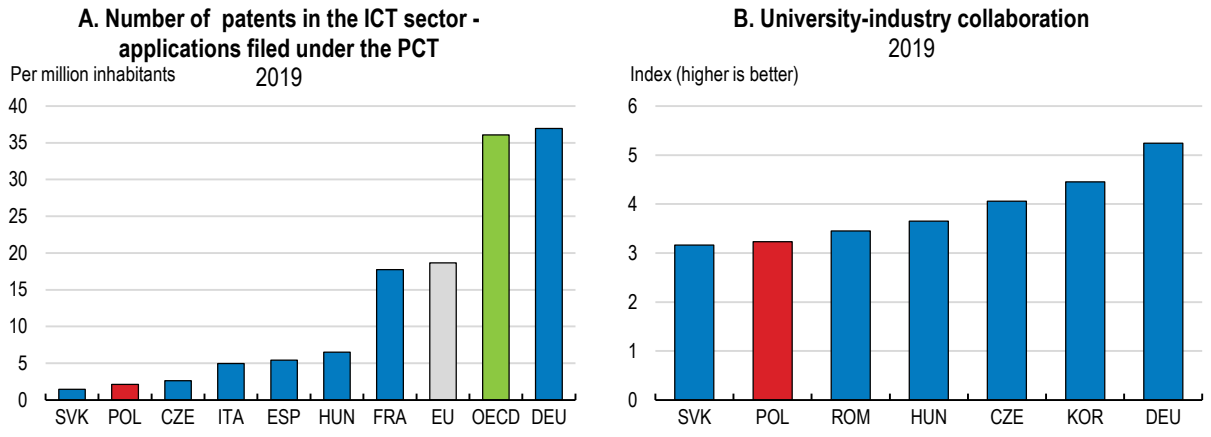
Chile's innovation agency recently launched the Digitalise Your SME ("Digitaliza tu Pyme") programme to provide e-commerce courses (78 hours of classroom experience), in which small business owners can learn about digital marketing, the use of social networks and electronic commerce. By the end of the programme, participants should understand processes associated with e-commerce such as the use of online platforms.

Source: OECD, Digital Economy Policy Platform (DEPP), edition 12/12/2021, https://depp.oecd.org/

Innovation is essential for a digitalised economy

Poland should boost its ICT innovation capabilities. Although R&D investment has increased steadily since 2015 and has been catching up to neighbouring European countries, it was around 1.4% of GDP in 2020, which remains lower than in the Czech Republic and well below the OECD average (OECD, 2022d). R&D by ICT firms is also relatively low. Poland's innovation system's performance is the fourth lowest in the EU, similar to Slovakia's performance but below the Czech Republic and Estonia (EC, 2022d). While computer science research is relatively prominent, it is less successful in terms of practical innovation. The rate of high-tech patents is similar to other Central and Eastern European countries, but significantly below the EU average (Figure 2.6 – Panel A). ICT patents make up around 10% of overall patents, far below the EU and OECD averages. Collaboration between universities and industry is on par with other countries in the region although a little below the Czech Republic and significantly below top performing countries like South Korea and Germany (Figure 2.6 – Panel B).

Figure 2.6. ICT innovation is low and could be better linked to industry



Note: Panel A - PCT is the Patent Cooperation Treaty. It refers to so-called priority dates, corresponding to first filling worldwide.
Source: OECD MSTI database; World Economic Forum, Global Competitiveness Index.

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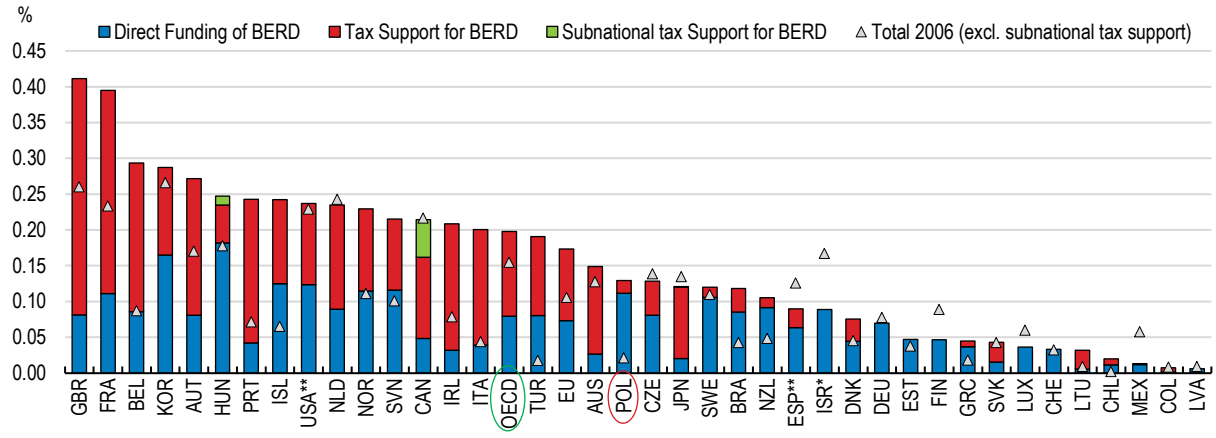
Successive reforms by the authorities have removed barriers and markedly increased incentives for R&D investment since 2016 when an enhanced, volume-based R&D tax allowance was introduced (OECD, 2021d). In 2022, a tax package called "Polish Deal", including a broad range of tax incentives to boost innovation and attract foreign investment, came into effect. More specifically, there are incentives for organisations conducting R&D that lower the cost of collaboration between firms and research institutions, incentives for investing in automation and robotisation, enhancing/developing new products and patents, and expanding businesses. For example, the new law entitles firms to deduct 200% of employees' costs in R&D from their tax base, up from 100% (EY, 2021). This should boost innovation, but the impact will need to be evaluated over time. The EU Smart Growth programme has helped fund innovation in Poland but the government could also consider boosting direct funding for R&D, focusing the additional funds specifically on ICT (Figure 2.7). In addition, Poland's "State purchasing policy 2022-25" aims to allocate 20% to innovative solutions (EC, 2022a).

Improving national research capacity and strengthening links between research and the private sector will help drive innovation including in ICT. Poland used to account for only 0.4% of global research and 64% of active researchers have only published with a domestic affiliation (Kamalski and Plume, 2013). In 2022,

10 Polish universities ranked in the Shanghai Top 500, up from two in 2016. However, Poland should continue to improve its academic research output through internationalisation because this tends to be positively correlated with higher scientific quality. It is important to enhance the internationalisation of existing staff further, continue to expand faculty and student exchanges, and bring top foreign academics and researchers to Poland to pursue cross-border collaborative research (EC, 2017). Furthermore, Poland should incentivise universities and research institutes to pursue more collaboration with industry when undertaking R&D and strengthen the role of technology transfer and commercialisation efforts (EC, 2017). Tax relief for cooperation between entrepreneurs and research institutions has been introduced and this should help.

Figure 2.7. Government support for R&D has been below the OECD average

Direct government funding and government tax support for business R&D, 2019



* Data on tax support not available, ** Data on subnational tax support not available.
Source: OECD R&D Tax Incentives Database, http://oe.cd/rdtax, April 2022.

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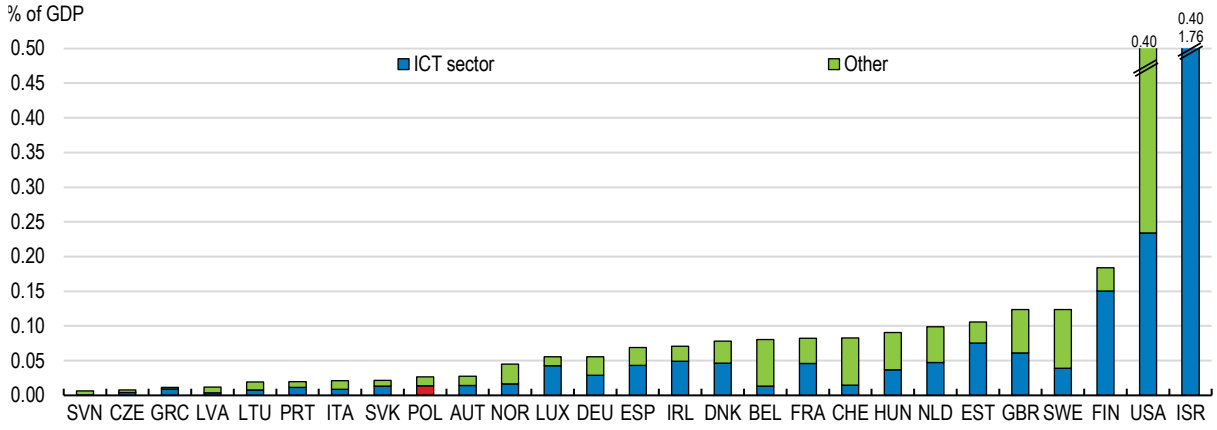
Financing digital investment

Expanding access to finance for new and innovative firms is important for digital innovation, both in the digital sectors and more widely. The system supporting start-ups has been rapidly developing recently. Poland has a higher share of ICT start-ups than the OECD average. Venture capital (VC) funding was relatively low in 2020 (Figure 2.8). However, it has been growing fast and expanded from PLN 2.2bn in 2020 to PLN 3.7bn in 2021, partly supported by the EU-funded “Start in Poland” programme. In 2021, there were 113 active VC funds and a third of the transactions by value came from public-private funds, focusing mostly on smaller transactions (PFR, 2021). Within the Polish Development Fund (PFR), PFR Ventures helps support start-ups through investment across a range of venture capital and private equity funds. Earlier stages of start-up development have been supported by a government agency, PARP, through incubation and accelerator programmes across the country. However, as the system has been maturing it will be important to make finance available for new companies at later stages. In this respect, PFR Ventures should continue its financial support of the Polish start-ups and expand into later stage financing up until the new firms’ initial public offerings.

Figure 2.8. Venture capital in the ICT sector could be boosted further

Venture capital investment breakdown, 2021 or latest available



Source: OECD Entrepreneurship Financing Statistics.

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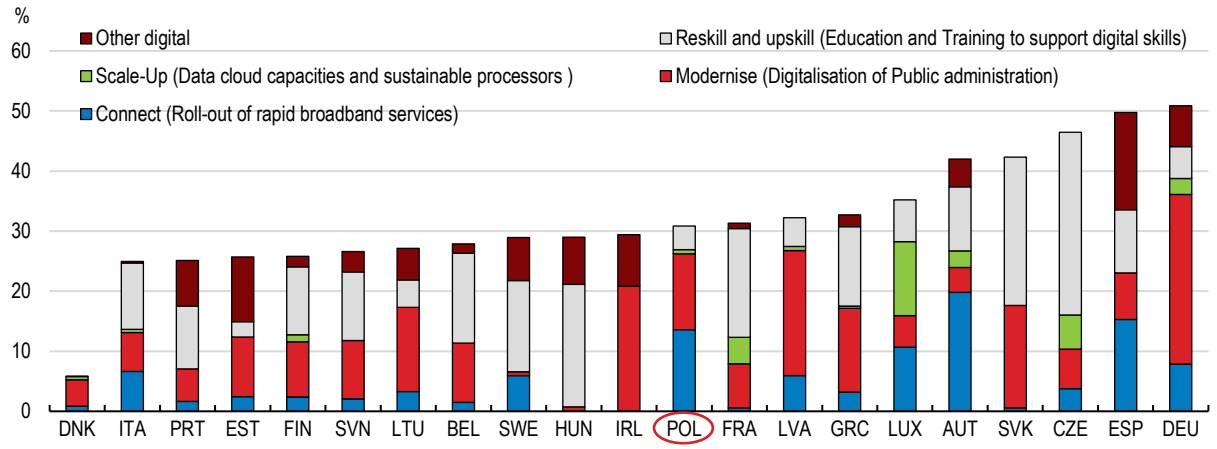
One constraint facing small and young digital firms is access to bank funding. Intangible assets, such as intellectual property (IP) and software are not easily used as a collateral to access debt finance because they often do not have a market value, are not easily separable from the firm and often cannot be transferred without a loss. In order to support the digital take-up and ease credit for SMEs, several OECD countries have established new programmes to support IP-backed loan and IP valuations (Box 2.2). The government could consider creating a collateral registry to improve SME access to loans (OECD, 2021g). Estimating the creditworthiness of small firms is particularly difficult and costly, and the related uncertainty drives up interest rates and tightens lending conditions.

To complement private sector finance, Poland is also using public funds. In particular, it plans to rely on substantial financial support from EU funds to finance digitalisation. At least a third of its national Recovery and Resilience Plan (RRP), EUR 11.1bn or 1.9% of 2021 GDP, will go to digital projects (Figure 2.9). The funds will be allocated across a range of projects that aim to improve digital administration and e-services, encompassing infrastructure, public sector worker skills, administrative process efficiency and analytical capacity for decision-making. However, the plan focuses mostly on digital connectivity and the public sector and not enough on supporting digitalisation in the private sector. In addition, RRP funds have been delayed and there is significant uncertainty around their disbursement.

Figure 2.9. Around a third of national Recovery and Resilience Plan spending is for digital projects

Overall resource allocation in national recovery and resilience plans, % of total RRF grants and loans



Source: Bruegel.

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Box 2.2. Intellectual property (IP)-backed loans and IP valuation schemes for SMEs across the OECD

Several OECD countries have implemented programmes supporting intangible-intensive SMEs to get access to bank loans. Selected examples include:

- The **French** public investment bank Bpifrance provides uncollateralised loans and bank loan guarantees to SMEs to support their digitalisation. Support is available for investment in intangibles, including intellectual property and software.
- The Bavaria Digital (**Germany**) initiative provides digital SMEs with loans on favourable terms for a total amount of up to EUR 1 million. In order to reach more SMEs, the application process was streamlined to reduce the administrative burden and part of the application cost is covered by a grant from the State of Bavaria.
- The **Japan** Patent Office and the country's Financial Service Agency assess the value of intellectual property of SMEs. They finance and conduct IP evaluation reports of SMEs, which inform the lending decisions of banks.
- The **Korean** Development Bank's Techno Banking initiative provides loans to SMEs for purchasing, commercialising, and collateralising intellectual property. The Bank also established a collection fund for distressed intellectual property for the disposal of intangible assets. In addition, the public Korea Credit Guarantee Fund provides credit guarantee schemes, some of them supporting intangibles as collateral. As in Japan, the Korean Intellectual Property Office estimates the value of SMEs' IP to facilitate loans by the Korea Development Bank and the Korea Credit Guarantee Fund.

Source: OECD (2019), Financing SMEs and Entrepreneurs 2019: An OECD Scoreboard.

Speeding up and upgrading the communications infrastructure

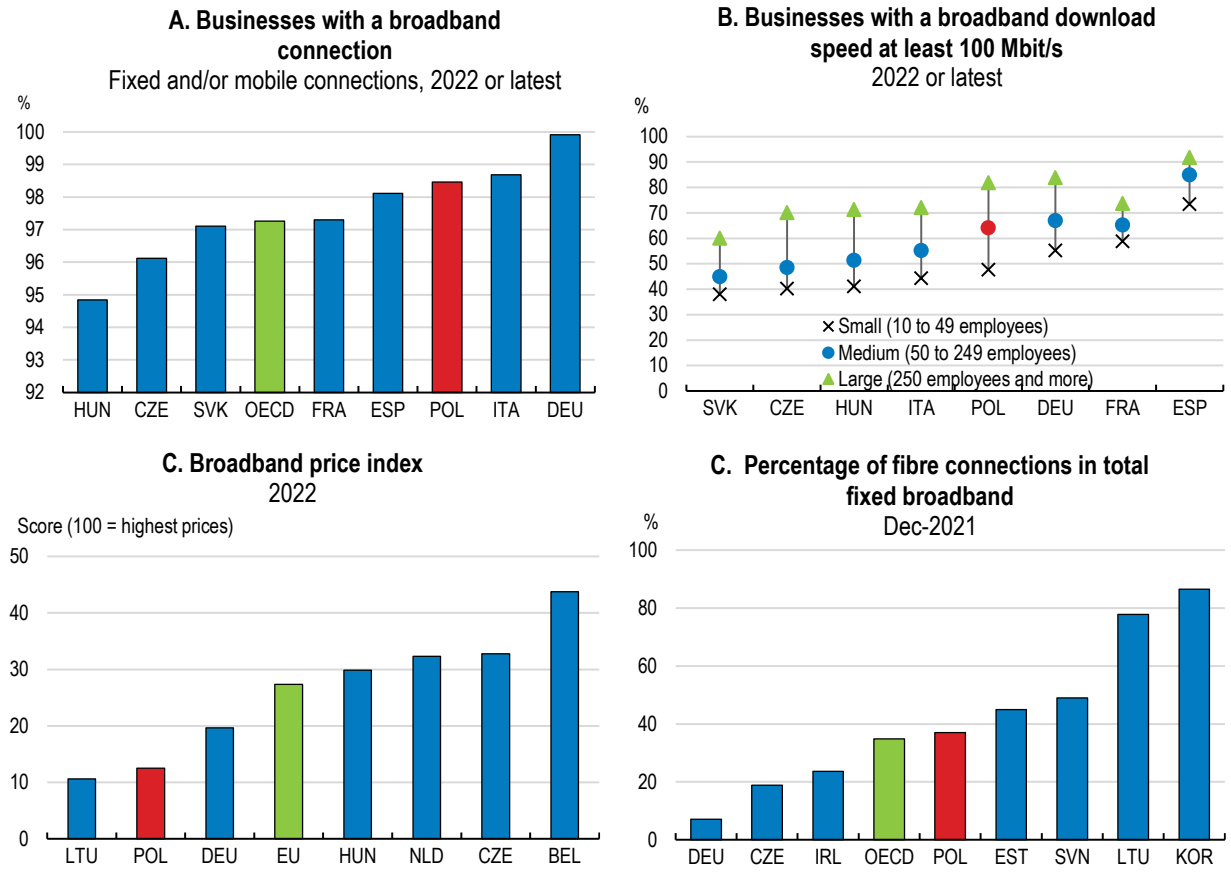
Reliable connectivity is essential for the digital transformation. The COVID-19 pandemic fueled demand for broadband communication services. Some operators have experienced as much as a 60% Internet traffic growth compared to before the crisis. Gigabit networks and 5G are likely to become the underlying connectivity behind the Internet of Things and artificial intelligence and for connected devices in critical contexts, including in health, energy or in transport sectors (OECD, 2020a). This underscores the need for ultra-reliable, low-latency networks (OECD, 2018). In the future, communication networks will also need to become more flexible and, in this sense, 5G may allow the same network to cater to objects with diverse quality features (OECD, 2019f).

Overall, the communications infrastructure in Poland is relatively good. The share of households and businesses with access to the internet has increased in 2021 and the rural-urban divide is small. Access to higher internet speeds has risen, but could improve further. Fixed broadband speeds and latencies are higher than the OECD average while mobile broadband speeds are below average. Prices for fixed and mobile broadband are among the lowest in the EU. However, internet usage is not as intense as in other countries. Broadband penetration as measured in terms of subscriptions is below the OECD average and the share of firms with fast broadband could be higher (Figure 2.10).

Work is ongoing to improve the infrastructure further. The authorities plan to draw on the Recovery and Resilience Facility (RRF) and the European Regional Development Fund (ERDF) to finance their future connectivity ambitions. The government estimates that both the RRF and the 2021-2027 ERDF will contribute around EUR 2 billion to the broadband inclusion of at least 1.5 million households in areas with no internet infrastructure, increasing the share of households with access to the internet to over 80% and boosting participation in the digital economy. The main goal of the Polish Digital Transformation Strategy for 2025 outlined in the National Broadband plan is to ensure universal internet access with downstream connection speed of at least 100 Mbps with the option to upgrade to gigabit speeds, providing at least 1Gbps for educational establishments, transport hubs and data-intensive companies, and 5G connectivity on all major communication routes and in major urban centres (EC, 2022b).

Deployment of 5G is planned for 2023. Some operators have rolled out 5G using existing infrastructure and without a dedicated 5G spectrum. This has resulted in some of the lowest 5G speeds in Central and Eastern Europe. In May 2020, the Polish government cancelled the auction of the 3.6 GHz band due to security concerns about adequate cybersecurity levels for the new network. The authorities decided to revise the legislation on the national cybersecurity system to address emerging new threats, including those coming from Poland's eastern borders, and make its networks safer and more robust to cyber risk. The technical preparations for 5G auctions in 700MHz and 3.6GHz have been completed and the auctions can proceed once amendments to cybersecurity laws have been finalised. The government should accelerate the legislative process and conduct the 5G auctions in order to speed up the development of a dedicated 5G network.

Figure 2.10. Network connections are widespread but firms could take advantage of higher speeds



Note: (Panel A) % of enterprises with 10+ employees. (Panel C) The broadband price index measures the prices of representative baskets of fixed, mobile and converged broadband offers. The index is normalised to the range 0 to 100, with 100 being the worst score referring to the highest prices.
Source: OECD ICT database on business usage; and OECD, Broadband Portal, http://www.oecd.org/digital/broadband/broadband-statistics/; and European Commission, DESI 2022.

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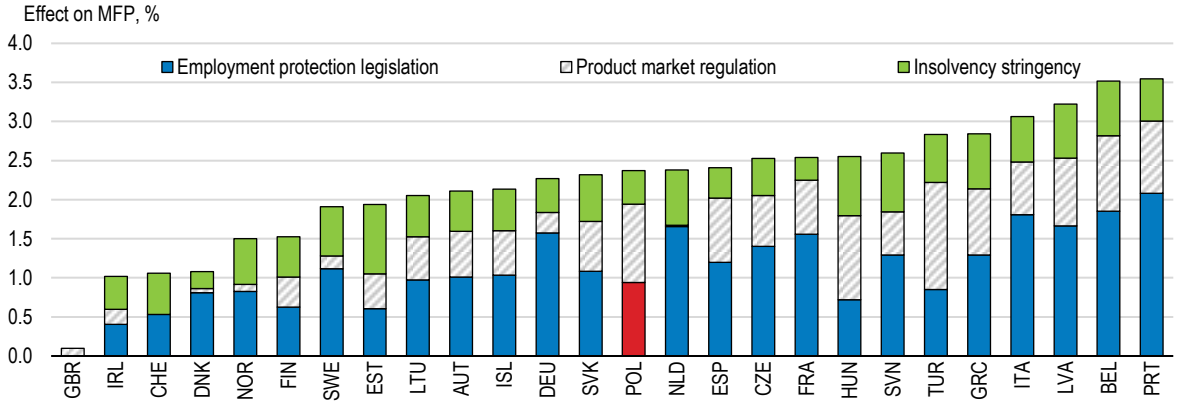
Ensuring a good regulatory framework

A favourable business environment provides the foundations for digital diffusion and productivity growth (Sorbe et al., 2019; OECD, 2018). In general, Poland has a good business environment with business-friendly regulations and low barriers to trade. However, despite significant reforms over the past two decades, some of its administrative, tax and legal procedures can still present barriers as they take longer than in other OECD countries (OECD, 2022f).

Poland should continue to streamline market regulations to support the digital transition and boost productivity (Figure 2.11). Overall, regulatory barriers to competition are slightly above the OECD average. Government ownership is still relatively high and government involvement is above average. The administrative burden on start-ups is higher than in many OECD countries, making it more difficult to start digital businesses. However, the government has recently been easing the burden through reforms, such as simplifying reporting and tax obligations for smaller businesses.

Figure 2.11. More favourable product and labour regulations could boost productivity

Effect on productivity after three years (through digital adoption) of reducing regulatory barriers to reallocation



Note: Estimated effect on multi-factor productivity (MFP) of the average firm from closing one-fourth of the gap to countries with least stringent labour protection on regular contracts, administrative barriers to start-ups and insolvency regimes.
Source: Sorbe et al. (2019), "Digital Dividend: Policies to harness the potential of digital technologies", OECD Economic Policy Papers, No. 26.

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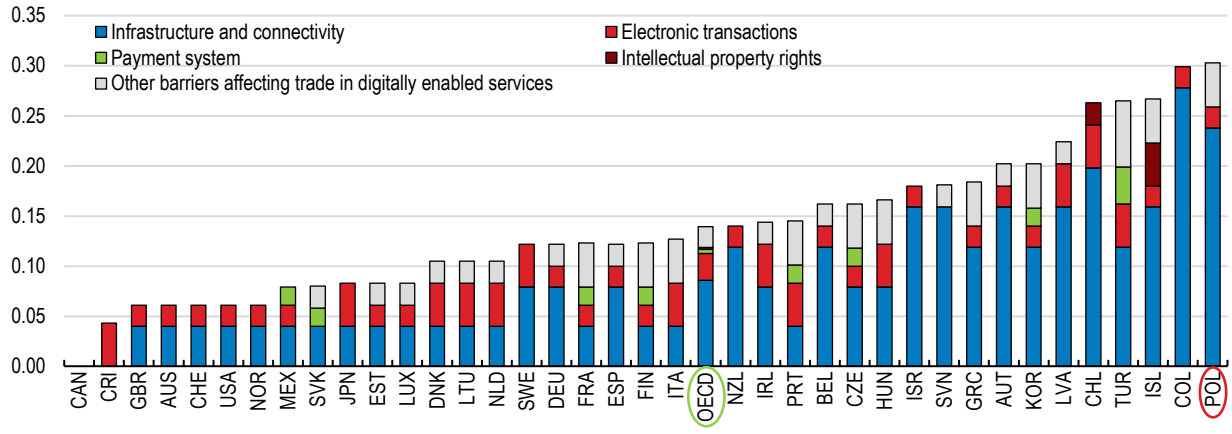
In terms of restrictions on trade in services, Poland is slightly more restrictive than the OECD average and could benefit from more open markets in trade for services. For example, it could relax labour market tests and quotas that apply to natural persons seeking to provide services in the country on a temporary basis as intra-corporate transferees, contractual services suppliers, and independent services suppliers. These may be particularly important for attracting workers and know-how in the digital sector. Digital services barriers are also higher than the OECD average (Figure 2.12). Regulation that limits access to high quality communication services and measures that hinder the seamless transfer of data across borders should also be reviewed.

Figure 2.12. Digital services trade restrictiveness is high and could be lowered

2022



Note: STRI indices take the value from 0 to 1. Complete openness to trade and investment gives a score of zero, while being completely closed to foreign services providers yields a score of one.
Source: OECD Digital Services Trade Restrictiveness Index database.

Online markets are becoming increasingly important in Poland. The use of online shopping is comparable to the OECD average and has grown strongly during the pandemic. There is a large domestic e-commerce platform, Allegro, competing with global e-commerce platforms such as Amazon. Trust in online payments is high and above the OECD average (OECD, 2022a).

Effective and independent regulation of digital markets is important to support their development. A salient feature of online markets are network effects, which imply that new users will be drawn to platforms that are already large thus leading to further increases in their size. This can be beneficial as it can increase efficiency of market matching and boost growth. But it can also be detrimental to markets as winner-take-all dynamics emerge and lead to a dominance of a few firms, weakening competition and resulting in rent extraction (OECD, 2019d). Competition authorities need to guard against such dynamics while, at the same time, supporting their development by ensuring fair and strong competition.

The Office of Competition and Consumer Protection (UOKiK) has actively pursued consumer infringement cases in online markets. It has also organised educational campaigns for schools such as 'Konsument.edu.pl' about safe online shopping behaviour. Such campaigns should be extended to a wider audience. Furthermore, UOKiK has developed recommendations around correcting tagging in influencer marketing. Effective monitoring of online markets requires understanding of new technologies such as algorithms and to this end ensuring sufficient qualified staff will be key. For example, in Japan, the Act on Improving Transparency and Fairness of Digital Platforms promotes transparency to ensure fair online participation in e-commerce (OECD, 2022e). In the field of digital financial services, the Polish Financial Supervision Authority (UKNF) offers regulatory and virtual sandboxes aimed at supporting new financial technology firms. These initiatives can be valuable and should be continued.

Active and timely anti-competition policy is key to ensuring well-functioning online markets. UOKiK works with the European Union to inform its approach and develop its capabilities. It has implemented the ECN+ Directive that will strengthen UOKiK's independence and grant it more powers. The EU Digital Services Act, entering into force in 2024, will better regulate online platforms and digital services in the Single Market. While the authorities have been active in implementing evidence-based anti-trust regulations, it will be particularly important to guard against 'killer' acquisitions, in which larger companies acquire smaller ones for the purpose of reducing competition. For example, German regulatory authorities may require every company in an industry to notify an acquisition (OECD, 2022e). To help develop expertise in digital markets, the authorities could consider establishing a digital markets unit as has been done in the United Kingdom (OECD, 2022e).

Upgrading skills for a digital transition

Digital skills are key for a successful transition

Digital skills encompass a range of abilities to use digital devices, applications, and networks to access and manage information as well as to create new services. Basic digital skills allow for simple access and use of digital devices and online applications for personal and work purposes. They are viewed as a critical component of a new set of literacy skills along with traditional literacy abilities. Advanced digital skills enable the use of complex technologies such as artificial intelligence, machine learning and big data analytics to complement work and develop new applications. Effective digital skills are underpinned by strong literacy and numeracy skills, critical and innovative thinking, complex problem solving, collaborative and socio-emotional skills (OECD, 2016d).

Poland has made great progress in increasing formal educational attainment over time. The share of 25-64 year olds with tertiary education has risen to around 30% in 2021, having been 9% in 2000 and one of the lowest in the EU. During the same period the share of adults with education below upper secondary levels has halved to 13% (Eurostat, 2022b). This has been driven by strong growth in educational

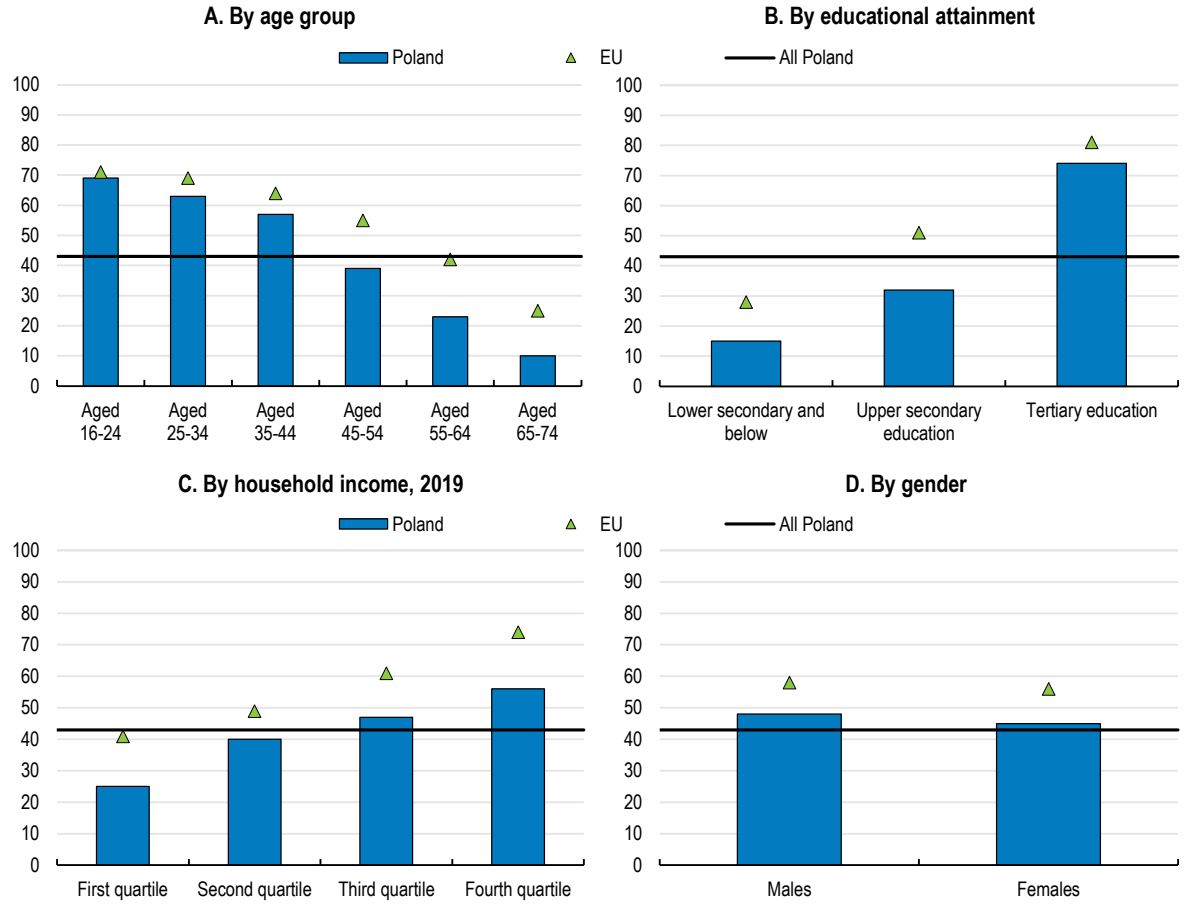
attainment among young adults. Since 2000, the share of adults aged 30-34 with tertiary education has more than tripled to around 45% and Poland now has some of the lowest shares of low-educated young adults in the EU (Eurostat, 2022b). Over the past two decades, PISA scores have increased significantly and Poland ranked among the top 10 countries in 2018 (OECD, 2019g).

Yet, a number of adults, particularly among older people, still have low general skills that are likely to limit their ability to learn new digital skills. This can be explained by education and age. Similar to other OECD countries, educational attainment seems to have the largest effect on literacy skills. In Poland, adults with a tertiary education have literacy proficiency scores about 55 points higher than those who have not attained an upper secondary qualification, after adjusting for other differences such as age and parents' educational attainment (OECD, 2019a). Older adults are more likely to be less skilled than younger adults. For example, the share of adults aged 25-34 with tertiary education was 41% in 2021, near the EU average, but this was around 17% for adults aged 55-64.

Competency in digital skills reflects the general skills composition of the adult population. Basic digital skills among Poland's adult population are below the EU average and decline with age. The share of young adults with basic or above basic overall digital skills was between 60-70% in 2021 but this declines to 40% for those aged 45-54 and falls further to 10% for 65-74 year-olds. Digital skills tend to increase with educational attainment. Differences by gender are relatively small in aggregate (Figure 2.13).

Figure 2.13. Digital skills are low among older adults

Share of individuals who have basic or above basic overall digital skills, 2021



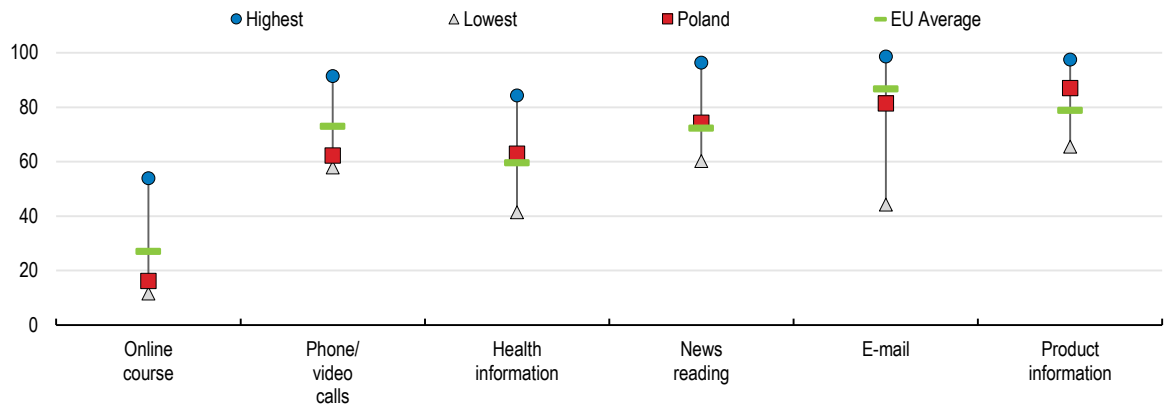
Note: Data by educational attainment and by gender refer to individuals aged 25-64.
Source: Eurostat.

StatLink https://stat.link/fz9t26

The use of digital skills in Poland tends towards basic and less intensive applications. Around three-quarters of adults use a computer over the year, similar to the EU average. But the proportion of those using the internet on a daily basis is around 60%, some 10 percentage points below the EU average (Eurostat, 2021a). Furthermore, the use of ICT is skewed towards more basic applications (Figure 2.14). For personal purposes, the most common uses are looking for information and using social media. At the same time, the use of some more complex services, such as online public services or e-banking, is much lower. For work purposes, the use of ICT is even lower. Around 40% use word processing software, 27% use software for creating presentations, while 13% use more advanced spreadsheet functions, all lower than the EU average. Older and less educated adults are less likely to use advanced and intense ICT applications. However, data from the PIAAC survey suggests that problem-solving abilities in technology rich environments have been relatively low and below the OECD average for all age groups (Figure 2.15).

Figure 2.14. The use of digital skills is relatively limited and basic

Share of 25-64 years-olds who used the internet in the last three months, 2022



Source: Eurostat.

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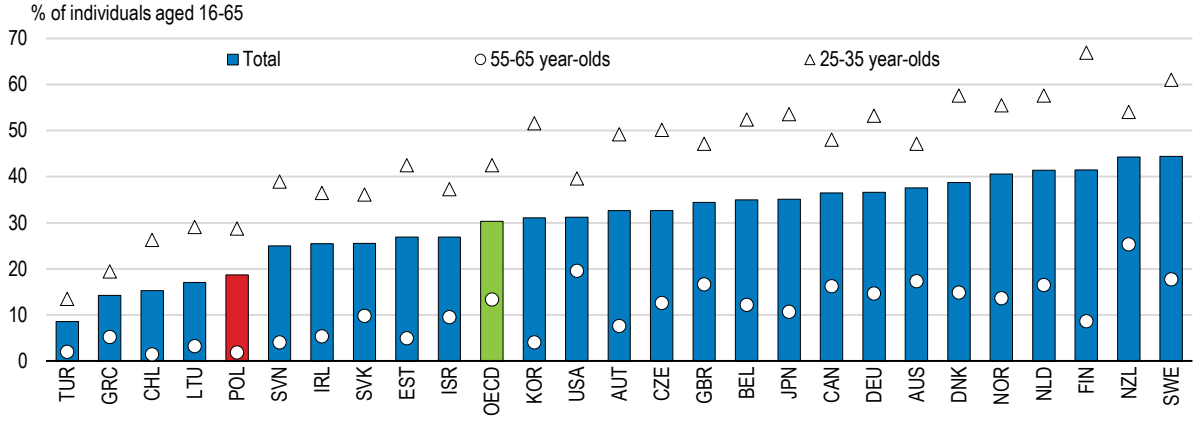
Figure 2.15. Problem-solving in technology-rich environments has been low in Poland

Problem solving in technology-rich environments by age, individuals in employment



Note: Problem solving in technology-rich environments refers to Level 2 or Level 3 of PIAAC proficiency and measures adults' abilities to solve the types of problems they commonly face as ICT users in modern societies: co-ordinated use of several different applications, evaluating the results of web searches, and responding to occasional unexpected outcomes. For most countries, data refer to 2012; for Chile, Greece, Israel, Lithuania, New Zealand, Slovenia and Turkey, data refer to 2015. Population weighted average used for the OECD aggregate.
Source: OECD Survey of Adult skills (2012 and 2015).

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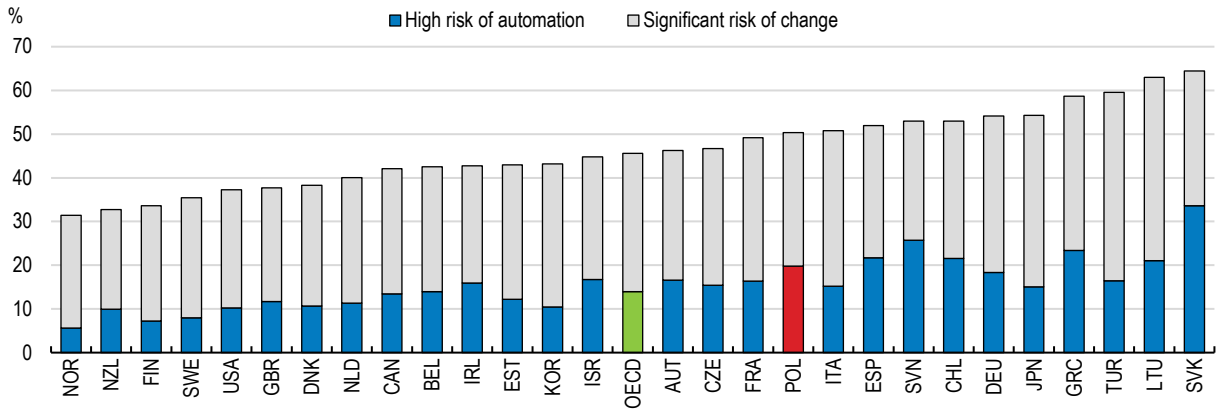
In order to use and benefit from new digital tools, people need to learn new skills. Around half of existing jobs are at risk of automation (Figure 2.16). Adults will need to upgrade their skills to adapt and benefit from evolving needs in the labour market, while some will need to re-skill. Without the requisite skills, digitalisation can reduce wages for some or lead to higher unemployment, potentially excluding and harming parts of society and exacerbating existing inequalities. The Integrated Skills Strategy 2030, adopted in 2019 and partly based on the OECD Skills Strategy for Poland (2019a), provides a national framework that guides skills development. The upcoming "Digital Competence Development Programme until 2030" will aim to increase the level of digital skills for work and personal applications.

Figure 2.16. Many Polish workers are exposed to digitalisation

Share of jobs that are at a high risk of automation or at risk of significant change (%)



Note: Jobs are at high risk of automation if the likelihood of their job being automated is at least 70%. Jobs at risk of significant change are those with the likelihood of their job being automated estimated at between 50 and 70%. Data for Belgium correspond to Flanders and data for the United Kingdom to England and Northern Ireland.
Source: OECD calculations based on the Survey of Adult Skills (PIAAC) (2012); and Nedelkoska, L. and G. Quintini (2018), "Automation, skills use and training", OECD Social, Employment and Migration Working Papers, No. 202, https://doi.org/10.1787/2e2f4eea-en.

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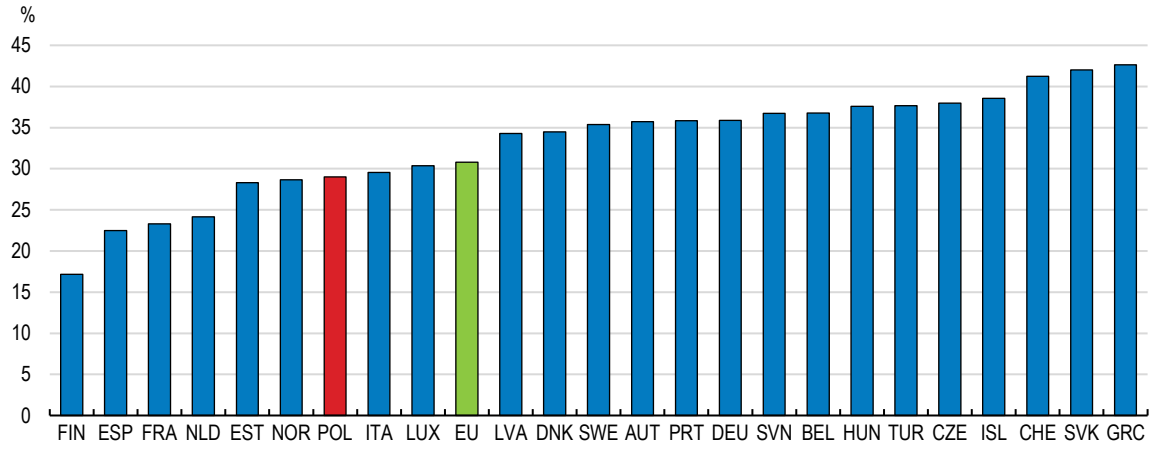
Expanding digital skills in vocational education and training

Nearly half of young Poles possess vocational and education training (VET) qualifications, higher than the EU average with almost a half studying towards engineering, manufacturing, and construction qualifications. The level of digital skills among the young (16-24 years old) with upper secondary education is lower than in the best performing European countries such as Greece and Slovakia (Figure 2.17). To boost the level of digital skills among VET graduates, policies should focus on ICT teaching capacity and equipment. Teachers' digital competencies are instrumental for their students' capacity to make the most out of new technologies. There is a significant positive relationship between teachers' problem-solving skills in technology-rich environments and students' performance in computer problem solving and computer mathematics (OECD, 2019a). The pandemic has also highlighted the need for adequate ICT equipment in schools in order to teach digital skills and teach in a digital environment.

Figure 2.17. Young workers with VET qualifications have weaker digital problem-solving skills

% 16-24 year olds with upper secondary education who have basic overall digital skills*, 2021



Note: *All five component indicators are at basic or above basic level, without being all above basic.
Source: Eurostat (isoc_sk_dskl_i21).

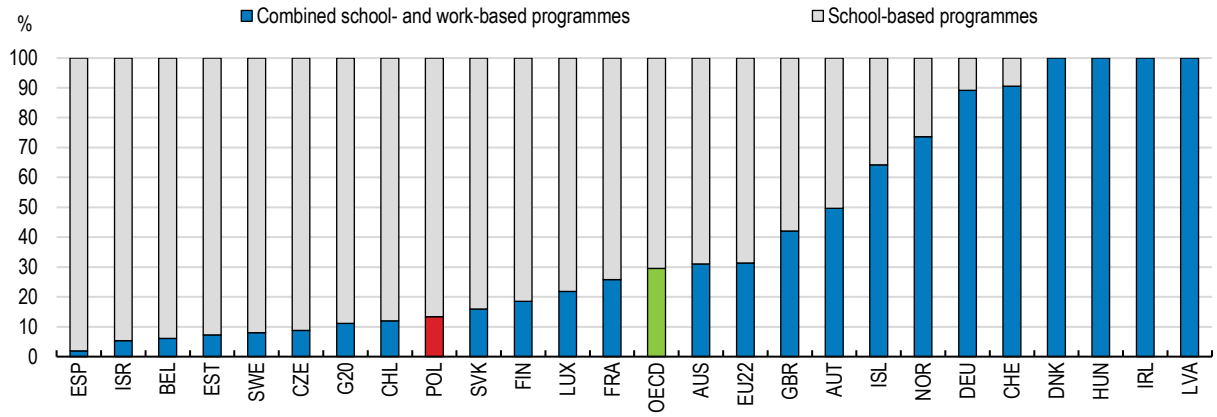
StatLink https://stat.link/f8rk79

The role of local employers in the development of digital education could be further strengthened. Poland established sectoral skills councils that bring together educational sector representatives, employers, and other social partners. Their aim is to monitor, identify and define skills required in different sectors in order to help shape formal education curricula and market development services. This should make it easier for firms to hire skilled workers. For example, core curricula for ICT VET were developed in close cooperation with the ICT sector. Since 2019 a new qualification, “technical programmer”, is offered and schools teaching this programme receive additional funding. Overall, almost 20% of students (134,000) in technical upper secondary schools are studying towards ICT-specific qualifications. In addition, the skills councils advise authorities on skill gaps in the private sector, which then informs the design of training and advisory services programmes operated by PARP. The number of sectoral councils is to expand from 17 to 27 and they are financed by EU funds until 2027. Given their importance, funding should be ensured on a continuous basis. In addition, given they are relatively new, they should be evaluated with experiences and the different councils should share experience and best practices.

To boost digital skills the role of work-based learning in VET programmes could be expanded. Polish schools are legally obliged to cooperate with employers including on work-based learning. In principle, VET students training in the industry should have access to the latest technologies, which could help them develop more advanced and applied digital skills, complementing what they have learned in school. In Poland, most of the VET programmes are school-based although the latest statistics underestimate the importance of work-based learning, due to methodological issues (Figure 2.18). In countries with strong apprenticeship systems, such as Germany and Switzerland, around 90% of programmes combine school and work. Polish VET students that attend a mixed programme spend nearly half their time in industry. VET programmes could include more work placements in digitally advanced firms and the legal requirements for schools to cooperate with employers should encourage more work-based learnings. Monitored use of such work placements could boost students’ digital skills.

Figure 2.18. Work-based VET learning could be more prominent

Distribution of upper secondary VET students by type of vocational programme, %, 2020



Source: OECD Education at a glance database.

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Poland has made progress in providing ICT education in VET and the wider school system. ICT equipment, online educational resources and teachers' digital skills have been improved through the Active blackboard ("Aktywna tablica") and Laboratories of the Future ("Laboratoria przyszłości") projects, the Integrated Education Platform, and the Nationwide Education Network. This has been funded by EU and national budgets. The share of teachers taking digital education training doubled between March and September 2020, reaching 81% (NIK, 2021). However, some schools were still inadequately equipped. The Supreme Audit Office (NIK) found that in 2020/21, 25% of schools had average or poor ICT equipment. Half of teachers indicated that they used private equipment and internet access to teach remotely (Figure 2.19). When asked about improving digital education, two-thirds of teachers suggested that having a laptop with an internet connection would be useful. They also reported that better quality (31%) and greater availability (25%) of training on digital education and its integration in initial teacher education would help (EC, 2021b). Currently, two large projects, covering 105,000 teachers, are supporting the development of teachers' digital skills and training in providing distance education. Poland should continue to increase its technical and teaching educational capacity in schools for ICT. VET teachers could also be given specific support to teach practical ICT skills. A good example is Denmark, where dedicated support centres have been established for VET teachers (see Box 2.3).

Skilled teachers are crucial for delivering high-quality education in this context. Poland has experienced teacher shortages while the appeal of the teaching profession remains low. In 2020/21, 46% of surveyed schools had problems with recruiting qualified teachers, mostly for physics, mathematics, chemistry, English and computer science. While vacancies accounted for 1% of all teaching jobs, the staffing needs were greater in larger cities. Shortages were addressed mostly through overtime work, employing retired teachers and people without the necessary qualifications (EC, 2021b). Polish teachers' enthusiasm in teaching is among the lowest in the European Union (OECD, 2019a). The range of teachers' salaries, adjusted for purchasing power, is similar in Hungary and Czech Republic but is below most EU countries (Eurydice, 2022). However, the authorities provide incentive payments and allowances for performance and starting salaries were increased by around 25% in 2022. To ensure high quality teaching capacity, the authorities should continue to ensure the attractiveness of the teaching profession.

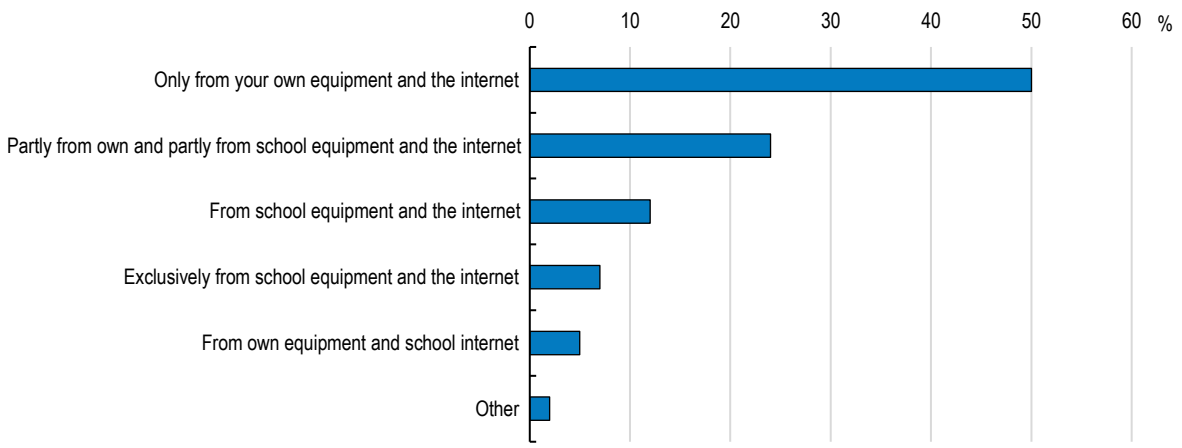
Box 2.3. Specialised centres to promote technology use in VET in Denmark

The "Knowledge Centre for IT in Teaching" promotes the use of digital technologies in VET by supporting teachers in the use of IT across all subjects. The Danish government created two Knowledge Centres for Automation and Robot Technology, promoting innovation in education and industry and helping VET schools make use of advanced technologies. Each centre works with over a dozen nearby VET schools. They provide teachers with educational material, such as teaching tutorials or short courses in Industry 4.0 and robots. Specialised facilities are used to demonstrate the use of robots to teachers and students. The centres lend digital machinery to VET teachers, provide them with training materials and technical support, with the objective of enabling teachers to set up and operate these technologies and incorporate them into their teaching practice. The centres also provide technological resources for VET programmes in the areas of industrial automation, mechanics, electronics, welding, data and communication, and education. The centre also has a network of pedagogical staff and a network of school leaders to facilitate the exchange of ideas, practical and technical knowledge, and help identify solutions to common challenges.

Source: (OECD, 2021d).

Figure 2.19. Schools need to be better equipped with ICT

Use of ICT equipment in teaching during 2020



Source: National Audit Office of Poland.

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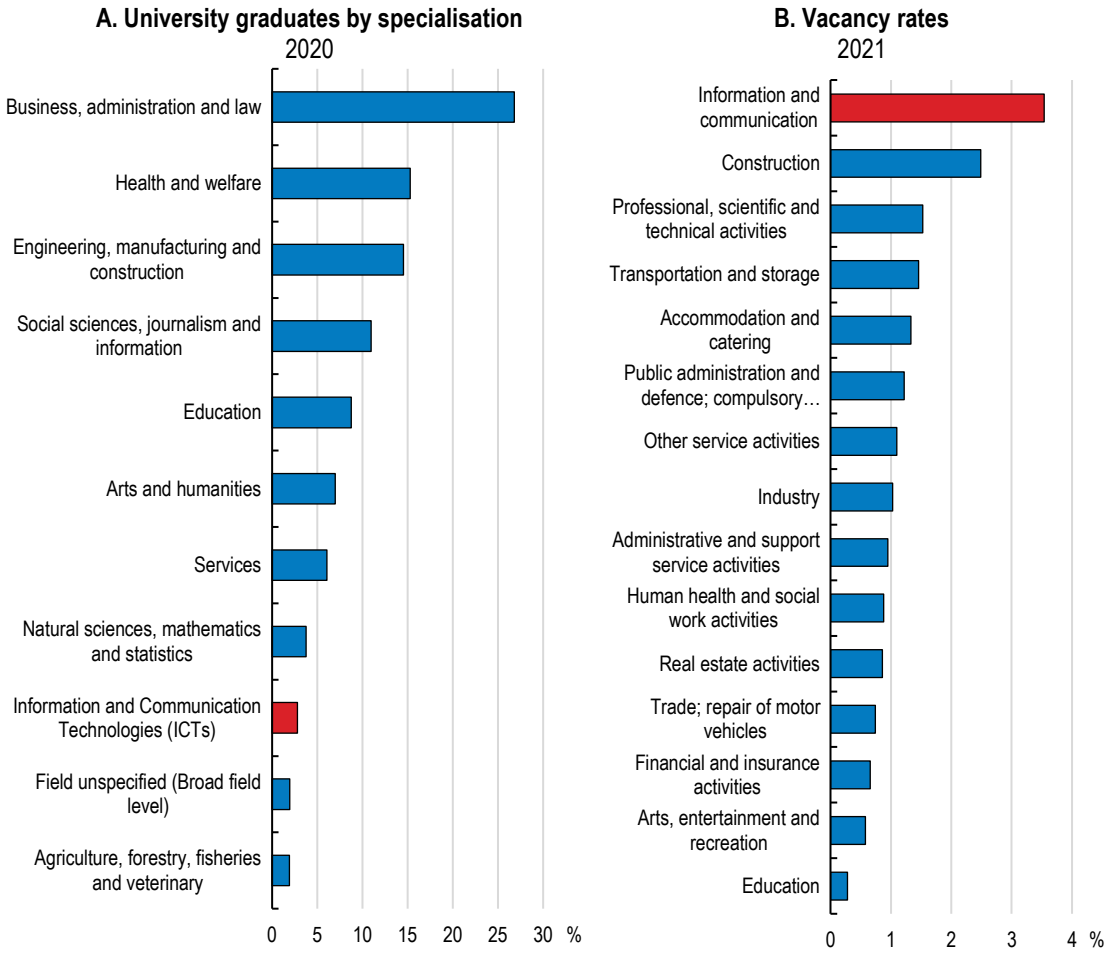
Universities could provide more ICT specialists

The main constraint for the Polish economy appears to be the inadequate supply of ICT graduates. In 2019, only 3% of Polish university graduates (around 4,500) specialised in ICT. But the demand for jobs in the ICT sector was much stronger. In 2019, there were 7,500 ICT vacancies, accounting for around 2.2% of all employment in the ICT sector. By 2021, the number of vacancies had risen to 12,000 or 3.5% of all ICT jobs. This was the highest vacancy rate across all sectors (Figure 2.20). Demand for ICT specialists has risen due to a rapidly growing ICT sector, in which employment rose by 60% between 2012 and 2021. Salaries for ICT workers are 60-70% higher than the national average salary (Statistics Poland, 2021). The shortages will partly be addressed by new VET ICT programmes but universities could also raise the number of ICT graduates.

Figure 2.20. There are many vacancies in ICT and not as many ICT graduates



Source: Statistics Poland; OECD Education at a Glance database.

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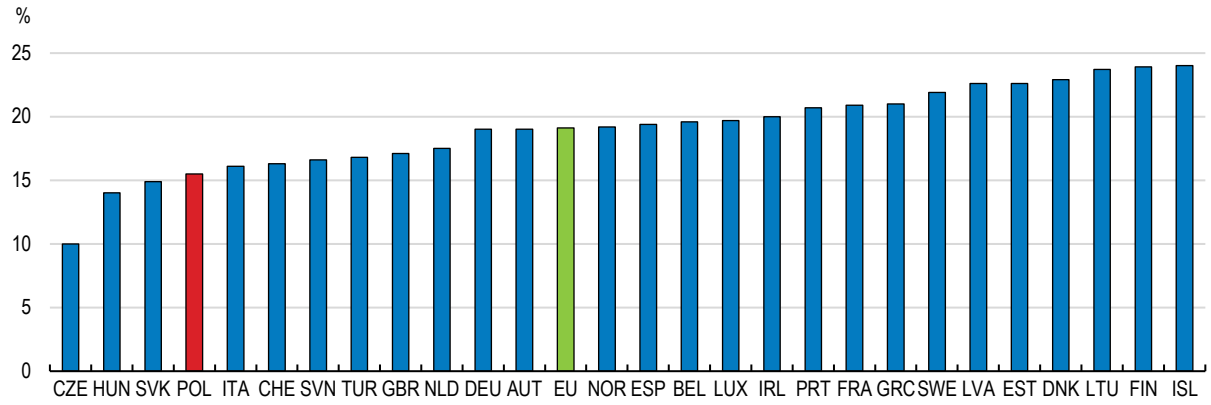
Universities can also boost digital skills through more flexible programmes. Dual degrees that combine ICT with other disciplines might increase the number of graduates with relevant ICT qualifications. Students in science, engineering and mathematics are well placed to also learn ICT skills. The Higher Education and Science Act allows higher education institutions to cooperate with professional industry bodies and employers in the development of new qualifications. This gives universities flexibility to adjust degrees in other areas such as business, which could offer ICT specialisations or recognised certificates. In general, universities could offer more certified programmes in ICT, which could be integrated into official programmes or offered as micro-credentials to adults who have already graduated (OECD, 2021a).

To increase the number of ICT graduates and to increase gender equality, Poland should encourage more women to study ICT. Within the EU, ICT employment remains dominated by men. The share of female ICT specialists in Poland is around 15%, similar to the Czech Republic, Slovakia, and Hungary. However, it is below the EU average of 19% and almost twice as low as in Romania and Bulgaria (Figure 2.21). The Perspektywy Education Foundation has organised a national campaign called “Girls and Engineers!” and “Girls go Science” in cooperation with the Conference of Rectors of Polish Technical Universities. The campaigns involved 150,000 girls and promoted technical and engineering studies among high school girls. This boosted the share of women in STEM programmes from 29% to 37% (EIGE, 2022a). The

Foundation also runs activities such as “Lean in STEM”, “Girls Go Start-Up! Academy”, “Girls to Learn!”, “IT for She”, and a scholarship programme for IT students, “New Technologies for Girls” (EIGE, 2022b). Poland has a number of active NGOs and professional organisations supporting women in ICT. To further boost the number of female ICT specialists similar targeted campaigns should be continued and expanded but aimed specifically at ICT. Even though university attendance is free, the government or businesses could offer additional scholarships to female ICT students.

Figure 2.21. There are relatively few women in ICT in Poland

Women ICT specialists share, 2021



Source: Eurostat (isoc_sks_itsps).

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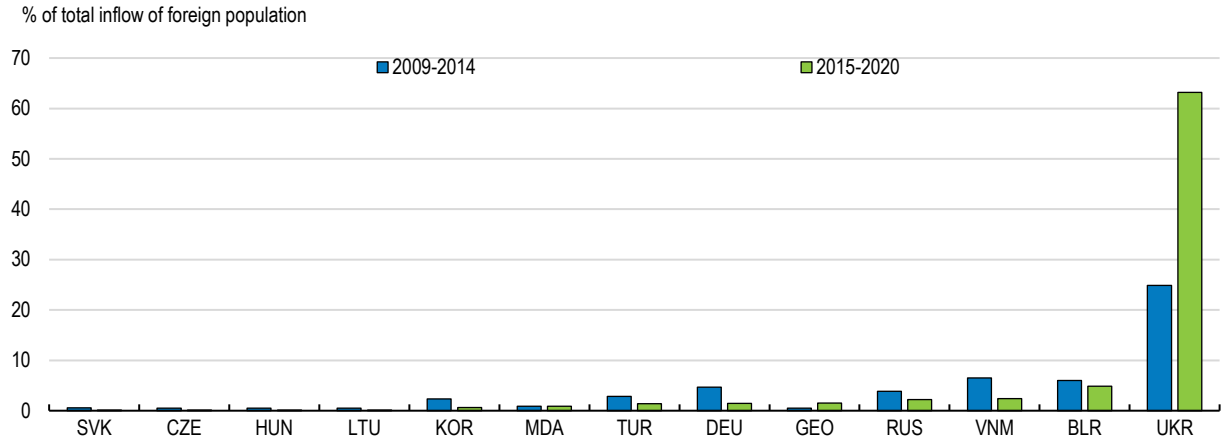
Migration could help to increase the supply of ICT specialists relatively quickly. Polish ICT graduates have strong incentives to emigrate to other EU countries. Despite the ICT sector paying the highest salaries, Polish ICT salaries are below the EU average and considerably lower than in neighbouring Germany. However, Poland has become an attractive country to work in, which is illustrated by an increase in immigration since 2014 (Figure 2.22). This was mostly driven by Ukraine but also by immigration from Belarus, Moldova, and Georgia. To attract ICT professionals, the government launched a new programme “Poland. Business Harbour” to draw in ICT entrepreneurs and specialists from Belarus and later expanding to Armenia, Georgia, Moldova, Russia and Ukraine. The programme has now been extended globally. Polish companies must be approved before they can sponsor ICT workers and currently 200 firms can do so. The challenge for the government is to increase the number of firms that can hire migrant ICT specialists and ensure there is sufficient technical capacity to process higher numbers of migrant worker visas. In this regard, the government could focus its resources on key countries, such as India.

Figure 2.22. Immigration has increased over the past decade



Note: Includes permanent and "fixed-time" residence permits.
Source: OECD Migration database.

StatLink https://stat.link/25l1qt

Lifelong and life-wide learning can address digital skill gaps among adults

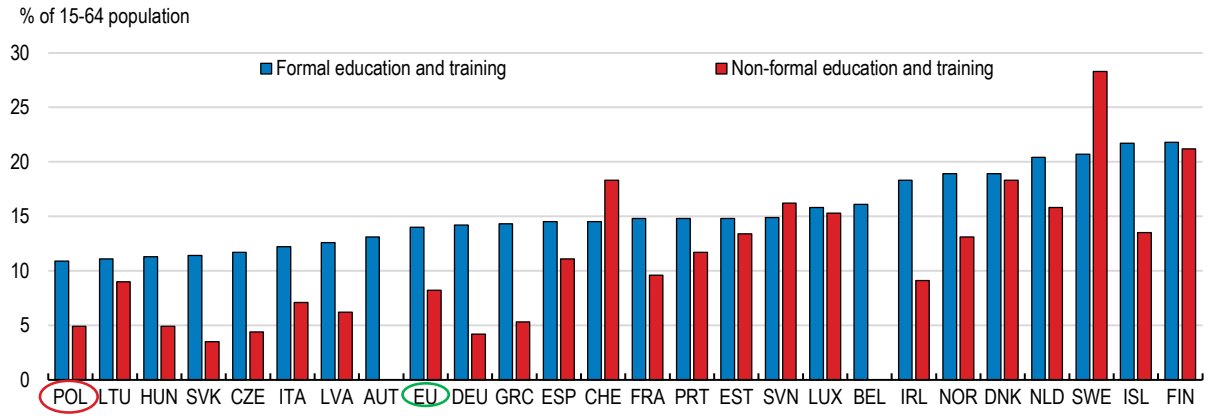
Targeted and relevant adult learning can address many of the digital skill gaps in Poland associated mainly with older adults. This learning should be lifelong, accessible to everyone at any age, and life-wide, encompassing learning outside of formal education systems, which is the main mode of learning for adults aged over 25. Adult lifelong and life-wide learning can take different forms and occur in various environments. Effective adult learning systems are crucial for developing and updating skills in response to digitalisation (OECD, 2019a).

Participation in adult learning is relatively low. In Poland, most learning during the course of adults' lives is non-formal. According to the latest Adult Education Survey (AES), only 4.4% of adults participated in formal training in 2016, which is learning that leads to a qualification, broadly in line with the EU average. More adults learned non-formally and 23% learned through on-the-job training, other forms of work-based learning, workshops, seminars and organised distance learning as well as through social involvement. Around 30% of Polish adults learned informally from colleagues, family or by themselves. More recent Labour Force Survey data show that adult participation in formal learning has remained low in 2022, relative to other EU countries (Figure 2.23). National BKL survey data, based on broader definitions of adult learning, points to higher rates of participation as most adults aged 25-64 develop their skills through non-formal and informal learning.

Low demand, rather than limited supply, is holding back adult participation in organised training. In Poland, as in other OECD countries, low levels of motivation to learn lead to low demand for training. According to the AES, around 60% of adults reported that they did not participate, and do not want to participate, in formal and/or non-formal education. A further 15% reported they did participate but did not want to participate more. Overall, the share of adults uninterested in formal and/or non-formal education is around the EU average. But few adults report that there is a lack of suitable learning opportunities or that distance was an obstacle to training (OECD, 2019a). According to the BKL, less than 10% of adults indicated that relevant organised training was not available close to them, and a few per cent said that the existing training offers were not useful to them (BKL, 2020).

Figure 2.23. Adult participation in formal learning is low in Poland

Adult participation in learning in the last 4 weeks, as % of the population aged 15-64, 2021



Source: Eurostat (trng_lfs_09).

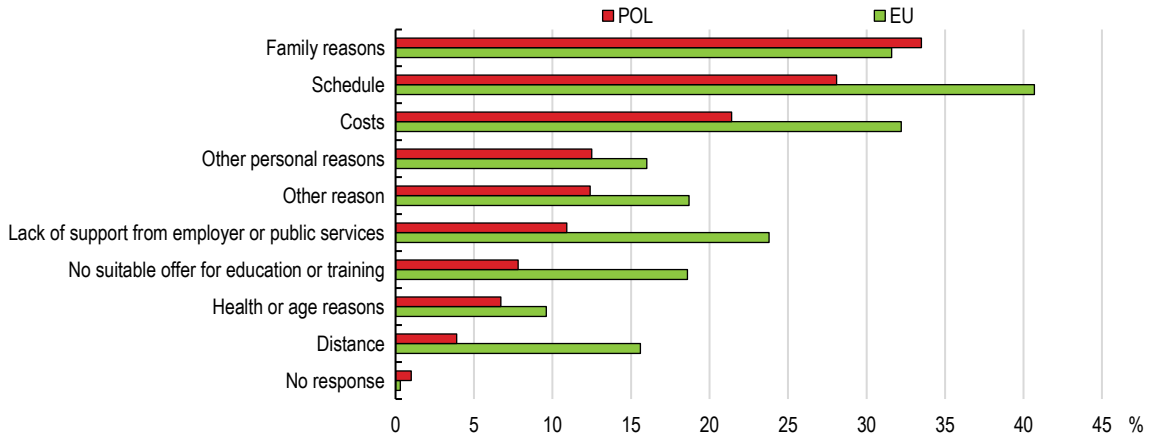
StatLink https://stat.link/5ylgq1

The main reason holding back demand for participation in organised adult learning is an absence of a perceived need for further training (BKL, 2022a). For those working adults who wanted to participate but did not, the most commonly cited obstacles were family responsibilities and scheduling issues (Figure 2.24). The cost of education was also frequently cited as an obstacle. The interest in developing professional competence declines with skill levels. For example, 70-80% of those in managerial and professional occupations show interest in training. In contrast, only 40% of service and sales workers reported any interest in further education and this fell to 26% among unskilled workers. Older adults with low levels of education see little incentives to continue learning (BKL, 2022a).

Policy needs to reduce informational frictions that lead to perceptions of low returns to learning, improve matching the supply of adult education and training to demand, and effectively support the development of general digital skills, especially among those less skilled. Many Polish workers and firms perceive that the return to investing in digital skills is lower than the cost of the investment, despite high returns in terms of wages and employment. Various policies such as awareness campaigns, engagement with social partners to promote learning and targeted guidance, can be effective in motivating adults to participate in education and training (EC, 2015). These take different forms across OECD countries (OECD, 2019a). In-depth case studies suggest that raising awareness of the benefits of adult learning can increase participation and boost workers' earnings (EC, 2015).

Figure 2.24. Family and scheduling reasons are obstacles to adult participation in training

Obstacles to adult participation in formal and non-formal education and training, 2016



Source: Eurostat, Adult Education Survey (trng_aes_176).

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To reduce informational frictions, OECD countries have used awareness campaigns (Table 2.1). Poland carried out a comprehensive nationwide campaign called *Edurośli* in 2019. This involved around 300 events spanning from conferences, seminars, workshops, open days, and meetings to shows, competitions and webinars and covered a range of topics. The campaign brought together different stakeholders such as government ministries, NGOs, schools, sports clubs, museums, libraries, community centres and local activists (MoES, 2019). The goal of the campaign was to emphasise the importance of continuous education and foster positive attitudes about lifelong learning as well as to increase participation in adult education. However, a lack of formal evaluation makes it unclear to what extent this was achieved. It also appears that such campaigns are organised *ad hoc*. To raise the level of digital skills, smaller, sustained and targeted campaigns that include social partners might be more effective in reaching those adults who stand to benefit and whose jobs could be at risk due to digitalisation (OECD, 2019a).

Table 2.1. Public awareness campaigns and their focus in selected OECD countries

	Focus						Name
	General Adult Learning	Specific Programmes	Specific Target Groups	Basic Skills	High-demand Skills	Firms	
Estonia	X	X	X	X			*Jälle Kooli* (Back to school again)
Germany		X	X	X		X	*Zukunftsstarter* (Future starter) *Nur Mut* (Courage)
Hungary		X					Hivatások éjszakája (Night of Vocations)
Ireland		X	X	X	X		Take the first step
Korea		X			X	X	Vocational skill month
Portugal	X	X		X			*Qualifica*
Slovenia	X	X	X	X			Lifelong learning week
Switzerland	X	X	X				*Simplement mieux* (Simply better)

Source: OECD (2019), *Getting Skills Right: Future-Ready Adult Learning Systems* https://doi.org/10.1787/9789264311756-en.

To improve matching of the supply of and demand for adult education, better coordination is needed. The responsibility for supplying adult education and training is spread across several institutions and should be coordinated. At the national level, the ministries responsible are the Ministry of Education and Science (MEiN), the Ministry of Family and Social Policy (MRiPS), the Ministry of Economic Development and Technology (MRiT), and Digital Affairs at the Chancellery of the Prime Minister. At the sub-national level, regions (voivodeships), and counties (*powiat*) have responsibility for formal educational facilities (OECD, 2019a). To maximise the impact of education policy, there should be effective coordination and information sharing. Social partners are also important for that process. Chambers of commerce and trade unions disseminate information, organise and support adult education and training for their members. Social partners participate in discussions and co-ordination of adult learning sectoral skills council and the Program Council on Competences (OECD, 2019a).

Regular and thorough evaluation of learning should be standard across all modes and providers. Formal and non-formal education is delivered by a diverse range of formal public education and training institutions and thousands of private providers of adult education and training. Informal learning is less structured and often self-taught. Learning methods also vary widely from teaching in classrooms to online learning and practical learning in the workplace from colleagues, family, and friends. More thorough and rigorous evaluation of education and training provision might identify effective ways of upskilling and re-skilling. Poland has already set up a graduate tracking portal (ELA) that provides additional information on the labour market outcomes of graduates from different disciplines in formal education. A similar tracking portal was developed in 2021 for Vocational Education and Training (VET) graduates. PARP regularly monitors and evaluates the Database of Development Services (BUR) that offers training to firms. However, there appears to be little rigorous analysis of the impact of adult training on labour market outcomes. Such analysis would help adults better choose their training and would better inform public funding and support for adult training programmes.

Digital skills may also provide a pathway to better employment for disengaged adults. However, they may be unable or unwilling to use public employment support services, or they can be overwhelmed by the range of training on offer. Guidance and counselling can be helpful (OECD, 2021f). Public employment services at the county (*powiat*) level are major providers of guidance services for the unemployed. Centres for information and career planning in regional (voivodeship) labour offices provide services to all adults. Employment agencies (*Agencje zatrudenienia*) provide jobseekers and employees with employment support and counselling while voluntary labour corps (*Ochotnicze Hufce Pracy*) make provisions for (disadvantaged) young people. Adults can receive guidance from education institutions directly as well as from non-governmental or private organisations (OECD, 2019a).

Counselling and guidance in Poland could be more extensive, detailed and proactive. The number of career advisers available to adults is low (OECD, 2019a). In 2017, there were 2,144 career advisers in the public employment service which equated to one adviser for 505 unemployed people. This declined in 2021 to fewer than 1700 advisers, increasing the number of jobless per adviser to 536 on average. In the past, career advisers did not fully assess and identify adult learning needs (Euroguidance, 2018). Such guidance should also be proactive and reach out to adults whose skills are most at risk of becoming obsolete. Some programmes do, however, reach out to adults to motivate them to learn (Box 2.4). While such projects are welcome, it is important that they are thoroughly evaluated.

Box 2.4. Reaching and training adults from disadvantaged backgrounds in Poland

The *'Lokalne Ośrodki Wiedzy i Edukacji'* or LOWE (Centres of knowledge and education) is a project that aims to reach parents and other adults in local communities in disadvantaged areas with difficult access to education in order to help them develop basic skills and other key competences to boost their prospects in the labour market, in the community and in their families. Equally important to encourage various institutions and organisations to increase adult training partly by developing methods and tools used by educators to work with adults. It is a collaboration between schools and local communities designed to offer non-formal education to adults in a variety of ways teaching many different competences, including digital skills.

LOWE supports adult education through finance and operational support. Five experienced organisations and institutions from Białystok, Bydgoszcz, Lublin, Krakow and Poznań were selected through a competition as organizers of 15-20 LOWE. The selected local educational organisations manage schools and support them with financial grants including substantive support such as a diagnosis of skills needs that forms the basis for educational offers. The programme conducts an assessment of the social environment, skills gaps and educational capabilities in each local area and provides organisational support to each LOWE centre through helping with management, training staff, communication, and promotional activities. Each selected organisation can receive a grant up to PLN 250,000 or around EUR 52,000 (LOWE, 2022).

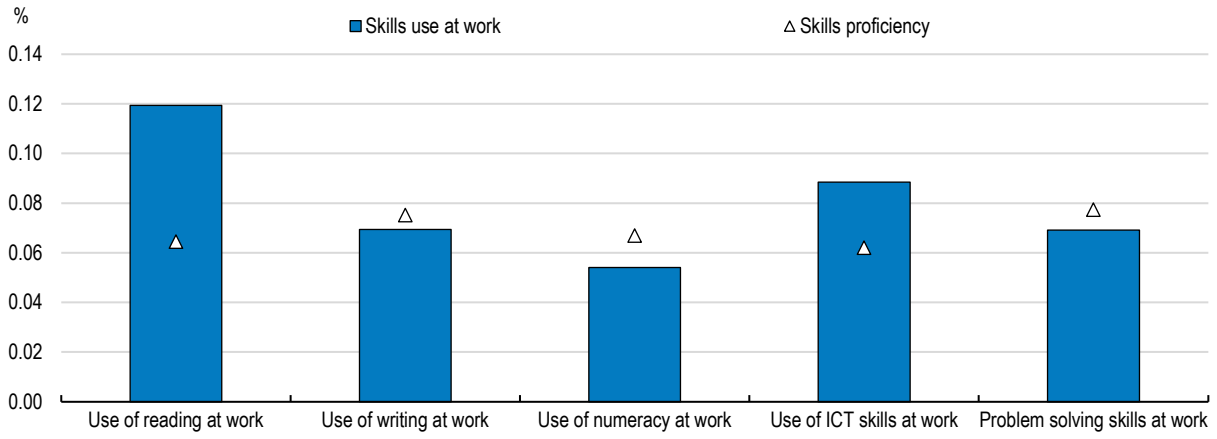
LOWE has expanded over time. In 2016-18, a pilot programme of 50 centres across 13 regions managed to successfully get 3700 adults to attend organised training, who previously did not participate or did so infrequently. The programme was then repeated in 2019-22 with 100 centres spread across all regions. It was financed jointly by Polish schools and the EU social funds.

Firms need to develop workers' digital skills

The returns to increasing skills can considerably boost wages and productivity. A higher level of skills and a more intensive use of skills within firms is associated with higher wages. Firms can play a key role in developing and using these skills. The highest increase in wages is associated with more use of reading skills at work. More intense use of ICT is complementary to basic skills and boosts wages the more it is used at work (Figure 2.25). This could be particularly beneficial for older workers and less educated workers.

Figure 2.25. Wage returns to skills use and skills proficiency in Poland

Percentage change in wages associated with a standard deviation increase in skills proficiency and skills use



Notes: A) One standard deviation corresponds to the following: 2.9 years of education; 47 points on the literacy scale; 53 points on the numeracy scale; 44 points on the problem solving in technology-rich environments scale; 1 for reading use at work; 1.2 for writing and numeracy use at work; 1.1 for ICT use at work; and 1.3 for problem solving at work.
B) Estimates from OLS regressions with log wages as the dependent variable. Wages were converted into USD PPPs using 2012 USD PPPs for private consumption. The wage distribution was trimmed to eliminate the 1st and 99th percentiles. All values are statistically significant. The regression sample includes only employees. Other controls included in the regressions are: age, age squared, gender and whether a respondent was foreign-born or not. Skills proficiency controls are the following: literacy for reading and writing at work, numeracy for numeracy at work and problem solving in technology-rich environments for ICT and problem solving.
Source: OECD calculations based on OECD (2017) Survey of Adults Skills database (PIAAC) (2012, 2015), www.oecd.org/skills/piaac/.

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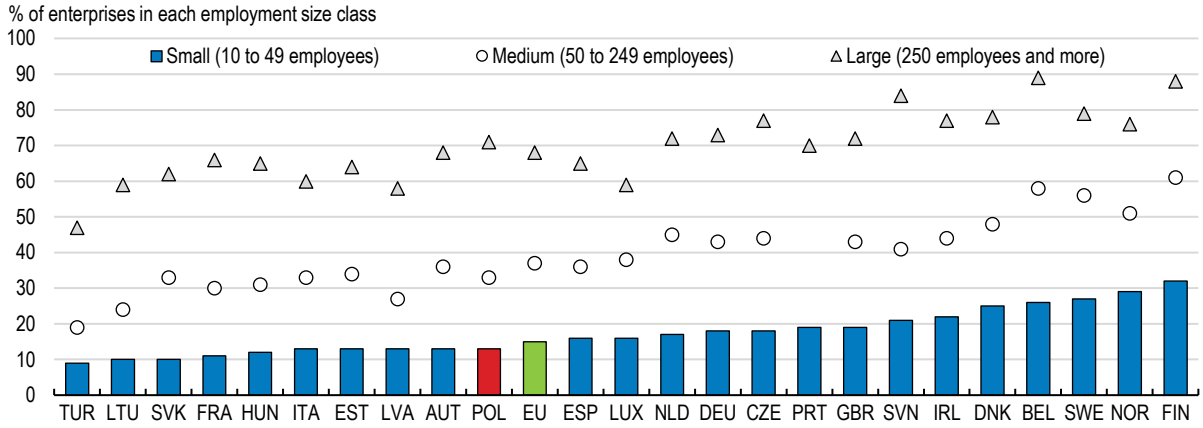
The level of training provided by Polish firms, including digital training, has risen but it remains relatively low. In 2015, 12% of all Polish firms provided training to their employees. This increased to 18% in 2019, similar to Austria, Latvia, and Estonia and just below the EU average (Figure 2.26). However, the prevalence of training provision declines with firm size. Among large firms, 70% have provided training, broadly in line with the EU average, but only 13% of small firms reported providing any training to their staff. However, more generic on-the-job training is relatively common in Poland with one in three employees participating in this type of training, a share comparable with the EU average (Eurofound, 2019). Nonetheless, a culture of firms actively supporting training for employees could be strengthened – 32% of firms had a training budget in 2021. Only one in three firms conducts an assessment of skills deficits among employees systematically while 44% do so occasionally. Around a fifth of firms did not offer any training to staff in 2021 with most of those firms reporting a lack of need to upgrade skills (BKL, 2022b).

Figure 2.26. Small firms provide less ICT training than larger firms

Percentage of businesses providing ICT training to their employees by size class, 2020 or latest year



Note: Firms with at least 10 employees that provided any type of training to develop the ICT related skills of their employees within the last 12 months.
Source: Eurostat (isoc_ske_ittn2).

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The government supports training in firms through three main channels. At the national level, one of the main government agencies for providing support to employers and entrepreneurs is PARP. For over twenty years, PARP has been contributing to the creation and effective implementation of policies related to enterprise development, innovation, and human capital development in enterprises. It targets primarily small and medium-sized enterprises (SMEs), with funding coming from the state budget and European funds. The second main source of support is the National Training Fund (*Krajowy Fundusz Szkoleniowy*, KFS). The KFS is a separate part of the Labour Fund that is financed by public funds and employer contributions. It is intended for co-financing the education and training of employees that is undertaken on the initiative of, or with the consent of, the employer. Its role is to prevent loss of employment because of the lack of adequate competences required in a dynamically changing economy. The third channel of support is made up of regional operational programmes that co-finance training in companies, partly funded by the EU. Increasing investment in human resources should improve the position of both companies and employees in a competitive labour market (OECD, 2019a).

Poland should increase awareness of training support programmes among firms, broaden their coverage and increase their funding. The uptake of the KFS has been limited in the past by its size. Around a third of applications in 2017 were unsuccessful due to a lack of funds. For the approved applications, the average amount received was below the maximum. Survey evidence suggested that low awareness and administrative complexity led to low participation by firms (Grabowski and Janiszewski, 2016; Szymańska and Ostrogórska, 2015). This suggests that reaching out to firms, specifically SMEs, could be productive in raising firms' demand for training. Furthermore, the size of the KFS could be increased and the authorities are planning to increase funding in the coming years. A larger KFS should be used to widen the range of firms that benefit from training support but any public training should be careful not to crowd out private courses.

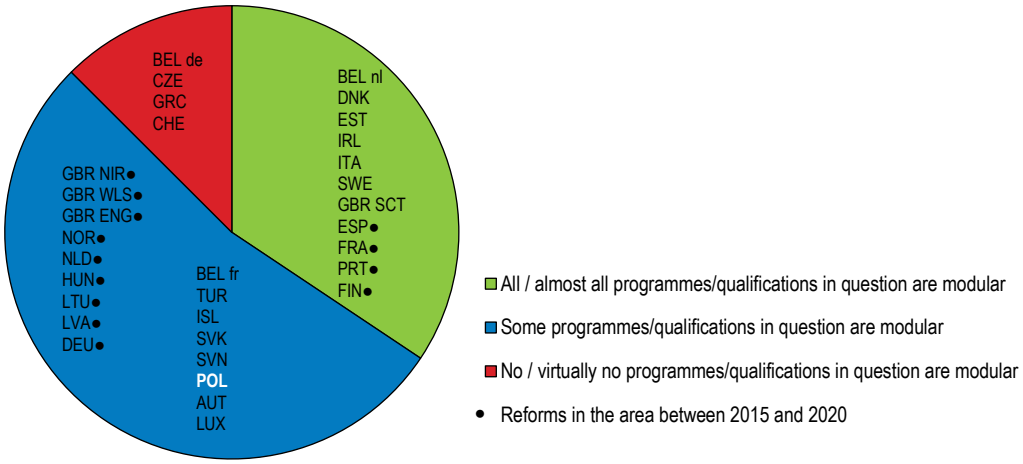
Recognition of prior learning (RPL) could raise the efficiency of training. Recognising prior learning can support upskilling and reskilling opportunities by fostering shorter training times and enabling personalised learning pathways for adults. Recognising a person's knowledge and skills within a formal and established framework can better determine future learning needs. The Higher Education and Science Act gives higher education institutions some flexibility to recognize prior learning when admitting students to regular

programmes. However, recognition of prior learning is not yet widespread or standardised in Poland. While some sectors have specific well-developed systems, there is no single coherent system. So far, the Integrated Qualifications System (Zintegrowany System Kwalifikacji,) is the main system and the Educational Research Institute has designed tools such as a database of good recognition practices and a tool to help adults organise their achievements in order to more easily communicate them to employers and educational institutions. This will enhance recognition of prior learning in Poland but should be developed further in collaboration with stakeholders. More broadly, efforts to introduce a functional national system should be accelerated (OECD, 2019a).

Digital education should be more flexible and modular

In general, the lack of flexibility of adult education in formal and non-formal education is one of the obstacles preventing higher participation in adult learning. Within VET, Poland had previously tried to develop modular courses for many occupations but despite their good quality they were not popular since they required changes in the teaching paradigm, new teaching methods and teacher training. Since then, short vocational courses *kwalifikacyjny kurs zawodowy* (KKZ) and *kurs umiejętności zawodowych* (KUZ) have been developed. KKZ is a course for adults outside of schools that allows them to participate in the same exams for vocational qualifications as graduates of initial VET schools. KUZ is a course that covers part of a vocational programme to supplement adults' prior learning. In addition, the Centre for Education Development (*Ośrodek Rozwoju Edukacji* (ORE)), a national teacher training institution, supports the development and implementation of distance learning in education and training institutions. ORE runs an online database consisting of almost 170 VET courses. In 2019, ORE started a project entitled 'Creating e-resources for vocational education and training' (*Tworzenie e-zasobów do kształcenia zawodowego*), with the main aim of increasing the use of ICT in VET. However, only some of Poland's educational programmes are modular (Figure 2.27). Denmark offers potentially useful examples of flexible vocational education for adults (Box 2.5). More flexible learning goes hand-in-hand with individualised learning pathways (Eurydice, 2021).

Figure 2.27. The education system could be more flexible by using more modular approaches



Note: Existence of modular programmes and qualifications up to (and including) ISCED level 3 / EQF level 4 that are open to adults, 2019/20.
Source: Eurydice.

Flexibility within higher education could improve further. Higher education institutions deliver a relatively high number of part-time courses and the share of students in part-time programmes is among the highest in the OECD at 30% (OECD, 2017). The Higher Education and Science Act provides some scope for

higher and vocational education and research institutes to conduct shorter and specialised courses although the decision to do so depends on the educational entity. But modular programmes are non-existent in higher education, which prevents adult learners from studying in a flexible manner towards a qualification. Nonetheless, there has recently been considerable progress in expanding online courses (MOOCs). The national education platform, Navoica, has gone from offering five online courses in 2019 to over 150 in 2022. It offers flexible and modular courses ranging from introductory to advanced courses. MOOCs, however, tend to be used more frequently by higher skilled adults.

Box 2.5. Flexible formal education for adults: the Danish labour market training centres

The Danish adult learning system offers a high degree of flexibility. The adult vocational training programmes provided by labour market training centres (*Arbejdsmarkedsuddannelse,* AMU) are geared to equip low-skilled and skilled workers resident in Denmark who are currently in employment, with flexible training provision to accommodate working schedules.

The centres offer learners the freedom to select courses individually from a catalogue of 3 000 adult vocational training programmes, and to combine courses from the 200 single-subject courses in the general education system. Moreover, students can combine courses from non-formal education programmes in independent institutions and across different subjects. As these courses are short term, ranging from half a day to six weeks, with an average of three days, they can easily be combined to meet individual needs.

The flexibility of training courses extends to the learning environment. Training can take place in a traditional classroom, in open workshops, through distance learning or in the workplace. Although many training programmes take place during working hours, weekday evenings and weekends are also available. Once a course is completed, an AMU certificate is issued and can be included in an assessment of prior learning for credit transfer to a mainstream VET programme in the same field. Such a high degree of flexibility in formal education lowers barriers to adult learning.

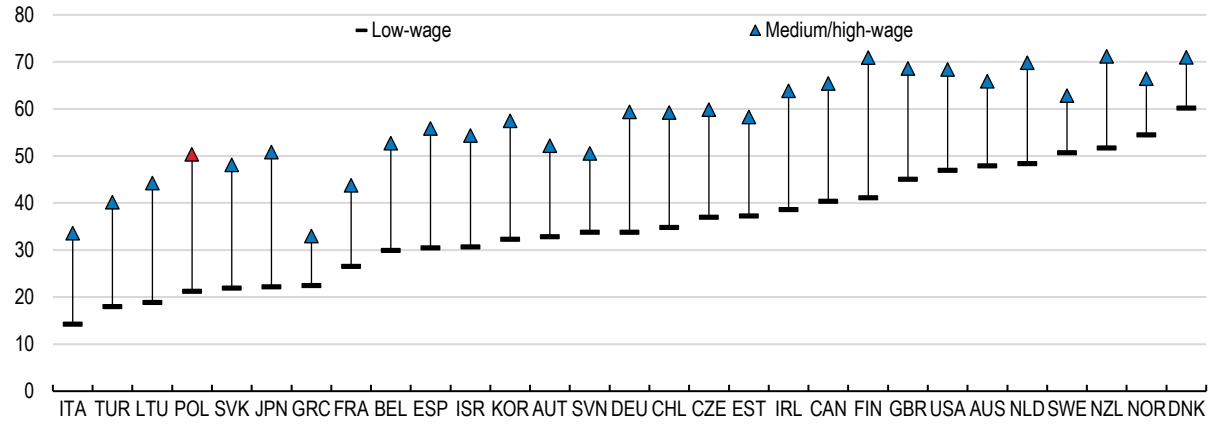
Source: OECD (2019), *Getting Skills Right: Future-Ready Adult Learning Systems*, https://doi.org/10.1787/9789264311756-en; Ministry of Children and Education (2018), *Adult vocational training*, www.eng.uvm.dk/adult-education-and-continuing-training/adult-vocationaltraining.

Adult education for basic and digital skills outside of formal institutions should be supported through public funds. Adult learning funding in Poland is largely directed to institutions which, in turn, reduces fees. Some ‘non-school courses’ that teach general skills courses charge fees, although these can be limited and reduced for low-income adults (Eurydice, 2021). Most of the adult education providers are private and charge fees. However, the main challenge for raising adult participation in adult learning seems to be on the demand side (OECD, 2019a). More demand-side funding that supports individuals’ ability to pay, complemented with effective quality assurance, information and guidance, can be effective. There is scope to make more use of direct financial incentives even though support, such as subsidies and training leave, exists.

Individual training accounts, such as those introduced in France in 2015, could be an effective way to facilitate adult learning. They are specific to each adult and can help facilitate learning throughout an individual’s career (OECD, 2019b). For example, in 2017 the pilot scheme “Loans for Education” targeted adults who wanted to learn and train. The scheme provided interest-free loans with a three-year repayment period but 20% of the loan could be reduced if the course was completed (ARRS, 2019). Financial support, particularly for those on lower incomes, is important as they tend to participate less in adult learning than those on higher incomes (Figure 2.28).

Figure 2.28. Lower income adults are less likely to participate in further learning

Participation in adult learning by wage-level



Note: Job-related in education and training only; low-wage is defined as earning at most two thirds of the national median wage.
Source: PIAAC data (2012, 2015).

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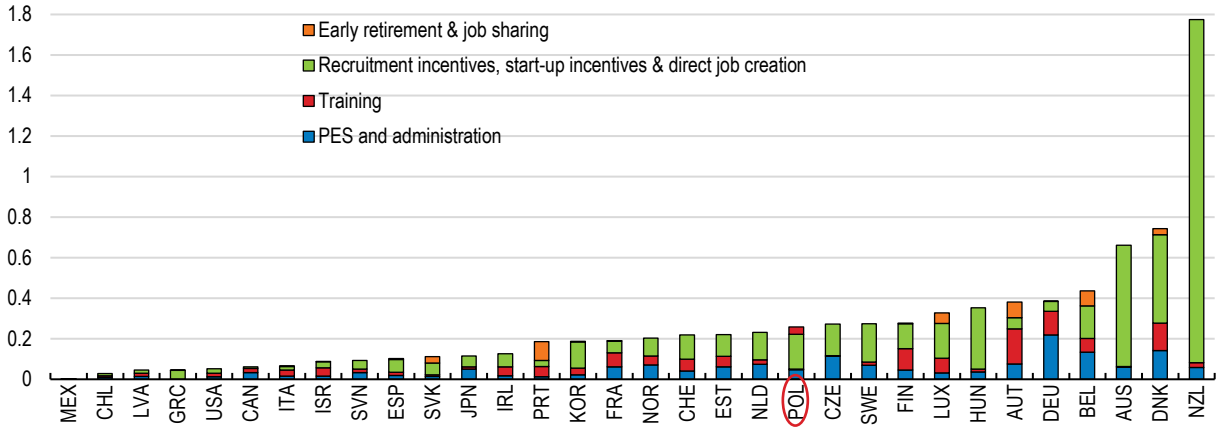
Active labour market programmes (ALMPs) should increasingly focus on training, including digital skills. ALMPs are an important tool for managing the transition back into employment. However, Poland's expenditure on ALMPs is relatively low. In particular, the share of ALMP expenditure on training is among the lowest in the OECD, even though overall spending on training for each individual is relatively high (Figure 2.29) (OECD, 2019a). The coverage of ALMPs should be widened to include more jobseekers and the overall spending on training should be increased. The training should partly also focus on digital skills to ensure jobseekers are also digitally competent. This could be combined with expanded career guidance services to maximise job search success.

Figure 2.29. Polish ALMPs focus too little on training

Labour market policy spending per unemployed (% of GDP per capita), by policy type, 2019



Note: Spending on public employment services (PES) includes funding for authorities that connect jobseekers with employers through information, placement and active support services.
Source: OECD Labour Market Programme database; and OECD Analytical Database.

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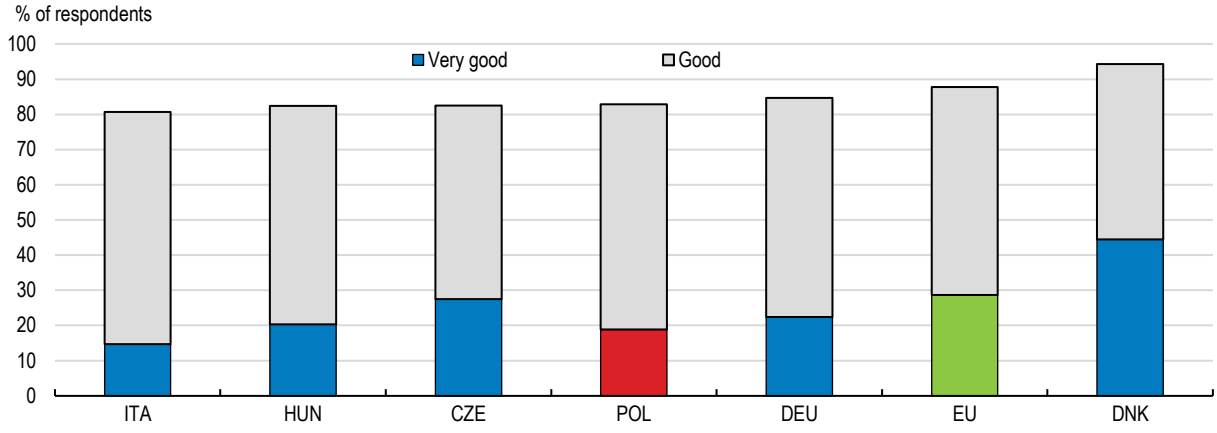
Boosting managerial skills

The limited number of highly skilled managers is considered one of the main barriers to the growth of Polish firms, and the lack of management support is a barrier to innovation (Zadura-Lichota, 2015). The Study of Human Capital found that Polish managers often do not have adequate levels of a variety of skills (Górniak, 2018). This is also reflected in the quality of management perceived by workers. According to the 2019 European Company Survey, most workers viewed management positively, although overall levels of management quality were below the EU average and below best performers like Denmark (Figure 2.30). There seem to be many domestic companies with management practices that are significantly below average (World Bank, 2021). In contrast, management quality in foreign multinationals in Poland is higher and at a similar level to other countries (Bloom et al., 2016).

Digitalisation generally requires changing business processes for which good management skills are crucial. Good managerial skills are associated with higher digital adoption. A shortage of managerial skills reduces the productivity gains from adoption (Andrews, Nicoletti and Timiliotis, 2018; Gal et al., 2019). Implementation of high-performance work practices that emphasise teamwork, autonomy, task discretion, mentoring, job rotation and applying new learning are key. Bonus pay, training provision and flexible working hours provide incentives for workers to more intensively apply their skills (OECD, 2016c). These practices can increase firms' internal flexibility to adapt to technological change (OECD, 2016c; Andrews et al., 2018).

Figure 2.30. Management quality is average

Management quality survey answers, 2019



Note: Responses to the question 'How would you describe the relations between management and employees in this establishment in general?'
Source: European Company Survey (ECS) 2019.

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Multiple programmes exist to improve managerial skills through new initiatives to support management training in SMEs (Box 2.6). Nonetheless, these could be enhanced by providing more flexible and modular training to increase accessibility including online courses such as the PARP Academy. The quality and relevance of the training offer should be regularly reviewed. Previous evaluation results suggested that more individual and customised training for management, potentially combined with coaching, could improve its effectiveness (OECD, 2019a). Financing support could be increased to further encourage participation in training for managers, particularly from SMEs. The National Training Fund (KFS) supports the training of higher skilled managers to a limited extent and the total available funding is unlikely to be sufficient to support wider management training needs. Raising awareness will be important through

sectoral skills councils, more extensive involvement of chambers of commerce and other industry organisations. The level of management training in public administrations and in numerous government-owned firms should also be increased as the positive benefits of better management skills can potentially spill over to the private sector (OECD, 2019e).

Box 2.6. Programmes that support management skills

The Polish Agency for Enterprise Development (PARP) is responsible for creating a business-friendly environment in Poland by creating and effectively implementing the state policy related to enterprise, innovation, and staff adaptability. PARP offers a range of programmes that can improve manager skills.

The Innovation Manager Academy

The Innovation Manager Academy is a programme administrated by PARP that aims to increase the skills and expertise of companies in the field of developing and implementing innovations. The programme's budget for 2018-23 is EUR 3.1 million and supports 470 managers dealing with innovation processes.

The Digital Manager Academy

The Digital Manager Academy, launched in 2021, co-finances training and advisory support for managerial staff in SMEs in the field of digitalisation. Firms receive a digital maturity assessment that provides a strategic analysis in terms of digital transformation and management competences. The budget for 2021-23 is EUR 14 million providing support to 3,620 employees.

SME Manager Academy

Launched in 2018, the SME Manager Academy is a programme administrated by PARP that finances training and advisory support for managerial staff in SMEs, in the area of business management, including HR. Financial support provided covers up to 80% of the project, while the remaining 20% is covered by the SME. The budget for 2018-23 is EUR 30 million including firms representing around 10,000 employees.

The Early Warning system

The aim of the project is to implement an early warning system for entrepreneurs who experience periodic difficulties in running a business. Support is provided for diagnosing the causes of emerging difficulties, training, consulting and mentoring tailored to the individual needs of the company. The budget for 2021-23 is EUR 11 million. Support will be provided to 2,000 companies.

PARP Academy

The PARP Academy, launched in 2006, is an e-learning platform that offers free-of-charge online training sessions, tailored towards SMEs, in areas related to setting up and running a business. Courses in e-commerce, digital marketing or social media are emphasised. There are 133,000 registered users and an average of 900 certificates are issued each week. The annual budget is around EUR 320,000.

The database of Development Services for education and training offers (BUR)

The BUR portal, managed by PARP since 2017, has become Poland's main online portal on adult learning opportunities. It contains a growing coverage of training courses and counselling for managers and employees of SMEs to improve their skills. There are almost 7,000 training providers in the database and 834,000 subscriptions to specific courses. The annual budget is around EUR 1 million.

Source: Polish Agency for Enterprise Development website, https://en.parp.gov.pl/.

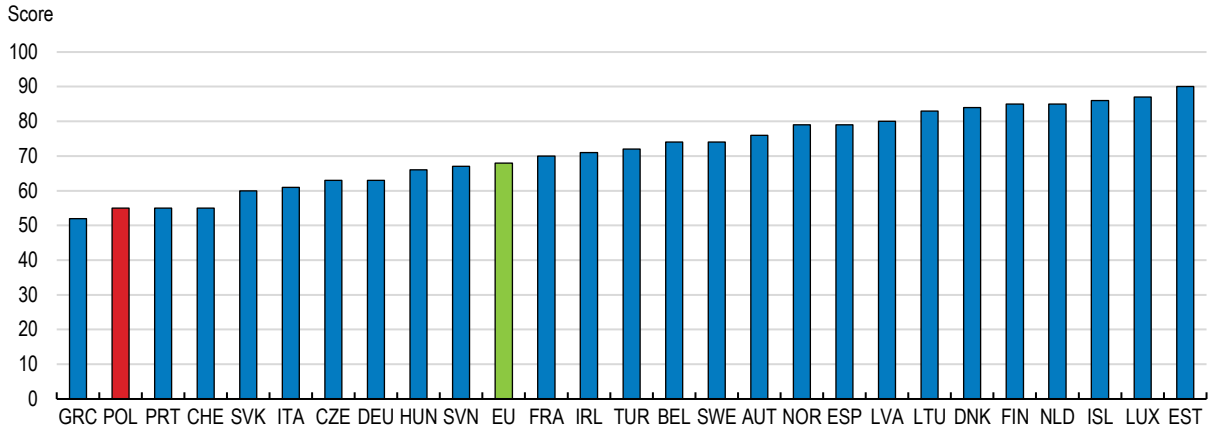
Digital government can facilitate and support the transition

Governments can facilitate digitalisation within a country by digitalising their own processes and the services they offer to citizens. The benefits are increased efficiency, higher transparency and lower costs and it may encourage greater digitalisation in the economy. However, cybersecurity risks have become more important and need to be managed.

The overall level of digitalisation of Polish government services is among the lowest in the European Union (Figure 2.31). According to the EU Digital Economy and Society Index, Poland has made rapid progress in digitalising government services in recent years but so have other countries. In 2021, 79% of government services were online and 85% accepted electronic ID logins. More than 15 million people used eID profiles. Digital government services are mobile-friendly and there is good user support (EC, 2022c). The use of digital government services increased during the pandemic. For example, the use of e-prescriptions in healthcare was particularly popular. However, online public services in transport and legal domains remain limited. Poland will need to make more progress as it aims towards the Digital Decade target of providing 100% of key public services online. Furthermore, transparency around how services are delivered and designed as well as how personal data is used is low. Cross-border digital public services, relevant to adults and businesses from other EU member states, are relatively undeveloped. The Biznes.gov.pl portal has launched a new English version in January 2022 but more could be done.

Figure 2.31. Digital government development in Poland lags behind other European countries

Overall eGovernment maturity, 2020-21 biennial average



Note: The overall maturity score is composed of the four key dimensions User Centricity, Transparency, Key Enablers and Cross-border Services.
Source: European Commission eGovernment Benchmark 2022 report.

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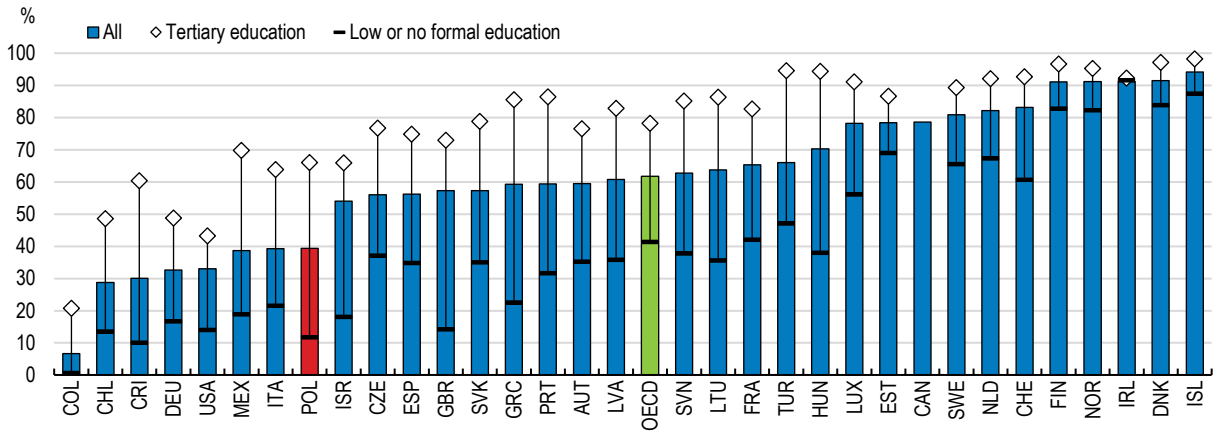
To maximise the benefits of digital government, Poland should aim to increase the use of its services. Currently, 55% of internet users use online government services. This is lower than the 65% EU average and below best performing countries like Denmark and Estonia, where 90% of internet users engage with online government services. In line with the digital skills mentioned earlier, high engagement levels are common around those adults with tertiary education but are very low for adults with low or no formal education as they are also unlikely to possess basic digital skills (Figure 2.32). To increase the uptake of online government services, Poland should gradually make online the default mode of interaction for those who are able to use them. To this end, it is also important to coordinate activities of central and local governments to ensure efficient and effective digital government services.

Figure 2.32. Use of digital public services is lower than in other countries

% of individuals who used the Internet to interact with public authorities, by educational attainment

2022 or latest year available



Notes: Unless otherwise stated, data refer the respective online activities in the last 12 months. Data relate to Internet use for obtaining services online from government offices, including download or filing official forms in the last three months.
Source: OECD ICT Access and Usage by Households and Individuals database.

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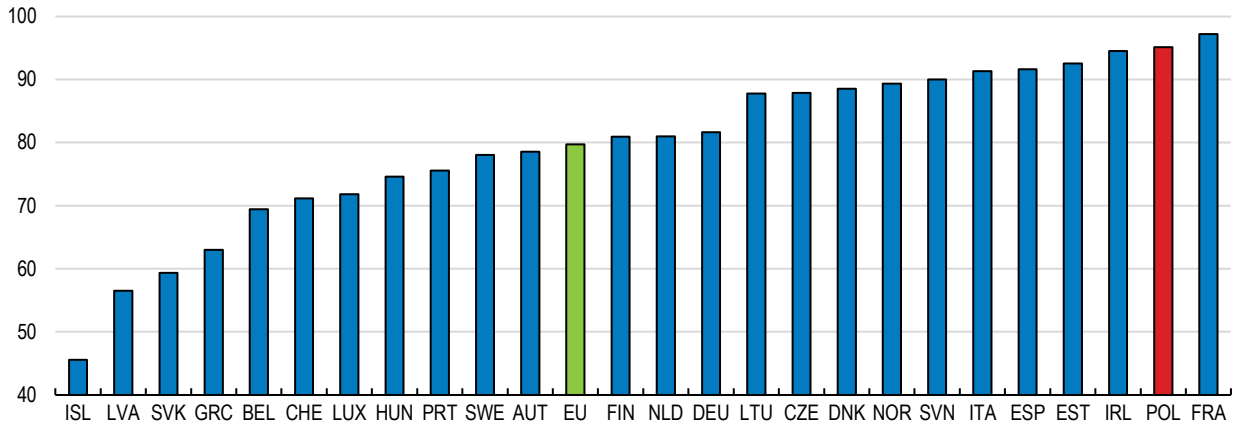
The public sector is one of the most data-intensive sectors in the economy. As the public sector both produces and consumes large amounts data, there is significant potential for governments to use digital technologies to innovate. The public sector can also drive innovation by enhancing access to public sector data. Firms have much to gain from open government data. They can use public data to better inform their business decisions. Some studies also suggest that opening up access to government data fosters the development of new start-ups.

Poland is a leader in opening its public data for wider use. According to the Open Data Maturity index, Poland ranked second in the EU in 2022, just behind France and ahead of Estonia (Figure 2.33). Otwarte Dane, the national one-stop-shop portal for open data, gained significantly in popularity and received international recognition. One of the best illustrations of the use of open data by the citizens was the CzyNaCzas application, which shows public transport buses and trams on the map in real time. During the health pandemic, another portal, SwiatPrzychodni, was widely used to search for public healthcare facilities with the shortest queues to doctors. Building on these successes, the government is continuing to implement its 'Open Data Programme' prompting public bodies to increase the number of datasets available and making the administration use the standards that allow for the opening of data (EC, 2021). The challenge for Poland is to maintain this momentum by continuing to update and expand available public datasets and through encouraging more private sector firms to use the data.

Cybersecurity is increasingly important as governments digitalise and systemically important systems go online. There has been a 60% increase in cyber attacks in 2020 and following Russia's invasion of Ukraine the overall threat level has risen. The government has been implementing the 2019-2024 Cybersecurity Strategy. The strategy includes both legislative and organisational changes, such as setting up operational cybersecurity centres at various levels – regional, sectoral and industrial. Poland ranks relatively well in terms of cybersecurity but there is clear room to improve resilience and safety. It should continue efforts to do so with the public sector. Estonia's X-road, the communication and encryption protocol underpinning its digital government, could offer useful insights for bolstering Poland's digital security (Box 2.7).

Figure 2.33. Poland is a leader in opening up public data

Open Data Maturity index (scale 0-100), 2022



Source: EU Open Data Maturity database.

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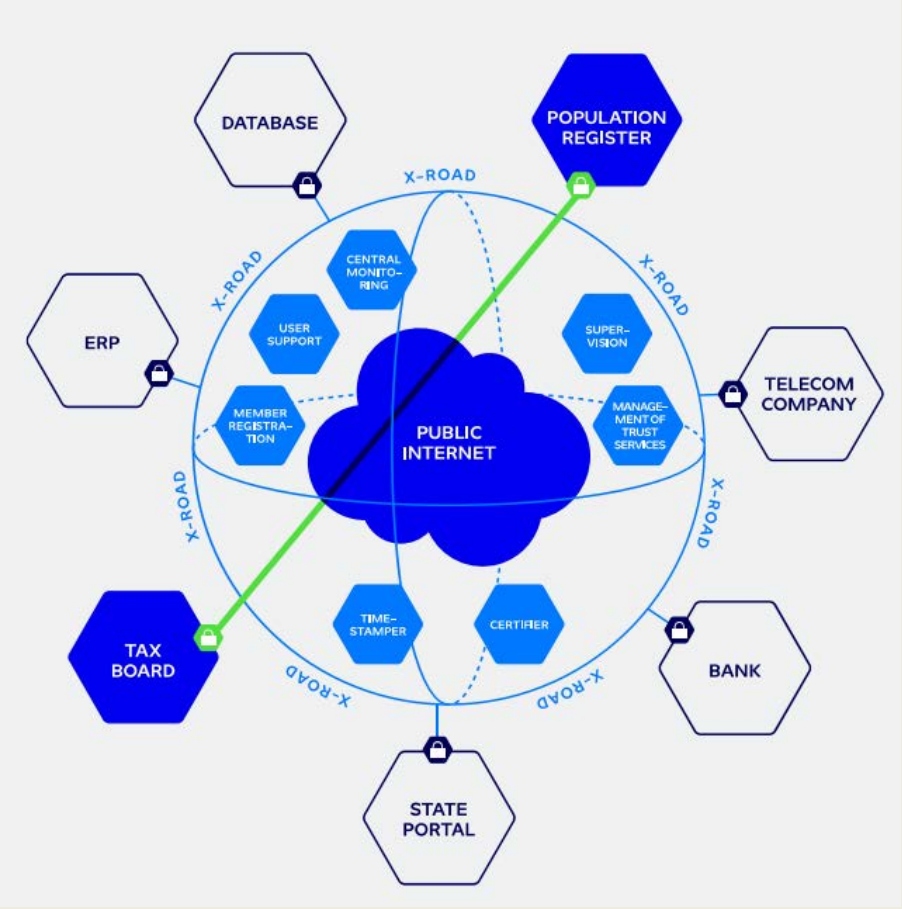
Box 2.7. Digital government in Estonia: E-Estonia

Estonia's success in e-government depends crucially on two features, which to this day are missing in some OECD countries: one (or more) secure digital ID(s), commonly accepted by service providers, and a secure, commonly accepted communication protocol, such as Estonia's X-Road (Figure 2.33). In 1994, the Information Policy Law was passed and the Data Protection Department created. A following major milestone was the Digital Signatures Act in 2000, which allowed a number of government services requiring a signature to go online. The same year marked the start of digital tax filing and paperless cabinet meetings. E-filing of personal income tax returns reached 95% as early as in 2013, ranking among the top third in the OECD. An even greater share of corporate income taxes and VAT were filed online and today all are paperless. In 2002 the e-ID card was introduced, which simplified considerably the way Estonians interact with the government. The e-health system was established in 2008, and two years later e-prescriptions became available.

Data security is achieved by state-of-the-art technologies outsourced to the private sector through procurement contracts. Personal data in Estonia are not stored on a single server but at various data registry points, interlinked through the X-Road (introduced in 2001), a platform for secure data sharing, with all incoming and outgoing transactions authenticated and encrypted. X-Road does not build on blockchain technology, but, like blockchain, it secures traceability through a distributed ledger, meaning that any transaction or information access will be recorded in several places. Citizens can monitor the time and access point of their data files through the government service portal www.esti.ee.

Figure 2.34. The X-Road platform for secure data sharing



Source: X-Road (website, x-road.global) Nordic Institute for interoperability services.

A major principle of the system is single sourcing of data, for instance, the population registry is in charge of recording home addresses and all such queries will end up there. The use of digital signatures in Estonia is estimated to save 2% of GDP every year relative to using paper-based processes (e-Estonia, 2019). The cost of e-voting, for instance, is a mere EUR 2 per vote, versus EUR 6 in the case of paper-based voting.

Source: E-Estonia Guide (2018) and OECD (2015).

MAIN FINDINGS	RECOMMENDATIONS (key recommendations in bold)
Fostering greater adoption of digital technologies in firms	
Poland has delayed 5G deployment due to cybersecurity concerns.	Accelerate the legislative process and conduct the 5G auctions in order to speed up the development of a dedicated 5G network.
The adoption of digital technologies is relatively low among SMEs.	**Expand consultancy services that offer expert technical advice to facilitate investment in digital technologies among SMEs**.
ICT innovation is too low.	**Increase direct funding for ICT R&D.** Incentivise universities and research institutes to pursue more collaboration with industry when undertaking R&D and strengthen the role of technology transfer and commercialisation efforts.
Finance for intangible (ICT) investment can be difficult to access for young and small firms.	Provide continued financial support to new digital firms including finance and development at later stage. Create a collateral registry to improve SMEs access to loans.
Upgrading skills for a digital transition	
Digital skills among graduates with upper secondary or below education could be higher.	**Provide ICT equipment in schools and training for VET teachers to teach digital skills.** Increase the share of VET programmes that include carefully selected work placements. Further strengthen the involvement of local employers in the development of digital education by expanding their role and representation in subnational councils.
There is a shortage of specialised ICT workers.	Consider dual and flexible degrees to allow potential students in other disciplines to study ICT. Effectively implement the newly created global immigration programmes to attract more skilled ICT specialists from abroad.
The share of women in ICT is 15%, below the EU average of 19%.	**Continue increasing the number of women studying ICT through targeted awareness campaigns and scholarships.**
Digital skills are low among adults, particularly among older adults.	**Expand modular training, making use of recognition of prior learning and micro-credentials.** **Adopt individual training accounts, making training rights portable from job to job.** **Promote lifelong learning, particularly among the unemployed and workers on temporary contracts.** Expand the use of guidance and counselling and widen the coverage of active labour market policies to include digital skills training. Conduct continued and targeted awareness campaigns to provide information on the benefits of digital skills to adults and SMEs.
Managerial skills, which are key to advancing digitalisation, are often lacking.	**Provide more flexible and modular training to increase accessibility and take up, including to online courses.** Increase the level of management training in public administrations and in numerous government-owned firms.
Digital government	
The level of government digitalisation is relatively low. Some services are not yet digitalised and usage is below the EU average.	Digitalise the remaining government services, increase transparency and boost the use of online public services.
Poland has been leading in opening up its public data and enabling related innovation.	Continue to update and expand available public datasets and encourage more private sector firms to use the data.
Cyber threat levels have risen since Russias invasion of Ukraine.	Ensure a resilient and robust digital government infrastructure to address increased cyber risks.

References

Adrjan, P. et al. (2021), "Will it stay or will it go? Analysing developments in telework during COVID-19 using online job postings data", *OECD Productivity Working Papers*, No. 30, OECD Publishing, Paris.

Andrews, D., G. Nicoletti and C. Timiliotis (2018), "Digital technology diffusion: A matter of capabilities, incentives or both?", *OECD Economics Department Working Papers*, No. 1476, OECD Publishing, Paris.

ARRS (2019), "Invest in development – loans for education", Agencja Rozwoju Regionalnego w Starachowicach.

Bailin Rivares, A. et al. (2019), "Like it or not? The impact of online platforms on the productivity of incumbent service providers", *OECD Economics Department Working Papers*, No. 1548, OECD Publishing, Paris.

BKL (2020), "Bilans Kapitału Ludzkiego *(Human Capital Study)*", Polish Agency for Enterprise Development (PARP), Warsaw.

BKL (2022a), "Bilans Kapitału Ludzkiego – Rozwój kompetencji" [Human Capital Study – Development of competences], Polish Agency for Enterprise Development (PARP), Warsaw.

BKL (2022b) "Bilans Kapitału Ludzkiego – raport z badania pracodawców" [Human Capital Study – Report on the survey of firms], Polish Agency for Enterprise Development (PARP), Warsaw.

Bloom, N., Sadun, R, and J. van Reenen (2016), "Management as a Technology", *CEPR Discussion Papers*, No. 11312.

Cadestin, C. et al. (2019), "Multinational enterprises in domestic value chains", OECD Science, Technology and Industry Policy Papers, No. 63, OECD Publishing, Paris.

CASE (2020), "Digitalisation of Poland's post-COVID economy – how to make the best use of the EU Recovery Fund?", Center for Economic and Social Research, Warsaw.

Criscuolo, C., Nicoletti, G., Gal, P. and T. Leidecker (2020), "Productivity gains from teleworking in the post COVID-19 era: How can public policies make it happen?", OECD Publishing, Paris.

Data.Europea.EU (2022), "EU Open Data Maturity Index", European Commission, Brussels (accessed on September 10, 2022).

EC (2015), "An in-depth analysis of adult learning policies and their effectiveness in Europe", European Commission, Luxembourg: Publications Office of the European Union.

EC (2017), "Peer Review of Polish Higher Education and Science System", European Commission Brussels.

EC (2021a), "Digital Economy and Society Index (DESI), Country Report Poland", European Commission, Brussels (accessed on June 15, 2022).

EC (2021b), "Education and Training Monitor 2021", European Commission, Brussels (accessed on June 28, 2022).

EC (2022a), "Poland sets targets for procurement of R&D and innovative solutions", European Commission, Brussels.

EC (2022b), "Broadband in Poland", European Commission, Brussels (accessed on September 4, 2022).

EC (2022c), "eGovernment Benchmark 2022", European Commission, Brussels (accessed on September 20, 2022).

EC (2022d), "European Innovation Scoreboard", European Commission, Brussels (accessed on June 30, 2022).
ECB (2021), "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No. 268, European Central Bank, Frankfurt.
E-Estonia Guide (2018), "E-Estonia Guide", Tallinn (accessed on September 4, 2022).
E-Estonia (2019), "Estonia to share its e-governance know-how", Tallinn.
EIGE (2022a), "Gender Equality in Academia and Research", European Institute for Gender Equality, Vilnius.
EIGE (2022b), "Girls as Engineers and Girls go Science! Motivation and support for girls in IT and STEM", European Institute for Gender Equality, Vilnius.
Eurofound (2019), "European Working Conditions Survey (EWCS) 2015", Publications Office of the European Union, Luxembourg.
Eurostat (2021a), "Digital economy and society", European Commission (database), Brussels (accessed on May 20, 2022).
Eurostat (2022a), "European Labour Force Survey data", European Commission (database), Brussels (accessed on September 3, 2022).
Eurostat (2022b), "Population by educational attainment level, sex and age (%) - main indicators", European Commission (database), Brussels (accessed on September 3, 2022).
Eurydice (2021), "EU Council Recommendation of 19 December 2016 on Upskilling Pathways: New Opportunities for Adults", OJ C 484/1, 24.12.2016.
Eurydice (2022), "Teachers' and School Heads' Salaries and Allowances in Europe – 2020/21", Publications Office of the European Union.
Euroguidance (2018), "Guidance System in Poland", Euroguidance Network.
EY (2021), "Poland: New Tax Incentives Package for investments in Poland from 1 January 2022", Ernst & Young, Warsaw.
Gal, P. et al. (2019), "Digitalisation and productivity: In search of the holy grail – Firm-level empirical evidence from EU countries", *OECD Economics Department Working Papers*, No. 1533, OECD Publishing, Paris.
Grabowski, J. and A. Janiszewski (2016), "Raport z badania dotyczącego wsparcia finansowanego z Krajowego Funduszu Szkoleniowego w województwie dolnośląskim" [Support Study Report financed from the National Training Fund in Lower Silesian Voivodeship], Lower Silesian Voivodeship Labour Office.
Grundke, R. et al. (2018), "Which skills for the digital era? Returns to skills analysis", *OECD Science, Technology and Industry Working Papers*, No. 2018/09, OECD Publishing, Paris.
Górniak, J. (2018), "Bilans Kapitalu Ludzkiego 2017", Polish Agency for Enterprise Development (PARP, Warsaw.
Guillemette, Y. and D. Turner (2021), "The long game: Fiscal outlooks to 2060 underline need for structural reform", *OECD Economic Policy Papers*, No. 29, OECD Publishing, Paris.
ITU (2020), "Global Cybersecurity Index 2020", International Telecommunication Union, Geneva.
Jankowska, B., E. Mińska-Struzik, M. Bartosik-Purgat, M. Götz and I. Olejnik (2022), "Industry 4.0 technologies adoption: barriers and their impact on Polish companies' innovation performance", *European Planning Studies*, Taylor and Francis.

Kamalski, J. and Plume A. (2013), "Comparative Benchmarking of European and US Research Collaboration and Researcher Mobility", *SciVal Analytics*, Elsevier.

Leśniewicz, F. and I. Święcicki (2021), "Czy pandemia przyśpieszyła robotyzację?" [Has the pandemic accelerate robotisation?], Polish Institute of Economics, Warsaw.

Lewandowski, J. and J. Tomczak, (2017), "Nowoczesne technologie ICT szansą na rozwój mikroprzedsiębiorstw" [Modern ICT technologies as an opportunity for development of micro enterprises], *Zeszyty Naukowe Politechniki Łódzkiej*, 1217(68): 123-141.

Lewiatan (2016), "Cyfryzacja polskiego sektora MŚP: wpływ digitalizacji na produktywność pracy i konkurencyjność biznesu" [Digitisation of the Polish SME sector: the impact of digitisation on labour productivity and business competitiveness], Polish Confederation Lewiatan, Warsaw.

LOWE, (2022), "Lokalny Ośrodek Wiedzy i Edukacji" [Local Center of Knowledge and Education], Małopolska Chamber fo Local Government Foundation, Cracow.

Melitz, M.J. (2003), "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity", *Econometrica*, 71: 1695-1725.

Milasi, S., I. González-Vázquez et E. Fernández-Macías (2021), "Telework before the COVID-19 pandemic : Trends and drivers of differences across the EU", *OECD Productivity Working Papers*, No. 21, OECD Publishing, Paris.

MoES (2019), "Dni uczenia się dorosłych" – dołącz do kampanii!" [Adult Learning Days], Ministerstwo Edukacji i Nauki, Warsaw.

NIK (2021), "Organizacja pracy nauczyciel w szkolach publicznych (part 1 and 2)" [Organisation of teachers' work in public schools (part 1 and 2)], Najwyższa Izba Kontroli (NIK), Warsaw.

Nedelkoska, L. and G. Quintini (2018), "Automation, skills use and training", *OECD Social, Employment and Migration Working Papers*, No. 202, OECD Publishing, Paris.

OECD (2015), "OECD Public Governance Reviews: Estonia and Finland: Fostering Strategic Capacity across governments and Digital Services across Borders", OECD Publishing, Paris.

OECD (2016a), "Employment and Skills Strategies in Poland, OECD Reviews on Local Job Creation", OECD Publishing, Paris.

OECD (2016b), "OECD Economic Surveys: Poland 2016", OECD Publishing, Paris.

OECD (2016c), "Skills Matter: Further Results from the Survey of Adult Skills", *OECD Skills Studies*, OECD Publishing, Paris.

OECD (2016d), "Skills for a Digital World: 2016 Ministerial Meeting on the Digital Economy Background Report", *OECD Digital Economy Papers*, No. 250, OECD Publishing, Paris.

OECD (2017), "Education at a Glance 2017: OECD Indicators", OECD Publishing, Paris.

OECD (2018), "Maintaining competitive conditions in era of digitalization", OECD Publishing, Paris.

OECD (2019a), "OECD Skills Strategy Poland: Assessment and Recommendations", OECD Skills Studies, OECD Publishing, Paris.

OECD (2019b), "Individual Learning Accounts: Panacea or Pandora's Box?", OECD Publishing, Paris.

OECD (2019c), *OECD Skills Outlook 2019: Thriving in a Digital World*, OECD Publishing, Paris.

OECD (2019d), *Going Digital: Shaping Policies, Improving Lives*, OECD Publishing, Paris.

OECD (2019e), "Digitalisation and productivity: A story of complementarities", *OECD Economic Outlook, Volume 2019 Issue 1,* OECD Publishing, Paris.

OECD (2019f), "Measuring the Digital Transformation: A Roadmap for the Future", OECD Publishing, Paris.
OECD (2019g), "PISA 2018 Results (Volume III): What School Life Means for Students Lives", OECD Publishing, Paris.
OECD (2019h), "Financing SMEs and Entrepreneurs 2019: An OECD Scoreboard", OECD Publishing, Paris.
OECD (2020a), "OECD Digital Economy Outlook 2020", OECD Publishing, Paris.
OECD (2020b), "OECD Economic Surveys: Poland 2020", OECD Publishing, Paris.
OECD (2021a), "Quality and value of micro-credentials in higher education: Preparing for the future", *OECD Education Policy Perspectives*, No. 40, OECD Publishing, Paris.
OECD (2021b), "Incentives for SMEs to Invest in Skills: Lessons from European Good Practices", in *Getting Skills Right*, OECD Publishing, Paris.
OECD (2021c), "Teachers and Leaders in Vocational Education and Training, OECD Reviews of Vocational Education and Training", OECD Publishing, Paris.
OECD (2021d), "OECD Skills Outlook 2021: Learning for Life", OECD Publishing, Paris.
OECD (2021e), "R&D Tax Incentives: Poland, 2021", OECD Directorate for Science, Technology and Innovation, Paris.
OECD (2021f), "Career Guidance for Adults in a Changing World of Work", in *Getting Skills Right*, OECD Publishing, Paris.
OECD (2021g), "OECD Economic Surveys: Netherlands 2021", OECD Publishing, Paris.
OECD (2022a), OECD Broadband Portal, OECD (database), Paris, accessed on September 1, 2022.
OECD (2022b), "OECD Education Statistics", OECD (database), Paris, accessed on June 19, 2022.
OECD (2022c), "OECD Employment Outlook 2022", OECD Publishing, Paris.
OECD (2022d), "Gross domestic spending on R&D", OECD (database), Paris, accessed on June 24, 2022.
OECD (2022e), "G7 inventory of new rules for digital markets", OECD Publishing, Paris.
OECD (2022f), "Indicators of Product Market Regulation", OECD Publishing, Paris.
OECD (2023), "The OECD Going Digital Toolkit", OECD (database), Paris, accessed on May 15, 2022.
Orłowska, R. and K. Żołądkiewicz (2018), "Ograniczenia digitalizacji mikro-, małych i średnich przedsiębiorstw (MMŚP) w Polsce na podstawie badań w województwie pomorskim" [Limitations of micro, small and medium digitization enterprises (MSME) in Poland based on research in the Pomeranian Voivodeship], *Studia Ekonomiczne*, 372: 94-109, Katowice.
Pisu, M. and C. von Rüden (2021), "Spurring growth and closing gaps through digitalisation: policies to LIFT all boats", *OECD Economics Department Working Papers*, OECD Publishing, Paris.
PFR (2021), "Polish VC market outlook 2021", PFR Ventures and Inovo, Warsaw.
Radziukiewicz, M. (2021), "Remote Work in Poland and its Perspectives", *Economic and Regional Studies*, 14(4), pp.409-427.
Sorbe, S., Gal, P. Nicoletti, G. and C. Timiliotis (2019), "Digital dividend: policies to harness the productivity potential of digital technologies", *OECD Economic Policy Papers*, No. 26.
Statistics Poland (2021), "Labour Market Statistics Yearbook", Statistics Poland.

Szymańska, B. and E. Ostrogórska (2015), “Krajowy Fundusz Szkoleniowy” [National Training Fund], Polish Agency for Enterprise Development (PARP), Warsaw.
Zadura-Lichota, P. (2015), “Innovative entrepreneurship: Revealed and hidden potential for innovation in Poland”, Polish Agency for Enterprise Development (PARP), Warsaw.
World Bank (2021), “Paths of Productivity Growth in Poland: A Firm-Level Perspective”, World Bank Group, Washington DC.
World Bank (2022), “Drivers of Productivity Growth in Poland: A Firm-Level Perspective on Technology Adoption and Firm Capabilities”, World Bank Group, Washington DC.

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Poland has successfully managed a large inflow of refugees from Ukraine. The impact of Russia's war of aggression against Ukraine is overshadowing the outlook and economic growth is expected to slow to 0.9% this year before it recovers to 2.4% in 2024. Both monetary and fiscal policies should ensure that higher inflation does not become entrenched. Fiscal policy continues to support the economy in managing higher energy prices. Long term fiscal pressures need to be addressed, for instance by broadening the revenue base, improving spending efficiency and raising retirement age.

Digitalisation can help unleash the entrepreneurial potential of Polish businesses at home and in global markets but requires adequate skills. This requires the government to take a comprehensive approach across several policy areas, such as adult education, life-long learning and training for SMEs.

Poland has made progress in transitioning to net zero emissions by 2050, but the rate of decarbonisation needs to accelerate significantly. Setting out a clear long-term path for carbon prices would provide more clarity to households and businesses. A just energy transition requires supporting the most affected workers and regions.

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