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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 Hungary were reviewed by the Committee on 27 November 2023. The draft report was then revised in light of the discussions and given final approval as the agreed report of the whole Committee on 22 January 2024. The cut-off date for the information included in this report is 16 February 2024.

The Secretariat's draft report was prepared for the Committee by Pierre-Alain Pionnier, Donal Smith and Tony Huang, with contributions from Soma Lehotzky (Chapters 2 and 5), Jakob Brunnengräber and Zeev Krill (Chapter 2), Mike Cressey (Chapter 3) and Jens Hoj (Chapter 5), under the supervision of Jens Arnold.

Editorial support was provided by Emily Derry, while François Iglesias contributed to the design of the publication.

The previous Survey of Hungary was issued in July 2021.

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

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Basic statistics of Hungary, 2022[1]

Numbers in parentheses refer to the OECD average[2]

LAND, PEOPLE AND ELECTORAL CYCLE					
Population (million)	9.7		Population density per km²	106.1	(39.0)
Under 15 (%)	14.4	(17.2)	Life expectancy at birth (years, 2021)	74.5	(78.7)
Over 65 (%)	20.0	(18.0)	Men (2021)	71.1	(75.9)
International migrant stock (% of population, 2020)	6.0	(13.2)	Women (2021)	78.0	(81.7)
Latest 5-year average growth (%)	-0.2	(0.4)	Latest general election	April	2022
ECONOMY					
Gross domestic product (GDP)			Value added shares (%)		
In current prices (billion USD)	178.7		Agriculture, forestry and fishing	3.2	(2.8)
In current prices (billion HUF)	66075.2		Industry including construction	30.4	(28.3)
Latest 5-year average real growth (%)	3.4	(1.7)	Services	66.4	(68.8)
Per capita (thousand USD PPP)	43.5	(60.2)			
GENERAL GOVERNMENT Per cent of GDP					
Expenditure	48.8	(42.9)	Gross financial debt	77.4	(113.5)
Revenue	42.6	(39.7)	Net financial debt	47.1	(67.6)
EXTERNAL ACCOUNTS					
Exchange rate (HUF per USD)	369.67		Main exports (% of total merchandise exports, 2021)		
PPP exchange rate (USA = 1)	164.16		Machinery and transport equipment	54.8	
In per cent of GDP			Chemicals and related products, n.e.s.	12.7	
Exports of goods and services	91.2	(33.4)	Manufactured goods	10.1	
Imports of goods and services	95.5	(34.8)	Main imports (% of total merchandise imports, 2021)		
Current account balance	-8.3	(-1.0)	Machinery and transport equipment	45.3	
Net international investment position	-50.0		Manufactured goods	14.6	
			Chemicals and related products, n.e.s.	13.4	
LABOUR MARKET, SKILLS AND INNOVATION					
Employment rate (aged 15 and over, %)	58.2	(57.5)	Unemployment rate, Labour Force Survey (aged 15 and over, %)	3.6	(5.0)
Men	65.3	(65.4)	Youth (aged 15-24, %)	10.6	(10.9)
Women	51.8	(50.1)	Long-term unemployed (1 year and over, %)	1.2	(1.2)
Participation rate (aged 15 and over, %)	66.5	(60.9)	Tertiary educational attainment (aged 25-64, %)	29.4	(40.7)
Average hours worked per year	1,700	(1,752)	Gross domestic expenditure on R&D (% of GDP, 2020)	1.6	(2.9)
ENVIRONMENT					
Total primary energy supply per capita (toe)	2.7	(3.8)	CO_2 emissions from fuel combustion per capita (tonnes)	4.3	(7.8)
Renewables (%)	12.4	(12.0)	Water abstractions per capita (1 000 m³, 2021)	0.4	
Exposure to air pollution (more than 10 µg/m³ of PM 2.5, % of population, 2019)	100.0	(61.7)	Municipal waste per capita (tonnes, 2021, OECD: 2020)	0.4	(0.5)
SOCIETY					
Income inequality (Gini coefficient, 2021, OECD: latest available)	0.278	(0.316)	Education outcomes (PISA score, 2022)		
Relative poverty rate (%, 2021, OECD: 2020)	6.7	(11.8)	Reading	473	(476)
Median disposable household income (thousand USD PPP, 2021, OECD: 2020)	15.4	(26.6)	Mathematics	473	(472)
Public and private spending (% of GDP)			Science	486	(485)
Health care	6.7	(9.2)	Share of women in parliament (%)	14.1	(32.5)
Pensions (2019)	8.0	(9.5)	Net official development assistance (% of GNI, 2017)	0.1	(0.4)
Education (% of GNI, 2021)	3.9	(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, Magyar Nemzeti Bank.

Executive summary

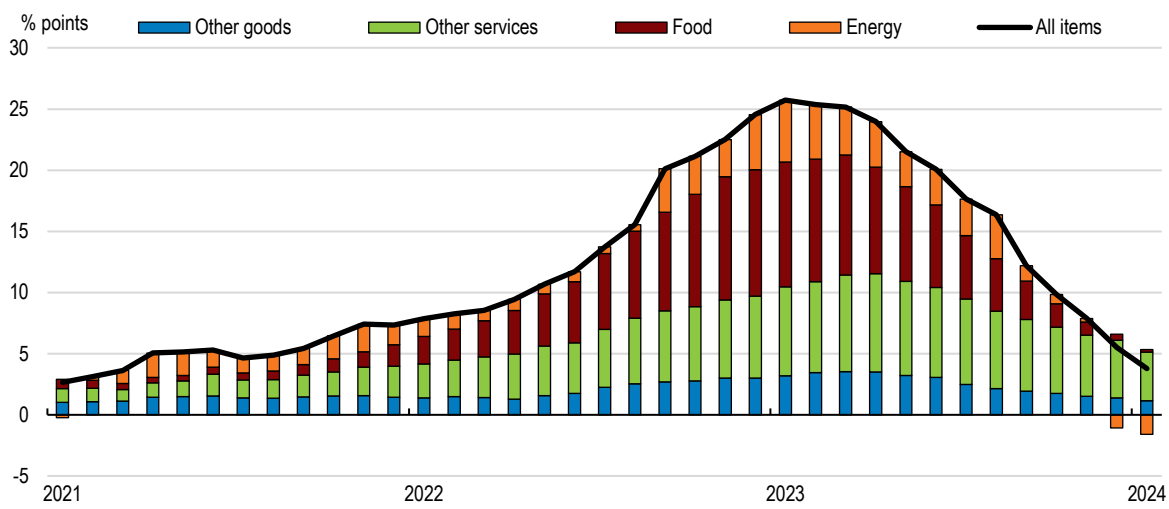
The economy is emerging from a downturn

Inflation is receding and growth has restarted in mid-2023. Fiscal policy should consolidate to curb inflation further and recreate fiscal space.

Economic activity declined amid high inflation. After a strong demand-based recovery following the COVID-19 pandemic, economic activity declined from mid-2022 until mid-2023, with high inflation eroding households' purchasing power, and high interest rates, uncertainty and low confidence dragging down investment. Despite the contraction in output, the labour market has held up strong, with unemployment rising only marginally and a high number of vacancies.

Inflation rose to the highest level in the European Union (EU) before peaking in early 2023. It was initially due to international factors such as supply-chain bottlenecks following the pandemic, the overheating of the economy, and was then amplified by the surge in global energy and food prices following the outbreak of the war in Ukraine. Domestic agricultural prices also contributed to the exceptionally high food price inflation (Figure 1).

Figure 1. Inflation is receding after a record increase



Source: OECD database on Consumer Price Indices.

StatLink https://stat.link/saudqh

Growth is projected to pick up in 2024 (Table 1), but the outlook is subject to significant risks. Beyond uncertainty related to inflation and energy prices, rising business failures may cause an increase in non-performing loans, which would further reduce credit distribution and weigh on economic activity. An incomplete or late delivery of EU funds that are currently subject to the implementation of rule-of-law reforms in Hungary is another key risk for investor confidence, the cost of capital and the exchange rate, beyond the direct negative impact on investment and public finances.

Table 1. Growth has slowed

Annual growth rates, %, unless specified

	2021	2022	2023	2024	2025
Real GDP	7.1	4.6	-0.9	2.4	2.8
Private consumption	4.6	6.5	-2.9	3.5	2.6
Government consumption	1.8	3.0	1.6	1.7	1.8
Investment	5.8	0.1	-11.3	-0.7	5.4
Exports	8.3	12.6	0.4	2.7	4.4
Imports	7.3	11.6	-4.7	2.0	5.1
Unemployment rate (% of labour force)	4.0	3.6	4.1	4.2	3.9
Inflation (CPI)	5.1	14.6	17.1	3.9	3.4
Headline fiscal balance (% of GDP)	-7.2	-6.2	-6.5	-4.5	-3.4
Structural primary fiscal balance (% of GDP)	-5.1	-4.4	-2.2	0.2	0.5
Public debt (% of GDP)	76.7	73.9	74.2	75.4	76.1

Source: Hungarian Central Statistical Office (HCSO), OECD projections.

Monetary policy is tight. Monetary policy tightening started in mid-2021 and stepped up in the autumn 2022 amid an accelerating depreciation of the currency. As headline inflation peaked in early 2023 and declined throughout the year, monetary policy started to ease in the spring 2023. Uncertainties regarding commodity prices, core inflation, the exchange rate, and the anchoring of inflation expectations call for a gradual and measured continuation of monetary easing.

Fiscal tightening is underway. The pandemic led to a substantial deterioration of Hungary's fiscal position. Fiscal consolidation started in 2023, but the headline deficit remained higher than in 2022 due to the economic downturn. A strong further consolidation would align fiscal policy with monetary policy efforts to curb inflation, strengthen public debt sustainability, and recreate fiscal space to finance significant ageing-related expenditures and the green transition.

Raising productivity and business dynamism

Productivity growth is key to sustain living standards, especially in a context of population ageing. Structural reforms could help raising it.

Productivity growth has slowed since the mid-2000s, even more so in Hungary than in neighbouring countries. Hungary's labour productivity was catching with G7 economies between the mid-1990s and the mid-2000s, but then started falling behind after the Great Financial Crisis of 2008-09. Productivity growth and income convergence have resumed now, but remain weaker than before the Financial Crisis. (Table 2).

Table 2. Productivity growth has slowed

	Labour productivity growth (%)		
	1999-2008	2008-2016	2016-2022
G7	1.7	0.9	1.0
Czechia	4.2	1.0	1.4
Poland	3.6	2.9	3.6
Slovak Republic	4.8	1.9	2.5
Hungary	4.6	-0.2	3.0

Source: OECD Database on Productivity Statistics.

Regulations limit business entry and competition in some key sectors. Competition is limited by stringent regulations in the retail energy, transport, and professional services sectors. This holds back productivity, including in downstream sectors.

Rigid industry structures and in particular the slow exit of weak performers, are related to remaining shortcomings in the insolvency framework. Firms with weak growth prospects immobilise significant amounts of capital that is not available for more productive firms. Further improving the insolvency framework would contribute to a better capital allocation and higher productivity.

Digitalisation is lagging behind, hampering productivity improvements in existing firms. While the pandemic led to an acceleration of digitalisation, Hungary has yet to bridge the gap with other EU countries in the adoption of advanced digital technologies, and the digital divide between small and large firms has widened recently. Accelerating the acquisition of digital skills in the population would facilitate the wider diffusion and use of digital technologies.

Recent reforms to promote public integrity should be fully implemented. These reforms have the potential to significantly improve the anti-corruption and public integrity framework. They can facilitate the release of EU funds and strengthen incentives for private investments.

Towards more inclusive growth

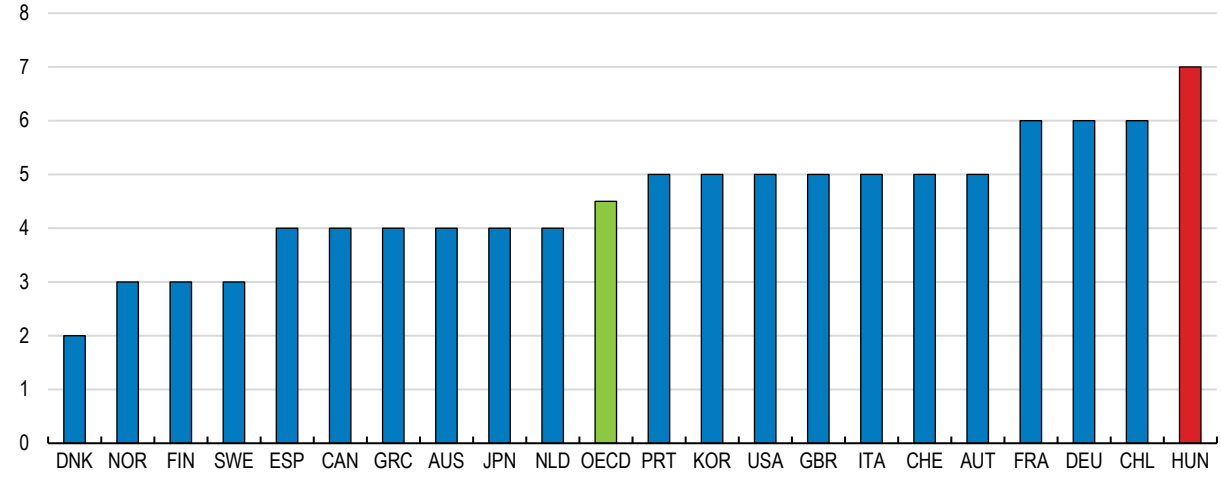
While transfers keep poverty low, growth could be made more inclusive by reducing inequalities of opportunities between men and women and between income groups.

Social transfers keep income inequalities and poverty low. However, those in the upper income quintile receive a larger share of social transfers than those in the lower income quintile. Better targeting of social transfers would allow achieving the same redistribution in a more cost-effective way.

Inequalities of opportunities are significant. Women face large employment and pay gaps compared to men and intergenerational income mobility is limited. On average, it takes seven generations for children in the lowest income decile to reach an average income level (Figure 2). This low income mobility is related to the education system where students' achievements are closely linked to their socio-economic background.

Figure 2. Income mobility is low

Expected number of generations to move from the bottom 10% to an average income



Source: OECD (2018), *A Broken Social Elevator? How to Promote Social Mobility.*

StatLink https://stat.link/4qulcy

The pandemic revealed weaknesses in workers' social protection. Hungary's newly created short-time work scheme had a slow take-up and some workers faced large income cuts during the first pandemic wave. Many workers were also left without unemployment benefits. To avoid this, eligibility conditions could be relaxed and benefit duration extended, at least during recessions.

Making the green transition happen

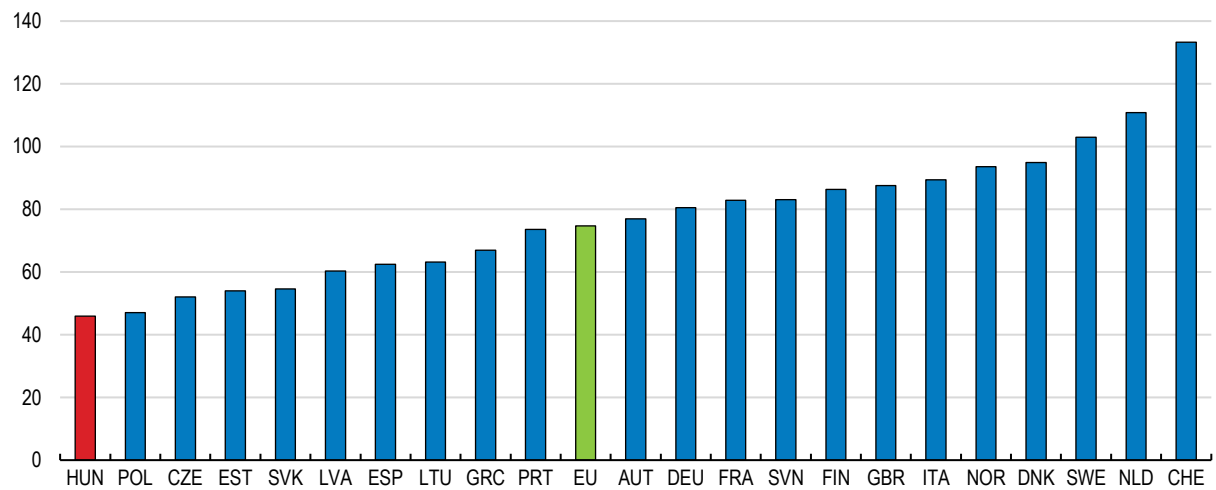
Stronger price signals and further investment in electricity supply from low-carbon sources are needed to accelerate the green transition.

Hungary's green transition has made progress but needs to accelerate. For a large part, emission reductions achieved so far have been related to structural shifts induced by the transition to a market economy in the early 1990s. Regulations and standards are currently the main tools used to support the green transition, but they will likely be insufficient to reach the 2030 and 2050 emission targets.

Price signals are key for an efficient decarbonisation. The EU Emission Trading Scheme is the main price-based measure to curb emissions, but only covers a third of emissions. As a result, average carbon prices are low in international comparison, and below what is needed to meet emission targets (Figure 3).

Figure 3. Carbon prices are low

Net effective carbon rates, all sectors, EUR per tonne of CO2 (2021)



Source: OECD (2022), Pricing Greenhouse Gas Emissions.

StatLink https://stat.link/av4kmr

Energy price caps and poor dwelling insulation make residential energy use a main source of emissions. Price caps keep residential energy prices at one of the lowest levels in Europe, which is very costly for the government and discourages energy savings and improvements in energy efficiency. Household energy consumption is high and only a small share of dwellings are insulated (Figure 4).

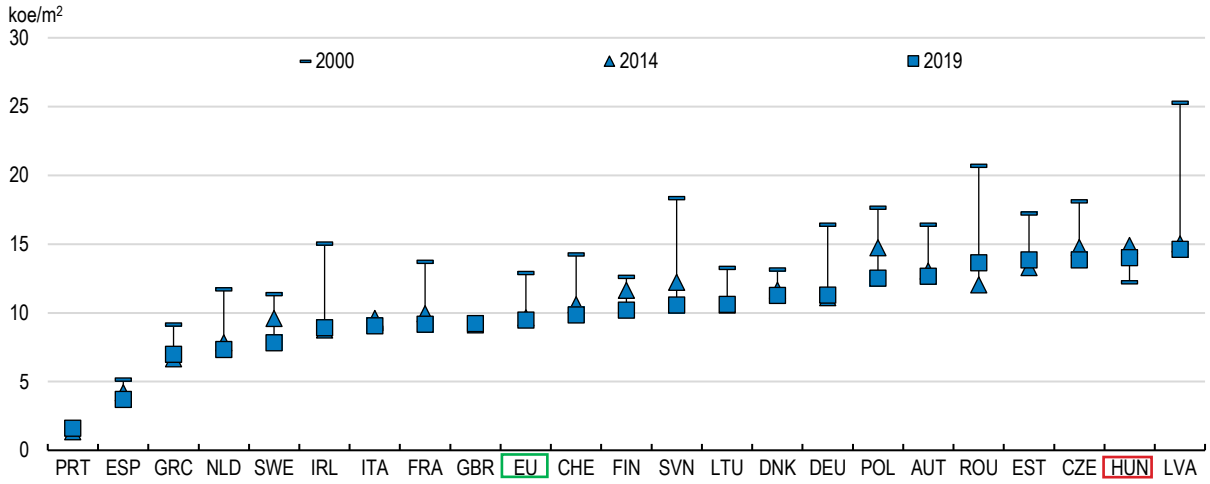
An ageing vehicle stock, low fuel duties and urban sprawl are pushing up transportation emissions. Over 70% of the car stock is older than 10 years. Low excise duties on motor fuels contribute to long distances travelled by car and high emissions, as do rapid suburbanisation around Budapest and traffic congestion.

The green transition will require a significant increase in electricity supply from low-carbon sources. Current plans to meet the expected increase in electricity demand are focused on solar energy and biomass. Nevertheless, burning additional biomass would increase emissions and

reinforce an already acute air pollution problem. The potential for wind and geothermal energy sources is underexploited. Moreover, the development of intermittent energy sources will require massive investments in the electricity grid.

Figure 4. Households' energy consumption is high

Energy consumption of households for heating, in kilograms of oil equivalent (koe) per m²



Note: For each country, energy consumption is corrected for changes in meteorological conditions across years.
Source: Odyssee-Mure, https://www.odyssee-mure.eu/

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Ensuring a sufficient low-carbon electricity supply will be a challenge. Hungary currently imports 40% of its electricity from neighbouring countries, which are engaged in a similar decarbonisation process. Moreover, the implementation of the planned replacement of Hungary's single nuclear plant in the coming years is subject to financial, technical and geopolitical risks.

Main findings and key recommendations

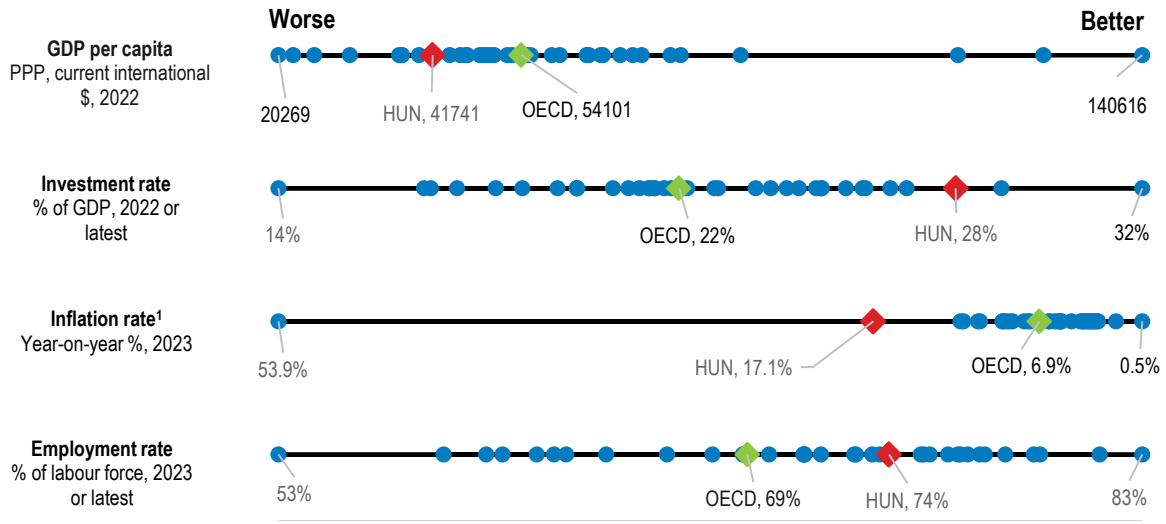
Main findings	Key recommendations
Macroeconomic developments and policy challenges	
The ongoing decline of inflation is subject to significant uncertainty, and the anchoring of inflation expectations has weakened.	Continue fighting remaining inflationary pressures and ease monetary policy at a gradual and data-dependent pace.
The non-performing loans ratio is above the OECD average and expected to increase given the rising number of business failures.	Closely monitor loan delinquencies and business failures. Phase out interest rate caps and stand ready to impose additional capital requirements on banks as needed.
Public debt has been on a declining trend since its peak of 79% of GDP in 2020, but it is projected to remain above its pre-pandemic level in 2025. The Fiscal Council pointed to risks surrounding the macroeconomic assumptions underlying the 2024 budget.	Take additional measures if needed to reduce the fiscal deficit in line with the 2023-2027 Convergence Programme. Create fiscal space for ageing-related expenditures and the green transition, including through spending reviews.
Energy price caps have been costly for the government budget and low energy prices reduce incentives for energy efficiency.	Restructure energy support by moving from price caps to more targeted cash transfers to vulnerable households while reducing the overall fiscal costs.
Raising productivity and strengthening institutions	
Low regulated prices in the retail electricity sector discourage the entry of competitors to state-owned firms. Telecommunication prices are relatively high and the mobile telecommunication sector recently went through a major reorganisation without the involvement of the Competition Authority.	Design more competition-friendly regulations, ensure a level-playing field between private and public enterprises, and reinforce the role of the Competition Authority.
Despite recent reforms, the insolvency framework could be further improved to facilitate the allocation of capital towards the most productive firms.	Further improve the insolvency regime by allowing creditors to initiate debt restructuring and simplifying debt restructuring procedures for SMEs, e.g. by allowing out-of-court settlements.
Recent reforms have the potential to improve the anti-corruption and public integrity framework in Hungary in line with OECD standards, if they are fully implemented. Two anti-corruption strategies have been formulated, which may complicate their implementation.	Fully implement the new anti-corruption and public-integrity framework, and enhance coherence between the two anti-corruption strategies.
Towards more inclusive growth	
Inequalities of opportunities exist in several dimensions. Intergenerational income mobility is low and women face significant employment and pay gaps.	Continue expanding access to early childhood education and childcare facilities for children under the age of 3.
Public education spending is low in international comparison, and there are strong educational achievement inequalities across students with different socio-economic backgrounds	Undertake a review of education spending to see how to improve its efficiency. Shift more resources to schools where students have a lower socio-economic background.
Green transition	
Carbon prices outside the EU-ETS are at or close to zero and do not provide a strong market-based incentive for emission reductions.	Enforce emission reductions through a mix of regulations and carbon prices, and progressively align carbon prices in sectors outside of emission trading to those in the EU-ETS.
Low excise duties on petrol and diesel encourage car usage.	Raise excise taxes on petrol and diesel.
Wind capacity expansion has come to a standstill in the last decade.	Remove restrictive rules on windmill installation, particularly the distance to housing rules.
Massive investments in the electricity grid will be needed to accommodate more renewable energy sources.	Allow the grid operator to raise fees to cover operating costs and investment needs if EU and government financing is insufficient.

1 As macroeconomic challenges recede, policy reforms become key

The last years have been characterised by severe macroeconomic challenges for Hungary, which put an end to a period of strong economic growth and improving public finances in the years preceding the COVID-19 pandemic. As the economy emerged from the pandemic, inflation rose to levels not seen in decades, initially on the grounds of international factors such as rising commodity prices and supply-chain bottlenecks and strong policy stimulus that stretched growth beyond its potential, later exacerbated by the economic fallout from Russia's war of aggression against Ukraine. Against a backdrop of declining household real incomes, higher interest rates and weak investor confidence, domestic demand softened, leading to declining activity from mid-2022 onwards. At the same time, however, the labour market has proven surprisingly resilient (Figure 1.1).

Policymakers reacted to this challenging situation with a number of policy initiatives meant to attenuate the burden of high inflation and the recession on households. Some of these helped to shield ordinary Hungarians from an even stronger impact, but frequently at substantial fiscal costs. As growth recovers and inflation recedes, the need to unwind some of the legacy left behind by emergency measures adds to the existing medium-term challenges.

Figure 1.1. Economic indicators



Note: [1] Indicator reversed so that the right side of the scale corresponds to a better outcome.
Source: World Bank; OECD Database on consumer price indices; OECD Database on labour market statistics; OECD calculations

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Looking ahead into the next years, economic policies will have to be guided by the need to rebuild fiscal space to address new and long-standing challenges. Population ageing will imply rising expenditure, especially on pensions. Amendments to the pension system will be needed to mitigate ageing-related costs, but that may not be enough to guarantee that public debt reverts back to 50% of GDP in the long term, as mandated by the Constitution. Reviewing existing policies and raising the efficiency of public spending will be key to ensure that investments for the future can be made without endangering fiscal sustainability.

Stronger productivity growth will be needed to sustain living standards amid a declining share of the working-age population. After a decade of falling labour productivity following the global financial crisis, productivity growth resumed in the late 2010s but remains lower than before the crisis. Future productivity growth will hinge on creating the right environment for new and innovative firms to enter markets and for existing firms to improve their performance. Innovation and new technologies will play a key role for that, and current challenges in digital preparedness and skills will have to be overcome.

Among the structural reforms that are discussed in this Survey, simulations show that increasing competition in network and services sectors, and improving the insolvency framework to the average of the five best-performing OECD countries has the potential to raise GDP per capita by a cumulated 3.2 percentage over 10 years. Moreover, reducing social contributions to the OECD average could raise GDP per capita by an additional 1.3 percentage point (Table 1.1).

Table 1.1. Illustrative impact on GDP per capita of structural reforms

Difference in GDP per capita 10 years after reform

	% of GDP
Competition reforms	
Increase competition in network sectors	1.4
Increase competition in services sectors	1.3
Improve the insolvency framework	0.5
Tax reforms	
Replace turnover taxes with VAT	0.5
Reduce social contributions to OECD average, by targeting low-income workers	1.3
Total	**5.0**

Note: For the three competition reforms, the simulation assumes that Hungary reaches the average product market regulation or insolvency framework characteristics of the 5 best-performing OECD countries.
Source: OECD estimates, based on (Xing, Bilicka and Hou, 2022[1]) and the OECD Economics Department's Long-Term Model.

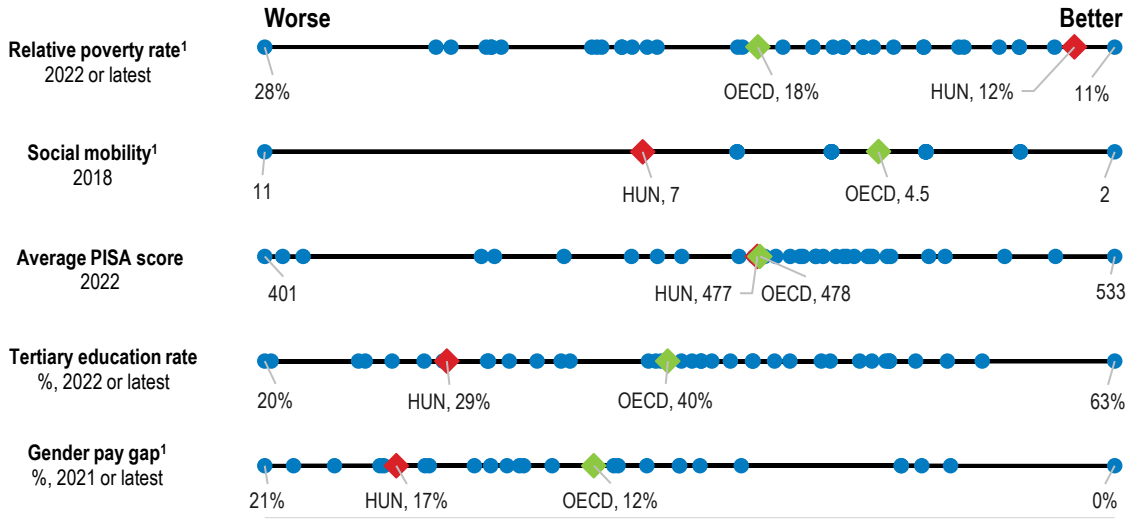
Reforms can make growth not only stronger but also more inclusive. Sizeable social transfers keep income inequalities and poverty at low levels. Nevertheless, inequalities of opportunities are high for women, especially after childbirth, and for those from less privileged socio-economic backgrounds, which is linked to the education system.

Investment in education will support stronger and more inclusive growth, but it will take additional resources to lift outcomes, such as the proportion of tertiary graduates, to the level of European peers (Figure 1.2). Rethinking how funds and teachers are allocated to schools could improve the support that students with lower socio-economic backgrounds receive.

A more recent structural policy challenge will be to master the transition towards a greener and less carbon-intensive economy. Price signals have been underexploited in the quest to achieve ambitious emission targets, with carbon prices being among the lowest in Europe. As a result, household energy consumption is high in international comparison (Figure 1.3).

Structural reforms will need to unwind energy price caps and the resulting subsidies, while finding more targeted and effective ways to protect vulnerable households against the economic effects of higher carbon prices. Moreover, the green transition will require increasing electricity supply, by raising the contribution of low-carbon energy sources. This would both reduce emissions and improve energy security.

Figure 1.2. Inclusiveness indicators



Note: [1] Indicator reversed so that the right side of the scale corresponds to a better outcome.
The relative poverty rate is the proportion of people earning less than 60% of the median income, after accounting for taxes and transfers. The social mobility indicator is the expected number of generations for children belonging to a family at the bottom 10% of the income distribution to reach average income. The average PISA score is the average score of mathematics, science and reading.
Source: OECD Income Distribution Database; OECD (2018), A Broken Social Elevator? How to Promote Social Mobility, OECD Publishing, Paris; OECD PISA database; OECD Education at a glance database; Eurostat; OECD calculations.

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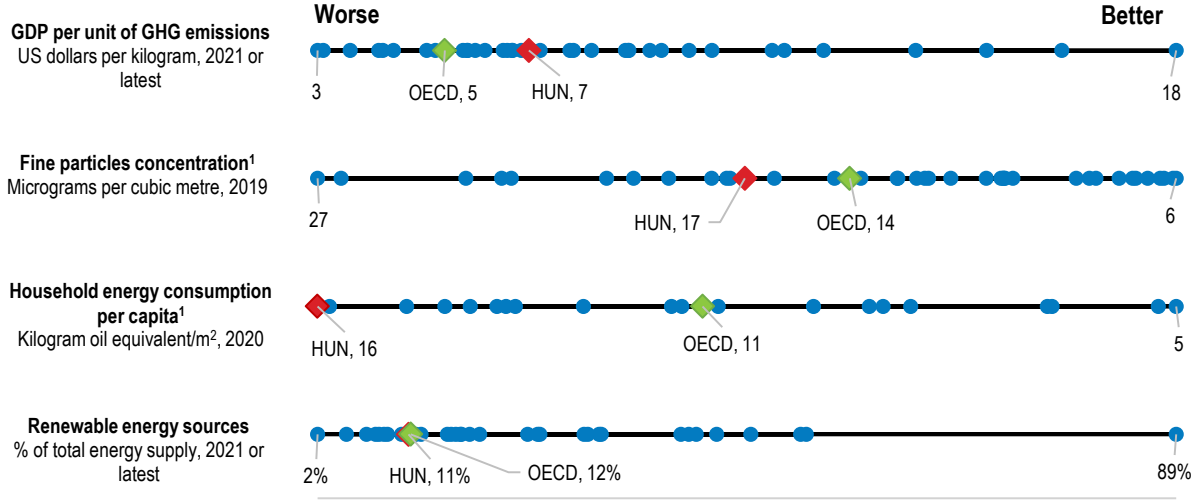
Figure 1.3. Sustainability indicators



Note: [1] Indicator reversed so that the right side of the scale corresponds to a better outcome.
GDP per unit of GHG emissions is the production-based CO2 productivity. Fine particles concentration is the mean population exposure to PM2.5.
Source: OECD Green Growth Indicators Database; Household energy consumption per capita: Odyssee-Mure (https://www.odyssee-mure.eu/); OECD calculations.

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

- Fiscal and monetary policies will need to work hand-in-hand to fight remaining inflationary pressures, and recreate fiscal space to finance future spending needs.
- Productivity has slowed since the mid-2000s and structural reforms that facilitate new firm entry and exit, in addition to a wider take-up of digital tools are needed. Recent reforms to promote public integrity will sustain investor confidence if they are fully implemented.
- Social transfers keep income inequalities and poverty low but should be better targeted to those most in need, while inequalities of opportunity are substantial. Further expanding access to childcare facilities for young children and improving the education system would help to address these challenges.
- Hungary's green transition has made progress but needs to accelerate. This will require a significant increase in electricity supply from low-carbon sources, with price signals acting as a catalyst for a more effective and efficient decarbonisation. Targeted transfers can help to protect vulnerable households against the effects of rising energy prices.

References

Xing, J., K. Bilicka and X. Hou (2022), "How Distortive are Turnover Taxes? Evidence from Replacing Turnover Tax with VAT", *NBER Working Paper #29650*, https://www.nber.org/system/files/working_papers/w29650/w29650.pdf. [1]

2 Macroeconomic developments and policy challenges

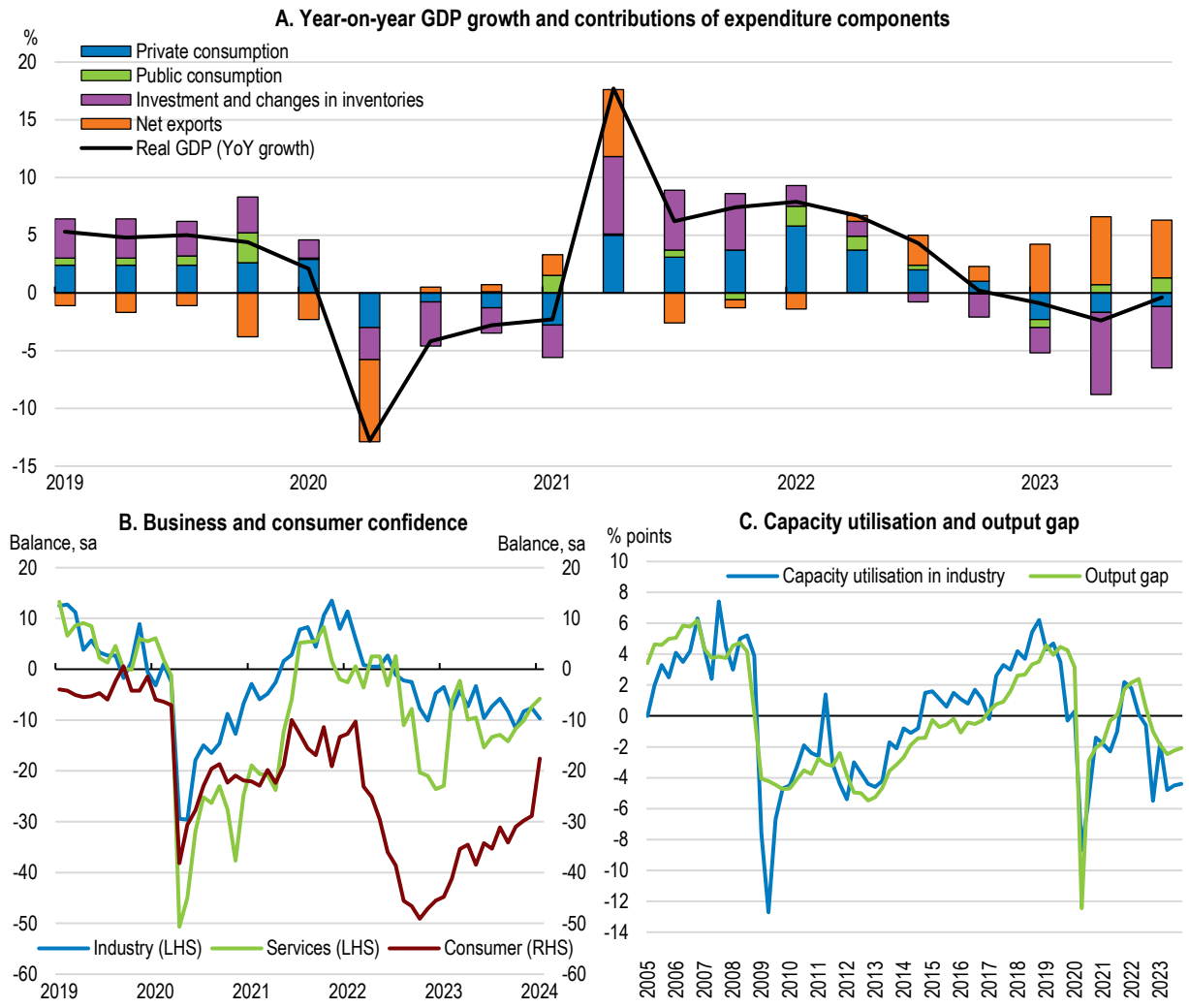
Pierre-Alain Pionnier

The economy is emerging from a downturn and expected to pick up in 2024

Economic activity and confidence declined significantly

A strong post-pandemic recovery, largely driven by domestic demand, lifted the economy above its potential in late 2021 and early 2022 (Figure 2.1). Since then, growth has shifted into reverse with four consecutive quarters of falling GDP. High inflation has curtailed the purchasing power of households and weighed on private consumption, while private investment has been held back by higher interest rates and lower confidence. Public investment has decreased but public consumption has remained supportive. External demand has also supported growth, although mainly related to lower imports in the face of falling domestic demand.

Figure 2.1. Growth and confidence declined in 2022 and early 2023



Note: Panel A: Year-on-year GDP growth of non-seasonally adjusted GDP, and contributions of expenditure-side components. The Hungarian Central Statistical Office (HCSO) does not provide additive contributions of expenditure-side components to quarter-on-quarter seasonally-adjusted GDP growth. Panel C: Capacity utilisation is shown as a percentage-point deviation from its long-term (2005Q1-2023Q2) average, and the output gap is expressed in percentage points of potential output.

Source: Panel A: Hungarian Central Statistical Office (HCSO); Panel B and Panel C (capacity utilisation): European Commission (Joint Harmonised EU Programme of Business and Consumer Surveys); Panel C (output gap): OECD Economic Outlook 114 Database.

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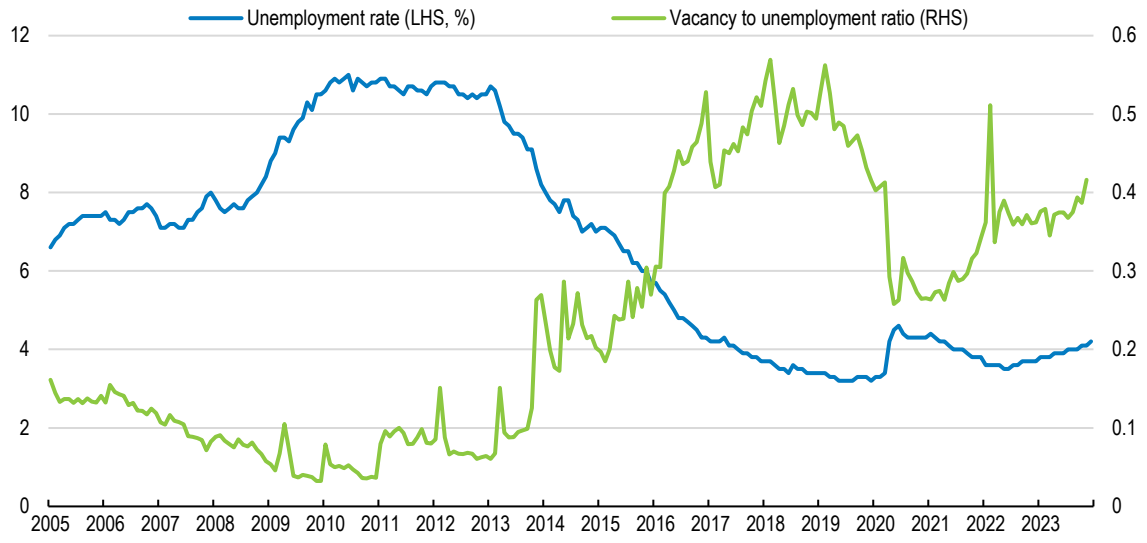
The labour market has held up well

Despite the contraction in output, the labour market has remained tight. The unemployment rate bottomed out at 3.5% in June 2022 at the peak of the recovery from the pandemic. It has increased again since, but this increase has been marginal and unemployment is only slightly higher than in 2019 amid a high number of job vacancies (Figure 2.2). Especially large firms have been hoarding labour despite the slowdown, possibly anticipating future hiring difficulties as the working-age population declines due to ageing, and supported by a recent strength in corporate profits (Magyar Nemzeti Bank, 2023, pp. 70-74[1]).

Figure 2.2. Despite plummeting economic activity, the labour market remains historically tight



Note: Unemployment refers to Labour Force Survey (LFS) unemployment.
Source: OECD Database on Short-Term Labour Force Statistics.

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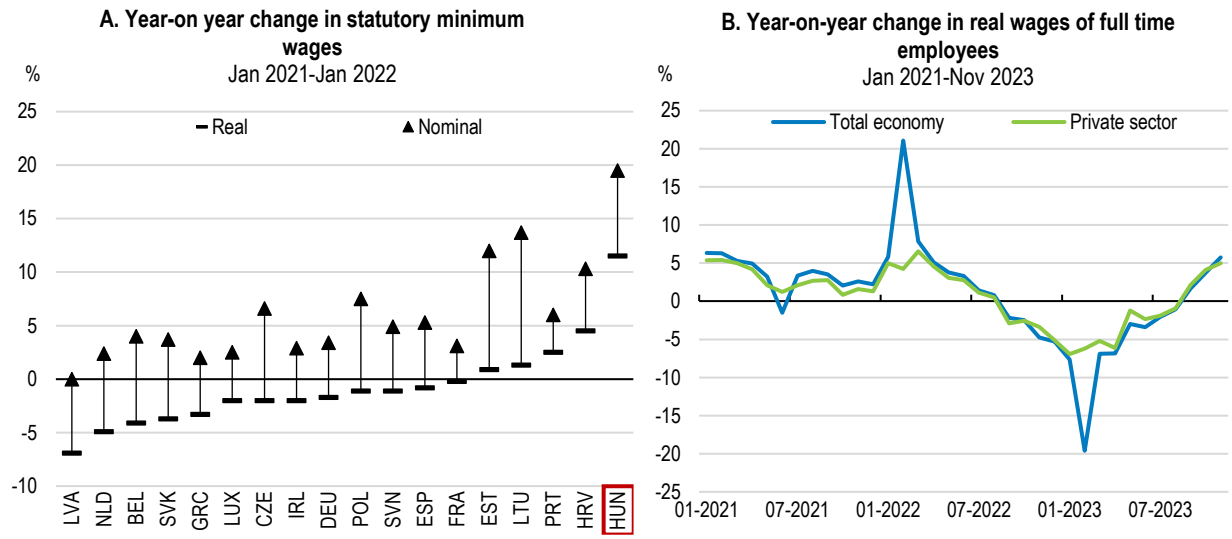
This tight labour market is putting pressure on wages and policies have exacerbated these pressures. The minimum wage was raised by 19.5% in January 2022, well above the 8% inflation rate at the time (Figure 2.3, Panel A). This marked the most significant minimum wage increase in the European Union (EU) in 2022, both in nominal and in real terms, albeit mitigated by a reduction in employers' social contributions. Wage increases and one-off transfers to many civil servants extended this strong wage growth to the public sector. As a result, the year-on-year real wage growth in the total economy exceeded 20% in February 2022.

This strong wage increase was not sustained over time and year-on-year real wage growth turned negative in September 2022, thus adding no further pressure on inflation and leading to a decline in private consumption (Figure 2.3, Panel B). Similarly, the January 2023 nominal minimum wage increase of 16% fell short of inflation, at 25.7% between January 2022 and January 2023. Nevertheless, the minimum wage was raised again by 15% in December 2023, well above the inflation rate of 5.5% over the previous year.

Looking ahead, well-defined rules for minimum wage adjustments, based on advice from an independent expert commission, such as those existing in France, Germany, and Spain, may improve the transparency and predictability of minimum wage increases in Hungary, even though the exact combination of expert advice, pre-defined rules and negotiation between social partners may be adapted to national circumstances. The recent bout of inflation has raised questions about how to sustain the purchasing power of minimum wage workers without fueling inflation. Productivity growth would be a useful benchmark for future real minimum wage adjustments. At 40% of the average wage in 2021, the minimum wage level in

Hungary is below the indicative reference level of 50% mentioned in the 2022 EU Directive on minimum wages (Eurofound, 2023[2]). Formal discussions involving social partners, the government and possibly an independent expert commission, would help clarify how the minimum wage should be revised in the coming years, in view of inflation and productivity developments, and the average wage level in the economy.

Figure 2.3. Strong wage growth fuelled inflation in early 2022



Note: The two opposite spikes in real wage growth in February 2022 and 2023 are related to one-off transfers to civil servants in February 2022.
Source: Panel A: Eurofound (2023[3]), Panel B: Hungarian Central Statistical Office (HCSO) and OECD calculations.

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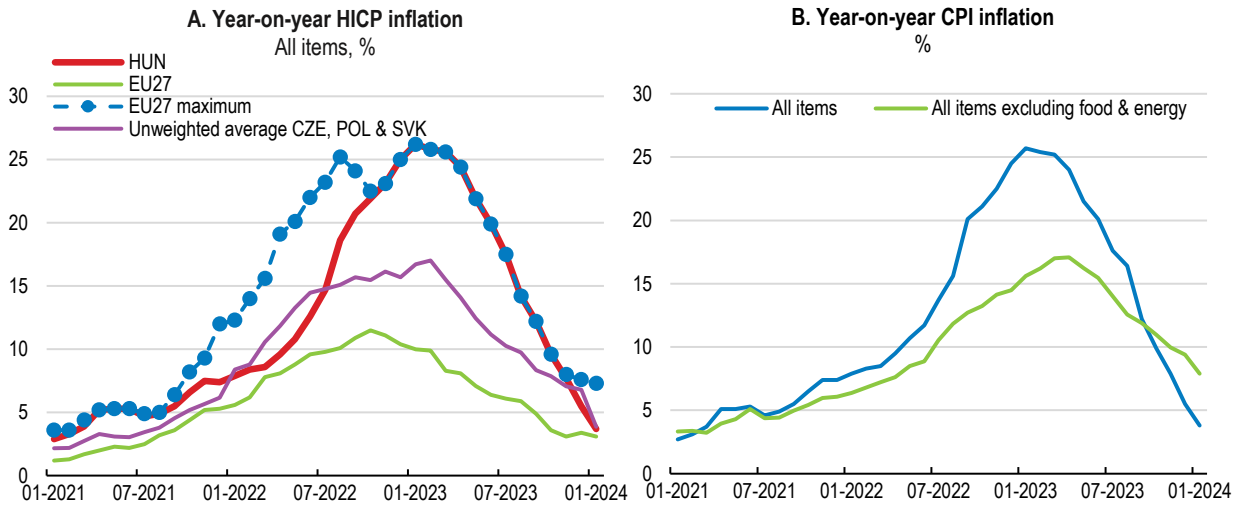
Inflation is receding after a record increase

Inflation increased continuously from mid-2021 to a peak of 25.7% in January 2023, a level not seen in over 25 years. Rising inflationary pressures were initially due to international factors such as increasing commodity prices and supply-chain bottlenecks following the COVID-19 pandemic, and the overheating of the economy, exacerbated by the income support policies implemented in early 2022, including large increases in the minimum wage and public sector wages, accompanied by income tax cuts. The surge in global energy and food prices following Russia's war of aggression against Ukraine then amplified these price pressures. Compared to neighbouring countries like Czechia, Poland and the Slovak Republic, inflation was stronger in Hungary, partly related to the depreciation of the currency, and lasted longer (Figure 2.4, Panel A). Headline inflation declined to 3.8% in January 2024, but core inflation excluding food and energy remains high, at 7.9%.

The difference in timing and amplitude of inflation in Hungary compared to neighbouring countries is largely related to food and energy prices. Food and the closely related hospitality services prices accounted for 12 percentage points of the 25.7% inflation rate prevalent in January 2023 (Figure 2.5). In early 2023, these prices explained two thirds of the inflation gap between Hungary and the neighbouring countries, and their strong increase was closely related to the behaviour of agricultural prices (Box 2.1). The exceptional food price inflation in Hungary contributed 2.5 times more to inflation than retail energy prices, which did not rise much until price caps implemented by the government were relaxed in August 2022 for electricity and heating gas, and in December 2022 for motor fuels. Inflation of other goods and services was more in line with developments in neighbouring countries. Looking ahead, the pace at which inflation will recede for these core items will be key to bring inflation under control.

Figure 2.4. Headline inflation has declined but core inflation remains high



Note: Panel A refers to HICP inflation, which is the harmonised measure of inflation in the EU. Panel B refers to national CPI inflation. While this may not be the case for all countries, HICP and national CPI inflation measures for Hungary are usually very close to each other.
Source: Eurostat Database on Harmonised Indices of Consumer Prices (HICP), OECD Database on Consumer Price Indices

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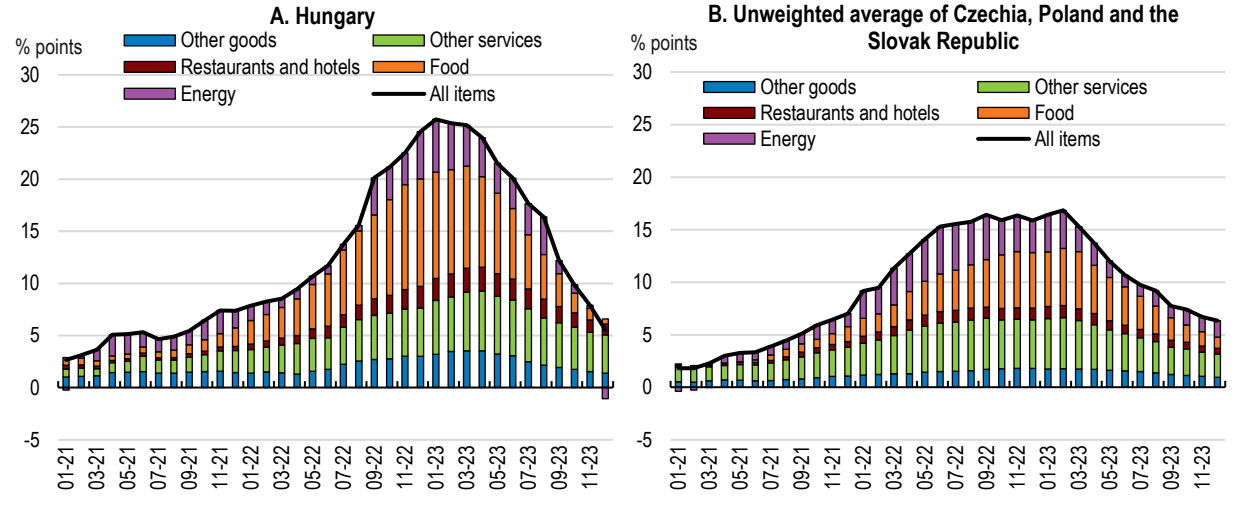
Figure 2.5. Recent inflation in Hungary has been largely driven by food prices



Note: Figure 2.5 refers to national CPI inflation. "Food" covers food and non-alcoholic beverages (COICOP 01). "Energy" covers electricity, gas and other fuels, as well as fuels and lubricants for personal transport equipment (COICOP 04.5 and 07.2.2).
Source: OECD Database on Consumer Price Indices.

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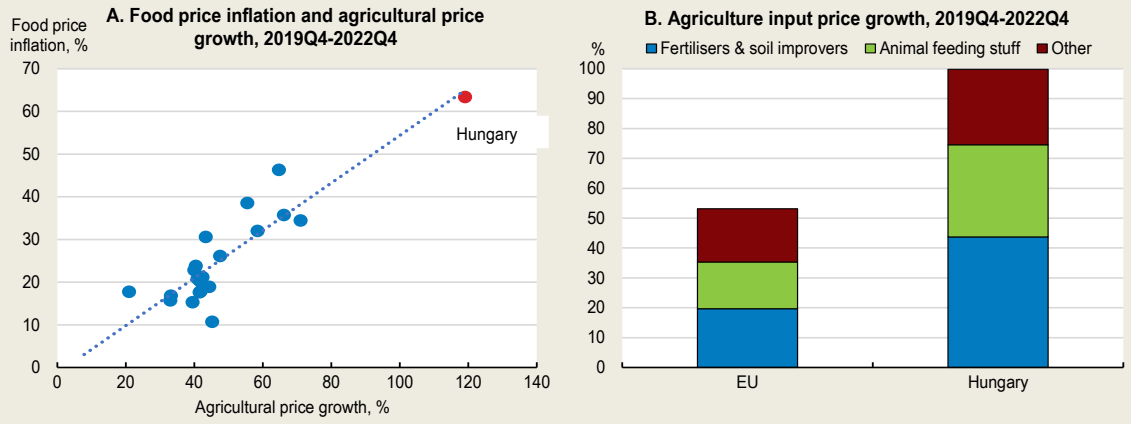
Box 2.1. Explaining high food price inflation in Hungary

Final food prices are affected by many intermediaries along the food supply chain, but almost 80% of cross-country differences in food price inflation between the last quarters of 2019 and 2022 can be explained by divergences in agricultural producer prices. Agricultural prices rose by less than 45% in the EU over this period, but increased by nearly 120% in Hungary (Figure 2.6, Panel A).

One likely factor behind this is the drought that affected Hungary in 2022, but there were also striking differences in the development of agricultural input prices between Hungary and the EU. These grew by 53% in the EU, but they doubled in Hungary, mostly driven by fertilisers and animal feeding stuff (Figure 2.6, Panel B).

Figure 2.6. Higher agricultural input price growth led to higher food price inflation in Hungary



Note: Panel A: Each dot represents an EU country. Panel B: The histogram breaks down the difference in agricultural input price growth between Hungary (100%) and the EU (53%) into contributions from specific inputs. Fertilisers and animal feeding stuff contributed for most of this difference. The "other" category includes energy and lubricants, other goods and services, plant protection products and pesticides, and seeds and planting stock.

Source: Eurostat database on Agricultural Prices, OECD database on Consumer Price Indices, and OECD calculations.

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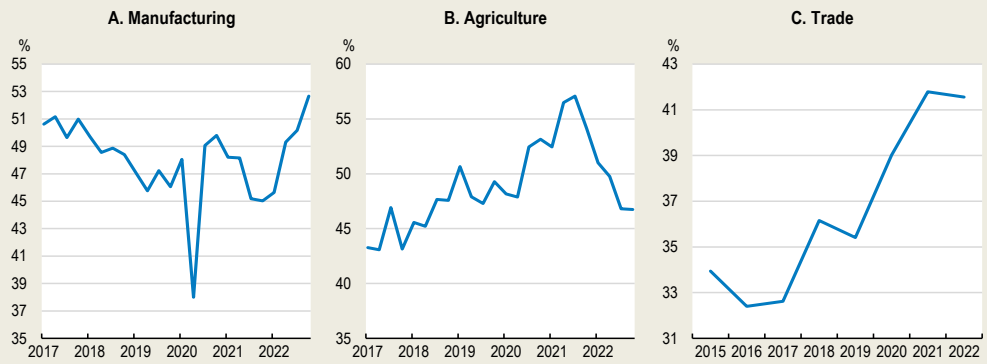
The war in Ukraine increased global fertiliser prices by cutting off major producers Belarus and Russia from global supply chains and raising the price of energy, a key input for fertilisers (Hebebrand and Glauber, 2023[4]). Recent estimates suggest that an increase in fertiliser prices by 10% leads to an average increase of 2% in agricultural prices (OECD/FAO, 2023[5]). Applying this result, the 190pp difference in fertiliser price growth between Hungary and the EU over 2019-2022 can explain a 40pp higher agricultural price growth in Hungary and a 20pp higher food price increase for final consumers (Figure 2.6, Panel A).

What can explain differences between Hungary and other EU countries? One explanation is the 25% depreciation of the Hungarian forint against the euro over the period 2019-2022, but it is unlikely to explain observed discrepancies in agricultural input prices. Another potential explanation relates to rising profit margins in the Hungarian manufacturing sector in 2022 (Magyar Nemzeti Bank, 2023, pp. 49-51[6]), which may have pushed up prices of agricultural inputs from the manufacturing sector such as fertilisers and animal feeding stuff, as well as processed food prices further down the value chain. Macroeconomic series are indeed consistent with rising profits in manufacturing, but not in agriculture, which indicates that agricultural prices were mostly driven by rising input prices, and not by rising producer margins (Figure 2.7). Similarly, there is no evidence that retailers contributed to a wider gap between agricultural and retail food prices in 2022.

Figure 2.7. Aggregate profits increased in 2022 in manufacturing, but not in agriculture or trade

Gross operating surplus over value added at factor costs, %



Note: Mixed income was split between gross operating surplus and labour income by imputing to self-employed workers the same hourly compensation as employees working in the same sector.
Source: Hungarian Central Statistical Office (HCSO, quarterly national accounts), OECD calculations

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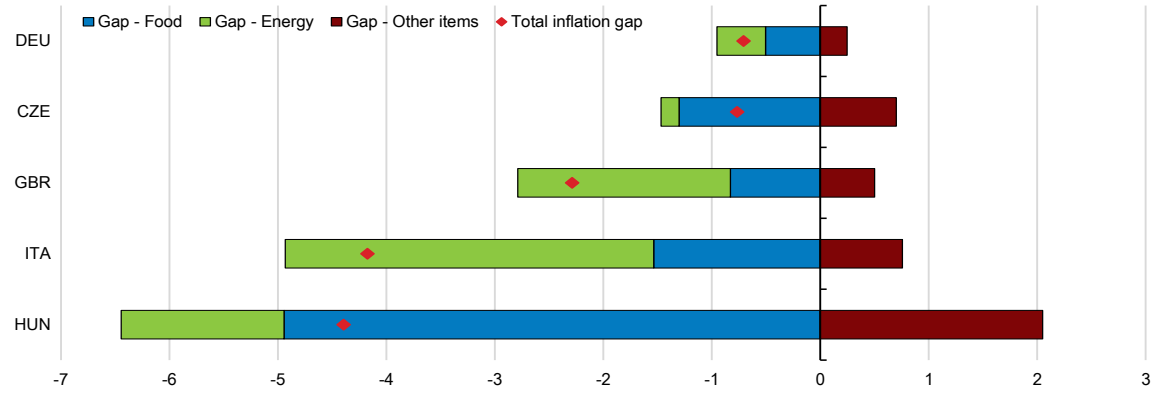
The disproportionate increase in food and energy prices in 2022 implied stronger real income losses for low-income households, who generally tend to spend more on food and energy. Households in the lowest income quintile faced a 4.4 percentage point higher inflation rate than households in the highest income quintile in December 2022, when food price inflation peaked and energy price inflation was increasing due to the phasing out of motor fuel price caps (Figure 2.8).

Figure 2.8. Inflation disparities between household income quintiles

Year-on-year inflation gap between the highest and lowest income quintiles, December 2022



Note: This chart follows the same methodology as (Causa et al., 2022[7]). It mostly accounts for the fact that expenditure shares for aggregate items such as food and non-alcoholic beverages, clothing and footwear, and transport differ across household income quintiles. Nevertheless, it does not account for very detailed consumption patterns, such as a higher consumption by poorer households of necessity products covered by food price caps. In this sense, the figure provides an upper bound of the inflation gap faced by poorer households due to food price inflation in Hungary. Results for comparator countries were updated to December 2022 while (Causa et al., 2022[7]) presented results for August 2022.
Source: Household Budget Surveys from the Hungarian Central Statistical Office (HCSO) and the national statistical offices of DEU, CZE, GBR and ITA; OECD calculations.

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After a decline in 2023, economic activity is projected to pick up in 2024

Economic activity declined by 0.9% in 2023, mainly driven down by private consumption and investment in the first part of the year. The decline in energy and food prices, as well as economic activity, pulled down headline inflation from 25.7% in January to 5.5% in December 2023, supporting a gradual pickup in household real income and consumption in the second semester. Since core inflation, excluding food and energy, remains at 7.9% in January 2024, monetary policy easing may only be gradual. This, and the uncertainty related to the international environment, exchange rate developments and the release of EU funds (see below) will continue to hold back investment in 2024. Due to slow growth in Hungary's main trading partners including Germany, exports are expected to pick up only progressively in 2024 and 2025. While international trade had a strong positive contribution to economic growth in 2023 due to the significant decline in imports, this contribution will be lower in 2024 and 2025 due to imports increasing along with the pick-up in economic activity (Table 2.1).

Table 2.1. Macroeconomic indicators and projections

	2020	2021	2022	2023	2024	2025
	Current prices (HUF billion)	Annual percentage change, volume (2015 prices)				
Gross domestic product (GDP)	48,425.4	7.1	4.6	-0.9	2.4	2.8
Private consumption	23,968.3	4.6	6.5	-2.9	3.5	2.6
Government consumption	10,327.2	1.8	3.0	1.6	1.7	1.8
Gross fixed capital formation	12,841.3	5.8	0.1	-11.3	-0.7	5.4
Final domestic demand	47,136.8	4.2	3.8	-4.3	2.0	3.2
Stockbuilding[1]	662.8	2.0	-0.1	-1.5	0.0	0.0
Total domestic demand	47,491.7	6.4	3.6	-5.0	2.1	3.2
Exports of goods and services	38,113.7	8.3	12.6	0.4	2.7	4.4
Imports of goods and services	37,180.0	7.3	11.6	-4.7	2.0	5.1
Net exports[1]	933.8	0.9	0.8	4.9	0.7	-0.2
Other indicators (growth rates, unless specified)						
Potential GDP		3.3	3.5	2.6	2.1	2.0
Output gap[2]		-0.1	1.0	-2.3	-2.0	-1.2
Employment		0.8	1.3	0.5	0.3	0.7
Unemployment rate (% of labour force)		4.0	3.6	4.1	4.2	3.9
GDP deflator		6.4	14.5	13.6	5.7	3.4
Consumer price index		5.1	14.6	17.1	3.9	3.4
Core consumer price index		4.5	10.2	13.8	5.4	3.4
Current account balance (% of GDP)		-4.2	-8.3	0.4	1.7	1.4
Government fiscal balance (% of GDP)		-7.2	-6.2	-6.5	-4.5	-3.4
Structural primary fiscal balance (% of GDP)		-5.1	-4.4	-2.2	0.2	0.5
General government gross debt (Maastricht, % of GDP)		76.7	73.9	74.2	75.4	76.1
Three-month money market rate, average		0.9	7.9	11.5	4.5	3.6
Ten-year government bond yield, average		3.1	7.6	7.5	6.2	6.0

Note: 1. Contribution to changes in real GDP; 2. As a percentage of potential GDP.
Source: Hungarian Central Statistical Office (HCSO), OECD projections.

The growth outlook is subject to significant risks

A key source of uncertainty is the pace at which inflation will recede. While headline inflation peaked in January 2023, its decline in the following months was largely related to lower food and energy prices. Core inflation, excluding food and energy, has only been declining since April 2023, at a slow pace. If core inflation proved more entrenched than expected, the Central Bank would need to keep rates high for longer,

affecting consumption and investment. A subsequent new surge in energy prices could have similar effects, while also straining Hungarian public finances, given the utility price cap that is currently in place.

Another major risk to the outlook is related to the delivery of EU funds which have been subjected to the implementation of rule-of-law reforms by Hungary (Box 2.5). These funds may have a signalling effect stretching far beyond their direct impact on public finances and investment. For example, rating agencies consider the uncertainty about EU funds as one of the key factors underlying their sovereign rating of Hungary (Fitch Ratings, 2023[8]). Setbacks in the negotiations with the EU may curb investor confidence, increase the cost of capital and put renewed pressure on the exchange rate, with negative implications for inflation and investment.

Financial sector risks, which include a potential deterioration of loan portfolios amid high business exits, may curb credit growth and could lead to lower growth outcomes, as discussed below.

Table 2.2. Events that could lead to major changes in the outlook

Risks	Possible outcomes
Construction delays and geopolitical uncertainties related to the planned Paks 2 nuclear power plant, which is set to play a dominant role for future energy supply.	Concerns about future energy supply security could hold back investment and cast doubts on the viability of planned battery plants. Diversifying energy sources at a later stage may lead to additional fiscal costs.
Further escalation of the war in Ukraine, leading to the closure of the pipeline supplying Russian oil and gas to Hungary.	This could lead to energy rationing and closure of some factories and businesses, with an associated significant decline in economic activity.

Monetary policy easing should be gradual

Price controls only managed to delay inflationary pressures

Price caps on gas, electricity and motor fuel prices have been the initial policy response against rising global energy prices up until mid-2022 (Box 2.2). The subsequent partial removal of energy price caps in the second half of 2022 then triggered an increase in headline inflation, similar to earlier developments in neighbouring countries. This delayed increase in retail energy prices explains why energy inflation did not decline in the first part of 2023, unlike elsewhere in Europe. Overall, energy price caps only managed to delay inflationary pressures while proving costly for the government budget due to their weak targeting.

Food price caps were more targeted on necessity items and provided some relief for low-income households, but they did not address the problem at its root and failed to contain food price inflation more widely. Food inflation became widespread and exceeded 40% for half of the food and beverage items in the household expenditure basket in December 2022. Rising retail margins on select substitute items for those subject to price caps may have somewhat reduced the effectiveness of price caps, but there is no evidence that retail margins increased overall between 2021 and 2022 (Figure 2.7) (GVH, 2023[9]).

Box 2.2. Food and energy price caps in Hungary

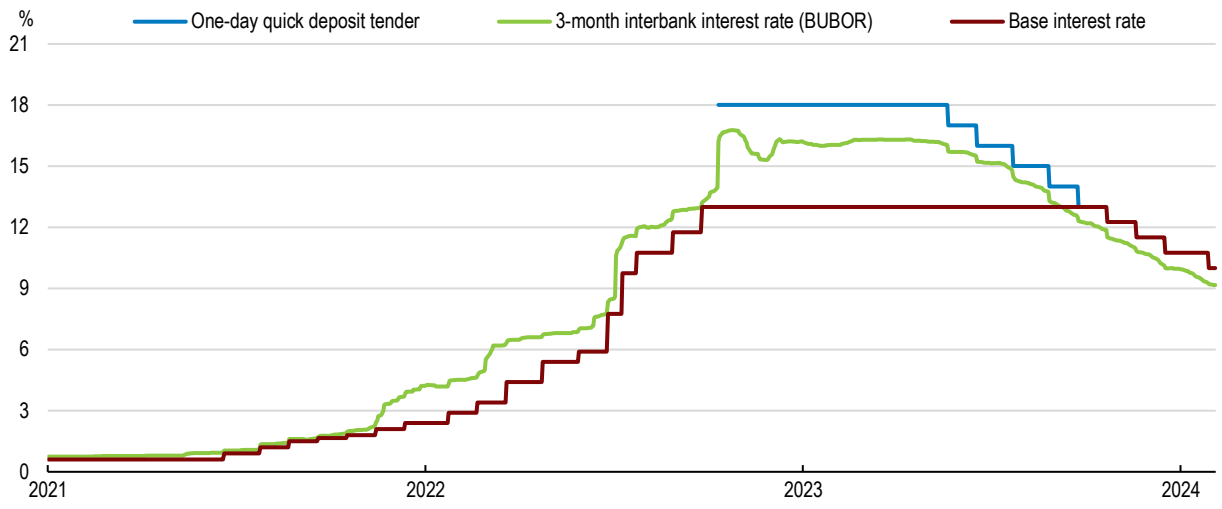
The government implemented different price cap mechanisms aimed to contain energy and food prices:

- Utility price cap: Gas and electricity prices for households have been capped since 2014, but the caps were removed for the part of gas and electricity consumption exceeding the national average in August 2022.
- Motor fuel price cap: Motor fuel prices were capped from November 2021 until December 2022. Coverage was initially universal, then narrowed to residents only in July 2022. The cap eventually ended earlier than initially planned in December 2022 amid supply shortages.
- Food price cap: Prices of seven basic food products were capped at their October 2021 level in February 2022, and further caps on potatoes and eggs followed in November 2022. Caps affected around 2.5% of the total consumer basket, or 10% of households' annual expenditure on food and non-alcoholic beverages (Balatoni, 2022[10]). All food price caps were eventually removed in August 2023. However, these products may still not be sold at a higher price than the purchaser price paid by retailers.

Monetary policy has tightened

Monetary policy started to tighten in mid-2021 when the first signs of increasing inflation appeared. The Central Bank progressively raised its base interest rate from 0.6% in June 2021 up to 13% in September 2022, marking the highest Central Bank base interest rate in the EU (Figure 2.9). In addition, all unconventional monetary policy measures related to the COVID-19 pandemic were phased out by December 2021.

Figure 2.9. The Central Bank significantly raised interest rates after mid-2021



Source: Hungarian Central Bank (MNB).

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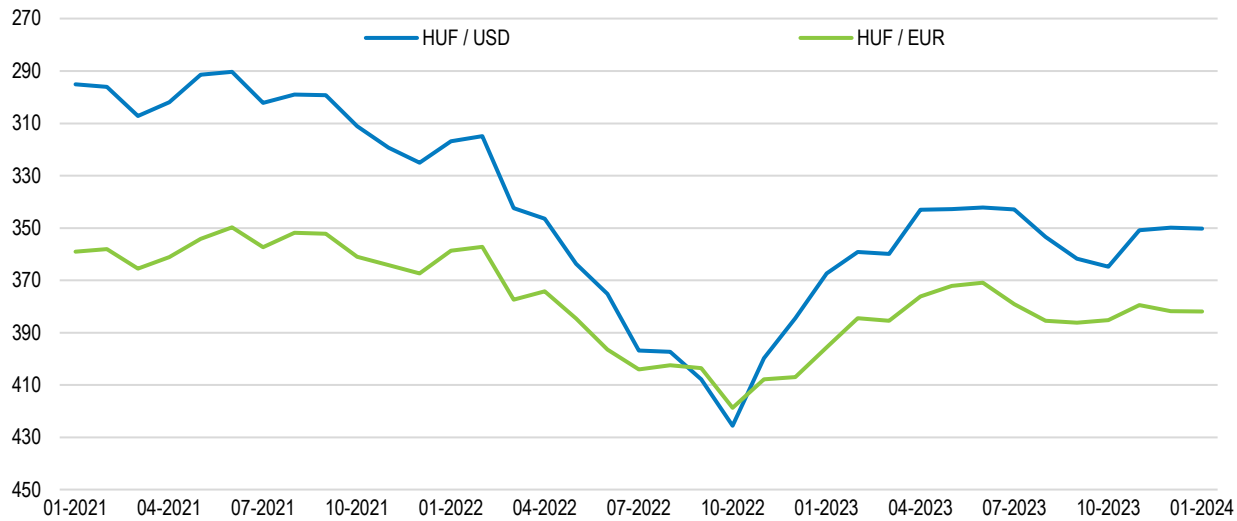
Monetary policy tightening stepped up in October 2022 amid an accelerating depreciation of the currency. Between February and October 2022, the forint had lost 35% against the US dollar and 17% against the euro (Figure 2.10). The Central Bank reacted by increasing the overnight deposit rate (or one-day quick

deposit tender), which then became the effective monetary policy rate, to 18%. Compared to the base interest rate, this overnight rate could be increased more quickly and abruptly, which made it an efficient tool to restore financial market stability and stop financial outflows leading to currency depreciation. This decision stabilised the exchange rate and triggered an appreciation against the US dollar and the euro, by 24% and 14% over the next six months, respectively.

Figure 2.10. The currency depreciated sharply in October 2022 but has recovered ground since then



Note: Inverted scale.
Source: OECD Main Economic Indicators (MEI).

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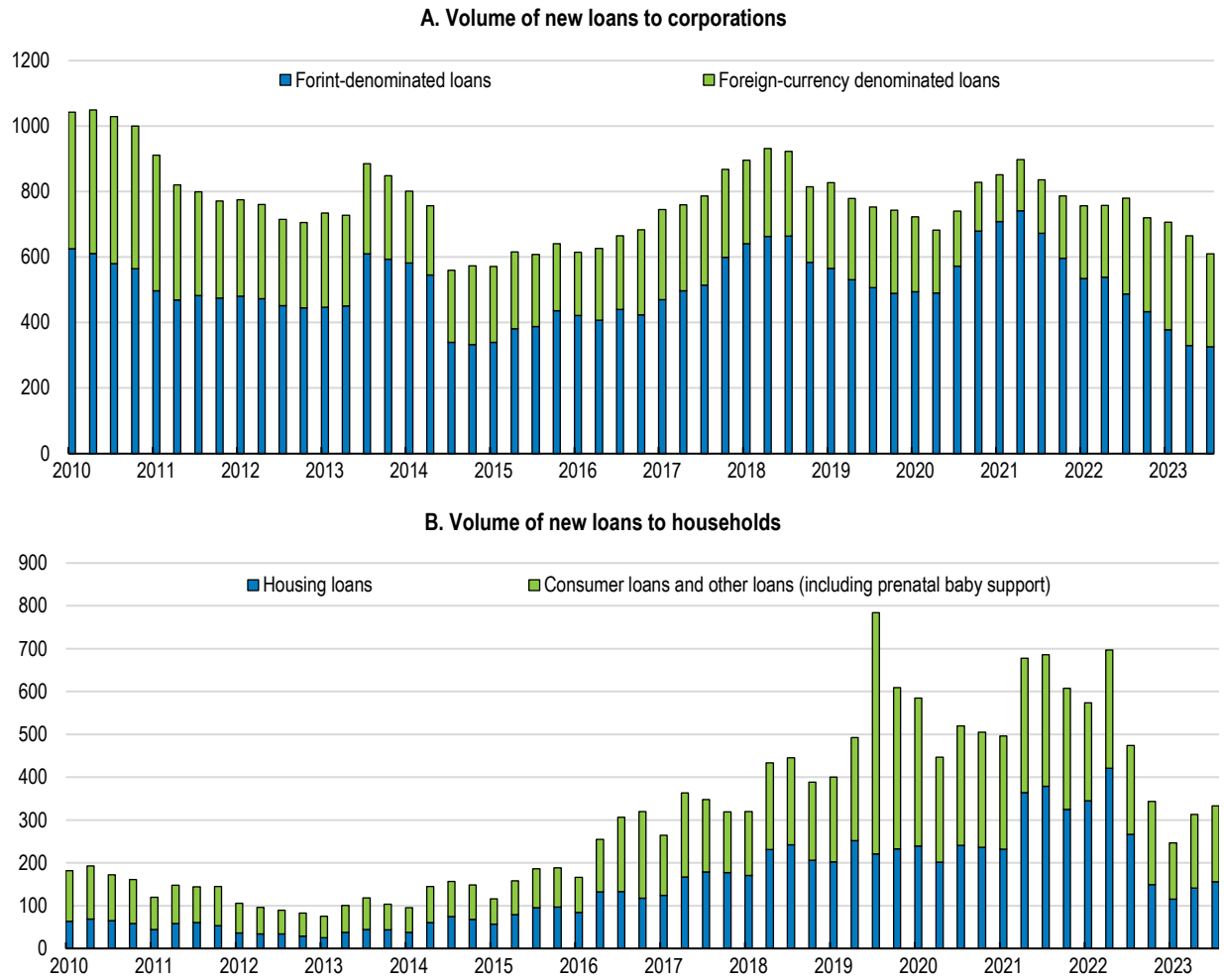
This interest rate increase was complemented with higher minimum reserve requirements as of October 2022. This helped to limit credit supply more directly and maintain an effective credit channel for the transmission of monetary policy in a context of significant credit volumes subject to subsidised and capped interest rates (Box 2.3). New loans began to decelerate significantly in mid-2022, driven by both tighter lending standards and declining credit demand by households and firms (Figure 2.11) (Magyar Nemzeti Bank, 2023[11]).

Figure 2.11. Credit distribution to households and firms slowed down markedly



Note: The volumes of new loans to corporations and households have been calculated by deflating the corresponding values by the Hungarian quarterly CPI (2015 = 100). In Panel A, the volume of new loans to corporations is shown as a moving average over the last four quarters.
Source: Hungarian Central Bank (MNB), OECD calculations.

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Until inflation is fully under control, monetary policy should remain cautious

The Central Bank started to ease monetary policy as of May 2023 by progressively decreasing the interest rate on the one-day quick deposit tender and reducing the gap with the base interest rate. This decision was appropriate because pressures on the exchange rate had eased, headline inflation had peaked in January 2023, and base effects were contributing to a faster decline in inflation in the second half of 2023.

The interest rate on the one-day quick deposit tender and the base interest converged at 13% in September 2023 and were further reduced by step to 10% in January 2024(Figure 2.9).

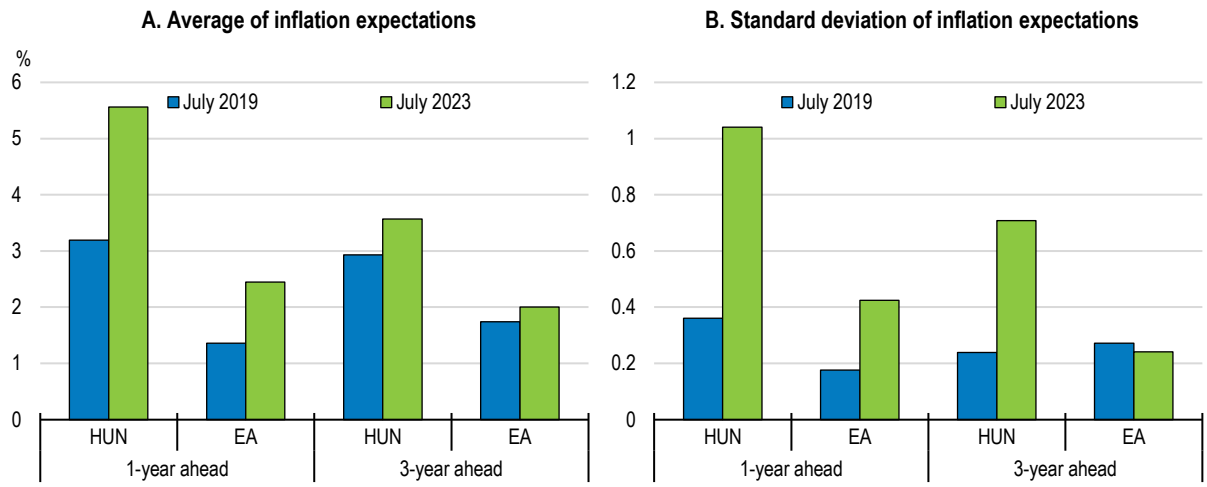
Continuing the gradual and moderate pace of monetary easing seems appropriate given the recent decline in inflation. Nevertheless, significant uncertainties remain. These include the evolution of global energy and food prices, which in turn depends on geopolitical developments and the global economic outlook, the speed at which core inflation will recede, and the evolution of the negotiations with the EU on the delivery of EU funds (see above). These uncertainties are reflected in the dispersion around the inflation projections of professional forecasters. They anticipate on average that inflation will be close to the Central Bank's

target of 3% within two years, but there is wide disagreement among them (Figure 2.12). While forecast dispersion used to be limited and similar for Hungary and the euro area before the pandemic, it is now much higher for Hungary. This may suggest that the anchoring of inflation expectations has weakened in Hungary more than in the euro area.

In this context, the Central Bank will need to remain vigilant and stand ready to keep monetary policy tighter for longer if upside inflation risks materialise. Fully anchoring inflation expectations, especially in the short term, is key to avoid a wage-price spiral and ensure that core inflation will recede (Jordà and Nechio, 2023[12]). The Central Bank should also be ready to pause monetary policy easing if needed, potentially due to renewed tensions on the exchange rate, in relation to interest rate developments outside Hungary or a lack of progress in the negotiations with the EU.

Figure 2.12. The anchoring of inflation expectations in Hungary is more fragile than before COVID

Inflation expectations, Hungary and Euro area, July 2019 and 2023



Source: Consensus Economics, OECD calculations.

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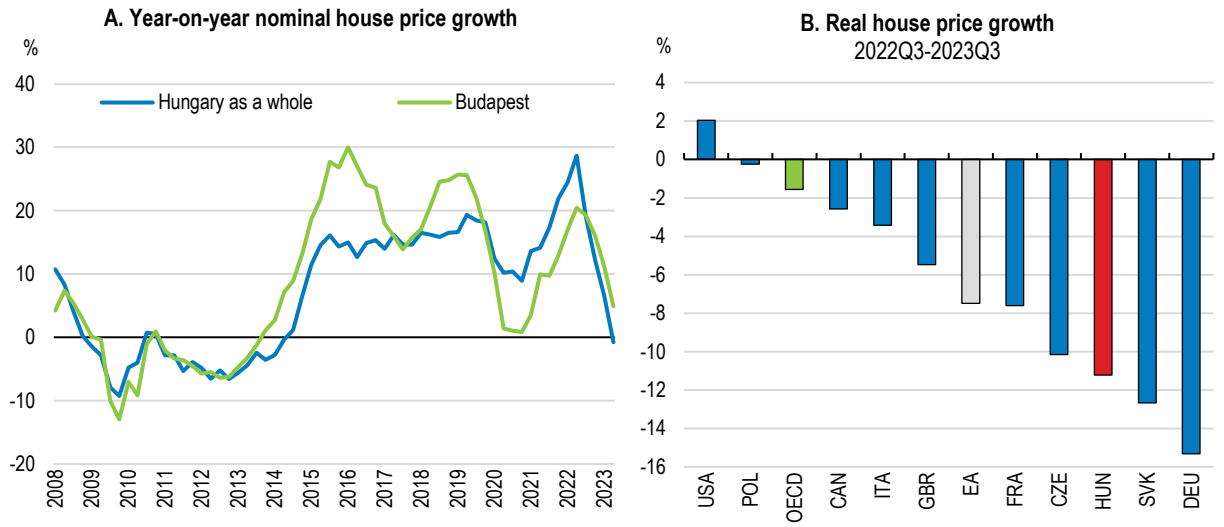
Financial stability risks require vigilance

The housing market is turning down but credit default risks seem to be limited

Rising interest rates and declining consumer confidence have contributed to a downturn in the housing market that became visible from mid-2022 onwards. Nominal house price growth is slowing and real house prices are declining all over the country, and even more so outside the capital Budapest (Figure 2.13). In real terms, year-on-year house price growth in early 2023 was negative in all Hungarian regions.

Figure 2.13. Real house prices are declining



Source: OECD Database on National and Regional House Price Indices.

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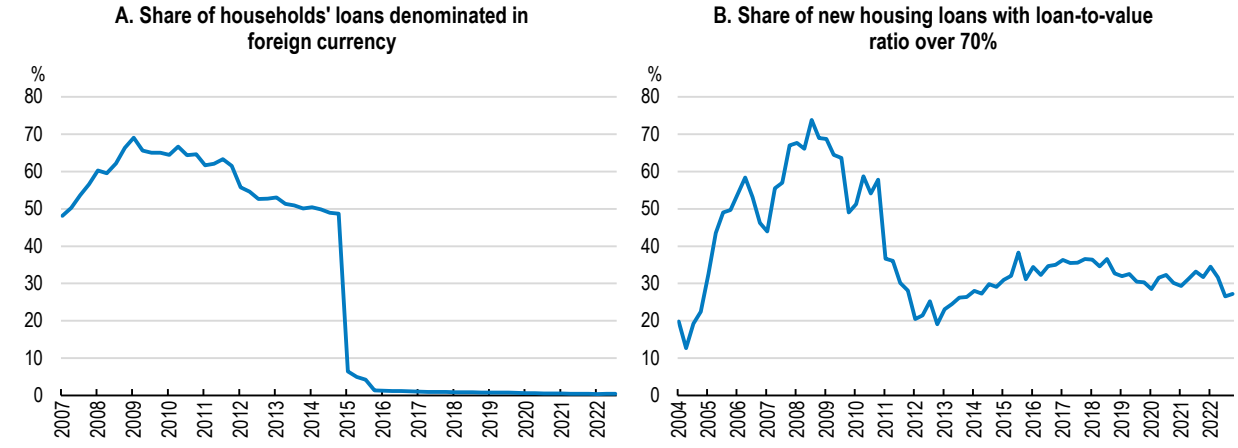
During the Great Financial Crisis (GFC) of 2008-09, the main factors that contributed to mortgage default risks in Hungary were the high share of mortgages denominated in foreign currency, the initial debt overhang of households and, to a lesser extent, the increase in unemployment (Balás, Banai and Hosszú, 2015[13]). Since then, the situation has changed markedly. In 2015, Hungary mandated the conversion of foreign-currency denominated mortgages into forint-denominated loans and restricted the possibility for households to take out new foreign-currency denominated loans. As a result, the share of foreign-currency households' loans was 0.5% at the end of 2022, down from nearly 70% in early 2009 (Figure 2.14, Panel A). Moreover, tighter lending standards from 2009 onwards and the introduction of macroprudential measures by the Central Bank as of 2015 led to a decrease in the loan-to-value (LTV) ratio of new mortgages, thus limiting the debt overhang of households (Figure 2.14, Panel B). Finally, the share of variable-interest rate loans in the stock of outstanding households' loans had come down to around 20% in late 2022, down from nearly 70% in early 2017 (Figure 2.16).

Figure 2.14. Credit policy has become more prudent and is expected to limit mortgage risks



Source: Central Bank of Hungary (MNB).

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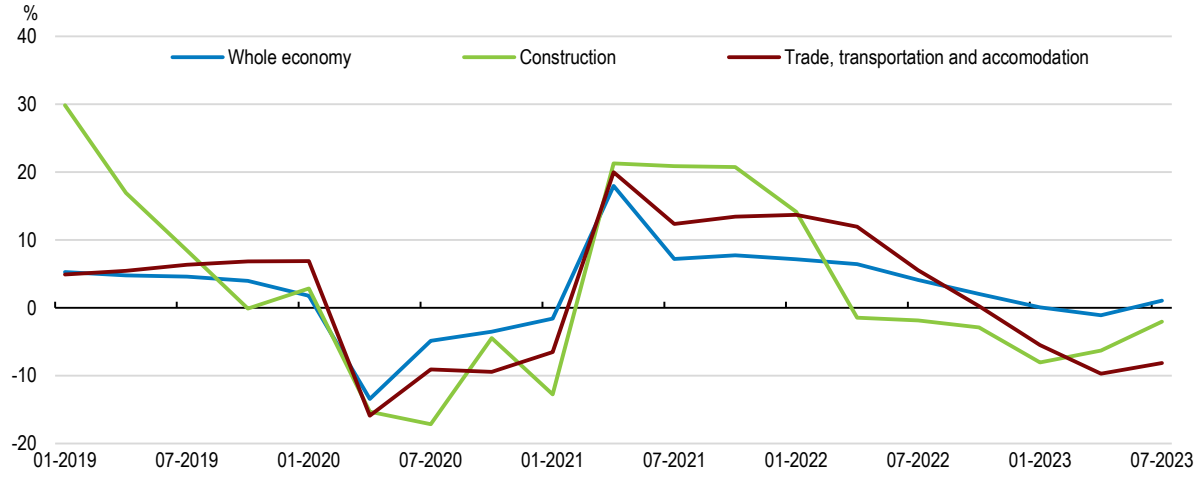
Non-performing loans are expected to increase, driven by business failures

Business failures have started to increase rapidly in 2022, driven both by the end of exceptional measures taken during the pandemic and the economic downturn. The construction sector was particularly hit by rising debt servicing costs and declining economic activity, followed by the trade sector, which suffered from the inflation-related decline in household consumption (Figure 2.15). Business failures in the construction sector were 2.5 times higher in the fourth quarter of 2023 than before the pandemic. Similarly, they were 40% higher than before the pandemic in the trade sector (Figure 2.17).

Figure 2.15. Economic activity has declined, especially in the construction and trade sectors

Value added, year-on year growth, %



Source: OECD Database on Quarterly National Accounts.

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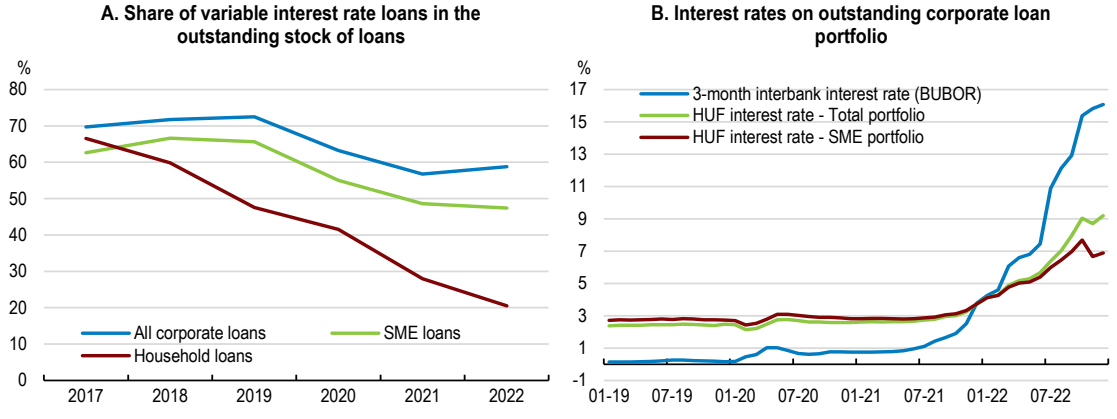
Contrary to household loans, most corporate loans in Hungary are subject to variable interest rates. The average interest rate on outstanding corporate loans increased significantly following the start of the monetary policy tightening cycle in June 2021, denting corporate profits (Figure 2.16). SMEs are slightly less exposed to rising interest rates than larger firms due a lower share of variable interest rate loans and because they can benefit from subsidised loans (Box 2.3).

Figure 2.16. Monetary policy tightening has pushed up interest rates on loans



Source: Hungarian Central Bank (MNB).

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Box 2.3. Subsidised and capped interest rate loans in Hungary

Subsidised loans

The government provides subsidised loans to households with children, including prenatal baby support loans and loans granted in relation to the Home Purchase Subsidy Scheme for Families (HPS). The former accounted for 19.5% and the latter for 7% of outstanding household loans in late 2022. From 2024 onwards, subsidised loans will undergo significant changes. The HPS will be largely phased out except in rural areas, and the prenatal baby support loans will only be available to couples where the woman is below 30, with a temporary exception for women below 41 who are already pregnant in 2024. In 2024, a new HPS Plus Programme will be launched, which will provide housing loans with discounted fixed interest rates of at most 3% to married couples that agree having additional children in the future. Beyond the second child born while participating in the Programme, families will be granted a further HUF10 million in debt relief.

Subsidised loans are also available to corporations, mainly SMEs. They can be obtained from the Central Bank or the government and their share in newly subscribed loans increased significantly during the pandemic. Since the phasing out of the Central Bank's Funding for Growth Scheme in September 2021, only government subsidised programmes are available. The interest rate differential vis-à-vis market lending can be substantial. For example, SMEs can obtain forint-denominated loans at an interest rate of 5% under the current *Széchenyi Card Program* in 2023.

Capped interest rate loans

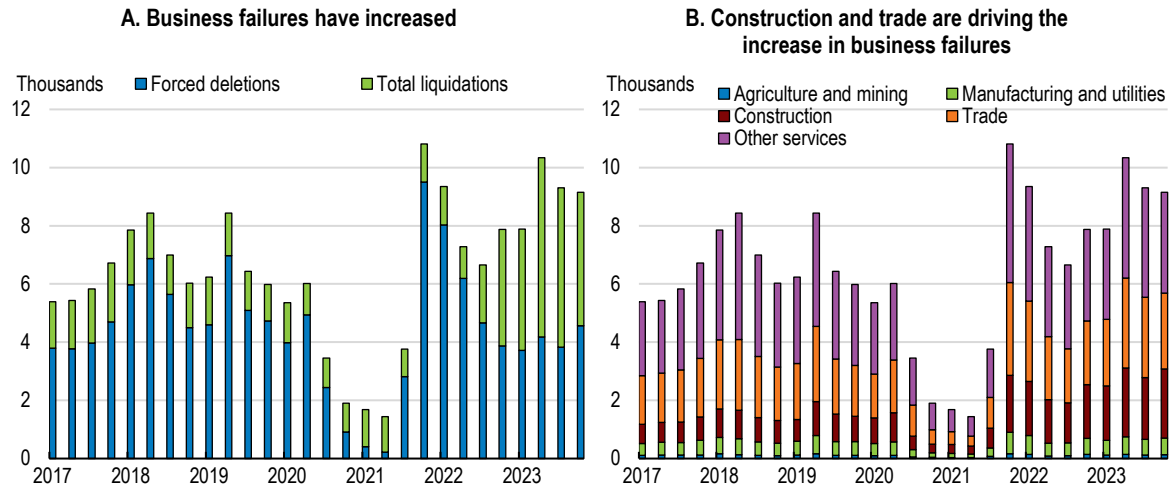
Variable-interest rate mortgages and government-subsidised loans which were supposed to undergo interest rate revisions have been subjected to interest rate caps from December 2021. The cap was extended to mortgages with a period of fixed interest rates of up to 5 years and non-overdraft forint-denominated SME loans in November 2022, and to some student loans in January 2023. Interest rates on eligible mortgages are capped at their October 2021 level, and those on SME loans are capped at their June 2022 level. The cost of these caps are borne by banks.

The share of non-performing loans (NPLs) is already higher than the OECD average and expected to rise further in view of the rapidly rising number of business failures (Figure 2.17) (Figure 2.18, Panel A).

Hungarian banks are capitalised with more than twice the international capital Pillar I capital requirement of 8%, although slightly below the OECD average (Figure 2.18, Panel B). In view of the deteriorating economic environment, they have started to increase loan provisioning in 2022 and the Central Bank expects this trend to continue in 2023. The Central Bank's latest stress tests show that while bank capital buffers would be significantly reduced in a scenario of GDP declining by 4% in 2023, there would be no capital shortage (Magyar Nemzeti Bank, 2023[11]). Nevertheless, the Central Bank should closely monitor business failures and their impact on non-performing loans. Tighter macro-prudential policies for sectors facing economic difficulties may limit a further build-up of non-performing loans.

Along with rising interest rates in Hungary, the demand for corporate loans has shifted towards foreign-currency (FX) loans (Figure 2.11, Panel A), which may increase currency mismatch risks. Analysis by the Central Bank, however, suggests that the majority of corporates borrowing in foreign currency have export revenues that limit the credit risk for banks (Magyar Nemzeti Bank, 2023[11]).

Figure 2.17. Business failures have increased



Note: Business failures are defined as the sum of forced deletions and liquidations. Forced deletions correspond to the removal of economically inactive businesses from the business register, without any judiciary procedure. These forced deletions were temporarily suspended during the pandemic. Moreover, the 2021 insolvency law stipulates that, from June 2022 onwards, forced deletions cannot occur when total claims against a company exceed HUF 400,000, thus turning cases that were previously handled as forced deletions into liquidations. Therefore, the recent increase in business failures, defined as the sum of forced deletions and liquidations, may be partly related to the resorption of the backlog of forced deletions accumulated during the pandemic. Under the 2021 insolvency law, these accumulated cases may give rise to forced deletions or liquidations depending on business claims.
Source: Hungarian Central Statistical Office (HCSO), OECD calculations.

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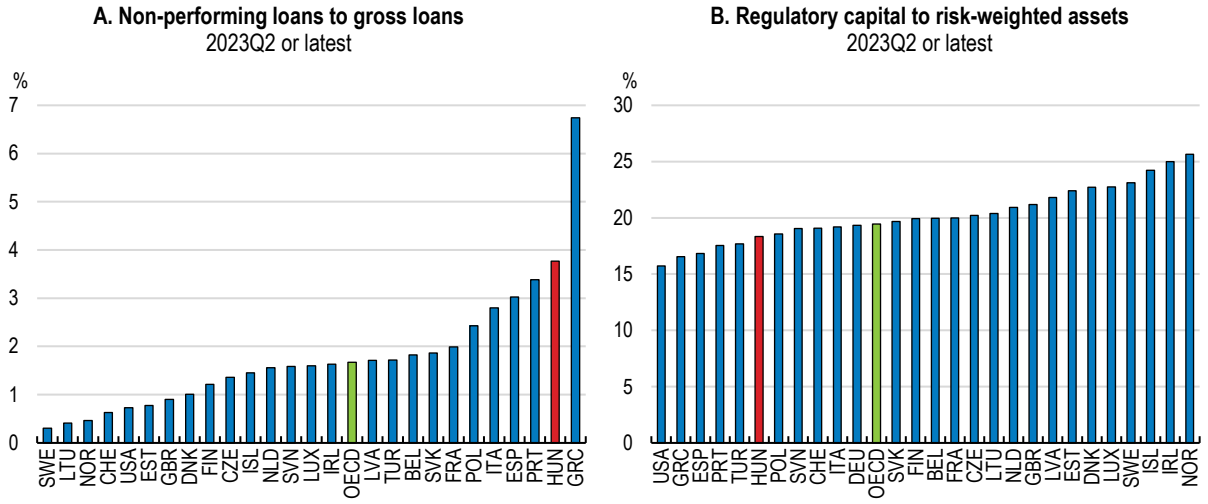
Figure 2.18. Non-performing loans are higher and bank capitalisation slightly lower than the OECD average

Non-performing loans to gross loans, %



Note: Panel A: All credit institutions, and all loans granted to both domestic and foreign borrowers (households, non-financial and financial corporations) are covered.
Source: IMF Database on Financial Soundness Indicators.

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Table 2.3. Past recommendations on monetary policy and financial stability

Recommendations in previous survey	Actions taken
Continue to increase policy interest rates if inflation expectations become unanchored. Gradually exit from unconventional monetary policy measures.	The Central Bank (MNB) started to increase interest rates in June 2021 and subsequently removed all COVID-related support measures and unconventional monetary policy tools.
Stand ready to increase the capital charge on non-performing loans. Continue to develop the secondary market for impaired assets.	The MNB has announced the reactivation of its Systemic Risk Buffer requirement targeting CRE-backed project loans and especially problematic portfolios (non-performing and evergreening). The buffer will be activated in July 2024.The development of secondary markets for impaired assets is regulated by an EU Directive, which will be transposed by end 2023.

Source: (OECD, 2021[14]), Government of Hungary.

Fiscal policy needs to further consolidate

As in most OECD countries, the COVID-19 pandemic led to a substantial deterioration of Hungary's fiscal position, both in terms of the fiscal deficit and public debt (Figure 2.19). The structural primary balance deteriorated by 3.2 percentage points (pp) of GDP between 2019 and 2021. Public debt peaked at 79% of GDP in 2020 and has declined since then. Nevertheless, it is projected to remain above its pre-pandemic level in 2025 (Figure 2.20). In the coming years, fiscal policy will be constrained by the Hungarian fiscal framework which imposes that government budgets put public debt on a downward trajectory as long as it is above 50% of GDP (Box 2.4).

Box 2.4. Hungary's fiscal framework

Hungary's fiscal framework is based on three different laws.

The **debt brake rule** included in the Constitution stipulates that, as long as public debt is above 50% of GDP, Parliament may only adopt a budget that is consistent with a decline in the debt-to-GDP ratio. The government may only derogate to this rule in special circumstances such as a GDP decline, and only to an extent that is justified by these circumstances.

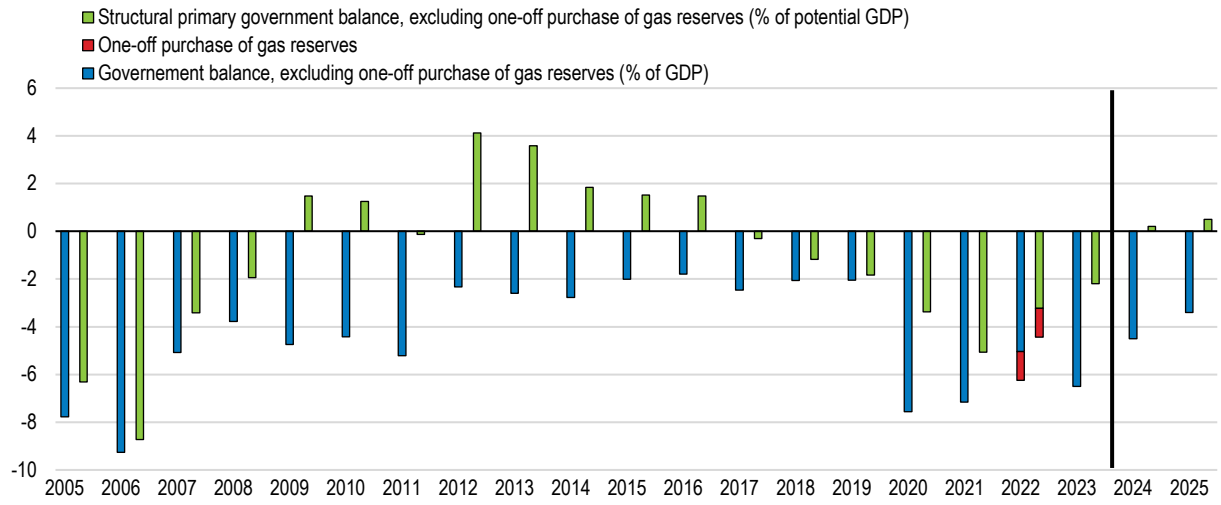
The **Act on Public Finances** sets as an obligation for the government to release revenue, expenditure and public debt projections for the next three years with each annual budget.

The **Stability Act** describes the functioning of the Fiscal Council. It is an independent fiscal institution in charge of monitoring compliance of the budget with the constitutional debt break rule. It informs the Parliament before the budget is voted. If the Fiscal Council formulates a negative advice, the government has to reconsider the draft budget.

Since 2015, the government has submitted the budget of the following year to the Parliament every year in June. This early submission process has the advantage of managing market expectations well in advance. Nevertheless, the macroeconomic assumptions underlying the budget have sometimes been revised even before the budget started to be executed.

Figure 2.19. Fiscal policy expanded during the pandemic but remained accommodative for long

Government budget balance, % of GDP



Note: Except when tax innovations are introduced, government revenues tend to track GDP very closely. By contrast, in absence of spending innovations, the level of government expenditure tends to be stable over the business cycle. Since government expenditure represents around 50% of GDP, the government expenditure-to-GDP ratio decreases by 0.5 percentage point when GDP increases by 1%. This explains the difference between the headline and the structural (cyclically-adjusted) deficit-to-GDP ratios. Tax and spending innovations are reflected to the same extent in both ratios, but the structural deficit-to-GDP ratio controls for business cycle effects. Finally, the structural primary deficit excludes debt servicing costs. All details of the OECD methodology are explained in (Price, Dang and Botev, 2015[15]).
Source: Hungarian Central Statistical Office (HCSO), OECD

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At 6.2% of GDP, the 2022 headline fiscal deficit remained 4.2pp of GDP above its 2019 level, despite the removal of most pandemic-related measures. While profit taxes in specific economic sectors enhanced revenues by 1.3pp of GDP, the deficit widened due to the reduction in employers' social contributions (2pp of GDP since 2019), the introduction of a reduced VAT rate on new housing and a reduced business tax for SMEs (0.4pp of GDP), higher debt servicing costs (0.6pp of GDP), and new measures related to the war in Ukraine and the surge in energy costs. Even without accounting for the latter, the fiscal stance in 2022 remained accommodative despite the fact that the economy was running above potential with a positive output gap, which contributed to higher inflation (Figure 2.1, Panel C). Measures taken to mitigate the impact of the war in Ukraine included significant additional energy subsidies to households and small firms worth 1pp of GDP. Moreover, the government purchased natural gas reserves to bolster energy security, at a cost of 1.2pp of GDP, which was recorded as a deficit-augmenting transaction according to EU accounting rules.

It is estimated that the headline deficit recorded a further increase in 2023, to 6.5% of GDP. On the revenue side, the sale of agricultural land owned by the government (0.4pp of GDP) and a further increase in sectoral profit taxes (0.9pp of GDP) contributed to the fiscal consolidation. These temporary windfall taxes concern the banking, insurance, energy, retail, telecommunication, aviation, and pharmaceutical sectors. Nevertheless, the decline in private consumption led to a fall in VAT revenues (by 1.2pp of GDP). On the expenditure side, it is estimated that the share of public consumption and investment in GDP declined by 0.4pp, along with the share of various capital transfers (by 0.6pp). Moreover, the exceptional purchase of gas reserves was not repeated, saving 1.2pp of GDP. At the same time, it is estimated that energy-related subsidies increased by 1.5pp of GDP and debt-servicing costs by 1pp of GDP, due to rising interest rates.

In 2024, the deficit is expected to fall to 4.5% of GDP. On the revenue side, the partial phasing out of temporary windfall taxes and the expected decrease in property income will reduce revenues by 0.8pp and

0.5pp of GDP, respectively. At the same time, the expected rebound in private consumption is expected to increase VAT revenues (by 0.8pp of GDP). On the expenditure side, the main measures are expected reductions in public consumption, public investment, and energy subsidies, due to lower energy prices, by 0.3pp, 1.1pp and 1.2pp of GDP, respectively. At the same time, debt-servicing costs are expected to increase by 0.3pp of GDP.

Based on the Convergence Programme released in the spring of 2023, all temporary windfall taxes are expected to be removed in 2025, which will reduce revenues by 1.4pp of GDP compared to 2024. Moreover, VAT revenues would revert back to their usual level as a share of GDP. At the same time, public consumption and investment are expected to decline by 1.2pp of GDP all together, along with debt servicing costs and capital transfers, by 1.0pp of GDP. As a result, the fiscal deficit is expected to narrow to 3.4% of GDP in 2025.

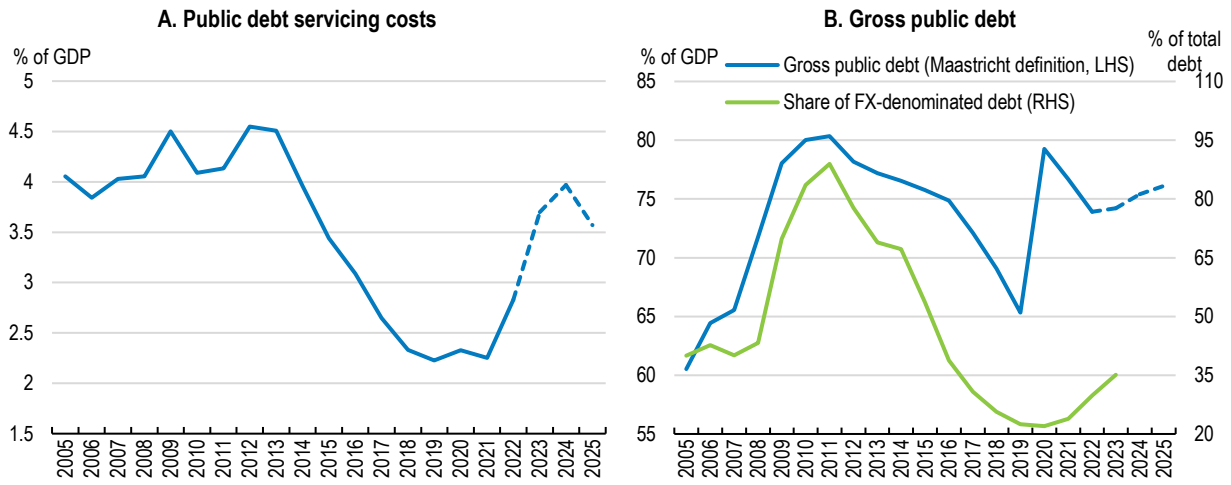
Even though, according to the latest estimates, the headline fiscal deficit increased marginally from 6.2% to 6.5% of GDP between 2022 and 2023, the fiscal consolidation was significant in cyclically adjusted terms, with a reduction in the structural primary deficit from 4.4% to 2.2% of GDP. Looking ahead, further fiscal consolidation is needed to align fiscal policy with monetary policy efforts to curb inflation, strengthen public debt sustainability, and recreate fiscal space to finance ageing-related expenditures and the green transition (see below). Nevertheless, three factors are likely to complicate this task: rapidly increasing debt servicing costs, the sensitivity of the budget to fluctuations in international energy prices, and the uncertainty around the delivery of EU funds.

Debt servicing costs are increasing rapidly

With higher debt, higher inflation and higher interest rates, debt-servicing costs are expected to increase by 1.3pp of GDP between 2022 and 2024 (Figure 2.20, Panel A). The average debt maturity of 6.1 years in 2022 remains below the OECD average of 8.2 years, despite an increase from 4.1 in 2012 (OECD, 2023, pp. 37-38[16]). With the current levels of public debt and public debt maturity, a permanent interest rate increase of 1 percentage point translates into higher debt servicing costs by 0.8 percentage point of GDP after 6 years.

The share of foreign-currency denominated public debt has been adequately kept below 40% since 2016, which is much lower than in the early 2010s, but it has been trending upward since 2020 (Figure 2.20, Panel B). This share should be maintained low in order to limit the currency-risk exposure of public debt amid significant exchange rate volatility.

Figure 2.20. Debt servicing costs are rising, but debt is mostly in domestic currency



Note: 2023-2025 (dashed lines): OECD projections.
Panel A: The share of foreign-currency (FX) denominated debt in total public debt is calculated as an annual average for each year except 2023 where it is calculated as an average between January and October.
Source: OECD projections, Public debt management agency (AKK, https://akk.hu/statistics/public-debt-finance/central-government-gross-debt).

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Winding down energy price caps to support the green transition and relieve public finances

As a landlocked country with a high dependence on fossil fuels imported from Russia, the energy price shock triggered by the war in Ukraine hit Hungary hard. Similarly to neighbouring countries, Hungary initially opted for large untargeted price caps to limit the increase in energy prices (Box 2.2). Vulnerable households without financial buffers might otherwise have been forced to take up high interest rate debt or reduce consumption in a way that would have durably affected their welfare (Hill, Skoufias and Maher, 2019[17]).

With an estimated cost of 2.5% of GDP in 2023, energy price caps have been very costly for the government budget, and one of the most expensive energy support measures implemented in OECD countries (Hemmerlé et al., 2023[18]). Looking ahead, the programme in place also exposes the budget to fluctuations in international energy prices in the coming years, even though the cost of subsidies is expected to decline in 2024.

Beyond any short-term fluctuations, a trend increase in energy prices is also required to curb CO_2 emissions and master the transition towards greener growth. This is likely to require additional support for low-income households, while at the same time maintaining energy-saving price signals and minimising the budget impact. General energy price caps will not be an effective way to achieve these objectives. The recent easing of energy prices provides a window of opportunity to phase out existing utility price caps. Some targeting has already been achieved by restricting this cap to the part of household energy consumption that is below the national average, but more should be done.

Targeted cash transfers based on households' exposure to rising energy prices can avoid creating incentives to consume energy and should become the preferred policy tool (Hemmerlé et al., 2023[18]). Only relying on household income to decide whether support is needed may be insufficient as vulnerability to high energy prices depends on different factors such as living in an energy-inefficient home, limited access to cheaper forms of energy, and having higher-than-average energy needs due to ageing, illness,

or living in rural areas and having limited transport alternatives to driving a car. Such criteria can be used to estimate the energy needs of households and calculate support.

The availability and combination of different data sources was a key factor behind many countries' efforts to implement targeted support measures during the recent energy crisis. For example, Denmark combined information on households' heating systems available on the national real estate register with income data to identify the households that should be granted heating cheques. Moreover, the United Kingdom provided households with an automatic Cold Weather payment for each 7-day period of cold weather by linking postal code data to information from local weather stations (Hemmerlé et al., 2023[18]). These two examples highlight the need to put in place statistical information systems that are able to combine information from multiple data sources and identify the right set of beneficiaries and support levels. Well-targeted cash transfers to households can complement other policies to address households' vulnerabilities in the long term, such as policies to support housing energy efficiency improvements (see Chapter 5).

Reaching a final agreement regarding the delivery of EU funds is key

EU funds, of which the currently blocked Cohesion and RRP funds represent the largest part, are expected to contribute 2.2% of GDP to public revenues in 2023 and 1.8% in 2024.

Hungary and the EU signed a Partnership Agreement on the delivery of EU Cohesion funds over the period 2021-27 and the EU approved Hungary's Recovery and Resilience Plan (RRP) at the end of 2022. However, the agreement also imposed conditions before most funds can be delivered to Hungary. €21.2 billion of EU funds (12.7% of 2022 GDP) are subject to the implementation of reforms by Hungary (Box 2.5).To avoid that the negotiations with the EU delay important investments for Hungary, the government has decided to pre-finance some projects that are expected to be eventually covered by EU funds. Indeed, Cohesion and RRP funds are planned to finance key investments for Hungary in the context of the green and digital transitions (Figure 2.21).

An incomplete disbursement of EU funds would imply a higher fiscal deficit or reduced investment. By contrast, a simple delay in receiving these funds would not by itself contribute to increase the deficit because the fiscal balance is calculated on an accrual basis and not a cash basis. Nevertheless, there are limits to the expenditures that the government can prefinance in practice because this requires borrowing money and generates interest expenses.

As discussed above, a failure or a significant delay in finalising the negotiations with the EU may also affect investor confidence, and lead to negative economic consequences such as renewed pressures on the exchange rate that may significantly outweigh the direct accounting impact on public finances.

Box 2.5. The uncertainty around the delivery of EU funds to Hungary

Several parallel and interrelated strands of negotiations are currently underway regarding the delivery of EU funds to Hungary.

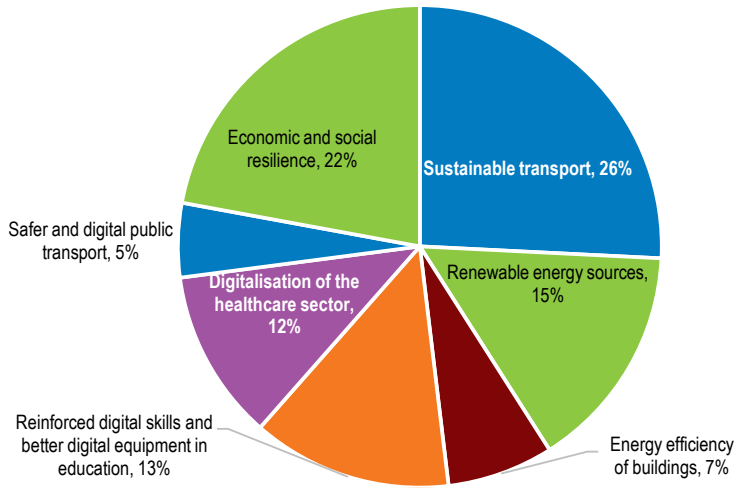
Negotiations about Hungary's Recovery and Resilience Plan (RRP) concern €10.4 billion of grants and loans to be delivered in several disbursements by mid-2026. The first part of the RRP, covering €5.8 billion of grants, was approved in 2022. In December 2023, the Council of the European Union has approved an amendment introducing a RePowerEU chapter to the original RRP, covering €0.7 billion of grants and €3.9 billion of loans.

Separate negotiations concern Hungary's Cohesion Funds for the period 2021-27. In December 2023, the EU agreed to unblock €10.2 billion following a positive assessment of the new legislation concerning the independence of justice. Nevertheless, €10.8 billion of Cohesion Funds remain blocked and their delivery is subject to different conditions.

Altogether, the currently blocked EU funds represent €21.2 billion, or 12.7% of Hungary's 2022 GDP.

- Two different parts of Cohesion Funds can be distinguished depending on the conditions preventing their delivery. A first part is subject to 17 conditions (also called "remedial measures") related to the rule of law and a second part is subject to conditions related to academic freedom and child protection.
- Even after the fulfilment of the conditions regarding the independence of justice, the delivery of RRP funds, including RePowerEU funds, is still subject to 23 remaining "super-milestones". They include all conditions preventing the delivery of the first part of Cohesion Funds (*i.e.* 17 remedial measures reorganised into 21 milestones) and 2 RRP-specific milestones. Out of the initial 27 super-milestones, 4 have been fulfilled with the new legislation on the independence of justice. In December 2023, Hungary received €0.8 billion of the expected €0.9 billion to prefinance 20% of the expenditures covered in the RePowerEU chapter. While this prefinancing is not subject to any condition, it will be deducted from future regular payment requests which are conditional on the fulfilment of the remaining 23 super-milestones and of the respective measures in the updated RRP.

Figure 2.21. Hungary's planned allocation of RRP grants over 2023-26



Source: (European Commission, 2022[19]).

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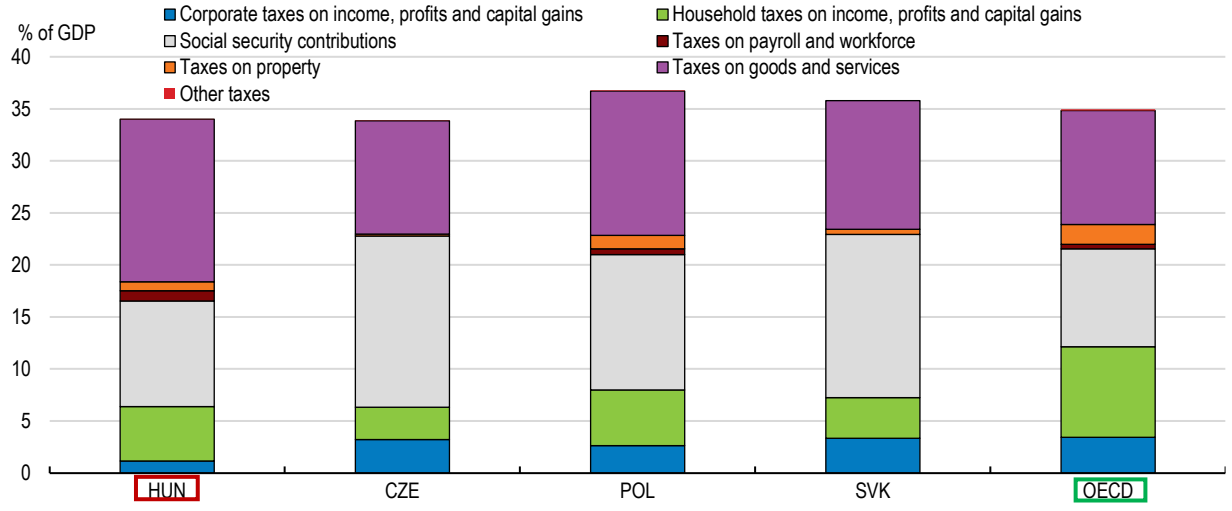
Improving the tax system

Tax revenues in Hungary represented around 35% of GDP in 2021, which is close to the level observed in other Central and Eastern European (CEE) countries and the OECD as a whole (Figure 2.22). Compared to other CEE and OECD countries, a larger share of Hungary's tax revenues comes from taxes on goods and services, while the share of income taxes is below the OECD average. Higher taxes on goods and services are largely related to a higher standard VAT tax rate (27%) and a relatively low VAT compliance gap, following significant improvements over the last decade (Figure 2.23, Panel A). Despite the progress made, there may be scope for making the tax system more conducive to growth and employment, through revenue-neutral tax reforms.

Figure 2.22. Hungary relies more on VAT and less on income taxes than OECD peers

Structure of tax revenues in 2021 (% of GDP)



Source: OECD Database on Revenue Statistics.

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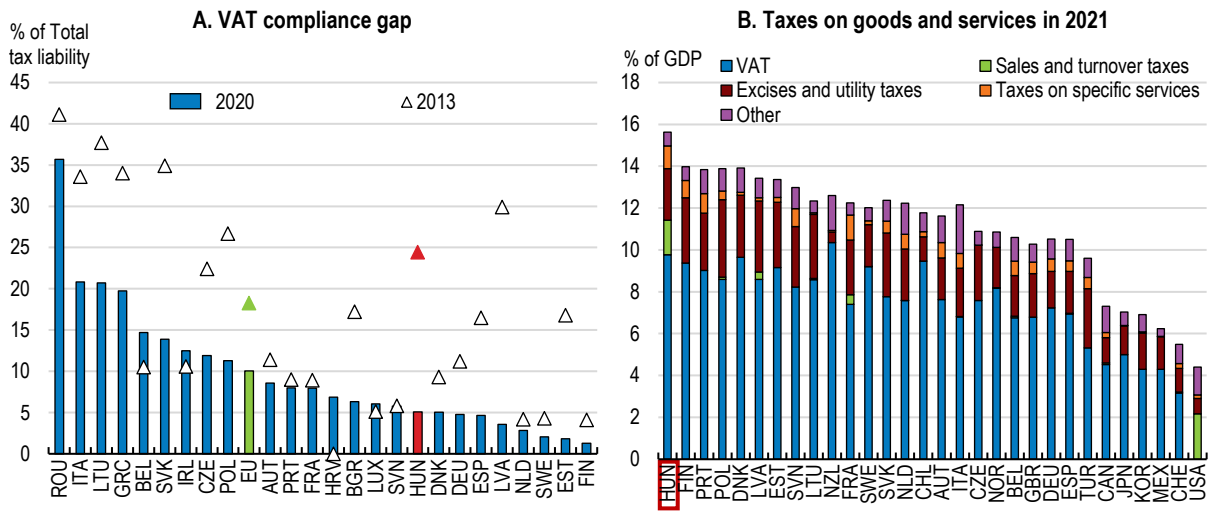
Turnover taxes should be phased out

In addition to VAT, taxes on goods and services also include business taxes levied on turnover rather than income (Figure 2.23, Panel B). Such taxes should be phased out over time, as they increase the price of intermediate consumption. This may lead companies to substitute untaxed imported inputs for domestic inputs, use other inputs that are less productive but less taxed, or vertically integrate to avoid paying the tax. Whenever firms along the value chain charge higher prices due to the turnover tax, cascading effects may occur because input prices are higher at each stage. Given their cumulative nature, turnover taxes may end up being much larger than their marginal rate in downstream sectors at the end of the production chain. Turnover taxes on products that are used at each stage of the production chain, such as taxes on telecommunication and financial services in Hungary, should be the first to be phased out because they are the most likely to cumulate. In France, turnover taxes have been found to increase production prices in downstream sectors by up to three times the marginal tax rate due to cascading effects. This has implications for productivity and competitiveness, and the survival of firms, especially during recessions (Martin and Trannoy, 2019[20]). By contrast, a VAT deducts intermediate inputs from the tax base and is neutral with respect to the organisation of value chains. In China, the 2012 reform that replaced turnover taxes with VAT for some services industries has been found to increase the sales of these industries by around 10%, driven by increased demand from downward industries (Xing, Bilicka and Hou, 2022[21]).

Figure 2.23. Both VAT and turnover taxes are high in Hungary



Note: Panel A: Contrary to turnover taxes in Hungary, sales taxes in Israel and the United States are not cumulative. They apply at only one stage of the production process. Panel B: The VAT compliance gap is the overall difference between the expected VAT revenue and the amount actually collected. It is expressed as a percentage of the VAT Total Tax Liability (VTTL).
Source: Panel A: OECD Database on Revenue Statistics, Panel B: (European Commission, 2022[22]).

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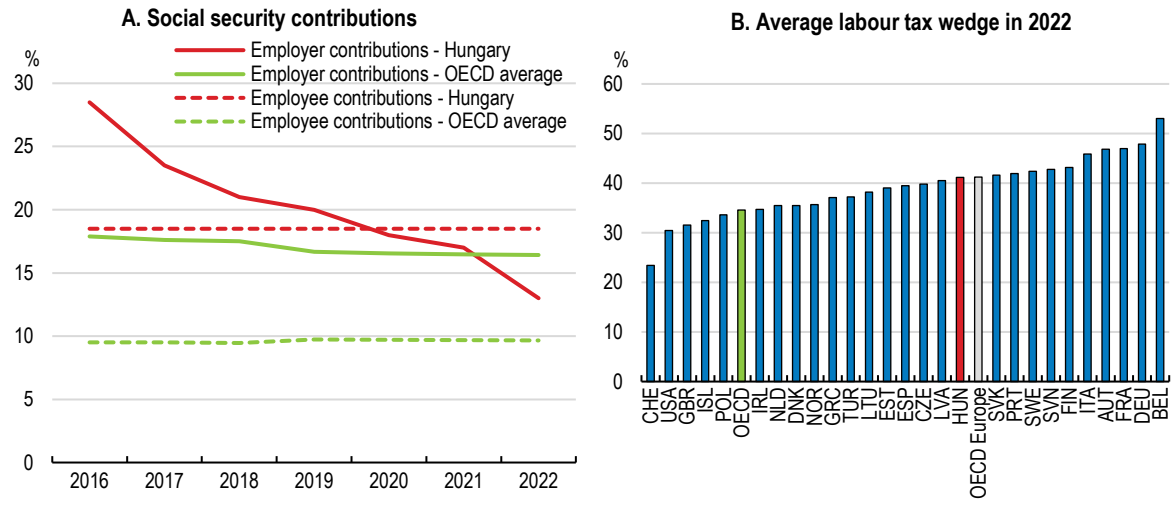
Further reductions in social contributions for low-wage workers may raise employment

In the early 2010s, Hungary faced structurally low employment rates for some categories of workers in a context of high social contributions in international comparison. In response, the authorities started to reduce employers' social contributions to boost labour demand. Relative to GDP, social contributions are now much closer to the OECD average. The reduction in employers' social contributions started with the Job Protection Act (JPA) in 2013 and was initially targeted at younger, older, and lower-skilled workers. Employers' social contributions were further reduced between 2017 and 2022 (Figure 2.24). The headline

employer social contribution rate is now significantly lower than before 2017. Moreover, a reduced rate is applied to the agricultural sector and low-skilled professions, for the part of the salary falling below the minimum wage. Nevertheless, employee social contributions and the overall labour tax wedge remain above the OECD average.

Figure 2.24. Employer social contributions have fallen, but employee' contributions remain high



Note: Panel A: The average rate of employer (employee) social contributions is the ratio of employer (employee) social contributions over gross wage earnings, expressed in percentage points, for a single person with average earnings and no child.
Panel B: The average labour tax wedge is the ratio of income tax, plus employee and employer social security contributions, minus cash transfers, over total labour costs, expressed in percentage points, for a single person with average earnings and no child.
Source: Taxing Wages 2023 (OECD, 2023[23]).

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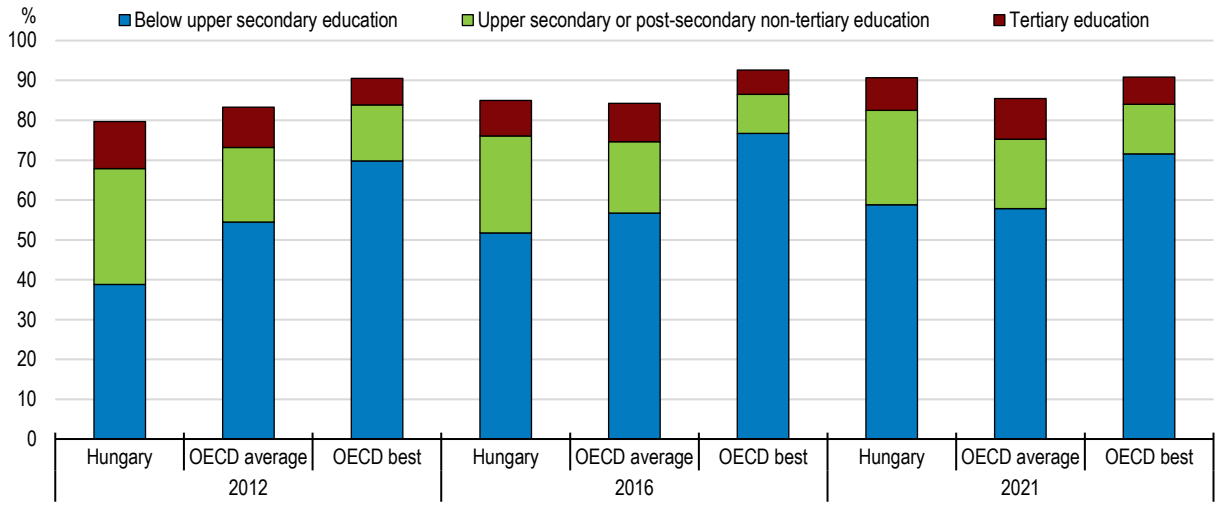
The reduction in employer social contributions was successful in raising the employment rate of younger, older, and lower-skilled workers immediately after the JPA entered into force in 2013 (Svraka, 2018[24]). Further progress was recorded after 2016, but at a slower pace. Employment rates for workers with upper-secondary and tertiary education were close to those observed in the best OECD performers in 2021. Only the employment rate for workers with below-upper-secondary education was still lagging behind (Figure 2.25).

A formal empirical assessment would be needed to assess the efficiency of the reduction in employer social contributions that started in 2017 and disentangle its effect from the impact of other factors such as minimum wage increases.

There may still be scope for further action to bring more low-skilled workers into the labour market, as employment, and in particular labour market participation, in this segment still have scope for improvement, while employment rates for higher-skilled workers are close to the highest levels recorded in OECD countries (Figure 2.25). The lower labour market participation of low-wage workers would particularly hint at the possibility of lowering *employee* social contributions for them, which would increase take-home pay for low-skilled workers in light of a comparatively high and binding minimum wage, and therefore encourage labour market participation and investments in skills. Moreover, it is mainly in employee social contributions where Hungary currently stands out in international comparison (Figure 2.24). In case employee social contributions are reduced, the increase in other taxes to ensure that the reform is revenue-neutral could be used to finance the social benefits currently related to social contributions.

Figure 2.25. Employment rates are relatively low among low-skilled workers

Employments rates, %



Note: In 2012, the employment rates of workers with below-upper-secondary, upper-secondary, and tertiary education in Hungary were 38.8%, 67.9%, and 79.7%, respectively, as shown by the first histogram on the left. The best OECD performer in 2012 and 2016 was Iceland, for all education levels. In 2021, it was New Zealand for workers with below-upper-secondary education, Switzerland for workers with upper-secondary education, and Poland for workers with tertiary education.
Source: OECD Education at a Glance (2022[25]).

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Corporate income taxes will need to align with Pillar 2

In 2017, Hungary reduced its statutory Corporate Income Tax (CIT) rate from 16% to 9%, the lowest level in the OECD. Since then, the Two-Pillar Solution to address the tax challenges arising from the digitalisation of the economy has been agreed by Hungary and 136 other jurisdictions of the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS). The Pillar 2 Model Rules are designed to ensure that large multinational enterprises (MNEs) pay an *effective* CIT rate of at least 15% on the profits arising in each jurisdiction where they operate. These new rules do not apply to Hungarian companies that have no foreign presence or generate less than EUR 750 million in consolidated global revenues (OECD, 2023[26]). In response to these rules, Hungary will raise its statutory CIT rate to 15% for in-scope businesses from 2024 onwards. In order to avoid foregoing CIT revenues that would otherwise be collected by the jurisdiction where the parent company of the Hungarian subsidiary is tax resident, Hungary should ensure that all in-scope MNE subsidiaries are taxed at an *effective* CIT rate of 15% (i.e. after accounting for various tax allowances that may have been granted to attract foreign direct investments).

Raising additional revenues from property taxes and VAT

Considering future fiscal challenges related to population ageing and the green transition, any reductions in public revenues will need to be compensated by increasing revenues from other sources (Box 2.6). Scope for raising revenues may exist in recurrent taxes on immovable property, which at 0.4% of GDP raise less than the 1.0% OECD average. These taxes have also been found to be relatively growth-friendly and could help to shift some investment out of housing into higher-return economic activity (Arnold et al., 2011[27]). In Hungary however, immovable property taxes are optional and levied by municipalities. Introducing a minimum local tax rate or a national tax could raise more revenues from property taxes (OECD, 2019[28]).

There may also be room to reconsider some of the current VAT exemptions and reduced rates, which tend to be distortive and raise the administrative costs of the VAT. VAT exemptions include public services, financial and insurance services, and the rental of real estate. A reduced VAT rate of 18% is applied to selected food products, and a reduced rate of 5% is applied to a list of goods and services including new residential property, district heating, books, newspapers and other cultural services, accommodation services, and selected pharmaceutical and food products. Removing all reduced VAT rates and VAT exemptions, except on the use of owner-occupied dwellings, financial and insurance services, and public services, could potentially raise VAT revenues by up to 3.4% of GDP (European Commission, 2022[22]).

While implementing these property tax and VAT reforms, low-income households could be compensated by increasing targeted social benefits, or by introducing a threshold above which the increase in property taxation would apply, but that would be less costly for public finances than keeping housing taxation low or applying reduced VAT rates for all households, whatever their revenues.

Box 2.6. The fiscal impact of selected policy recommendations

The upper part of Table 2.4 presents the fiscal impact of phasing out turnover taxes and reducing labour taxes for low-income workers, while at the same time increasing recurrent taxes on immovable (residential) property and removing some VAT exemptions to ensure that this tax reform is fiscally neutral *ex ante*. The impact of removing some reduced VAT rates and exemptions is presented net of the cost of compensating low-income households with targeted cash transfers. While the cost of targeted cash transfers depends on how exactly they are designed, *gross* fiscal revenues from removing some VAT reduced rates and exemptions would need to increase by more than 1.7% of GDP to finance these transfers. This tax reform is expected to increase GDP in the medium to long term (Chapter 1) but the related fiscal revenues are not considered here.

The lower part of Table 2.4 presents the fiscal impact of net investments related to the green transition (Chapter 5). Investment costs related to the water infrastructure and the Paks 2 nuclear plant are not included in this table as these investments are mainly expected to restore or replace existing infrastructures. The modernisation cost of the electricity grid is a mid-range estimate, while the cost of subsidies for dwelling insulation is the cost of improving the energy efficiency of 10% of the housing stock with new windows and modern boilers, taken as an indicative cost of necessary subsidies to support financially constrained households. In order to finance these investments, fiscal savings may be generated by restructuring the energy support scheme and moving from price caps to targeted cash transfers to vulnerable households, as advocated in this Survey. The cost of this scheme is 1.5% of GDP per year on average since the outbreak of the war in Ukraine. While the exact amount of savings from reforming it depends on how the replacing targeted cash transfers would be designed and on energy prices in the coming years, 1% of GDP is taken as an indicative estimate. Moreover, 2/3 of EU RRP grants are expected to be allocated to the green transition, which represents 2.3% of GDP of additional funding. Nevertheless, these two sources of financing fall short of the required investment expenditures, which shows the need to create additional fiscal space to finance the green transition. Launching spending reviews would be helpful to consider how the efficiency of public spending could be improved in the future.

Table 2.4. Indicative *ex-ante* fiscal costs (-) and revenues (+)

	% of GDP
Revenue-neutral fiscal reform	
Phase out turnover taxes	-1.6
Reduce social security contributions to OECD average, by targeting low-income workers	-0.7
Increase recurrent taxes on immovable property to OECD average	+0.6
Remove some reduced VAT rates and exemptions, while compensating low-income households with targeted cash transfers	+1.7
Total	0
Net investments related to the Green transition	
Modernise the electricity grid	-3.0
Provide subsidies for dwelling insulation	-3.0
Restructure energy support by moving from price caps to more targeted cash transfers to vulnerable households	+1.0
EU funds (RRP grants dedicated to the Green transition)	+2.3
Total	-2.7

Source: OECD estimates.

Longer-term fiscal challenges relate to the financing of pensions and the green transition

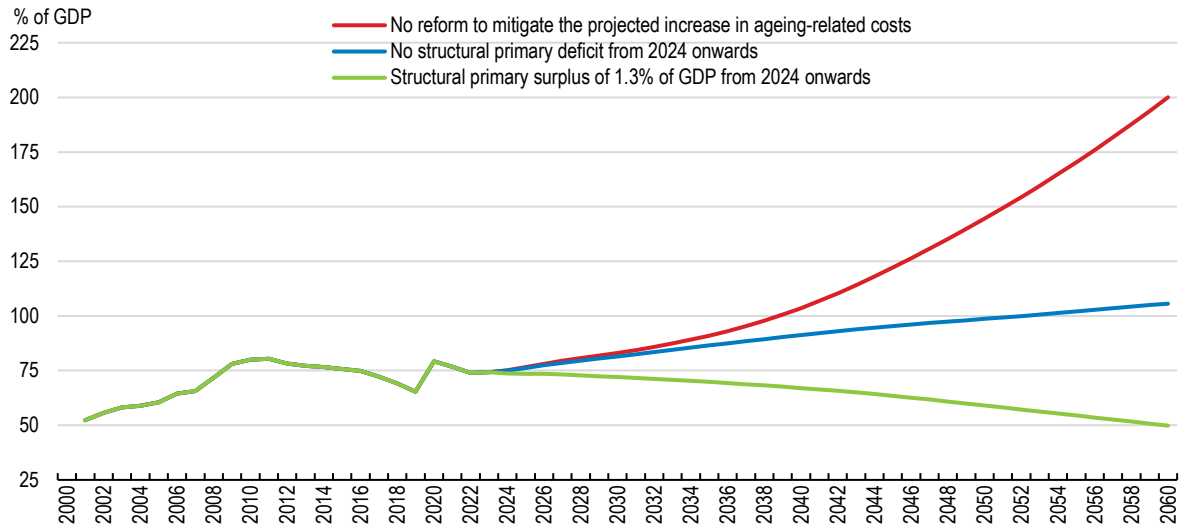
Further reforms are needed to limit the projected increase in pension costs

According to the 2021 Ageing Report by the European Commission (European Commission, 2021[29]), ageing-related expenditures related to pensions, healthcare, long-term care, and education will rise from 17.1% of GDP in 2019 to 22.5% in 2070, mostly driven by a strong increase in pension costs. Hungary will face the fourth largest increase in pension-related expenditures in the EU (+4.1pp, from 8.3% to 12.4% of GDP). Most of this increase (+2.4pp of GDP) is projected to occur between 2030 and 2045, in line with the rise in the ratio of people aged 65 or above to people aged 20-64.

Debt simulations show that the absence of reforms to reduce ageing-related costs would lead public debt to reach 200% of GDP by 2060, in a scenario where the primary fiscal deficit would entirely be due to the increase in ageing-related costs (Figure 2.26). By contrast, ensuring that public debt reverts back to 50% of GDP by 2060 would require a primary fiscal surplus of 1.3% of GDP over 2024-2060. Achieving this objective would necessitate reforms to limit the increase in ageing-related costs, and raising the primary fiscal balance substantially above the 2023 level. Indeed, the structural primary position is estimated to be around -2.2% of GDP in 2023 (Figure 2.19). Reforming the pension system but failing to raise a primary fiscal surplus would lead public debt to exceed 100% of GDP by 2060. Replacing the current energy subsidies to households with targeted cash transfers, as recommended above, would significantly improve the fiscal balance, as their cost has been 1.5% of GDP per year on average since the outbreak of the war in Ukraine.

Figure 2.26. Addressing the fiscal effects of ageing is key to safeguard fiscal sustainability

Gross government debt (Maastricht definition), % of GDP



Source: OECD estimates.

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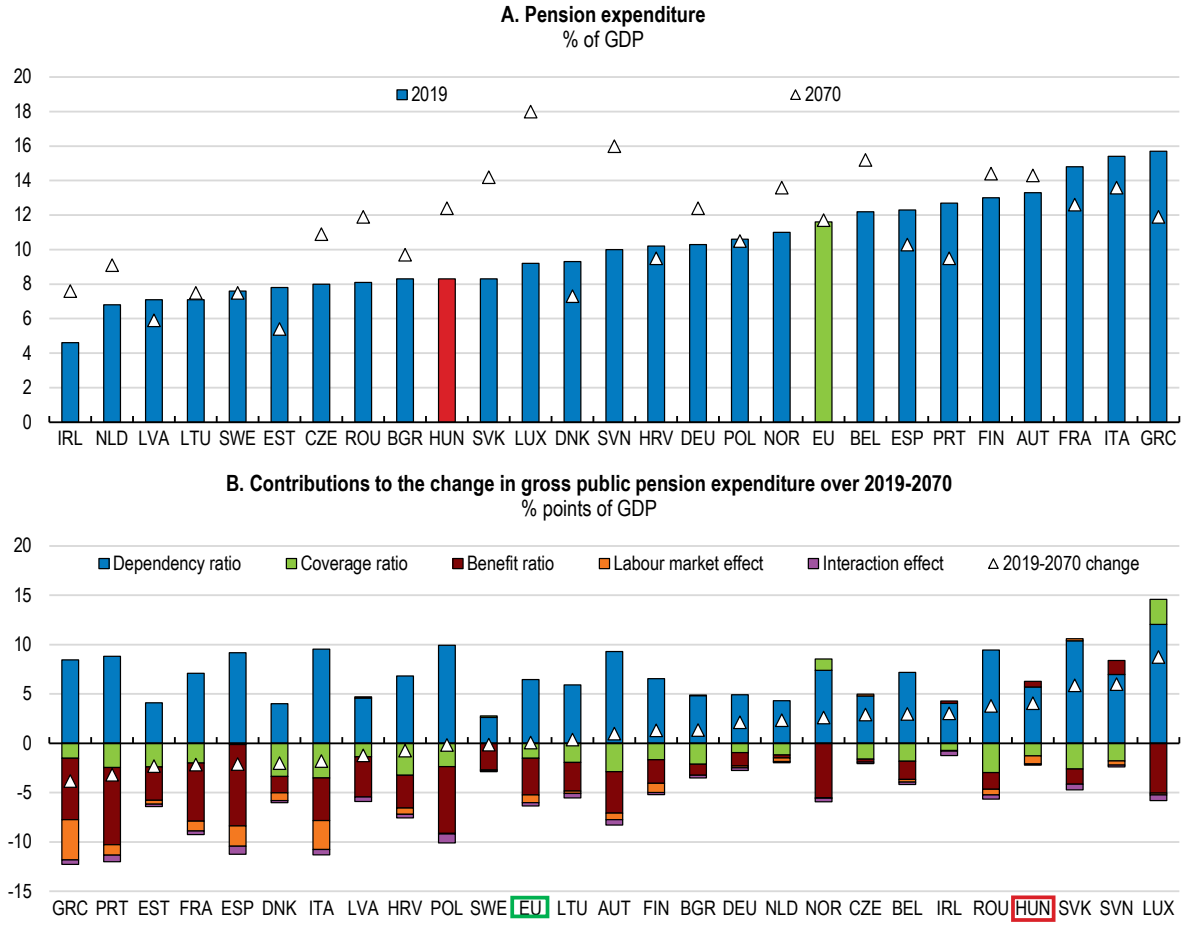
In most EU countries, the increasing dependency ratio effect will be countered by a decline in the ratio of average pensions to average wages (benefit ratio), driven by reforms lowering replacement rates and limiting the increase in calculated pensions over time (Figure 2.27). By contrast, Hungary is one of only two EU countries where the benefit ratio is planned to increase between 2019 and 2070 (Figure 2.28). This increase is primarily related to the reintroduction of the 13th monthly pension payment in 2021, and the absence of other measures to contain entitlement increases, such as linking retirement age to gains in life expectancy (Hungarian State Treasury, 2021[30]). Moreover, saving effects of the 2009 pension reform, which raised the statutory retirement age from 62 in 2010 to 65 in 2022, are partially offset by generous accrual rates for long careers beyond 40 years, driving up the overall replacement rate.

To address these challenges, Hungary's Recovery and Resilience Plan includes a reform roadmap to improve the sustainability of the pension system, while increasing lower-income pensioners' entitlements (Government of Hungary, 2022[31]). The reform is expected to be introduced by 2025 and will need to consider a set of measures applicable to both current pensioners and contributors to the pension system (Box 2.7).

Figure 2.27. Without further reforms, pension expenditure will increase sharply



Note: The dependency ratio quantifies the impact of demographic changes, i.e. the relative change in the old-age (65+) versus working-age (20-64) population. The coverage ratio divides the number of pensioners of all ages by the population above 65. The benefit ratio is the ratio between the average pension and the average wage, both measured in gross terms. The labour market effect describes the labour market behaviour effect on pension expenditure. This effect accounts for developments in the employment rate, labour intensity (hours worked per person), and career shift (hours worked by the population aged 20-74 divided by hours worked by the population aged 20-64).

Source: 2021 Ageing Report (European Commission, 2021, p. 79[29]; European Commission, 2021[29])

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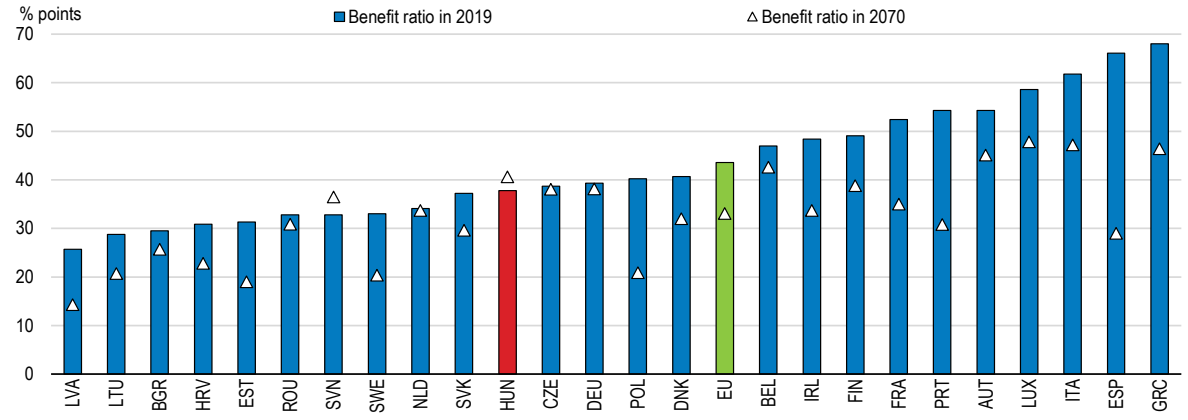
Figure 2.28. The benefit ratio of Hungarian pensions is planned to increase between 2019 and 2070



Note: The benefit ratio is the ratio between the average pension and the average wage, both measured in gross terms.

Source: 2021 Ageing Report (European Commission, 2021, p. 84[29]).

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Box 2.7. Improving the fiscal sustainability of the Hungarian pension system

The Hungarian pay-as-you-go public pension system performs well in maintaining the standard of living after retirement. The average disposable income of individuals older than 65 is on par with the rest of the population, relative old-age poverty is low, and new entrants to the labour market can expect high pension benefits. However, population ageing challenges the current system. Some reforms from the last decade – such as raising the statutory retirement age and cancelling the early retirement options – partially offset the adverse fiscal effects of population ageing. Nonetheless, other policy measures deepened the fiscal challenge. Since 2011, women who accumulate 40 years of rights have been allowed to retire with full benefits before reaching the statutory retirement age, and more than half of female retirees take advantage of this scheme and retire at relatively young ages. The 2021 reintroduction of the 13th monthly pension bonus has increased all pension benefits, including those of high earners, by 8.3%. Overall, spending on public pensions in Hungary is expected to rise by 4.1% of GDP by 2070, while pension contributions are expected to decline slightly as a share of GDP.

To put the current pension system on a more sustainable fiscal path, Hungary can tighten eligibility conditions, reduce benefit levels and/or increase social security contribution rates or other taxes to finance the expected increase in spending.

The different reform options have different effects on pension adequacy, vulnerable groups, and total pension-related spending which need to be carefully evaluated. The acceptability of a pension reform will also likely depend on the chosen reform option and the way of implementation.

Linking the retirement age to life expectancy, for example, is an automatic adjustment mechanism based on a relevant development in a crucial indicator. Relying on such a mechanism could help avoid the economic and social costs of changing the pension parameters in an *ad-hoc* and sudden manner when fiscal pressure becomes too tight.

It would be equally important to consider features of the current system that make it difficult for individuals to fully assess the optimal time to retire and make it hard for policymakers to adjust the system's parameters. For example, the pension entitlements in Hungary are calculated based on non-linear accrual rates that vary with the length of the contribution period and net wages, and the accrued earnings are adjusted annually by the previous year's average wage increase so that large fluctuations due to, for example, the business cycle can occur.

The financing of the green transition should be clarified

Reaching GHG emission reduction targets and achieving the green transition may also have a significant impact on public finances (see Chapter 5). Large public investments include the construction of a new nuclear power plant in Paks, with an estimated cost of 7% of GDP (International Energy Agency, 2022[32]) at this stage but significant risks of cost overruns; the modernisation of the electricity grid to accommodate electricity supply from renewable energy sources, with an estimated cost between 1 and 5% of GDP; the modernisation of the water infrastructure, with an estimated cost of at least 6% of GDP; and the support to households for improving the thermal insulation and the heating systems of their dwellings. While public support will mainly be needed to help financially-constrained households, illustrative estimates indicate that improving the energy efficiency of 10% of the housing stock with new windows and modern boilers will already cost around 3% of GDP. Taken together, the cost of these major green transition projects amounts to nearly 20% of GDP. Some of these investments may be covered by EU funds or higher carbon tax revenues. Nevertheless, both sources of financing are uncertain at this stage and should be clarified to ensure that green transition investments are consistent with fiscal sustainability.

Table 2.5. Past recommendations on fiscal policy

Recommendations in previous survey	Actions taken
Continue to provide targeted fiscal support as needed, while preparing for fiscal consolidation once the recovery has become self-sustained.	Fiscal consolidation started in 2022H2.
Adopt a medium-term strategy to reduce debt and prepare for long-run fiscal challenges of ageing.	No action taken.
Phase out distortionary sector taxes in energy, finance and retail sectors.	No action taken to reduce existing sectoral (turnover-based) taxes. Additional sectoral (profit-based) taxes have been introduced in the wake of the 2022 energy price shock, but the government plans to progressively reduce them.
Make the tax system more growth-friendly by further reducing the reliance on labour taxation and continuing increasing the reliance on consumption taxes and raising immobile property taxes, while addressing adverse distributional impacts.	Employers' social contributions have been significantly reduced between 2016 and 2022. No action taken regarding property taxes. They are decided at the municipality level, and the government only sets maximum tax rates.
Simplify the VAT system by moving towards a broader-based and lower standard VAT rate.	Some additional VAT exemptions have been granted, as allowed by EU legislation.
Complete the ongoing increase of the statutory retirement age to 65 by 2022. Thereafter link it to gains in life expectancy.	The increase of the statutory retirement age from 62 to 65 was completed by 2022. No further action taken yet.

Source: (OECD, 2021[14]), Government of Hungary.

Table 2.6. Policy recommendations from this chapter (key recommendations in bold)

MAIN FINDINGS	RECOMMENDATIONS
Monetary policy	
The ongoing decline of inflation is subject to significant uncertainty, and the anchoring of inflation expectations has weakened.	**Continue fighting remaining inflationary pressures and ease monetary policy at a gradual and data-dependent pace.**
Financial market developments and financial stability	
The non-performing loans ratio is above the OECD average and expected to increase given the rising number of business failures.	**Closely monitor loan delinquencies and business failures.** **Phase out interest rate caps and stand ready to impose additional capital requirements on banks as needed.** Continue developing the secondary market for impaired assets.
Fiscal policy	
Public debt has been on a declining trend since its peak of 79% of GDP in 2020, but it is projected to remain above its pre-pandemic level in 2025. **The Fiscal Council pointed to risks surrounding the macroeconomic assumptions underlying the 2024 budget.**	**Take additional fiscal measures if needed to reduce the fiscal deficit in line with the 2023-2027 Convergence Programme.** **Create fiscal space for ageing-related expenditures and the green transition, including through spending reviews.**
The share of public debt denominated in foreign currency is lower than in the early 2010s, which has shielded the economy from high exchange rate volatility.	Keep the share of public debt denominated in foreign currency at a low level.
Energy price caps have been costly for the government budget and low energy prices reduce incentives for energy efficiency.	**Restructure energy support by moving from price caps to more targeted cash transfers to support vulnerable households while reducing the overall fiscal costs.** Invest in the data infrastructure needed to improve the targeting of social transfers, and in particular the targeting of energy support measures.
Labour market taxes deter labour market participation and investment in skills.	Run a formal statistical assessment of the labour tax reduction impact between 2017 and 2022. Only continue reducing labour taxation by playing on both employer and employee social contributions and focusing on low-wage workers.
The sectoral windfall taxes that were introduced in 2021 may deter investment and be harmful to long-term economic growth.	Phase out temporary windfall taxes in 2025 as planned.
Cumulative turnover taxes harm productivity, competitiveness, business entry and the survival of firms. At the same time, property taxes are low and VAT exemptions/reduced rates give room to increase public revenues.	Undertake the following revenue-neutral tax reform: • Phase out cumulative turnover taxes. • Increase taxes on immovable property. • Limit VAT exemptions and reduced rates, while compensating vulnerable households with targeted transfers.
Hungary will adapt its corporate taxation to comply with Pillar 2 Model Rules from 2024 onwards.	Ensure that all in-scope MNE subsidiaries are taxed at an effective corporate income tax rate of 15% to avoid foregoing any tax revenue.
Beyond its direct impact on investment in key areas such as the digital and the green transition, a delayed or incomplete delivery of EU funds may affect investor confidence and have adverse effects on the exchange rate and the cost of capital in Hungary.	Continue working with the EU to reach a final agreement regarding the timely and complete disbursement of EU funds.
Under the current policy setting, pension costs are projected to increase by 4.1% of GDP by 2070. This is the fourth largest projected increase in the EU. Most of it will occur before 2045.	Pursue the commitment to reform the current public pension system, including by considering options for tightening eligibility conditions and adjusting benefit and contribution levels.

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3 Raising productivity and strengthening institutions

Pierre-Alain Pionnier

Productivity growth is key to sustain living standards, especially in a context where the working-age population share is declining due to ageing. Labour productivity growth in Hungary has resumed only recently after a decade of decline, but it remains lower than before the Great Financial Crisis. Boosting productivity will necessitate lifting barriers to entry for new businesses and fostering competition, especially in network sectors such as energy, transport, and telecommunication. Strengthening the insolvency framework and advancing the digitalisation of firms will also be key. Despite a good internet infrastructure, Hungarian firms are lagging behind OECD peers in the adoption of advanced digital technologies, and the digital divide between small and large firms has increased during the pandemic. Lower telecommunication prices and a wider diffusion of digital skills in the population would help improve the situation. Recent reforms to the anti-corruption and public integrity framework will also support the business environment if they are fully implemented.

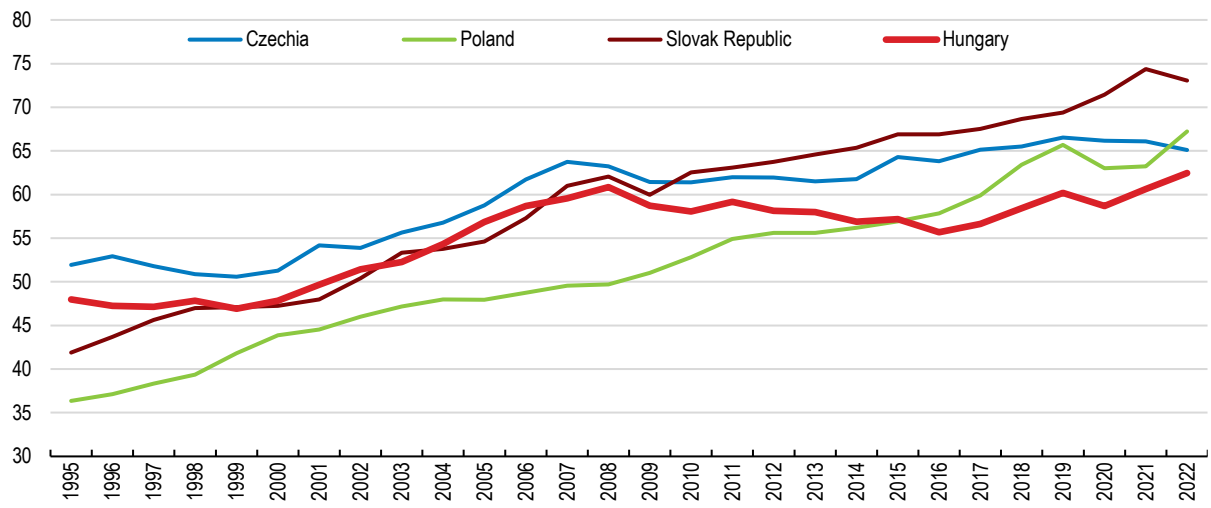
Productivity has slowed since the mid-2000s

Labour productivity growth is the key to sustaining living standards. This is particularly important in the context of an ageing population. Hungary's working-age population is set to decline from 60% to just above 50% of the total population between 2020 and 2070, an evolution that is close to the average across OECD countries (United Nations, 2022[1]). This will weigh on GDP per capita unless productivity can be increased to compensate for this trend.

Like in other Central and Eastern European (CEE) countries, labour productivity in Hungary rapidly caught up with the most advanced economies between the mid-1990s and the mid-2000s. In contrast to neighbouring countries, however, this catching-up process then came to a halt in Hungary in the wake of Great Financial Crisis (GFC) of 2008-09 and only resumed in the late 2010s. Nevertheless, labour productivity growth remains lower than before the GFC, as well as the convergence process towards the most advanced economies (Figure 3.1, Table 3.1).

Figure 3.1. Labour productivity in Central and Eastern European countries

Total economy, G7 = 100, constant prices and PPPs



Note: Labour productivity is defined as value added divided by total hours worked by employees and self-employed workers. Due to the lack of industry-level PPPs, labour productivity convergence across countries can only be meaningfully assessed at the total economy level.
Source: OECD Database on Productivity Statistics

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Table 3.1. Average productivity growth in Central and Eastern European countries

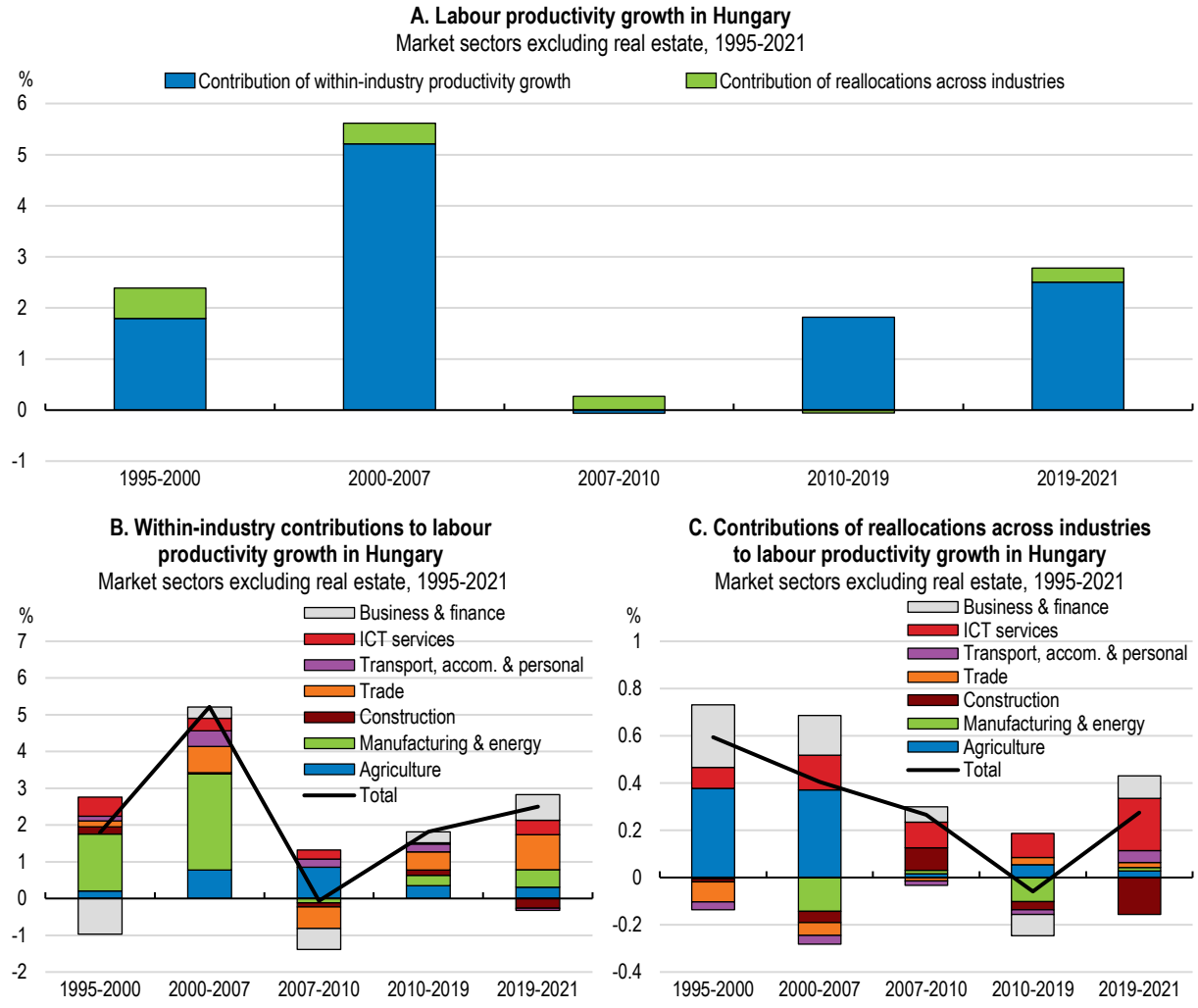
	1999-2008	2008-2016	2016-2022
G7	1.7%	0.9%	1.0%
Czechia	4.2%	1.0%	1.4%
Poland	3.6%	2.9%	3.6%
Slovak Republic	4.8%	1.9%	2.5%
Hungary	4.6%	-0.2%	3.0%

Note: Periods have been selected to match the break points in the Hungary series in Figure 3.1.
Source: OECD Database on Productivity Statistics

The Hungarian economy has undergone major structural changes since the mid-1990s as it transitioned from a command-and-control to a market economy. These structural changes could have affected aggregate labour productivity developments through various channels.

One of these channels is reallocation of labour resources between economic activities with different productivity levels or growth trajectories. Before 2008, the movement of workers away from agriculture, where labour productivity is below the average level in the economy, towards services sectors where labour productivity is above average, has contributed positively to labour productivity growth, but only to a limited extent. The lockdown of contact-intensive industries during the pandemic also triggered reallocation effects, but these were short-lived and did not contribute much to labour productivity growth between 2019 and 2021. Consistently with the evidence in other OECD countries (OECD, 2023[2]) (Pionnier, Zinni and Luu, 2023[3]), the aggregate productivity impact of reallocations across sectors has been small in Hungary (Figure 3.2, panels A and C). Looking ahead, more significant reallocation effects may be triggered by the green transition and will need to be monitored (see Chapter 5).

Figure 3.2. The labour productivity slowdown is mainly related to within-industry developments



Note: Labour productivity is defined as value added divided by total hours worked by employees and self-employed workers.
Panel A considers reallocations across 2-digit industries. Panels B and C: The within-industry and reallocation effects presented in Panel A are broken down into contributions of specific industries. All underlying calculations are done at the 2-digit industry level.
Source: OECD Compendium of Productivity Indicators 2023 (OECD, 2023[2])

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By contrast, developments within specific industries have been a key driver of aggregate labour productivity growth in Hungary over the medium term. Within-sector developments are also the main explanation for the productivity slowdown after the mid-2000s. The manufacturing sector explains much of the decline in the within-industry contribution to aggregate labour productivity growth (Figure 3.2, Panel B). The slowdown in manufacturing productivity after the mid-2000s is mainly related to the TFP slowdown of exporting firms, with no significant difference between foreign- and domestic-owned firms (Muraközy, Bisztray and Reizer, 2018, pp. 81-82[4]).

Within-industry productivity growth is generally related to the strength of competitive forces among existing and future firms within specific sectors, as firms strive to stay ahead of their competition by offering better goods and services at competitive prices (Syverson, 2011[5]). Productivity growth within industries can be further decomposed into the contribution of productivity growth that takes place within firms, the contribution of business creations and destructions, and the contribution of reallocations between existing firms. Evidence based on comprehensive firm-level data covering the market sector suggests a decline in all three contributions in Hungary since the mid-2000s, with the largest impact from the slowdown in within-firm productivity growth (Muraközy, Bisztray and Reizer, 2018[4]).

Lowering entry barriers for new businesses would boost competition and productivity

The entry of new firms on a market facilitates the diffusion of innovations and can be an important source of future growth. For example, the significant FDI that Hungary is currently attracting in the manufacturing sector, mainly in relation to electric mobility, will contribute to the transition of this sector to green technologies. Nevertheless, it is still too early to assess to what extent they will increase domestic value added and productivity in the long term. Moreover, the benefit of these investment projects for the Hungarian economy will depend on the ability of domestic SMEs to contribute to the new value chains.

Entry, and potential entry, also play a role for maintaining the necessary competitive pressures on incumbents to enhance their productivity and prices competitively (OECD, 2015[6]). Nevertheless, business entry rates in Hungary are lower than in other OECD countries, in almost all economic sectors (Figure 3.3), but particularly in telecommunication and IT services. In most sectors, these lower-than-average entry rates are also compounded by lower-than-average survival rates of new entrants in the first five years after their arrival on the market (OECD, 2020[7]).

Hungary has favourable product market regulations (PMR) overall, as measured by the OECD PMR indicators, but some aspects contribute to limit business dynamism. On the positive side, administrative burdens on start-ups are low by OECD standards. One-stop shops inform businesses about their licensing requirements and deal with issuing all licenses and permits. There is also a “silence is consent” rule that accelerates approval procedures.

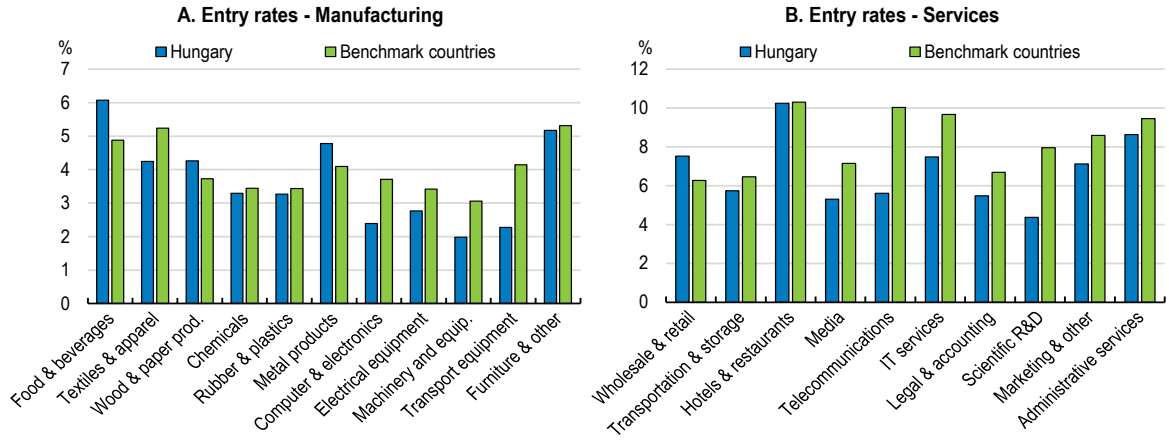
In some sectors, however, regulations create barriers to competition and market entry. The number of regulated professions in Hungary is the highest in any European country (Figure 3.4) (OECD, 2018[8]). For example, stringent regulations affect competition in legal professions such as lawyers and notaries, as well as water and road transport. Regarding the latter, licenses are required to operate freight and long-distance passenger transport by road, regional monopolies are in charge of long-distance passenger transport by road, and itineraries need to be approved by the administration.

In the household retail electricity market, there is a strong presence of state-owned enterprises and the regulations in place tend to hinder the entry of competitors. First, potential competitors perceive the risk of changing regulations as high (Felsmann et al., 2021[9]). Second, low regulated prices discourage competitors from entering the market as their return on investment would be insufficient and the low regulated prices would not give them the opportunity to distinguish themselves from incumbents by offering lower prices (Felsmann et al., 2021[9]). Replacing the current energy price caps with targeted cash transfers to vulnerable households, as advocated in Chapter 2, would increase the attractiveness of the Hungarian

retail electricity market for new investors. In turn, increased competition may contribute to efficiency gains and reduce the cost of targeted cash transfers for the government.

Figure 3.3. Business entry rates are lower than in other OECD countries in most sectors

Entry rates in manufacturing and services, 2010-15, %



Note: Calculations based on the OECD DynEmp3 database. The underlying microdata sources for Hungary are Corporate Income Tax data and National Tax and Custom Administration data. Benchmark countries are all OECD and G20 countries for which similar data are available in the DynEmp3 database: Austria, Belgium, Brazil, Canada, Costa Rica, Finland, France, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden and Türkiye.
Source (OECD, 2020[7]):

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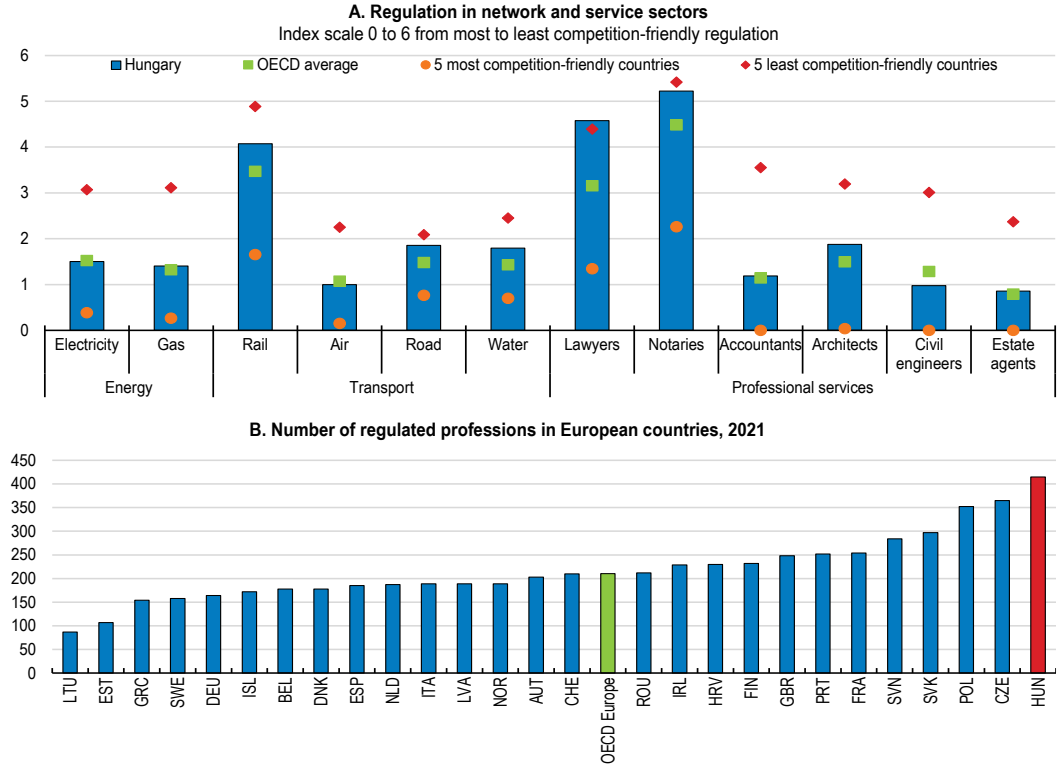
Figure 3.4. The regulation of network sectors and professional services is relatively stringent



Note: Panel A: Information refers to laws and regulation in force on 1 January 2018.
Source: Panel A: OECD - 2018 PMR database; Panel B: European Commission – Regulated Profession database

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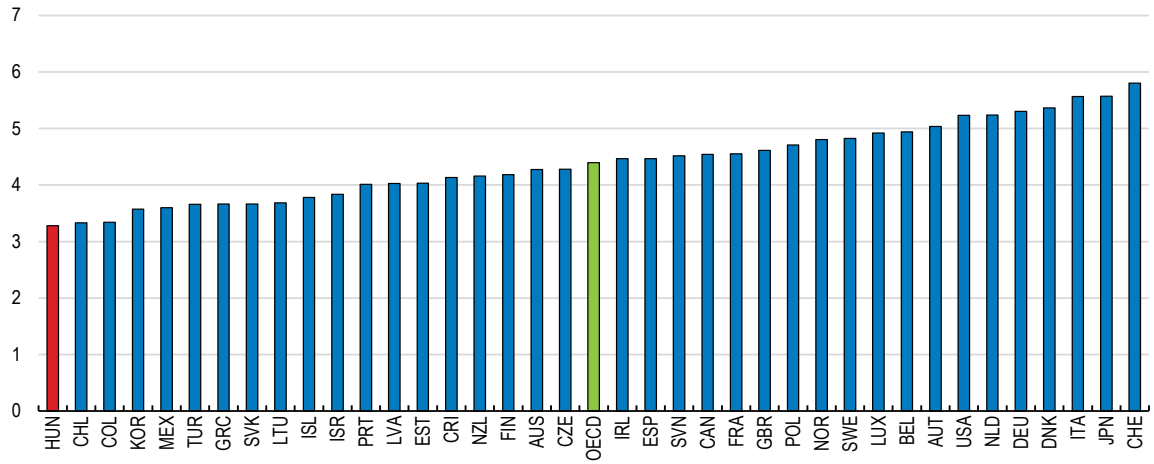
The low entry and survival rates of new businesses are likely related to the dominant position of a few firms (Figure 3.5). This, in turn, limits competitive pressure on incumbent firms and probably contributes to the fact that both innovation activities and business-financed R&D are low compared to other EU and OECD countries (Figure 3.6). Identifying and eliminating barriers to competition in network sectors and professional services will be a priority to boost productivity growth.

Moreover, state-owned firms tend to be less productive than privately-owned firms operating in the same sector (Muraközy, Bisztray and Reizer, 2018, p. 48;57[4]). This may be due to the fact that they are largely shielded from competition, but also to potentially weaker corporate governance structures.

Figure 3.5. Few firms dominate markets in Hungary

Extent of market dominance, 1-7 (best), 2019



Note: A lower score indicates that markets are spread among fewer firms.
Source: (World Economic Forum, 2019[10])

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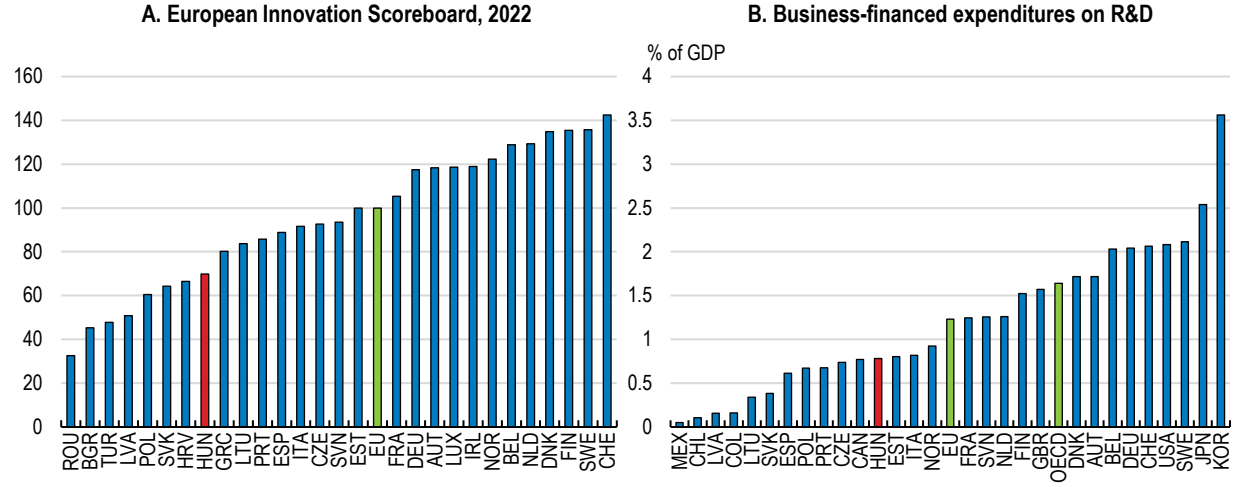
Figure 3.6. Innovation and R&D expenditures are low

Business-financed Gross domestic expenditure on R&D (GERD) as a percentage of GDP, 2019



Note: Panel A: A lower score indicates a lower performance of innovation systems.
Source: Panel A: (European Commission, 2022[11]); Panel B: OECD Main Science and Technology Indicators (MSTI) database.

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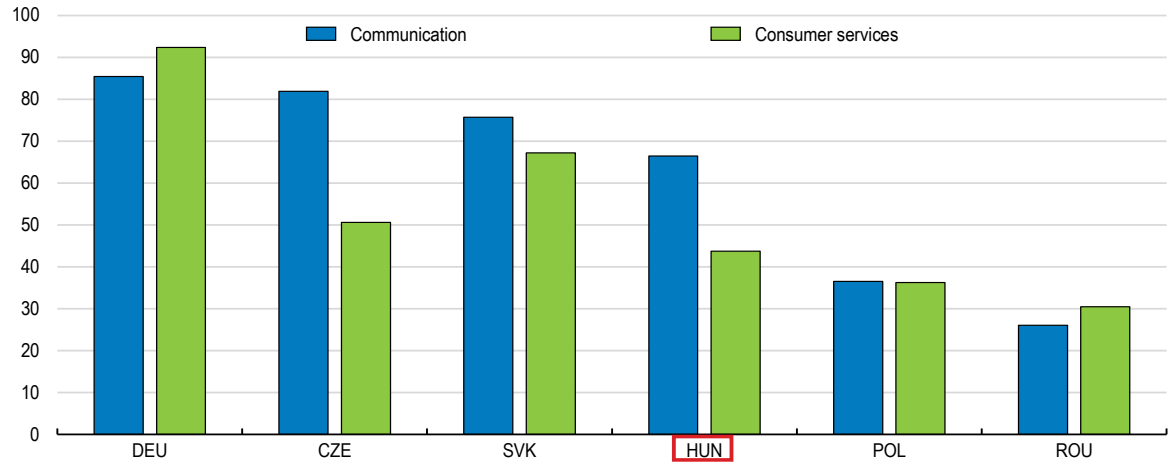
A lack of competition in upstream network and services sectors is not only harmful for productivity in these sectors, but can also curb productivity in downstream sectors (Arnold, Javorcik and Mattoo, 2011[12]) (Bourlès et al., 2013[13]). For example, restrictive regulations and limited competition in transport services may hinder the development of efficient distribution channels and thus indirectly affect productivity in the rest of the economy.

Downstream productivity effects are also particularly relevant for the telecommunication sector, as telecommunication services often lay the grounds for productivity-enhancing digital applications. Currently only a minority of firms at the frontier are adopting advanced digital technologies (see below). Lower prices of communication services would likely encourage a wider use of digital technologies. In fact, considering that Hungary's overall price level of consumer services is lower than in other OECD countries, the price level of communication services stands out as relatively high (Figure 3.7).

Figure 3.7. Communication prices are relatively high

Price level indices of communication and consumer services as a whole (OECD = 100, 2020)



Note: Price level indices measure price ratios across countries once prices have been converted into a common currency. Communication services include postal services, telephone equipment, wired and wireless telephone services, internet access provision services, bundled telecommunication services, and other information transmission services.
Source: Eurostat-OECD Purchasing Power Parity (PPP) Programme, 2020 results

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Hungary's mobile telecommunication market recently went through a major reorganisation. While three independent operators shared most of the market until 2022, the government partnered with a private company to buy one of the three operators in early 2023, and temporarily held a 25% share of another one which it finally sold in late 2023. These transactions were declared as being of national economic importance, thus allowing to bypass the Competition Authority.

Across Europe, multiple service providers have replaced historical monopolies, and effective competition between the new operators enforced by both national and European authorities has led to more investment and lower prices (European Commission, 2017[14]). The example of France shows that the opening of the market to a fourth operator, the intervention of the competition authority to stop the collusion between three incumbents, and the enforcement of an adequate regulation to organise network sharing between operators were key to achieve lower prices and increase investments (Box 3.1).

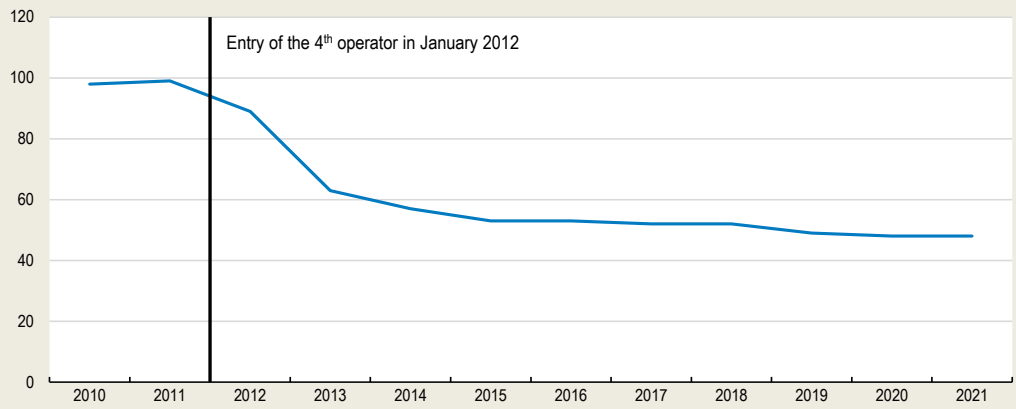
One of the lessons that emerges from other EU countries is the need for a strong role of the Competition Authority in preventing collusion between existing operators and in assessing any future reorganisation of the telecommunication sector. Second, additional market entry may help to boost competition in this sector. Third, mandating the sharing of infrastructure between operators through the network regulator, the NMHH

in the case of Hungary, can help to foster investment in costly high-speed fiber-optics and 5G networks (OECD, 2019[15]).

Box 3.1. Competition in the French mobile telecommunication sector

Despite the coexistence of three different operators on the market since 1994, mobile prices in France remained relatively high and infrastructure investments sluggish until the competition authority condemned the three incumbents for collusive behaviour, and a fourth operator was allowed to enter the market in 2012. Its aggressive marketing strategy led to a sharp decrease in mobile services prices (Figure 3.8).

Figure 3.8. Mobile services prices in France (January 2010 = 100)



Source: (Dozias, 2023[16]), based on ARCEP data

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France also intervened actively to achieve the sharing of network infrastructure between operators. New operators were initially granted access to the historical operator's copper network. In the 2010s, a specific legal framework organised the large-scale rollout of the fibre optic network. Any operator providing fibre optic access to a subscriber had to provide access to alternative internet providers, subject to prices and conditions determined by the regulator (ARCEP).

Source: (Dozias, 2023[16])

The insolvency framework can be strengthened

The scope for new firm entry will also depend on the policies that effectively facilitate the exit or restructuring of weak firms, to free up resources needed for new entrants to grow. Policies should therefore aim to avoid that the persistence of so-called *Zombie* firms, defined as low productivity firms that would typically exit in a competitive market, crowds-out the growth in capital stock of more productive firms, as this would slow aggregate TFP growth via less efficient capital allocation (Adalet McGowan, Andrews and Millot, 2017[17]). While there is no evidence that the share of *zombie firms* has increased in recent years in Hungary, their presence immobilises a significant amount of capital that is not available for more productive firms (Muraközy, Bisztray and Reizer, 2018[4]).

Sound insolvency frameworks contribute to an efficient allocation of resources across firms by facilitating corporate restructuring, allowing a timely exit of non-viable companies and a partial recovery of outstanding debts, preventing the failure of viable firms, and promoting entrepreneurship by offering a second chance to honest failed entrepreneurs. In the current environment where the number of business failures is

increasing (see Chapter 2), streamlining procedures becomes even more important to ensure that courts have enough resources to deal with the increased number of cases in reasonable time.

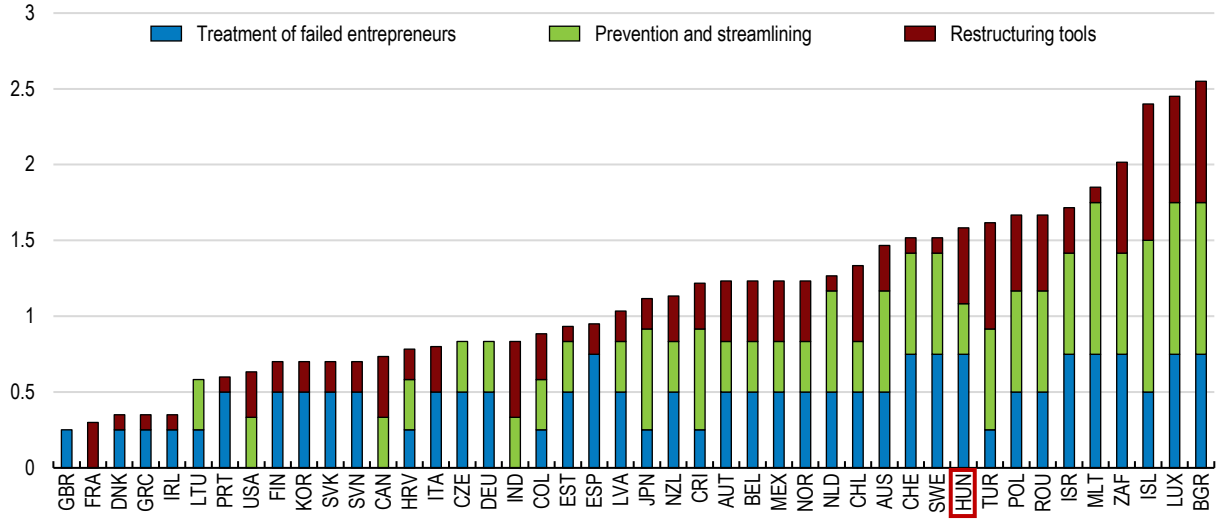
In recent years, Hungary's insolvency framework has made progress with respect to the early detection and resolution of debt distress (Figure 3.9). At the same time, there is scope for further improvements. Remaining shortcomings include a long time of discharge for failed entrepreneurs, the inability for creditors alone to initiate debt restructuring, and the absence of simplified debt restructuring procedures for SMEs.

While an amendment to the Personal Insolvency Act introduced in July 2022 now in principle gives failed entrepreneurs the possibility to be discharged after three years, its practical effects remain to be seen. So far, the average time to discharge is five years and can reach up to seven years.

Regarding debt restructuring, the current legislation allows debtors to apply for debt restructuring, either alone or jointly with creditors, but creditors alone cannot initiate debt restructuring. Moreover, while simplified liquidation procedures exist, no simplified debt restructuring procedures exist for SMEs. Such procedures, including more scope for out-of-court debt restructuring, could help reduce the share of *zombie firms*, which is usually higher among SMEs than among larger firms (Banerjee and Hofmann, 2020[18]). Moreover, the low asset values of SMEs may lead creditors to adopt a passive role if procedures are cumbersome, and the usual insolvency procedures may be too costly for SMEs with limited financial resources (André and Demmou, 2022[19]). An out-of-court regime for debt restructuring can speed up debt resolution proceedings at an early stage to prevent the deterioration of the debtor's assets. Such a system has recently been introduced in other OECD countries, such as Japan and Portugal (OECD, 2017[20]) (OECD, 2017[21]).

Figure 3.9. Hungary has a less favourable insolvency framework than most EU and OECD countries

OECD Insolvency framework indicator, 2022



Note: The scores for the three components of the indicator are scaled from 0 to 1, with lower scores indicating more favourable insolvency frameworks. The treatment of failed entrepreneurs includes all factors affecting the ability of failed entrepreneurs to start a new business (e.g. obligation of repaying past debt due to bankruptcy). Prevention and streamlining refers to mechanisms allowing the early detection and resolution of debt distress. Restructuring tools refer to the way debt restructuring is organised (e.g. ability of creditors to initiate debt restructuring, and possibility for a minority of shareholders to block a restructuring plan).
Source: (André and Demmou, 2022[19])

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Bolstering the productivity of existing firms through digital technologies

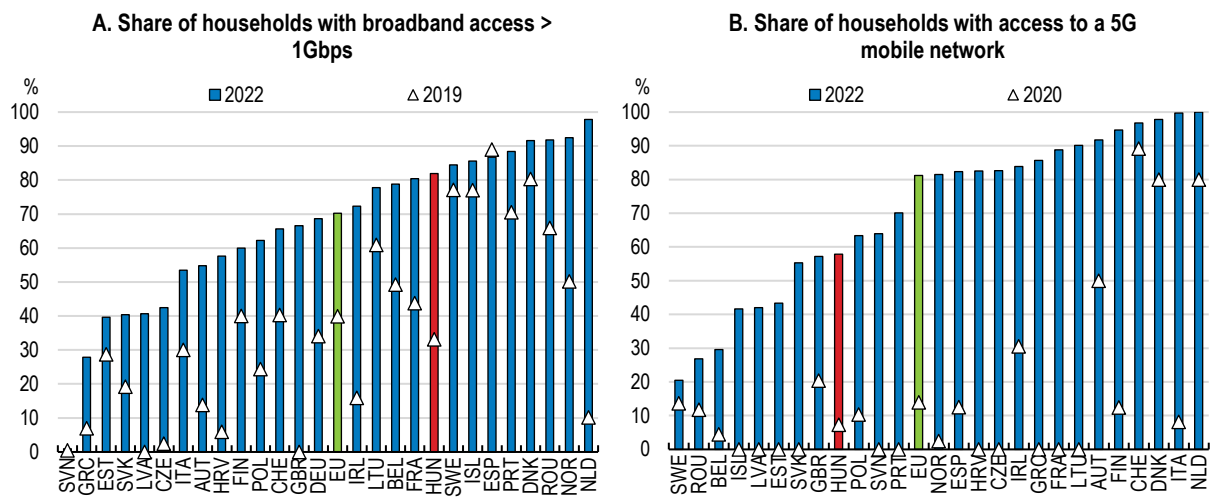
The wider diffusion of digital technologies is a key instrument to strengthen the productivity of existing firms. Information and communication technologies (ICT) have been a key driver of labour productivity growth in the United States and, to a lesser extent, in Europe (Jorgenson, Ho and Stiroh, 2008[22]) (Cette et al., 2016[23]). While the potential of the current digital revolution to continue driving productivity growth in the most advanced countries and firms is subject to debate, a large empirical literature suggests that the diffusion of digital technologies has been unequal across countries, and across firms belonging to the same narrowly-defined industries within countries. This, in turn, has contributed to a widening of the productivity divergence between firms (Andrews, Criscuolo and Gal, 2016[24]). This suggests vast underexploited potential for a wider diffusion of existing technologies and a more efficient use of these technologies, especially in Hungary.

Digitalisation has made uneven progress in Hungary. Good connectivity of households and firms overall, exceeding the EU average, contrasts with a limited take-up of digital technologies by firms, especially when it comes to small firms and the most advanced technologies.

The coverage of Hungarian households with high-speed broadband and a 5G mobile network has increased rapidly over the last years (Figure 3.10). Further investments are required to reach the EU target of having all households covered by a gigabit broadband and a 5G mobile network by 2030, but this objective seems achievable. This will be important to boost the use and development of new applications and services at higher speed, including the greater use of cloud solutions and "Internet of Things" applications (OECD, 2019[15]). These are areas where Hungarian firms are lagging behind (see below).

Figure 3.10. Further investments are needed to keep Hungary's Internet infrastructure at the frontier

Share of households with access to a broadband download speed of at least 1Gbps (Panel A) or a 5G mobile network (Panel B)



Source: Eurostat (Database on Digital Economy and Society)

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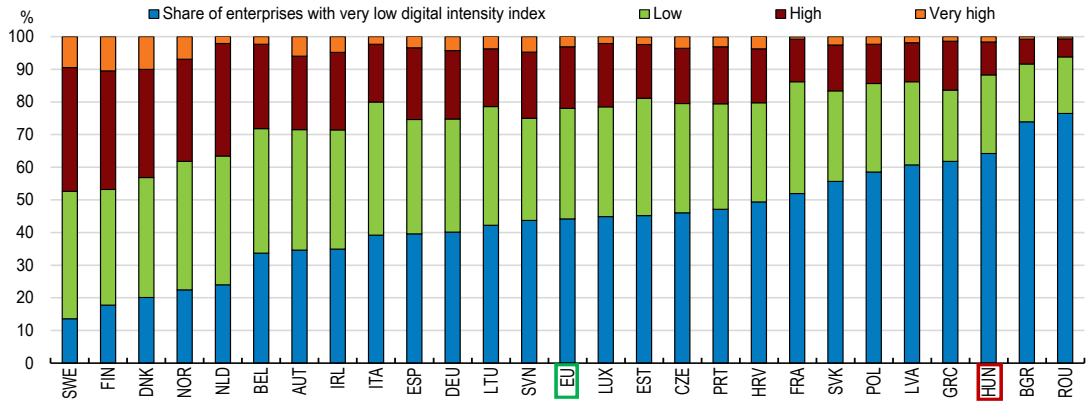
While good infrastructure is necessary for digitalisation, it is not sufficient in itself. According to the EU Digital Intensity Index measuring the digital activity of firms, Hungarian firms are among the least digital-intensive in the EU. Two thirds of Hungarian firms had a very low Digital Intensity Index in 2021 (Figure 3.11).

Figure 3.11. The digitalisation of firms is lagging behind

Distribution of firms according to the EU Digital Intensity Index (2021, %)



Note: Businesses with 10 persons employed or more. The 2021 DII is based on a business survey where firms are asked whether more than 50% of their employees use computers with access to Internet for business purposes; the maximum contracted download speed of the fastest fixed line Internet connection is at least 30Mbps; the company uses any social media; the company uses two or more social media; web sales represent at least 1% of total turnover; web sales represent more than 1% of total turnover and B2C web sales more than 10% of web sales; the company buys cloud-computing (CC) services; the company buys sophisticated or intermediate CC services; uses a customer relationship management software; uses an enterprise resource planning software; uses any Internet of Things (IoT); and uses any AI technology.
Source: Eurostat Database on Digital Economy and Society.

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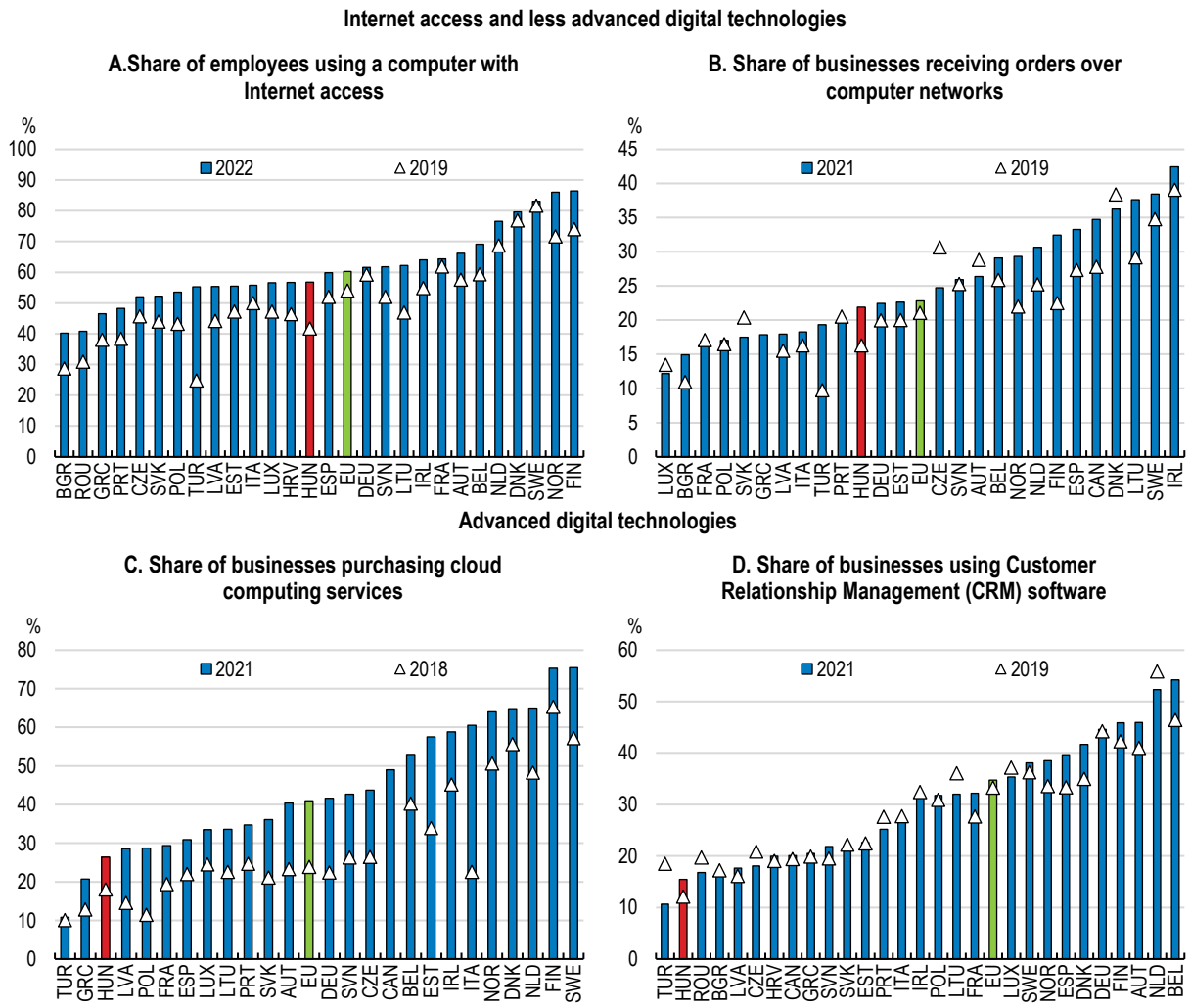
In absolute terms, most indicators measuring the digitalisation of firms have improved since 2019, largely due to the accelerated digitalisation of the economy during the pandemic. The most significant improvements include the ability of firms to receive orders online, and the rising share of employees using a computer with internet access. These are two areas where Hungary has caught up with the EU average between 2019 and 2022 (Figure 3.12, Panels A and B).

Compared to other OECD countries, Hungary is mainly lagging behind in the adoption of advanced digital technologies, such as cloud computing, the use of customer relationship management (CRM) or enterprise resource planning (ERP) software. While the situation improved during the pandemic, Hungary did not manage to bridge the gap with other EU countries (Figure 3.12, Panels C and D).

Figure 3.12. Hungarian firms are lagging behind for the adoption of advanced digital technologies



Note: Businesses with 10 persons employed or more.
Source: OECD Database on ICT Access and Usage by Businesses.

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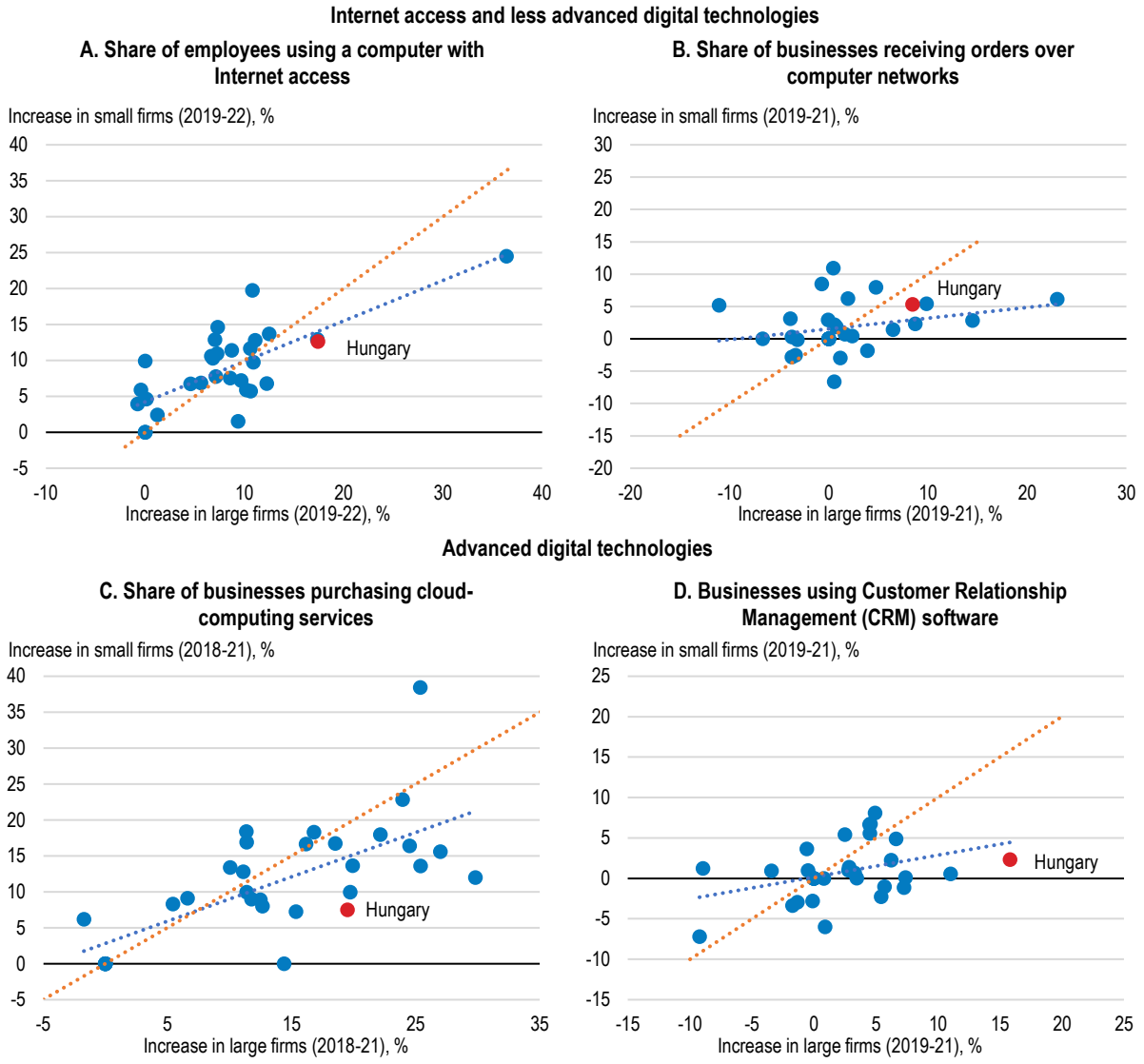
Moreover, the diffusion of digital technologies tends to be unequal across firms. Already before the pandemic, the empirical evidence in most countries pointed to a significant digital adoption gap between firms (Bach, Zoroja and Vukšic, 2013[25]). Indeed, digital technologies and other intangible assets are characterised by scalability, large sunk costs and synergies which give an advantage to the largest and most established firms on a market (Haskel and Westlake, 2018[26]). The available evidence for Hungary shows that the pandemic accelerated the digitalisation of firms, but also widened the digital divide between small and large firms for the adoption of advanced digital technologies. For example, while the share of employees using a computer with internet access and the share of businesses receiving online orders increased similarly for small and large firms, cloud-computing services and CRM software were adopted more consistently among large firms (Figure 3.13). This may exacerbate the pre-existing productivity gap between small and large firms in Hungary.

Figure 3.13. The digital divide between small and large firms has widened during the pandemic



Note: Businesses with 10 persons employed or more.
Each dot corresponds to a country, red dots identify Hungary, and red lines are 45° lines. In countries below (above) the 45° lines, the digitalisation of large firms improved more (less) rapidly than the digitalisation of small firms during the COVID-19 pandemic.
Source: OECD Database on ICT Access and Usage by Businesses

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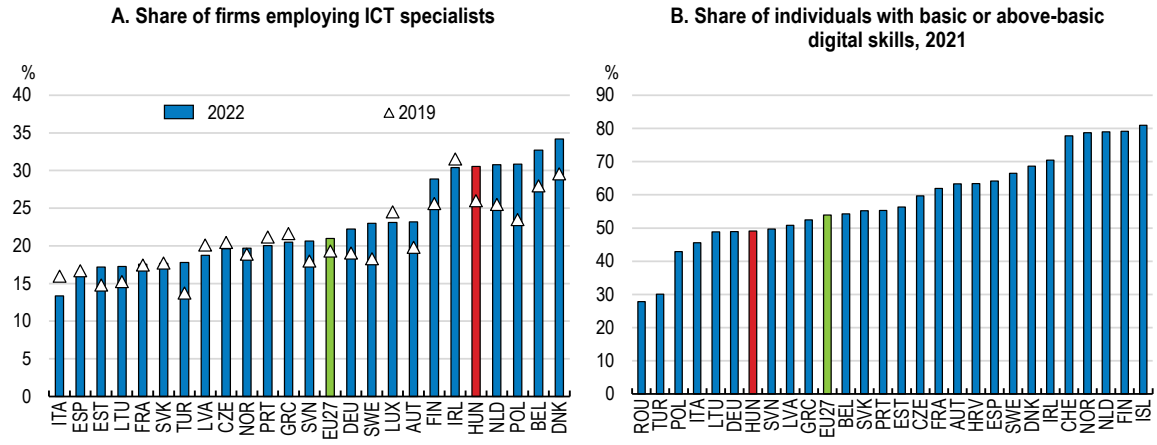
In addition to lower telecommunication prices, accelerating the acquisition of digital skills in all segments of the population would also facilitate a wider diffusion and use of digital technologies. While the share of Hungarian firms employing ICT specialists has continued to increase during the pandemic and is now above the EU average, the diffusion of generic digital skills in the population remains weak (Figure 3.14). Empirical evidence shows that skill shortages prevent less productive firms, which are less able to attract the most qualified workforce, from reaping the productivity gains from investments in digital technologies (Figure 3.15). Dedicating more time to ICT in all school and adult training programmes would be a first step in this direction, as recommended in the 2021 Economic Survey of Hungary (OECD, 2021[27]). Managerial skills and the organisation of firms are also key to ensure that investments in ICT assets actually translate into productivity improvements. For example, management practices related to how promotions are granted, and how hiring and firing decisions are taken, have been one factor behind a more

rapid ICT adoption in US firms relative to their European counterparts at the turn of the 21st century (Bloom, Sadun and van Reenen, 2012[28]). Returns on ICT investments have also proven higher in firms with a more decentralised work organisation (Bresnahan, Brynjolfsson and Hitt, 2002[29]).

Figure 3.14. Generic digital skills should be improved



Note: Panel B: The Digital Skills Indicator 2.0 (DSI) is a composite indicator which is based on selected activities related to Internet or software use that individuals aged 16-74 perform in five specific areas (Information and data literacy, Communication and collaboration, Digital content creation, Safety, and Problem solving). It is one of key performance indicators in the context of the Digital Decade, which sets out Europe's ambition on digital. The 2030 target of the Digital Compass is that at least 80% of citizens aged 16-74 have at least basic digital skills.
Source: Panel A: OECD Database on ICT Access and Usage by Businesses. Panel B: Eurostat Digital Economy and Society database (https://ec.europa.eu/eurostat/databrowser/explore/all/science?lang=en&subtheme=isoc.isoc_sk&display=list&sort=category)

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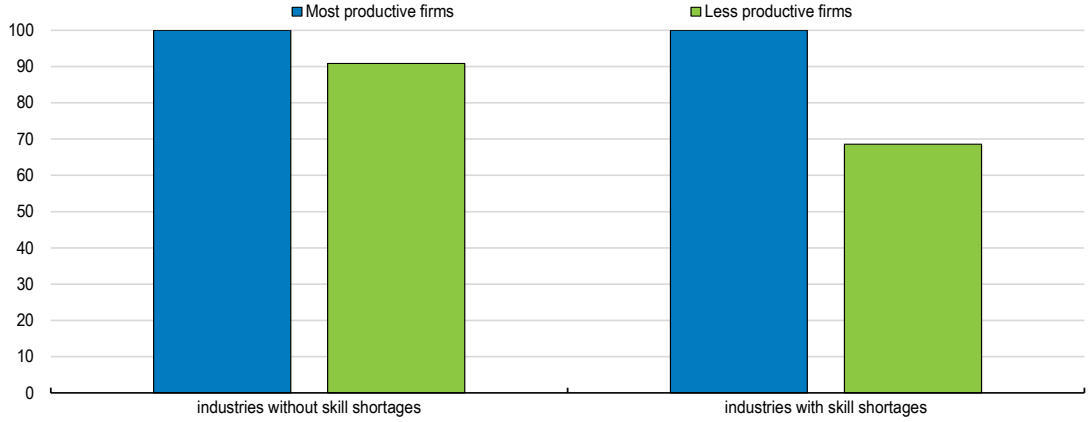
Figure 3.15. Digital skill shortages reduce gains from digitalisation in less productive firms

Productivity gain in most productive firms without skill shortages = 100



Note: Estimated effect on TFP of adoption of a mix of digital technologies (high-speed broadband, cloud computing, ERP and CRM software) for two categories of firms: the 25% most productive firms in each industry, and those between the 50th and the 75th percentiles of the productivity distribution in each industry ("less productive firms").
Source: (Sorbe et al., 2019[30])

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Strengthening the role of the National Competitiveness Council

Many OECD Member countries have long-standing institutions that aim to improve productivity and competitiveness at the national level (e.g. Australia, Denmark and Ireland). Over the past few years, several European Member countries have established pro-productivity institutions, in line with a 2016 European Commission's recommendation asking that all countries in the Euro area set up National Productivity Boards (NPBs). Such institutions have been successfully contributing to productivity analysis and advising governments in different countries. Their aim is to bring together academic research and policy making. They are intended to function as independent expert bodies, with clear guarantees regarding their financing, the appointment of their members based on competence criteria, and autonomy in the choice of their work programme. While independence is key for their credibility, regular exchanges with the government at technical and political levels make it more likely that their analysis effectively contributes to policymaking. They also benefit from the feedback of trade unions, social partners, and relevant stakeholders, through open and formal exchanges. (Cavassini et al., 2022[31]).

In Hungary, the government decided in 2016 to set up the National Competitiveness Council (NCC). The NCC is a consultative body consisting of economic actors and academics whose aim is to provide economic analysis and policy advice to help the government address policy challenges related to productivity and competitiveness. The role of this institution to analyse productivity developments could be strengthened and made more visible, especially in a context where the green and digital transitions may have a large impact on productivity. The impact of health conditions on productivity would be another relevant issue to analyse in Hungary, given the challenges in this area (OECD/European Observatory on Health Systems and Policies, 2021[32]).

Table 3.2. Past recommendations on productivity and business dynamism

Recommendations in previous survey	Actions taken
Support skills and mobility	
Link funding for vocational schools to the number of students in work placements. Allow apprenticeship to start only once a placement with a company for the work-based part of the programme is secured.	In the case of dual apprenticeships, companies act as schools and receive funding based on the number of apprentices.
Regulate tenancy to better balance the interests of tenants and landlords.	The rights and obligations of tenants and landlords are currently being reviewed by the government.
Consider increasing the duration of unemployment benefits.	No action taken, as the government considers that longer unemployment benefits would discourage job search.
Ensure dynamic and competitive product markets	
Liberalise entry conditions in services sectors by reducing certification and licensing requirements.	No action taken.
Subject all mergers that fulfill the merger threshold to full reviews. Establish limited and explicit public interest grounds for exemption.	The government continues to take decrees that may allow bypassing the Competition Authority in case of mergers considered of national strategic importance.
Increase the use of e-invoicing through the electronic procurement system. Further enhance transparency and continue to increase the share of public procurement subject to competitive tendering.	New search functionalities have been added to increase the transparency of the Electronic Procurement System. The shares of single bids financed by the EU or the national budget fell below 15% and 32%, respectively, in 2022.
Promote digital adoption	
Phase out levies on phone calls and messages.	The government plans to remove sectoral taxes on telecommunication services when the budget will allow.
Strengthen network competition through auctioning of additional spectrum to expand the number of mobile network operators.	No action taken, as all available spectrum has already been allocated.

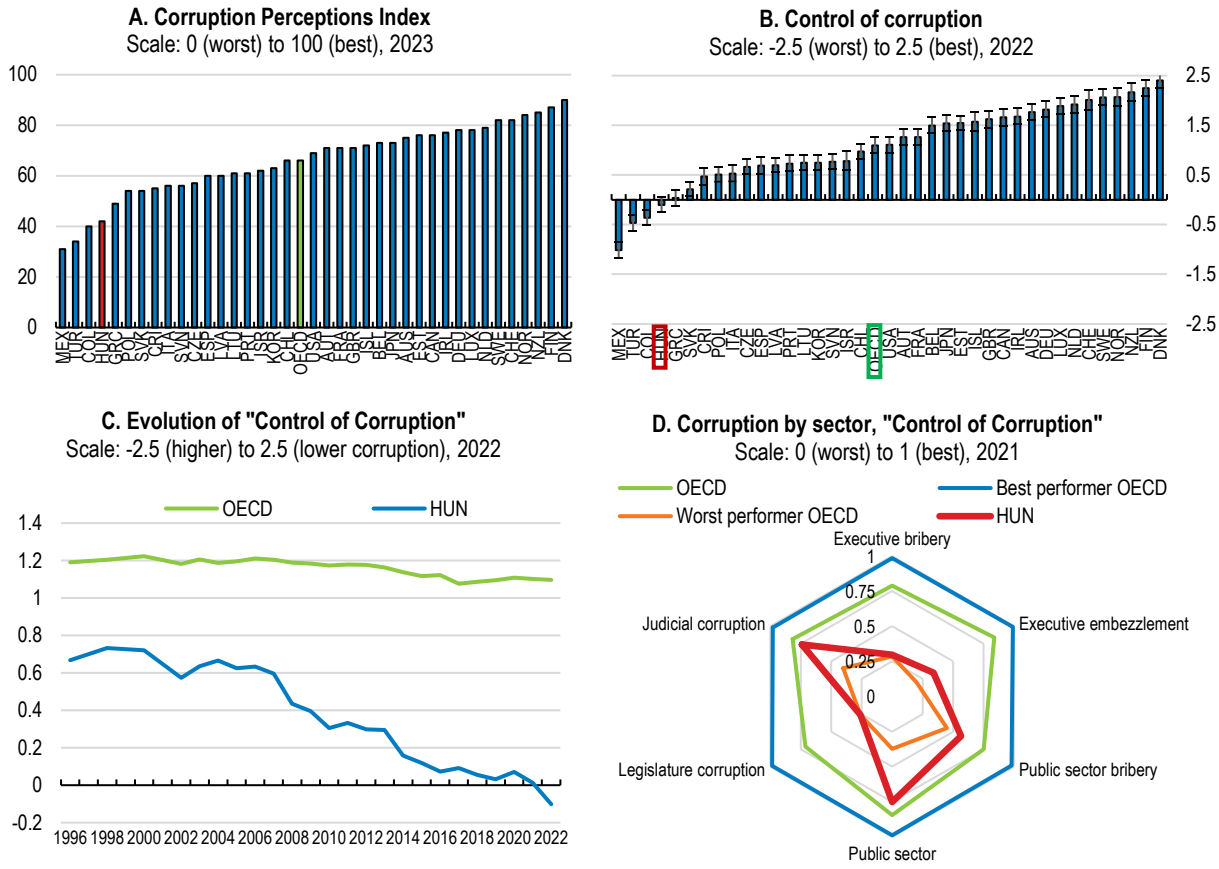
A full implementation of recent reforms would strengthen public integrity

Corruption and challenges with respect to public sector integrity reduce economic efficiency, lead to a waste of public resources, widen economic and social inequalities, and reduce trust in institutions (OECD, 2017[33]). International indicators available until 2021 or 2022 show that corruption in Hungary is perceived to be higher than in most other OECD countries (Figure 3.16).

Hungary has launched important efforts to improve the country's rule of law with a focus on strengthening anti-corruption efforts and promoting public integrity. The main objectives include strengthening Hungary's institutional capacity to fight corruption, improving conflict of interest and asset declaration regulations, enhancing transparency and reducing corruption risks in public procurement, increasing the systematic use of digital tools in selected policy areas, and strengthening Hungary's capacity to detect, investigate and prosecute corruption cases, including foreign bribery.

Hungary has taken a number of steps to improve the effectiveness of its anti-corruption framework. In 2022, the government adopted the "Integrity Authority Act" introducing the Integrity Authority and the Anti-Corruption Task Force to strengthen the country's institutional capacity to fight corruption. During this process, Hungary consulted both the Council of Europe and the OECD and considered certain recommendations by these institutions. In addition, Hungary adopted a new Strategy Against Fraud and Corruption for EU Funds in September 2022 and a National Anti-Corruption Strategy for 2024-25 in February 2024.

Figure 3.16. Corruption is perceived as high



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 and C: World Bank, Worldwide Governance Indicators; Panel D: Varieties of Democracy Project, V-Dem Dataset v12

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The Integrity Authority is a major step forward but its powers should be further enhanced

The Integrity Authority is tasked with the prevention, detection and correction of fraud, conflicts of interest and corruption, and other irregularities in the implementation of EU financial support. The Integrity Authority has powers to request information, carry out analysis, make recommendations and suspend public procurement procedures. These powers are exercised in coordination with other state bodies within the existing governance structure (e.g. the Prosecution Service, the Competition Authority, the Public Procurement Authority, the State Audit Office), which are invited by the Integrity Authority to take action in their respective areas of competence. For example, the Integrity Authority can instruct contracting authorities to suspend tenders, recommend the exclusion of specific economic operations from EU funding, request administrative investigative bodies to carry out investigations, and request a judicial review of all decisions of authorities concerning public procurement procedures that involve any financial support from the EU. The EU Council has positively assessed the scope of the Integrity Authority's purpose and objectives, its mandate and powers, and the rules on the appointment of its board (EU Council, 2022[34]).

Despite these efforts, recent external assessments indicate that certain weaknesses remain regarding the Integrity Authority (EU Council, 2022[34]) (GRECO, 2022[35]) (OECD, 2023[36]). These relate to a large extent to its competences. For example, the Integrity Authority Act currently leaves it unclear whether the

Integrity Authority retains its competence after a project is withdrawn from EU financing. In addition, the scope of the Integrity Authority's verification powers in relation to asset declarations remains limited, as it does not cover all "high-risk officials", such as members of Parliament and high-level decision makers, and does not enable access to information otherwise protected by law, on banking, tax, and insurance, for example. Additional measures could also be implemented to strengthen the system for the judicial review of the decisions of contracting authorities that do not follow the recommendations of the Integrity Authority. Finally, the arrangements for the Authority's co-operation with other bodies and access to information and the Authority's powers to independently conduct investigations could be clarified in law.

In light of these findings and building on recent reforms, Hungary should enhance the powers of the Integrity Authority to remove any constrains which may undermine the Authority's capacity to effectively fulfil its purpose and objectives. Latvia's Corruption Prevention and Combating Bureau (KNAB) could provide a useful example of good practice in this regard.

The role of the Anti-Corruption Task Force should be clarified

The Anti-Corruption Task Force is tasked with a broader remit and is responsible for examining the existing anti-corruption measures and elaborating proposals concerning detection, investigation, prosecution, and sanction of corruption, as well as putting forward proposals to improve corruption prevention and detection. Part of this role includes evaluating the implementation of Hungary's NACS on an annual basis. The establishment of the Anti-Corruption Task Force also offers potential for meaningful dialogue and engagement with civil society organisations, with 50% of its members representing non-governmental actors and selected based on an open, transparent, non-discriminatory selection process with objective criteria related to expertise and merits.

The regulatory framework for the new Anti-Corruption Task Force is in line with Hungary's commitments set out in the remedial measures agreed with the EC (EU Council, 2022[34]). Following these positive developments and to fully utilise the role of the Anti-Corruption Task Force, Hungary could consider streamlining its functions to mobilise evidence and insights that will inform government action, such as in monitoring and evaluating the implementation of the NACS and ensuring its consistency with the new Strategy against fraud and corruption for EU Funds.

The two parallel anti-corruption strategies should be consistent with each other

In September 2022, Hungary adopted a new Strategy against fraud and corruption for EU Funds for the 2021-2027 programming period (Hungarian Government, 2022[37]). This Strategy defines the tasks of entities involved in the implementation of any EU financial support in relation to the prevention, detection and correction of fraud, conflict of interest and corruption. The EC has positively assessed the adoption of the new Strategy and considers that Hungary has successfully fulfilled its commitments in this area (EU Council, 2022[34]).

In February 2024, Hungary also adopted a National Anti-Corruption Strategy for 2024-25, which is a comprehensive prevention document, designed to enhance awareness and responsibility regarding the fight against corruption across the whole of society.

The ongoing reforms have the potential to significantly improve Hungary's anti-corruption and public integrity system at all levels of government and the private sector, and into wider society, in line with OECD standards, including the OECD Anti-Bribery Convention and its 2021 Anti-Bribery Recommendation, and the Recommendation on Public Integrity (OECD, 2017[33]). While it is still too early to assess the impact of these reforms, their timely and effective implementation is not only important to ensure the release of EU funds, but also because strong transparency, anti-corruption and public integrity measures are crucial to improve the business environment and the efficiency of public spending.

Ahead of its adoption, the OECD provided an assessment of Hungary's NACS against OECD standards and international best practice. The OECD made several recommendations for improving the NACS and Hungary's wider integrity framework. These included that the NACS could improve its problem analysis to better define the challenges it is seeking to overcome, clarify certain measures in the action plan, and potentially add more on asset declarations, political financing and the revolving door, and could improve its monitoring and evaluation processes to ensure effective implementation. The OECD also recommended strengthening measures to detect and investigate foreign bribery cases, reviewing the investigation time limit for foreign bribery offences, and clarifying the scope and application of Hungary's framework for holding legal persons liable for foreign bribery. Hungary is expected to report back to the OECD Working Group on Bribery (WGB) with regard to progress made in addressing these recommendations in the NACS.

Looking ahead, Hungary should focus on developing and maintaining a monitoring and evaluation system, which will allow to understand what works and why, and enable the authorities responsible for overseeing the strategies to ensure their continued relevance and effective implementation.

The monitoring and implementation of two separate but related strategies in the same field (the Strategy against fraud and corruption for EU Funds 2021-27 and the NACS 2024-25) might prove challenging in practice. Hungary should continue to enhance coherence and avoid duplication. The Anti-Corruption Task Force could assess the strategies' complementarity in its annual evaluation process.

Table 3.3. Past recommendations on fighting corruption and the public integrity framework

Recommendation	Actions taken since the 2021 Economic Survey
Establish an independent anti-corruption authority or a strong coordination committee. Strengthen public integrity in conflict of interest, lobbying, rules of conduct, parliamentarians' asset declarations, and independence and transparency of the judicial system.	The new Anti-Corruption Strategy (NACS 2023-25) and the related Action Plan are expected to be adopted by the end of 2023. An independent Integrity Authority and an Anti-Corruption task Force involving members from the administration and the civil society were created in 2022.

Table 3.4. Policy recommendations from this chapter (key recommendations in bold)

MAIN FINDINGS	RECOMMENDATIONS
Business dynamism and productivity	
Low regulated prices in the retail electricity sector discourage the entry of competitors to state-owned firms. **Telecommunication prices are relatively high and the mobile telecommunication sector recently went through a major reorganisation without the involvement of the Competition Authority.**	**Design more competition-friendly regulations, ensure a level-playing field between private and public enterprises, and reinforce the role of the Competition Authority.**
Regulations limit business entry and competition in transport.	Ease barriers to entry in the transport sector.
The productivity of state-owned firms is lower than that of privately-owned firms in the same sector.	Strengthen the corporate governance structure of state-owned enterprises.
Sharing network infrastructure among telecommunication operators can lead to lower prices and more investments, especially in costly high-speed fiber-optics and 5G networks.	Mandate infrastructure sharing between operators in the telecommunication sector.
Despite recent reforms, the insolvency framework could be further improved to facilitate the allocation of capital towards the most productive firms.	**Further improve the insolvency regime by allowing creditors to initiate debt restructuring and simplifying debt restructuring procedures for SMEs, e.g. by allowing out-of-court settlements.**
The number of business failures is rising.	Ensure that courts have adequate resources to deal with rising business failures.
The diffusion of generic digital skills in the population remains weak, despite increased hiring of ICT specialists.	Review all school and adult training curricula in order to allocate more time to ICT.
The digital and green transitions are making the role of national productivity boards even more important to ensure sustainable productivity growth.	Enhance the role of the National Competitiveness Council to conduct productivity analysis and advise the government.
Anti-corruption and public integrity framework	
Recent reforms have the potential to improve the anti-corruption and public integrity framework in Hungary in line with OECD standards, if they are fully implemented. **Two anti-corruption strategies have been formulated, which may complicate their implementation.**	**Fully implement the new anti-corruption and public-integrity framework, and enhance coherence between the two anti-corruption strategies.**
The competencies of the Integrity Authority could be further extended or clarified.	Ensure that the Integrity Authority's capacity to fulfil its purpose and objectives.

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4 Towards more inclusive growth

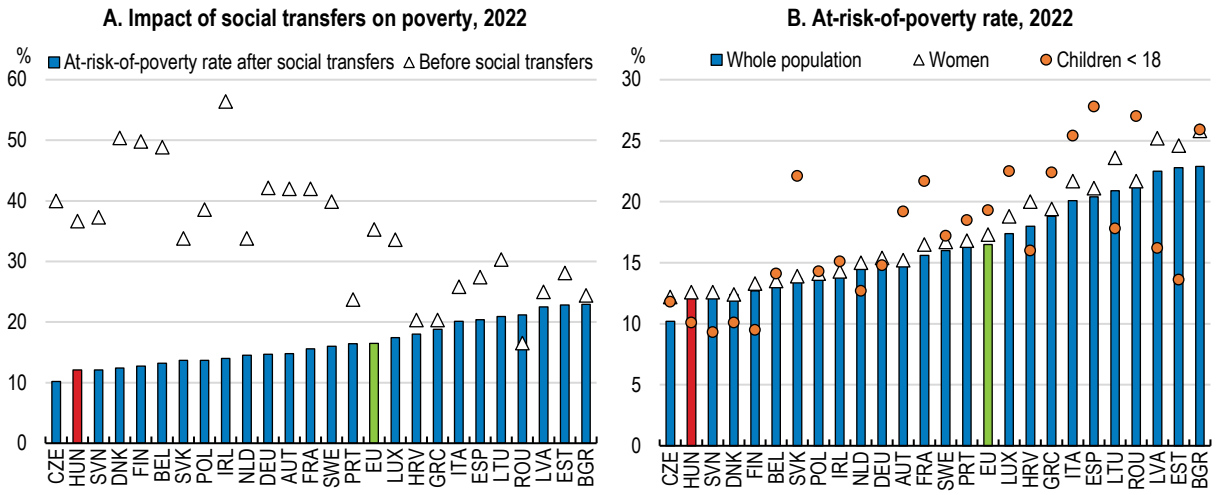
Pierre-Alain Pionnier

Income inequalities and the risk of poverty are limited in Hungary. This is largely related to existing social transfers. Nevertheless, there is room to achieve the same result in a more cost-effective way by improving the targeting of those transfers. At the same time, inequalities of opportunities are a substantial issue. Women face significant employment and pay gaps compared to men. Moreover, social mobility from one generation to the next is limited, which is related to the education system. Public education spending is low in international comparison and students' achievements are closely related to their socio-economic background. The COVID-19 pandemic also revealed weaknesses in the social protection of workers. Addressing them would require devising a permanent short-time work scheme that could be activated rapidly during recessions, as well as relaxing eligibility conditions for unemployment benefits and extending their duration, at least during recessions.

Social transfers keep income inequalities low, but they could be better targeted

Income inequalities are limited in Hungary. In particular, the share of poor people is the second lowest in the EU, and the existing social transfers largely contribute to this outcome. Without such transfers, the poverty rate would be above the EU average (Figure 4.1, Panel A). In contrast to other countries, there is no significant difference in poverty rates between men and women, or between different age groups (Figure 4.1, Panel B). Nevertheless, the Roma population, representing 7% of the total population in Hungary, is facing a poverty rate of 33%, significantly above the general population poverty rate of 12%.

Figure 4.1. Social transfers contribute to a low poverty rate in Hungary



Note: Panel A: The at-risk-of-poverty rate is defined as the share of persons living with an equivalised disposable income that is below 60% of the national median equivalised disposable income (after social transfers). The alternative poverty rate before social transfers is calculated by removing all social transfers except pensions from disposable income. The social transfers in scope are unemployment benefits, family-related benefits, sickness and invalidity benefits, education-related benefits, housing allowances, social assistance and other benefits. They can be provided in cash or in kind. They do not include any tax rebates such as family-related tax rebates. Disposable income is always calculated as an after-tax income.
Source: Eurostat Database on the European Pillar of Social Rights.

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Even though social transfers significantly reduce poverty on average, the same result could be achieved in a more cost-effective way by better targeting transfers at low-income people. Current transfers are not well-targeted to those most in need. In 2020, Hungarians in the upper income quintile received a larger fraction of social transfers than those in the lower income quintile (Figure 4.2). By contrast, 25% of transfers accrued to the poorest income quintile in Czechia, and up to 45% in Finland, while 13% and 8% accrued to the richest quintile, respectively.

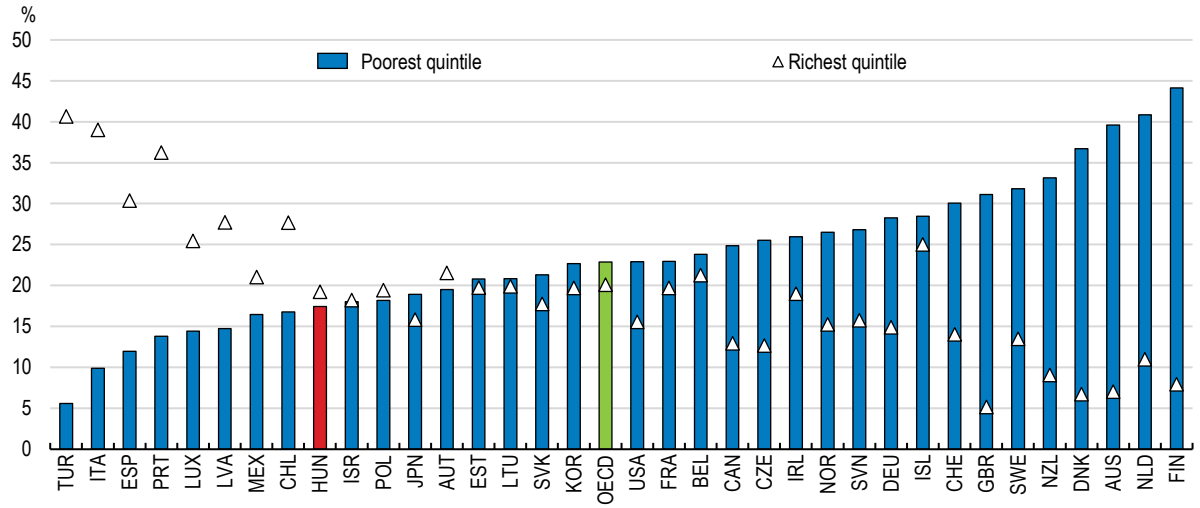
While other transfers may play a role as well, the low level of minimum income benefits and the universality of most family benefits contribute to the lack of targeting of social transfers in Hungary. The minimum income benefit is only about 20% of the poverty threshold, one of the lowest levels in the EU. Moreover, most family benefits in Hungary are not means-tested. This includes the family allowance, the childcare allowance, and the child-raising support. The family allowance is granted to parents of children below compulsory school age, children aged below 16 attending compulsory school education, and children aged below 20 attending public education or vocational training establishments. The childcare allowance is granted to parents raising children aged below 3, and the child-raising support is granted to parents of families with at least three children (OECD, 2022[1]).

Avoiding non-take up by households in need may be an argument for having a minimum universal child benefit for all families to ensure continuously low child poverty. At the same time, additional family benefits may be made available subject to means-testing to improve targeting. Italy implemented such a reform of its family support in 2022, merging six family benefits into one universal benefit, topped up with additional benefits that are means-tested based on income and wealth criteria (OECD, 2022[2]). Means-testing is widely used in the OECD countries where social transfers are well targeted (Box 4.1). Considering the large empirical evidence demonstrating the impact of parental income and income shocks on children's cognitive development and school attainment (OECD, 2018[3]), a better targeting of family benefits towards low-income families may contribute to increase intergenerational mobility, which is currently low in Hungary (see below).

The resulting targeting may be further reinforced by using the realised savings to increase minimum income benefits and ensuring that they reach all people in need, including in the Roma population. Looking ahead, a comprehensive review of existing social transfers in Hungary would be useful to better understand to what extent they reach the lowest parts of the income distribution, and how their targeting could be further improved while keeping poverty low.

Figure 4.2. The targeting of social transfers could be improved

Share of current transfers from public social security received by working-age individuals in low and high-income quintiles, 2021 or latest



Note: Data for Hungary refers to 2020. Current transfers from public social security include accident and disability benefits, old-age cash benefits, unemployment benefits, maternity allowance, child and/or family allowance, housing benefits, and other means-tested benefits.
Source: OECD Income Distribution Database.

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Box 4.1. Targeting of social transfers in selected OECD countries

In Denmark, housing benefits may only be granted based on a means test taking into account households' income and financial wealth. Moreover, housing rentals can only be subsidised up to a certain limit. All child and youth benefits are also means tested.

In the Netherlands, housing benefits are means tested and subject to the condition that households always pay part of the rent themselves. There are two child benefit systems. The general child benefit is not means-tested, but the higher additional child benefit is subject to a means test. Childcare benefits are also means tested.

In Sweden, all social assistance programs are means tested. The Early Childhood Education and Care benefit is means-tested based on income, but other social assistance programs are subject to wealth criteria as well.

Source: OECD Tax-benefit Database: Description of policy rules for Sweden (2022), OECD Tax-benefit Database: Description of policy rules for the Netherlands (2022), OECD Tax-benefit Database: Description of policy rules for Denmark (2022).

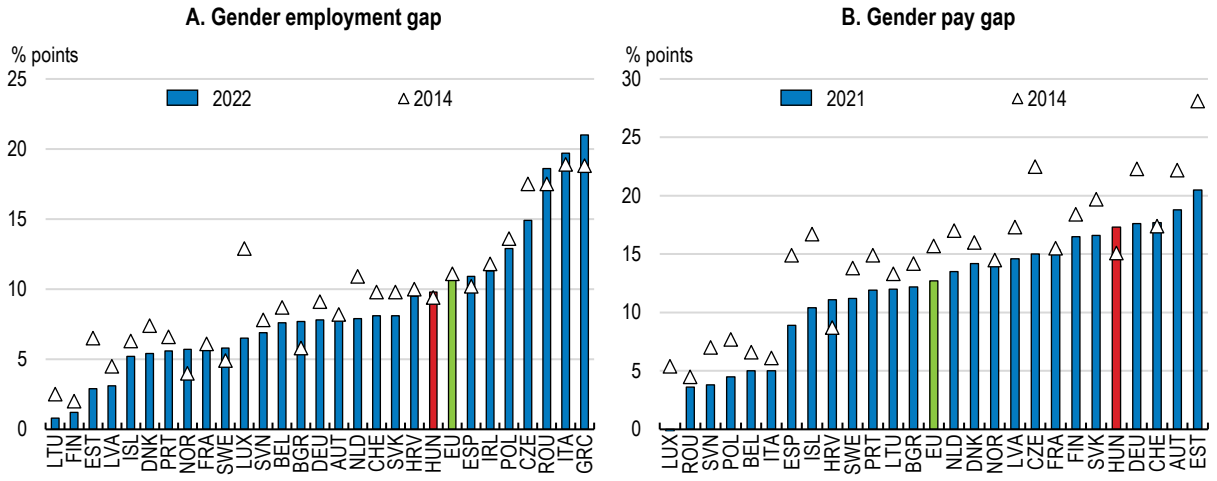
Inequalities of opportunities between men and women and between income groups should be addressed

While social transfers and family structures manage to keep women out of poverty, women face significant employment and pay gaps compared to men. In 2022, the employment rate of men was 10 percentage points higher than the one of women, and their wage 17% higher (Figure 4.3). Nevertheless, there is no significant difference in the propensity of men and women to work part-time.

Gender wage gaps may have different causes, and understanding their origin is a pre-condition for devising effective policies. A first explanation is related to pure labour market discrimination against women. A second explanation is that after the birth of their first child, women may accept lower wages in return for the non-monetary benefit of flexible working arrangements which allow them to spend more time in unpaid work at home. A third explanation is that, after the birth of their first child, women may transition to more flexible working schedules than men. As a consequence, they may not develop the skills and professional networks that would allow them to climb the wage ladder. While the second and third explanations are both related to maternity, the third one supports the idea that wage gaps may increase with age.

The available evidence shows that pure labour market discrimination between men and women does not play a significant role in explaining the gender wage gap in Hungary. This gap is mostly related to maternity and does not increase with age (Ciminelli, Schwellnus and Stadler, 2021[4]). The adequate policy response in this case would be to promote flexible working arrangements such as teleworking and part-time work, promote a more equal sharing of parental leave and flexible working arrangements between men and women. This can be complemented with improved access to early childcare facilities. Hungary already provides universal childcare benefits to make childcare more affordable, but only few nursery places are available, as highlighted in the 2021 OECD Economic Survey of Hungary (OECD, 2021[5]). While the number of places for young children in childcare facilities has increased by nearly 20% between 2017 and 2022, less than 13% of children under the age of three benefitted from formal childcare in 2022. This is far below the EU average, even considering measurement uncertainty (Figure 4.4). Expanding the number of places in childcare facilities should remain a priority, as acknowledged by the government. That would contribute to reduce both the wage gap and the employment gap between men and women. Potential fiscal savings achieved by providing more targeted transfers to families (see above) could be used to finance additional childcare places.

Figure 4.3. Significant employment and pay gaps put women at a disadvantage



Note: Panel B: The gender pay gap is the relative difference between the average wage of men and women, without controlling for any composition effect. Controlling for educational attainment and age, the hourly wage gap in 2014 was estimated to be 10% in Hungary, hence slightly lower but of the same order of magnitude as the unadjusted wage gap (15%) (Ciminelli, Schwellnus and Stadler, 2021, p. 17[4]).
Source: Eurostat Database on the European Pillar of Social Rights

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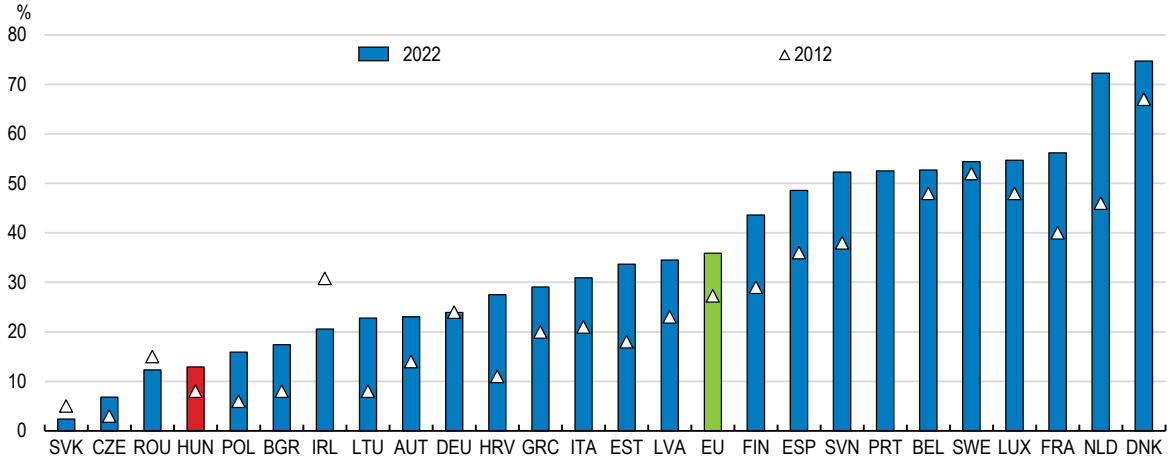
Figure 4.4. Only a minority of children under three have access to formal childcare

Proportion of children aged less than three in formal childcare (2022, %)



Note: According to national statistics published by the Hungarian Central Statistical Office (HCSO), the proportion of children aged less than three in formal childcare was 18.1% in 2022, vs. 12.9% according to Eurostat statistics based on the EU-SILC survey. The Hungarian authorities consider that the small sample of the EU-SILC survey does not provide an accurate estimate of this ratio. Assuming that the EU average is less sensitive to this issue than country-specific statistics, the proportion of children aged less than three in formal childcare in Hungary remains significantly below the EU average (35.9%) using one measure or the other.
Source: Eurostat Database on the European Pillar of Social Rights.

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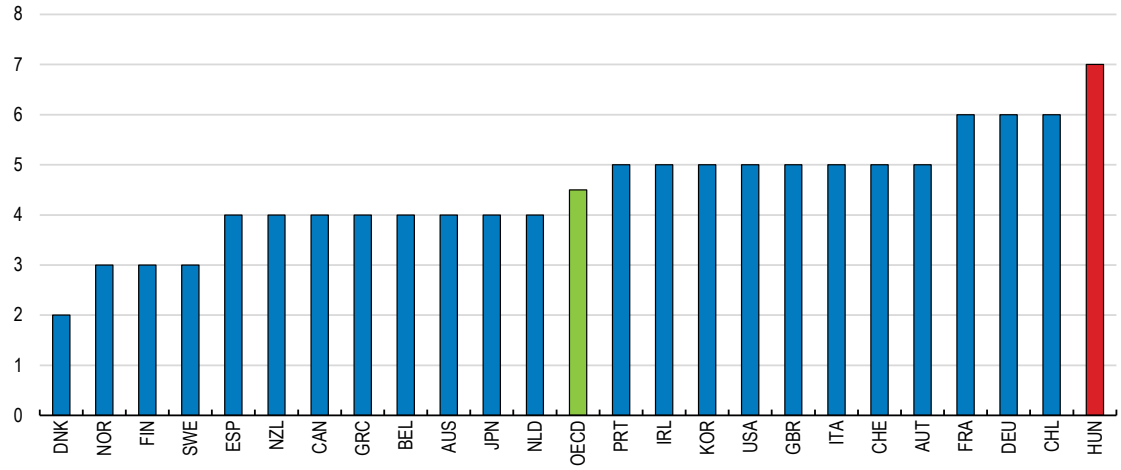
Inequalities of opportunities are not only significant between men and women. They are also high across people from different economic backgrounds. Social transfers keep income inequalities low at a given point in time, but moving up the income ladder is difficult in Hungary. With current intergenerational mobility, it

would take on average seven generations for low-income family children to reach the average income, versus only two or three generations in Scandinavian countries (Figure 4.5).

Figure 4.5. Income mobility across generations is low

Expected number of generations for the children of a family at the bottom 10% if the income distribution to reach average income



Note: This Figure shows the expected number of generations that children from families at the bottom 10% of income to reach the average income. These estimates are simulation-based and intended to be illustrative. They are based on the current level of household incomes at the bottom decile and the mean, and assume that earnings persistence between fathers and sons remains constant over time.
Source: (OECD, 2018[3]).

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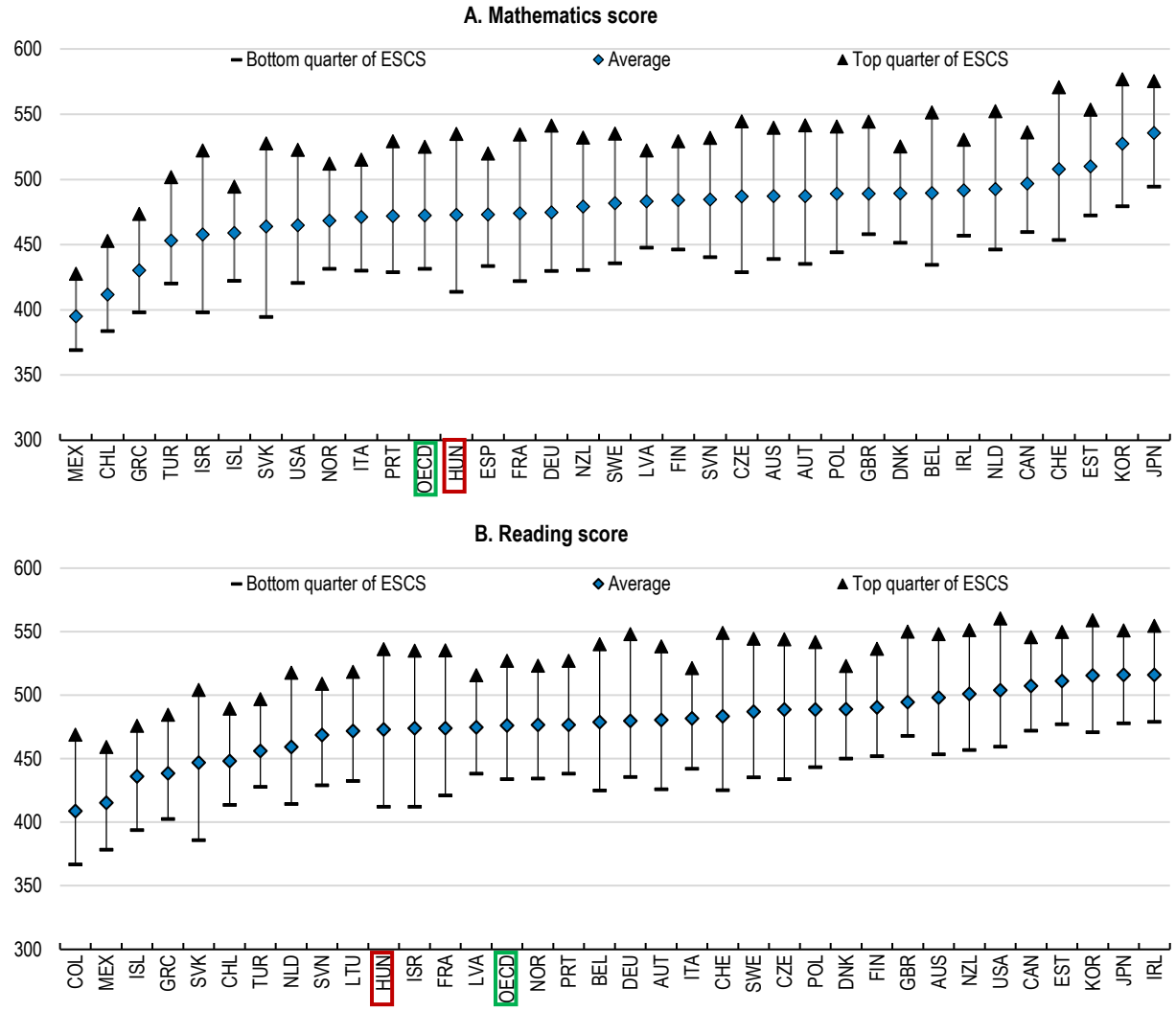
The low income mobility across generations is at least partly related to the education system. Hungary's educational outcomes measured by the OECD PISA survey are not significantly different from the OECD average, but they are more dispersed and tend to reproduce inequalities from one generation to the next (OECD, 2023[6]). The achievements of Hungarian students are closely related to the socio-economic status of their parents. For example, PISA outcomes in mathematics are 30% better among students from the highest socio-economic background than among those from the lowest socio-economic background. Other countries such as Latvia manage to have a similar average performance with a lower dispersion between students with different socio-economic backgrounds (Figure 4.6).

Figure 4.6. Student achievements are closely related to their socio-economic background

2022 PISA outcomes by economic, social and cultural status (ESCS) of parents



Source: OECD PISA survey, 2022.

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Reforms of the education system can contribute to improving education outcomes and avoid that socio-economic advantages or disadvantages are passed from one generation to the next. The low average student performance and the disparity between students with different backgrounds coincides with low education spending in Hungary (Figure 4.7). In OECD countries, the correlation between the number of years of education across parents and children, which is a proxy for education persistence, is lower in countries where public spending on education is higher (OECD, 2018, pp. 298-299[3]). Nevertheless, the efficiency of education spending also varies significantly across countries, and while spending more on education should be a long-term objective in Hungary, there is also room to undertake a review of education spending to see how to improve its efficiency.

One possible avenue to reduce the influence of the socio-economic background on education outcomes would be an expansion of early childhood education for children below three. This is often the part of the education system with the highest returns on public spending, not only in terms of average outcomes but also for reducing inequalities (Heckman, 2008[7]). Empirical evidence from the United States and Norway

suggests that early childhood education is particularly effective in remedying initial cognitive and social development disadvantages of children from less stimulating family backgrounds (Heckman and Masterov, 2007[8]) (Havnes and Mogstad, 2015[9]).

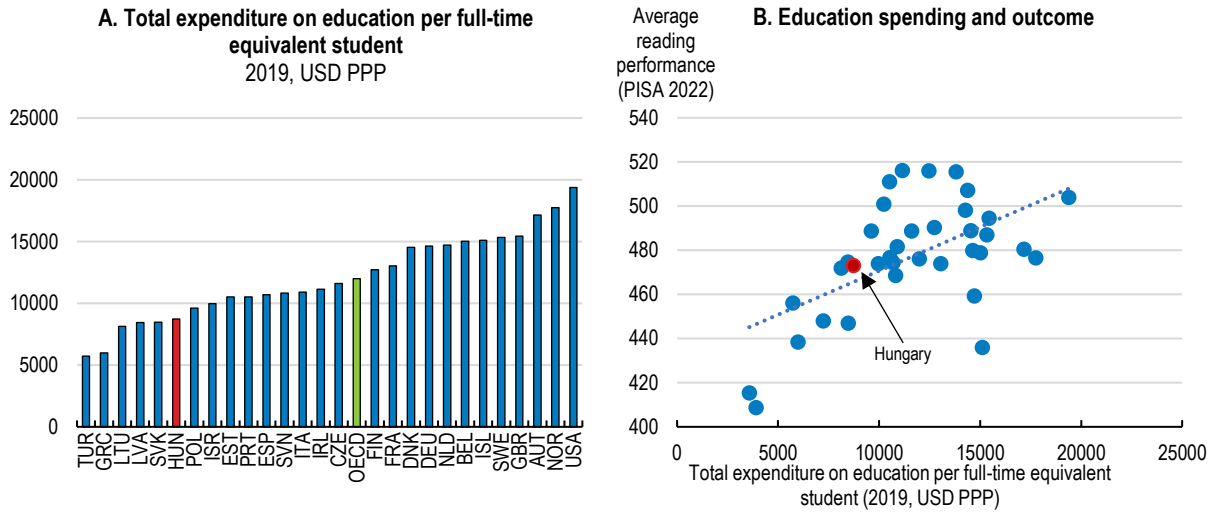
The way funding is allocated to schools also matters for equity. Evidence from the United Kingdom shows that the sorting of pupils into schools plays an important role in explaining why the test scores of richer and poorer children diverge (Crawford et al., 2016[10]). Funding combining both horizontal equity – schools with similar characteristics are funded at the same level – and vertical equity – schools with higher needs receive higher resources – allows to account for students' educational needs relating to socio-economic disadvantages and learning difficulties. It can be used, for example, to provide further help to pupils, such as additional teaching time, specialized learning material, and in some cases smaller classes. Such type of funding has been adopted in Australia, Canada, Chile, and the Netherlands (OECD, 2018[3]).

Developing a more supportive learning environment also comes through recruiting and training teachers and fostering effective learning strategies. Teacher quality is particularly important to support the long-term success of children in disadvantaged areas: students assigned to high value-added teachers, measured by how much they improved children test scores on average, are more likely to attend higher-ranked colleges, earn higher salaries, and live in higher socio-economic status neighbourhoods (Chetty et al., 2014[11]). For a majority of countries, a larger proportion of more experienced teachers teach in less challenging schools than in more challenging schools. Some countries have put in place proactive approaches to reverse this trend. In Japan and Korea, teachers and principals are often reassigned to different schools so that the most capable professionals are more equally distributed. Getting the best teachers to teach in disadvantaged schools may also require higher pay. While results from France show that the salary increase needs to be sizeable to provide a sufficient incentive (Prost, 2013[12]), non-financial incentives such as faster career progression, or the free choice of a new assignment after having served in a disadvantaged school, can also be used to complement financial incentives.

Flexible schooling and adapting teaching methods and programme contents to the needs of disadvantaged students can help improve achievements. In the United States, "charter schools" are public schools that enjoy greater leeway to manage staff, adapt curricula and organise teaching time. They often target students from disadvantaged backgrounds. A substantial body of research finds that charter schools can exert a significant, lasting impact on educational attainment and the later employment of disadvantaged youth (OECD, 2016[13]). Such examples could be adapted to the Hungarian context in order to target specific groups of disadvantaged students, including among the Roma population.

Vocational training programmes, in which students from disadvantaged socio-economic background tend to be disproportionally represented, have a key role to play to help these students move up the income ladder. In Hungary, a large share of upper-secondary students are enrolled in vocational programmes and all of these programmes now combine school- and work-based learning, well above the OECD average of 45% (OECD, 2023[14]). Upper-secondary vocational graduates in Hungary also have a high employment rate, exceeding that of upper-secondary graduates from the general education system. Nevertheless, access to tertiary education for students enrolled in vocational education is more limited in Hungary than in most other OECD countries, as 40% of VET programmes do not provide a pathway to access tertiary education after successful completion. In such cases, restarting secondary education and obtaining the baccalaureate is required to access tertiary education. This share is twice as high as the OECD average (OECD, 2023[14]). Creating additional pathways to higher education would offer VET graduates more opportunities for lifelong learning and career progression.

Figure 4.7. Lower education spending contributes to lower education outcomes



Source: OECD (Education at a Glance and 2022 PISA Survey).

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Unemployment and in-work benefits could do more to protect workers

The design of unemployment or in-work benefits is key to mitigate the impact of economic shocks on workers' income and career path. The recession triggered by the COVID-19 pandemic provided a stress test for the Hungarian social protection system of workers and revealed some weaknesses.

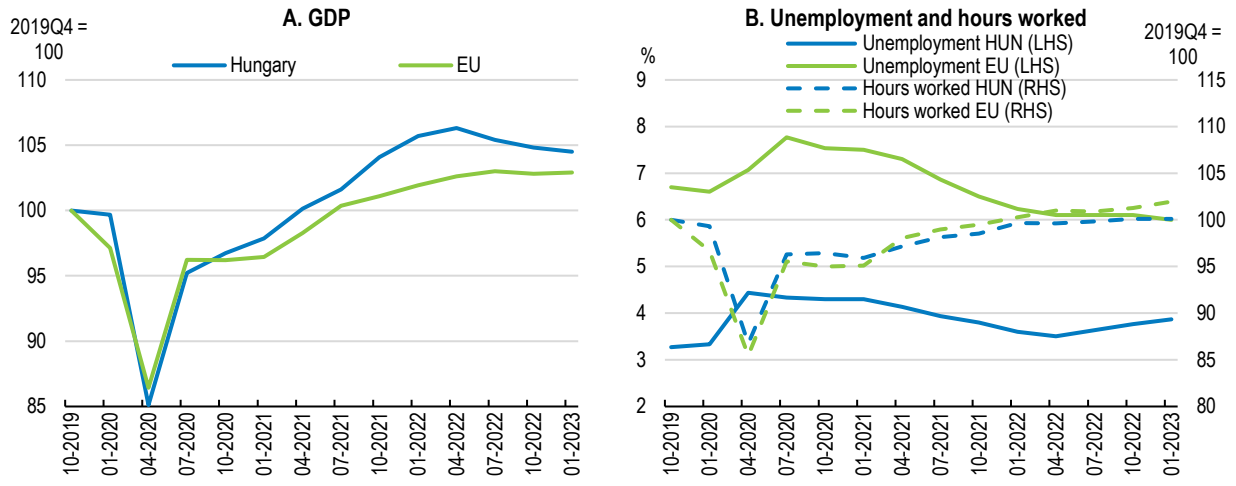
The short-time work scheme did not avoid large income losses for the poorest during the pandemic

In most European countries, the recession triggered by the pandemic led to much larger fluctuations in hours worked than in unemployment (Figure 4.8). Hungary is no exception to this, as unemployment rose by only 1.1 percentage points between late 2019 to its peak in mid-2020. By contrast, hours worked and economic activity dropped by 15% during the first wave of the pandemic, both in Hungary and in the European Union.

This divergence of unemployment and hours worked was related to the widespread use of job retention schemes in Europe. All EU countries relied on such schemes during the pandemic, but for 15 among them including Hungary, the pandemic was the first time a job retention scheme had been applied (Baptista et al., 2021[15]) (Box 4.2). The common feature of these job retention schemes was to allow keeping work contracts in force while work was partially or fully suspended, and compensating workers for at least part of their income losses. These schemes helped to limit costly layoffs and re-hirings following a temporary disruption of economic activity. By contrast, the United States did not rely on job retention schemes but mitigated the impact of the crisis by strengthening unemployment benefits and family support. (Blanchard, Philippon and Pisani-Ferry, 2020[16]).

Hungary's short-time work scheme was characterised by a low take-up rate compared to similar schemes in other OECD countries during the first wave of the pandemic in April-May 2020, partly related to its introduction only several weeks after the start of the pandemic and its initially strict eligibility conditions. The situation improved during the second wave in the autumn of 2020 (Figure 4.9).

Figure 4.8. The drop in GDP and hours worked during the pandemic was significant



Source: OECD Databases on Quarterly National accounts and Short-Term Labour Market Statistics.

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Box 4.2. Job retention schemes during the pandemic in Hungary

Hungary had three major job retention schemes during the pandemic.

A first short-time work scheme was launched in mid-April 2020, a month after the state of emergency had been declared (11 March). Its eligibility conditions were very strict initially, but the government relaxed them at the end of April. While the programme initially covered 70% of wage losses for working time reduction comprised between 30 and 50% and up to HUF 75,000 per month (50% of the minimum wage at the time), it was then extended to cover 70% of wage losses for working time reduction comprised between 15 and 75% and up to HUF 112,000.

A specific programme for R&D workers was also launched in mid-April 2020. It benefitted most researchers in Hungary, even if their job was not directly threatened by the pandemic, and it was much more generous than the short-time work scheme. This programme lasted for four months and was relaunched for another five months in January 2021.

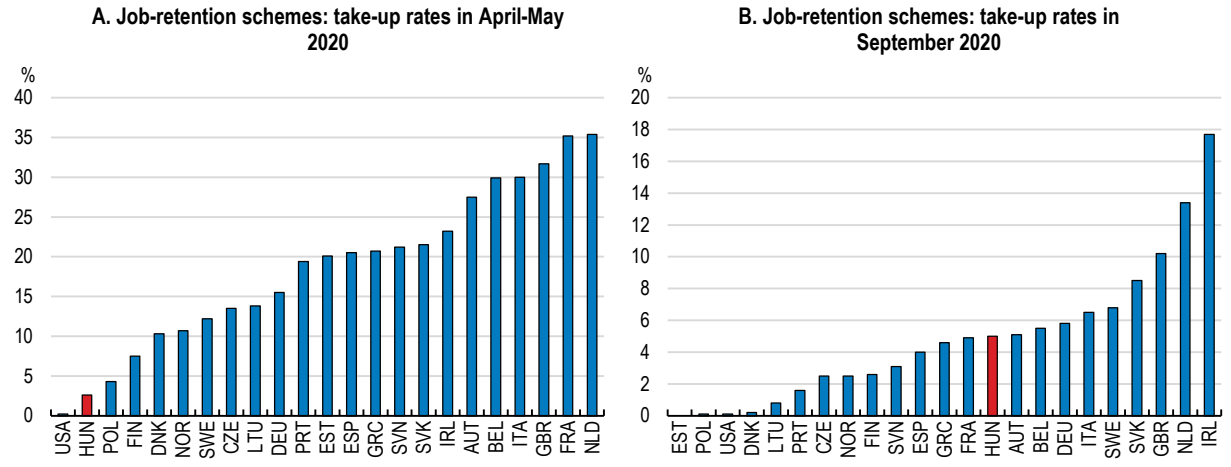
A sector-specific programme for the sectors most affected by the pandemic, mainly related to tourism, hospitality and cultural services, replaced the previous general short-time work scheme immediately after the second lockdown in November 2020. The number of eligible sectors was extended during the third pandemic wave in March 2021. The subsidy covered a maximum of 50% of the wage, and up to 150% of the minimum wage.

Table 4.1. Characteristics of job retention schemes

	Short-time work scheme	Specific programme for R&D workers	Sector-specific programme
Number of subsidised employees	198,000	37,000	166,000
Average amount spent per employee (HUF)	140,000	770,000	670,000
Duration of the programme	16 April 2020 – 31 August 2020	16 April 2020 – 31 August 2020 4 January 2021 – 31 May 2021	11 November 2020 – 31 May 2021

Source: (Krekó and Varga, 2022[17]).

Figure 4.9. The short-time work scheme had a low take-up rate during the first COVID wave



Source:. (OECD, 2022[18])

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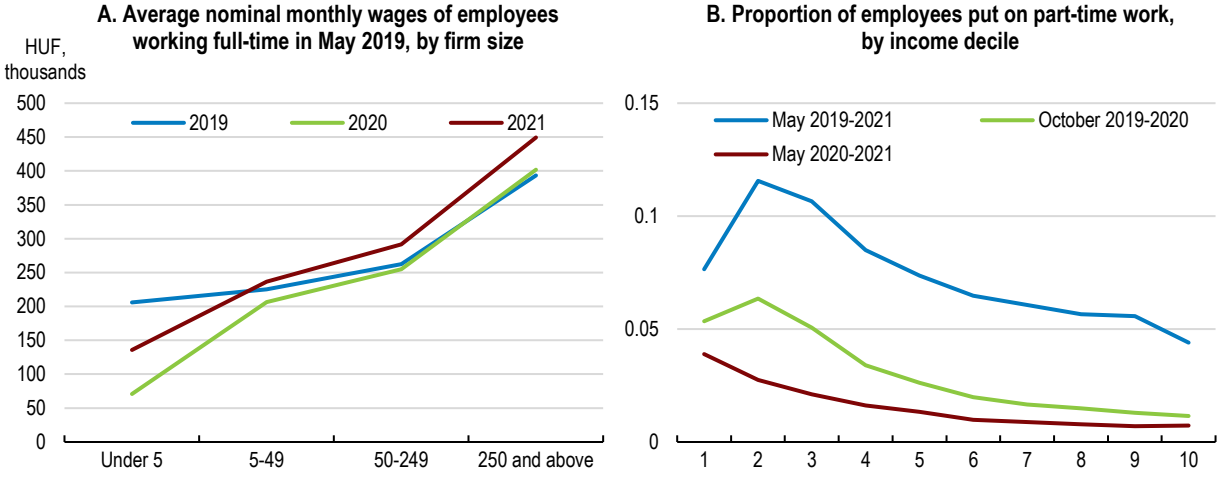
The empirical evidence available so far suggests that employees working in smaller firms or belonging to the lowest income deciles faced significant income losses during the pandemic despite the job retention schemes (Gáspár and Reizer, 2022[19]). For example, full-time workers in firms with less than 5 employees in May 2019 earned less than half of their earlier monthly salary in May 2020 on account of lower working hours (Figure 4.10). Teleworking was often not an option for low-skilled workers in services, and those at the lower end of the income distribution were more likely to see their working hours reduced during the pandemic.

Figure 4.10. Employees in smaller firms and the lowest income deciles were more likely to work reduced hours and face monthly wage cuts during the pandemic



Note: Calculations based on individual-level and exhaustive income tax declarations.
Lecture note: Panel A: The average nominal monthly wage of people who worked full-time in firms with less than 5 employees in May 2019 was HUF 200,000 in May 2019 (blue curve) and less than HUF 100,000 in May 2020 (green curve).
Panel B: 12% of people who belonged to the second income decile and worked full-time in May 2019 were working part-time in May 2021 (blue curve). By contrast, the same situation happened to less than 5% of the people in the last income decile.
Source: (Gáspár and Reizer, 2022[19]).

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In order to avoid any implementation delay during future recessions, Hungary may consider devising a permanent short-time work scheme in advance. The experience of other countries suggests that such schemes are effective in stabilising employment and allow firms to retain valuable staff during downturns, thus avoiding human capital losses due to job separations. The main drawback of such schemes is that they may hinder productive job reallocations if they continue to be used into economic recoveries to protect businesses that have become unproductive. To limit this drawback, two features should be built into their design. First, employers relying on the short-time work scheme for longer should be asked to contribute more. Second, eligibility rules should be stable. Ideally, they should be designed under normal economic conditions and not during recessions to avoid pressure to set up excessively generous schemes that may be difficult to turn off later (Cahuc, 2019[20]) (Hijzen and Martin, 2013[21]).

Unemployment benefit duration could be extended, at least during recessions

Job losses during the first wave of the pandemic resulted in a doubling of the number of people on the employment service register compared to the same period of 2019 (Boza and Krekó, 2022[22]). As the lockdowns made it more difficult than usual to find a new job, most OECD countries temporarily eased the eligibility conditions for unemployment benefits, increased benefit levels, and/or extended benefit durations. Hungary maintained its unemployment benefit system unchanged during the pandemic, despite having the shortest unemployment benefit duration in the OECD (Table 4.2).

While the proportion of jobseekers who were eligible for unemployment benefits during the first pandemic wave was higher than a year before, 20% of those who registered at the National Employment Service did not receive any benefits. Moreover, 40% of registered jobseekers, equivalent to half of those initially eligible to unemployment benefits, lost their unemployment benefits after 3 months (Figure 4.11), in a context where it was difficult to find a new job due to lockdowns and depressed economic activity.

Shorter benefit durations will generally act as an incentive to find a new position more quickly after a job loss. Nevertheless, these incentives are unlikely to be effective during recessions when the number of job vacancies is limited. Drawing on the lessons from the pandemic, eligibility criteria and benefit durations could be made more generous in times of macroeconomic downturns. For example, France made the duration of benefits contingent on macroeconomic conditions in 2023. Such a reform would account for the fact that people already unemployed at the onset of a recession or falling in unemployment during a recession will likely require more time to find a job than when economic activity is strong.

Table 4.2. Most OECD countries extended unemployment benefits during COVID-19, but not Hungary

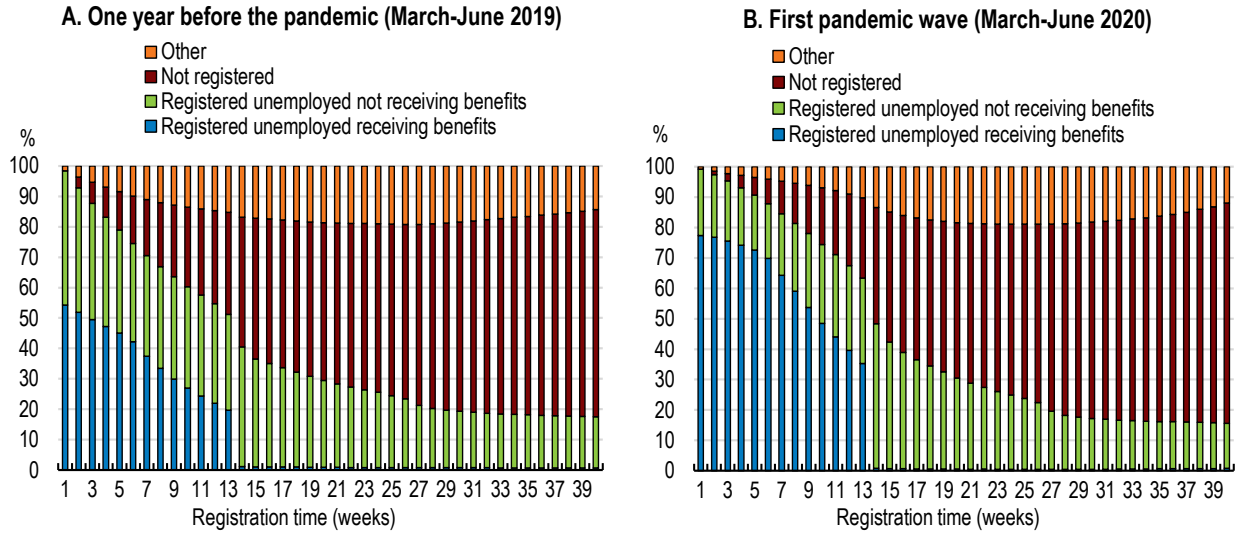
Extraordinary extensions in unemployment benefit entitlements relative to January 2020

	Improved access			Extended benefit duration			Raised benefit generosity		
	Spring 2020	January 2021	January 2022*	Spring 2020	January 2021	January 2022*	Spring 2020	January 2021	January 2022*
Australia**	•	•					•	•	
Austria							•		
Belgium	•						•	•	
Canada	•	•			•			•	
Chile									
Colombia	•						•		
Costa Rica									
Czechia									
Denmark				•	•				
Estonia**								•	•
Finland	•						•	•	
France	•	•		•					
Germany				•					
Greece				•	•				
Hungary									
Iceland								•	•
Ireland	•	•	•						
Israel	•	•		•			•	•	
Italy				•	•				
Japan				•	•	•			
Korea		•	•						
Latvia	•	•		•	•				
Lithuania	•	•							
Luxembourg				•					
Mexico									
Netherlands									
New Zealand**	•						•		
Norway	•	•	•	•	•	•	•	•	•
Poland	•						•	•	•
Portugal**	•			•	•			•	
Slovak Republic				•					
Slovenia	•								
Spain	•	•	•	•	•	•		•	•
Sweden	•	•	•				•	•	•
Switzerland				•					
Türkiye	•	•		•	•				
United Kingdom							•		
United States***	•			•	•		•		
# of countries	19	12	5	16	11	3	12	12	6

Note: Table 4.2 documents changes in either “first-tier” unemployment insurance or “second-tier” unemployment assistance programmes. A black dot indicates an extension in unemployment benefit entitlements relative to January 2020. * Data for 2022 are preliminary; shaded cells for Israel indicate that information for 2022 is missing. ** Some unemployment benefit extensions are not shown in the Table because they do not directly relate to the COVID-19 crisis. *** Information for the United States refers to the federal level.
Source: OECD Employment Outlook (OECD, 2022[18]).

Figure 4.11. During the first pandemic wave, many workers lost unemployment benefits after 3 months or did not receive any

Trajectory of new entrants in the unemployment register during the first pandemic wave and one year before



Note: The "Other" category includes unemployed receiving pre-retirement benefits, those enrolled in public work schemes, those working part time in wage subsidy programmes, and those enrolled in classroom training.
Source: (Boza and Krekó, 2022, p. 195[22]), based on individual anonymised data of the National Employment Service register of jobseekers.

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Table 4.3. Past recommendations on social issues

Recommendations in previous survey	Actions taken
Expand the availability of affordable, high-quality childcare.	A new programme provides financial support to young parents relying on -often scarce and costly- nursery services. EU funds will support the programme and fund an expansion of daycare facilities. Young mothers under the age of 30 have been granted a Personal Income Tax exemption upon return to work as of 2023.
Continue to facilitate more flexible working arrangements.	Parents with children aged 8 and younger can request teleworking or part-time work or a transfer to a new position as of January 2023.
Reduce the effective length of parental leave.	No action taken.
Link funding for vocational schools to the number of students in work placements. Allow vocational training to start only once a placement with a company for the work-based part of the programme is secured.	No action taken.
Consider increasing the duration of unemployment benefits.	No action taken.

Source: (OECD, 2021[5]), Government of Hungary.

Table 4.4. Policy recommendations from this chapter (key recommendations in bold)

MAIN FINDINGS	RECOMMENDATIONS
Social transfers keep poverty low but are often not well targeted.	Improve the targeting of social transfers to enhance spending efficiency while keeping poverty low.
Inequalities of opportunities exist in several dimensions. Intergenerational income mobility is low and women face significant employment and pay gaps.	**Continue expanding access to early childhood education and childcare facilities for children under the age of 3.** Promote a more equal sharing of parental leave between men and women.
Public education spending is low in international comparison, and there are strong educational achievement inequalities across students with different socio-economic backgrounds.	**Undertake a review of education spending to see how to improve its efficiency.** **Shift more resources to schools where students have a lower socio-economic background.** Consider granting schools greater autonomy to manage staff, organise teaching time, and provide tutoring to students at risk of falling behind. Provide financial and career incentives to attract good and experienced teachers in disadvantaged schools. Allow access to tertiary education after the successful completion of a wider range of vocational programmes.
During the first wave of the pandemic, the implementation of the short-time work scheme was slow and failed to prevent large income losses for low-income earners.	Devise a permanent short-time work scheme that can be rapidly activated during recessions.

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5 Towards more sustainable growth

Donal Smith and Tony Huang

Hungary's green transition has made progress but will need to accelerate to reach emission reduction targets. For a large part, emission reductions achieved so far are related to structural shifts induced by the transition to a market economy in the early 1990s. Regulations and standards are currently the main tools used to support the green transition, but they will likely be insufficient to reach the 2030 and 2050 emission targets. Price signals are key for an efficient decarbonisation, but the EU's Emission Trading Scheme only covers a third of emissions. Energy price caps have curbed incentives for energy saving and energy efficiency improvements, which contributes to high residential emissions. An aged vehicle stock, low fuel duties and urban sprawl are pushing up transportation emissions. The green transition will require a significant increase in electricity supply from low-carbon sources and massive investments in the electricity grid.

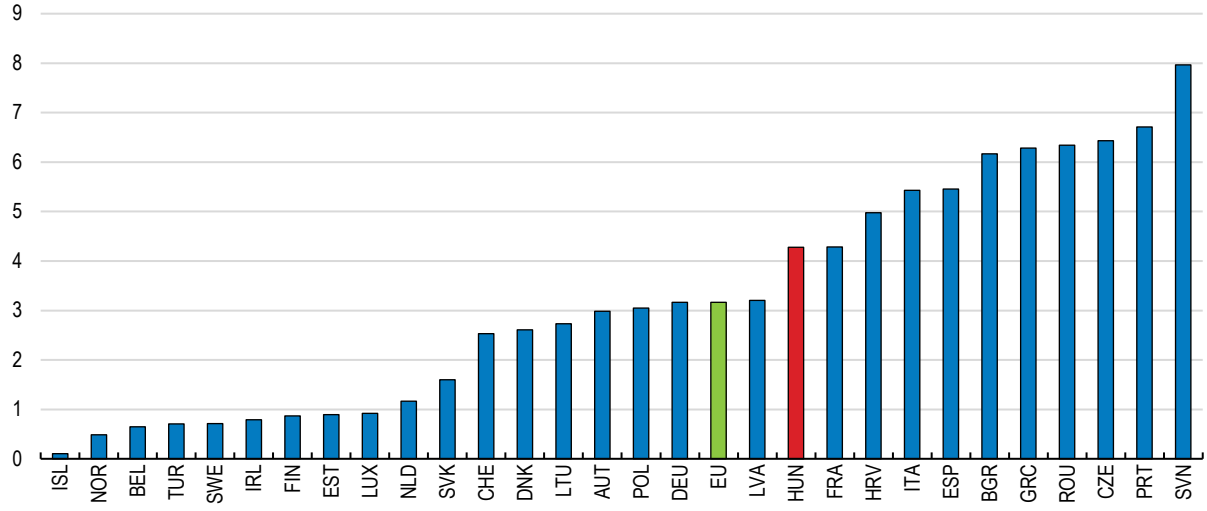
Addressing climate change requires policy action

Hungary stands to gain significantly from contributing to global efforts to rein in climate change, as changing climate patterns are already having significant economic costs due to altering temperatures and rainfall. The annual average temperature rose by 1.15°C between 1907 and 2017, outpacing the global average of +0.9°C, which led to proportionately higher economic losses (Figure 5.1). This will only intensify in the future, implying a need for additional spending on adaptation measures. Extreme heat episodes will increase further, with the number of days classified as extremely hot expected to more than double in 2071-2100 as compared to 1960-1990 (Vahava, 2010[1]). This will create stress for the forestry stock, an important source of carbon sequestration (MIT, 2020[2]).

Rainfall patterns are also affected by climate change. Projections suggest significant changes in the availability and quality of water within a year, even if average annual precipitation is not expected to change significantly (Barreto et al., 2017[3]). Changing rain distribution throughout the year and the increased occurrence of extreme precipitation, along with unsustainable water resource management, have already led to reductions in surface and groundwater reservoirs (Németh, Kravalik and Séra, 2022[4]). In the future, the wettest seasons will be winter and spring and the driest summer, the reverse of the current situation (Vahava, 2010[1]). Moreover, droughts and extreme rainfall events are both expected to become more intense and more frequent (Buzási, Pálvölgyi and Esses, 2021[5]). Droughts are already a challenge affecting over one third of the country and causing average damages for EUR 110 million every year. In 2022, droughts resulted in losses of 0.6% of GDP in agriculture (Németh, Kravalik and Séra, 2022[4]; Ministry of Agriculture, 2022[6]). Moreover, close to one quarter of land is exposed to floods (OECD, 2020[7]). Preventive investments in flood infrastructure have already led to adaptation costs of 1.9% of GDP between 2014-2020 (OECD, 2020[7]).

Figure 5.1. Economic costs of climate change

1980-2020, % of 2020 GDP



Source: European Environment Agency; and Maes, et al. (2022), "Monitoring exposure to climate-related hazards: Indicator methodology and key results", OECD Environment Working Papers, No. 201, OECD Publishing, Paris.

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A multi-faceted strategy is needed to reduce carbon emissions, with electrification and decarbonisation as key pillars. Many activities that currently rely on high-carbon fuels will have to be electrified, a process that will also cut local air pollution. This hinges on a decarbonisation of electricity generation itself, based on

the development of renewable and other low-carbon energy sources. Decarbonisation will also call for a reduction in energy demand through improved efficiency, particularly in housing.

Ensuring that energy supply meets demand as the fuel mix fundamentally alters will require substantial investment. Three key elements in any transition path are: higher carbon emission prices to stimulate the use of non-carbon-based energy sources and innovations in production, transport and heating systems; a well-designed set of standards and regulations; and subsidies and complementary polices to enhance the acceptance of mitigation measures (D'arcangelo et al., 2022[8]). Standards and regulations can be particularly effective in restricting and phasing out high-emitting activities or technologies and accelerating the deployment of low-emitting technologies. They can complement emission pricing and incentive-based policies.

Current policies mostly rely on increasing the share of renewable energy sources and ambitious investments in a new nuclear power plant. Moreover, there are policies to encourage home energy efficiency improvements as well as tax advantages that favour electric vehicle use. However, the system of taxes and subsidies has yet to fully align with these objectives and strengthen incentives to meet green transition targets. Subsidies for sectors with high energy use create distortions and impede price signals from redirecting resources towards less emission-intensive activities. This situation also distorts the market on the supply side. Replacing this system with effective and uniform price signals for emissions would assist in reaching environmental goals.

Against this background, this chapter's main messages are:

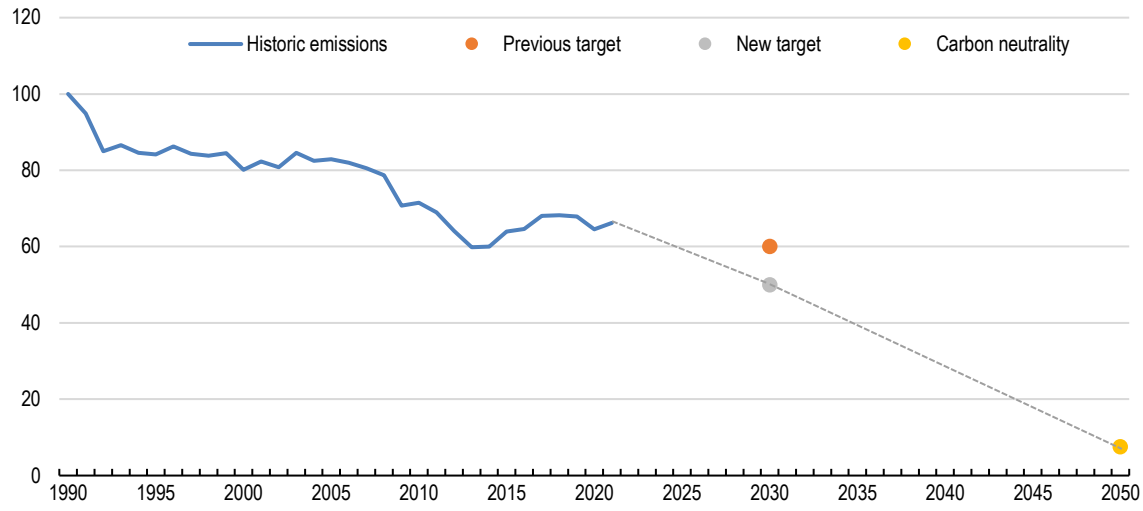
- Future policies will need to address an extensive regulation of gas and electricity prices, which results in retail prices being among the lowest in Europe and contributes to high energy use and emissions in the household sector.
- Accelerating the development of new low-carbon energy sources will be key. Current plans focus on solar energy and biomass but the potential of wind and geothermal energy is underexploited. This development of intermittent energy sources will also require massive investments in the electricity grid.
- An investment in a new nuclear power plant, worth 7% of GDP and with a production capacity corresponding to roughly 50% of the current domestic electricity supply, is subject to risks related to completion delays, cost-overruns and geopolitics.
- Substantial investment in water infrastructure will be needed to facilitate adaptation to changing water availability.

Climate mitigation objectives and progress towards net zero

Hungary's environmental objectives are stipulated in a series of strategies, action plans and legislative measures with the aim of achieving a cut in greenhouse gas (GHG) emissions in line with European Union (EU) targets. Emissions have declined by 32% between 1990 and 2021, from 95 to 64 million tonnes of carbon dioxide equivalent. Based on the latest estimates for 2022, Hungary's GHG emissions decreased by 37% compared to 1990, with per capita GHG emissions (around 6 tonnes) being under the EU average (approximately 7 tonnes). However, much of this reduction occurred in the early 1990s with the structural change of moving from a centrally planned to a market economy. Since then, the pace of emission abatement has fallen by 36% and 85% over the past 20 and 10 years, respectively. The current reliance on regulation and subsidies, but not on price signals, may have been sufficient to reach the previous objective of reducing gross emissions by 40% between 1990 and 2030 (Figure 5.2). However, the National Energy and Climate Plan (NCEP) now aims to reduce gross emissions by 50% by 2030, in line with the EU's new more ambitious 2030 emission reduction targets and net zero emissions by 2050 (Directorate-General for Energy, 2023[9]). Achieving these goals will require a substantial change in the policy mix, and a stronger role for price signals.

Figure 5.2. CO2 emission targets have become more ambitious

Index, 1990 = 100



Note: GHG Greenhouse gases (CO_2, N2O in CO_2 equivalent, CH4 in CO_2 equivalent, HFC in CO_2 equivalent, PFC in CO_2 equivalent, SF6 in CO_2 equivalent, NF3 in CO_2 equivalent).
Source: EU energy statistical pocketbook; and OECD calculations.

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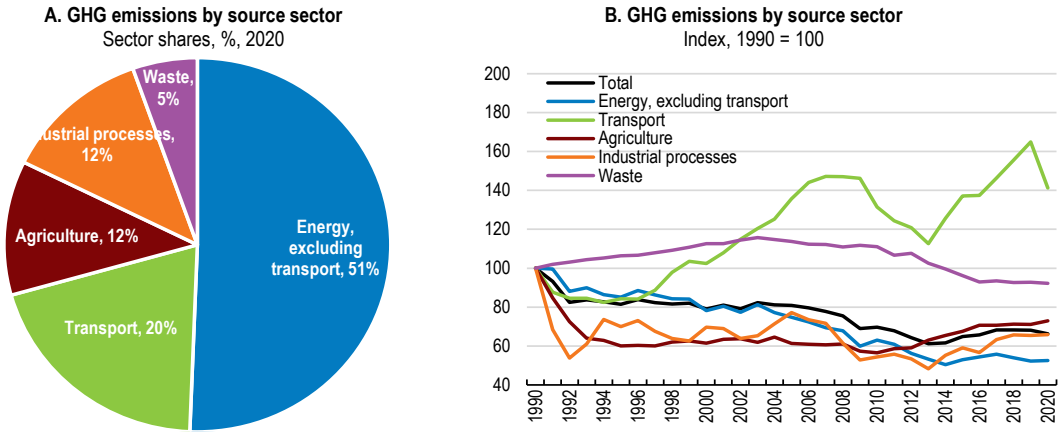
Reaching climate change objectives will be challenging and will involve sizeable infrastructure investments. Construction costs of the new Paks II nuclear plant are estimated at 7% of GDP (International Energy Agency, 2022[10]). Upgrading the electrical grid to facilitate the expansion of renewables may to cost between 1.6% and 5% of GDP. Illustrative estimates of improving the thermal insulation of 10% of the housing stock with new windows and modernised boilers total to 3% of GDP (Csoknyai et al., 2022[11]). Furthermore, climate change is expected to alter rainfall patterns adding further impetus to accelerate overdue investments in water infrastructure, estimated to be at least 6% of GDP. Taken together, the cost of these major green transition projects amounts to up to a fifth of 2022 GDP. While substantial, these investments are needed to avoid potentially large costs arising from inaction on climate change. This highlights the scale of resources needed and the importance of pursuing the most economically efficient policies.

Energy generation and transport are the main sources of emissions

At the national level more than half of GHG emissions come from energy use excluding transport, followed by emissions from transport (20% of total emissions), industrial processes and agriculture (12% of total emissions each) (Figure 5.3, Panel A). The largest driver of energy demand is the household sector. Therefore, it will be crucial to achieve energy savings in this sector, as well as to increase the share of energy produced from low-carbon sources. There are also sectors where emissions have risen over the last decade, including transport, industry and agriculture (Figure 5.3, Panel B).

Figure 5.3. Energy use accounts for half of Hungary's GHG emissions



Note: In Panel A, Energy includes all energy uses except transport. They may be related to households and firms.
Source: Eurostat Greenhouse gas emissions by source sector database; European Environment Agency; European Automobile Manufacturers' Association, Vehicles in Use - Europe 2022; OECD Transport database; and OECD calculations.

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Policies can mitigate the use of high carbon fuels in energy, transport and industry

Emission reductions can be achieved by a policy mix containing three broad sets of instruments: regulations, price-based measures and complementary and framework policies. Carbon prices are typically the most cost-efficient solution, as a single carbon price incentivises economic agents to adopt the emission solutions with the lowest abatement cost first, until marginal abatement costs, which represent the cost of reducing an additional tonne of CO_2 emissions reach carbon prices. Carbon prices can be introduced directly via a carbon tax or indirectly with an Emissions Trading Scheme (ETS). An ETS – as opposed to a tax – is a quantity-based policy that limits or caps the allowed amount of GHG emissions and lets market forces determine the carbon price through emitters trading emissions allowances (D'arcangelo et al., 2022[8]).

The second approach to carbon reduction, regulation and standards, or non-price-based measures, can be also useful to overcome market failures and deal with circumstances where the responsiveness to price signals is weak. Effective regulation and standards can complement carbon prices as they reduce the level of pricing needed to reach emission targets. Indeed, carbon prices that are too high may not be politically feasible to implement. Likewise, carbon pricing may be less effective in influencing long-run household investment decisions, either due to liquidity constraints, risk aversion or because of a present bias. For example, some might not retrofit their homes even when it makes economic sense because savings will be realised far in the future. Well-designed regulations and standards can also help overcome coordination failure and realise network effects, for example, by setting technical standards for electric vehicle charging stations or green hydrogen (D'arcangelo et al., 2022[8]). They can also help to solve problems such as split incentives between homeowners and tenants, which can cause an underinvestment in energy efficiency measures.

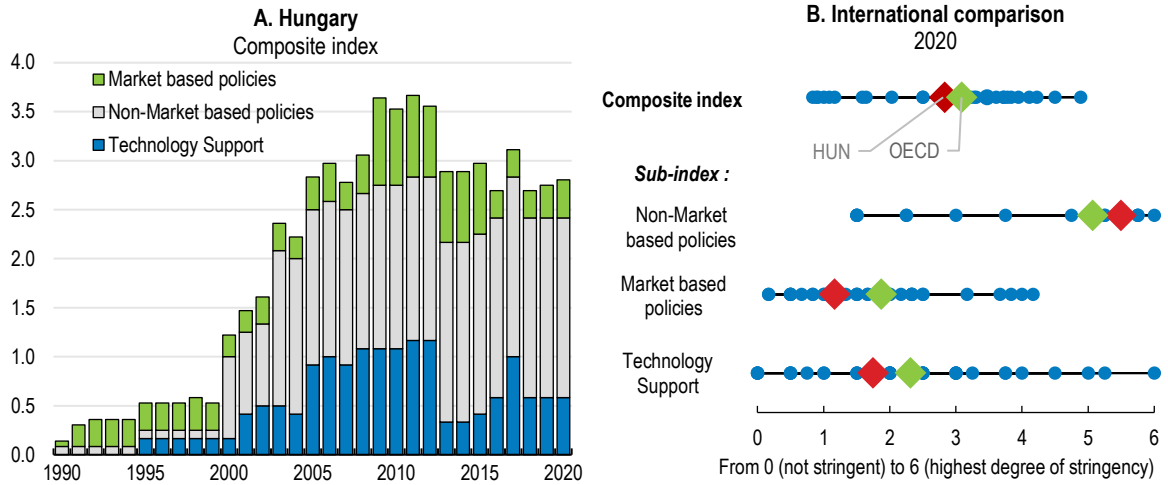
Complementary and framework policies are the third component of a comprehensive policy mix. These include all those policies that do not directly target a reduction in emissions but provide the enabling economic and social conditions to do so, by lowering the economic and social costs of decarbonisation. These fall into two broad categories: 1) policies to improve the cost effectiveness of decarbonisation strategies, including measures to accelerate the development and deployment of new abatement technologies, support business dynamism, upgrade infrastructure networks and crowd-in private capital;

and 2) policies to allay the distributional effects of climate policies and help people in the transition, such as reforms to the tax and benefit system and active labour market programmes.

Hungary is pursuing emission reductions to a large degree through non-market-based measures, such as regulations and standards (Figure 5.4). The OECD Environmental Policy Stringency Index illustrates the rise of climate mitigation efforts in Hungary in the last two decades. While non-market-based policy instruments contributed the most to this increase, in recent years the technology support sub-index shows a significant rise as well. The EU-ETS contributed to the increase in the stringency of market-based policies since 2006. Nonetheless, the scope for higher and more unified carbon pricing remains significant. Given the rebalancing of the policy mix needed, complementary and framework policies can improve the public acceptability of these changes.

Figure 5.4. Non-market based environmental policies dominate

The OECD Environmental Policy Stringency Index, from 0 (not stringent) to 6 (highest degree of stringency)



Note: The Environmental Policy Stringency Index includes climate change and air pollution policies, such as performance standards for NOx, SOx, and PM. OECD is an unweighted average of countries with available data.
Source: 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, https://doi.org/10.1787/90ab82e8-en

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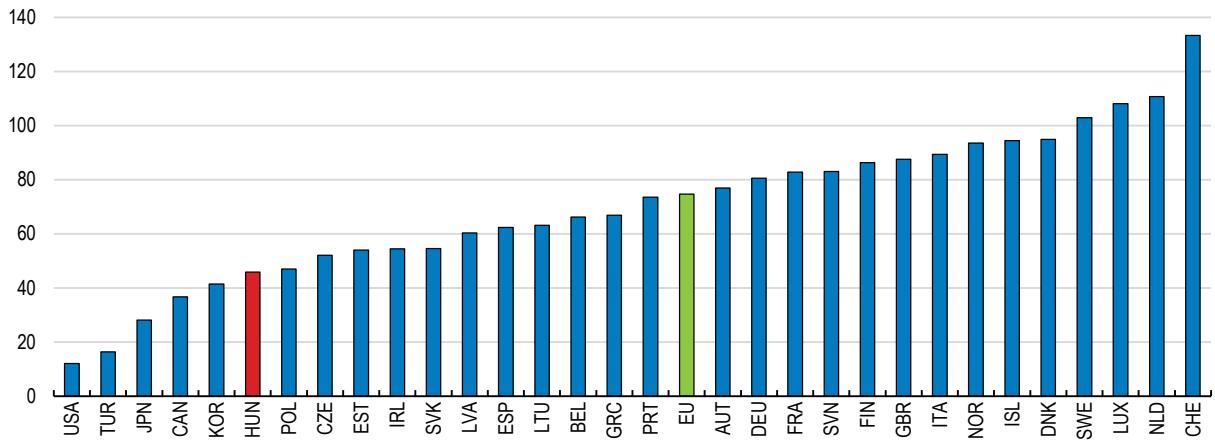
The EU's Emission Trading Scheme is currently the most salient price-based measure applied in Hungary. The cap declines over time, ensuring that the desired emission mitigation target in the EU ETS sectors is achieved cumulatively. However, this currently only applies to energy generation, industry, and aviation (OECD, 2023[12]). Just 32% of Hungarian emissions are covered by the scheme, compared with 40% on average in the European Union. For sectors not covered by the ETS, individual member states are responsible for applying a positive carbon price. These sectors are covered by an EU regulation called "Effort sharing regulation", providing country-specific targets but no specific pricing mechanism to reach these targets. Under this regulation, Hungary has committed to a 18.7% emission reduction by 2030 (European Council, 2023[13]). Non-ETS sectors generate almost 68% of total emissions in Hungary and include some of the largest energy users, transport, housing, agriculture and waste management (IEA, 2022[14]).

There are many reasons why the coverage of the EU-ETS is limited to selected sectors, including practical implementation and political economy aspects. Ideally, economic efficiency would call for additional measures that align carbon prices in non-ETS sectors with those inside the ETS to equalise marginal abatement costs. In Hungary, however, carbon prices for some sectors outside the EU ETS are currently

at or close to zero. As a consequence, average prices across the whole economy are low, below EUR 60 which is a mid-range estimate of carbon costs consistent with a slow decarbonisation scenario, and most likely insufficient to achieve emission targets (Figure 5.5) (OECD, 2021[15]). In the future, many of these sectors will face positive carbon pricing under the soon to be implemented EU ETS 2 (Box 5.1).

Figure 5.5. Net Effective Carbon Rates

All sectors, EUR per tonne of CO2, 2021



Note: The net effective carbon rate consists of emission trading prices, carbon taxes, and fuel excise taxes minus fossil fuel subsidies.
Source: OECD (2022), Pricing Greenhouse Gas Emissions.

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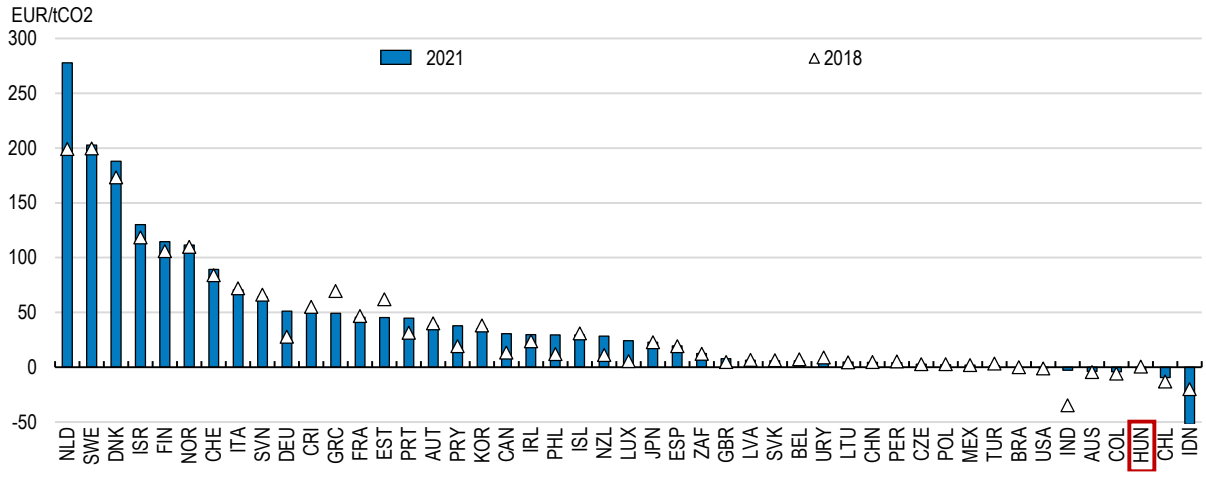
A further issue is that net effective carbon prices related to energy use are lowered by subsidies and exemptions. These include a reduced VAT rate for district heating (almost entirely produced with fossil fuels), an up to 82% refund on excise tax for diesel used in agriculture, a lower tax rate on diesel for commercial hauliers, and a subsidy to public heating suppliers. Large differences in net effective carbon prices across sectors and activities lead to a substantial variation in abatement incentives, increasing the overall cost of emission reductions.

Housing has one of the lowest net effective carbon prices internationally (Figure 5.6). Looking ahead, a higher effective carbon tax on households would encourage improvements in energy efficiency and heating systems towards a wider use of low carbon options (OECD, 2021[15]). Given the long timeline for housing renovations, such policies would take significant time to show effects, which is a strong argument for acting early. This would also ease the transition to the new ETS 2 emission system at the EU level, where emissions from buildings will be covered (European Commission, 2020[16]). In addition to carbon taxation, other non-carbon-based green taxes can be used to combat other polluting activities. These taxes reflect the polluting characteristics of the different products or activities, e.g., on water use, water pollution, waste, certain chemicals and waste landfill (OECD, 2018[17]).

Figure 5.6. Net effective carbon rates for the buildings sector are among the lowest in the OECD



Note: The net effective carbon rate consists of emission trading prices, carbon taxes, and fuel excise taxes minus fossil fuel subsidies.
Source: OECD (2022), Pricing Greenhouse Gas Emissions: Turning Climate Targets into Climate Action, OECD Series on Carbon Pricing and Energy Taxation, OECD Publishing, Paris.

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Box 5.1. Fit for 55: reform of the EU emissions trading system

The ETS is the cornerstone of the EU's climate mitigation policy as it determines a market-based carbon price. The 'Fit for 55 package' is a set of proposals, including a reform of the EU ETS, to revise the EU's climate-related legislation in order to achieve the 55% emissions reduction target by 2030 (against a previous target of 40%), and net zero emissions by 2050 (European Council, 2023[3]).

As well as an enhanced emissions target, the package aims to raise the coverage of the ETS to other sectors, and increase the share of renewables in electricity supply to 40%. There will be a gradual phase-out of free emission allowances from the EU ETS until 2027. The phase-out will be accompanied by a phase-in of a border carbon adjustment mechanism (CBAM) to address the risk of carbon leakage. A new and separate ETS 2 will cover sectors such as buildings, road transport, and additional sectors (mainly small business) which are exempt from the ETS. This will expand carbon pricing to all major sectors aside from agriculture and land-use.

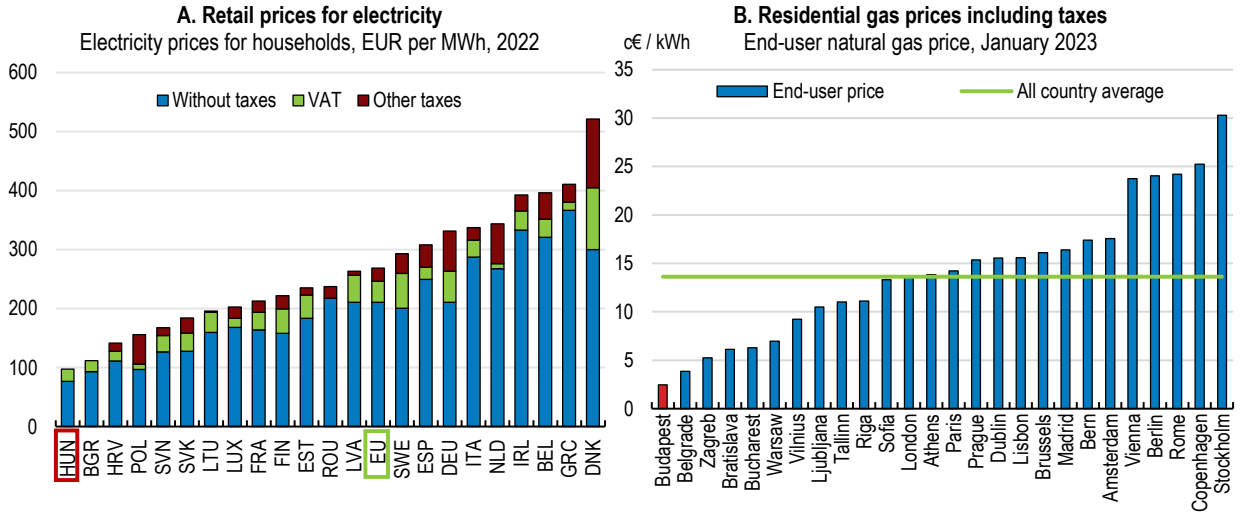
Source: (International Carbon Action Partnership, 2023[18]; European Council, 2023[19])

Residential energy prices in Hungary are among the lowest in Europe

Residential gas and electricity prices in Hungary are among the lowest in Europe, pushing up energy demand (Figure 5.7). Since 2010, the government has set maximum retail prices for electricity and natural gas for almost all consumers under the so-called Universal Service Scheme (USC) (Szőke, Hortay and Farkas, 2021[20]). This has implications for the government budget through large contingent liabilities. Furthermore, in 2013–2014 prices for natural gas and electricity were reduced by 25% for households and by 27% for district heating (Weiner and Szép, 2022[21]). These prices have remained unchanged since. The USC has helped to achieve an impressive reduction in poverty. The share of those unable to keep their homes sufficiently warm and those in arrears on their utility bills have both have fallen by over 10 percentage points since the scheme commenced (Streimikiene, 2022[22]). However, low prices have also led households' use of energy for heating to be among the highest in Europe (Figure 5.8). This high energy

use reflects poor insulation as well as a significant share of buildings being unnecessarily overheated, by around 1-3°C (Csoknyai et al., 2022[11]).

Figure 5.7. Price caps for electricity and gas generate Europe's lowest energy prices



Note: Electricity prices for household consumers in the consumption bands 2.5 MWh-5 MWh (band DC).
Source: Eurostat Electricity prices components for household consumers database.

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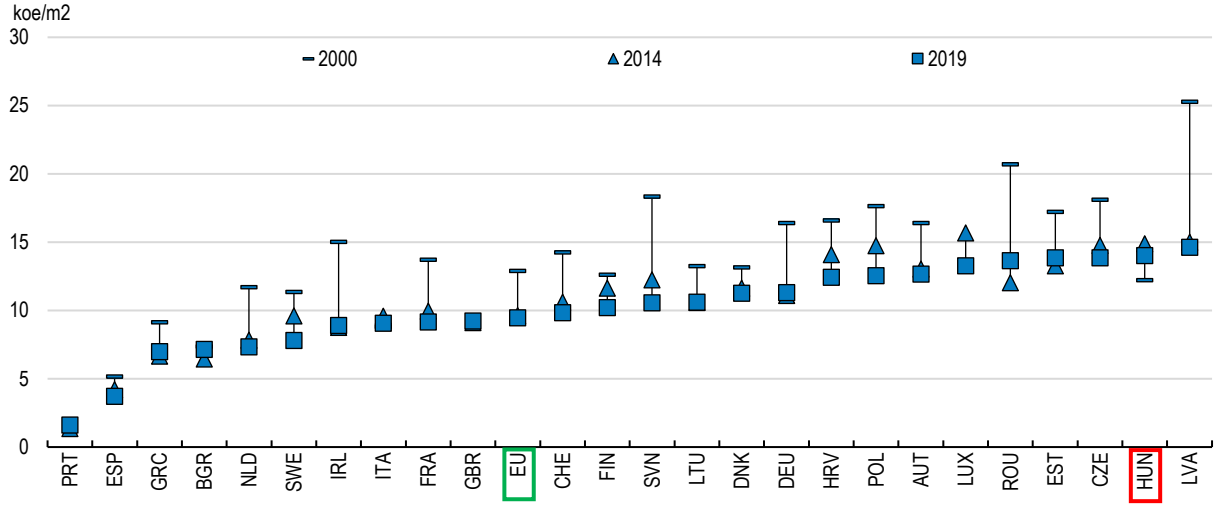
Figure 5.8. Households energy consumption is comparatively high

Energy consumption of households for heating, climate corrected, in kilograms of oil equivalent (koe) per square metre (m²)



Note: Energy efficiency indicators are climate corrected so that their variation from one year to the other is independent of climatic influences.
Source: Odyssee-Mure (https://www.odyssee-mure.eu/). Database on energy efficiency indicators and energy consumption by end-use.

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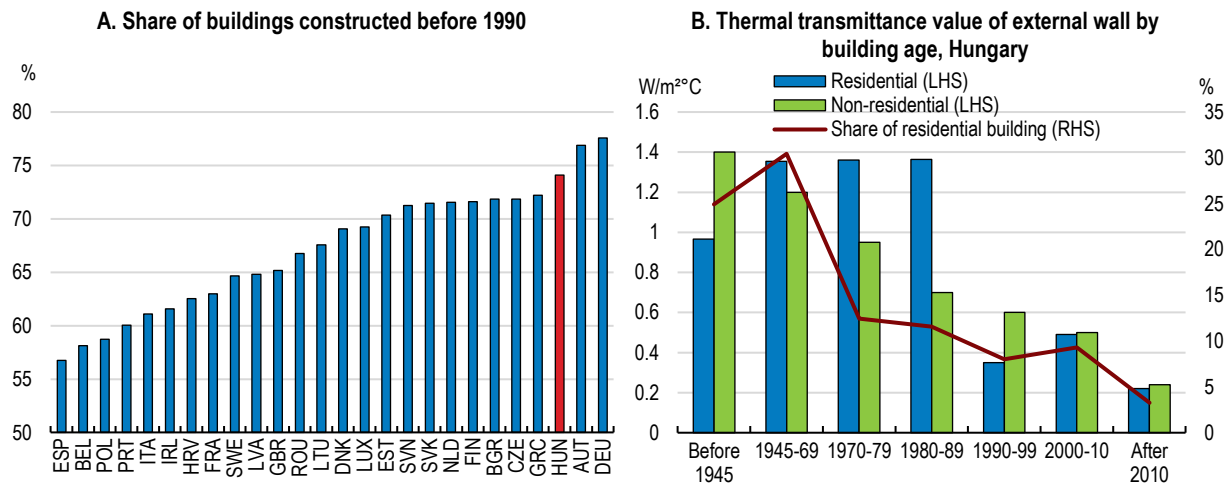
Energy price caps have created a large fiscal burden. In 2019, 99.6% of electricity provided to household consumers and small businesses was delivered through a regulated price universal service contract

(International Energy Agency, 2022[10]). Energy suppliers must pay for the difference between the wholesale costs and the regulated prices. To cover the resulting losses and maintain service provision, the government pays full compensation to suppliers. The fiscal cost of maintaining low energy prices for households and small businesses has amounted to an average of 2% of GDP per year over 2022-2023.

Moreover, evidence points to regressive distribution effects of the energy price caps, given that richer households reap most of the financial benefits. This is in part due to the comparatively high reliance of poorer households on coal and wood for heating which are not covered by the cap (Weiner and Szép, 2022[21]). In addition, the fiscal cost of price regulation dwarfs spending on social assistance programmes specifically targeting fuel poverty. The Social Fuel Programme aims to assist small settlements with household heating. The budget for the programme in 2020 was HUF 3 billion as opposed to a medium-term average of over HUF 230 billion per year for the general price control (Weiner and Szép, 2022[21]). A better approach would be to clearly target and means test social assistance programs. Reaching social objectives through uniform price controls has a high fiscal burden and is inefficient.

Price regulation is also slowing down the energy transition by weakening incentives for households to reduce energy consumption and invest in energy-efficiency upgrades of their housing. The Hungarian housing stock is one of the oldest in Europe and despite a range of renovation programmes, continues to have a poor level of energy efficiency (Box 5.2). This reflects the large share of housing built prior to 1990 during the communist period, when public construction programmes often delivered poorly insulated low-quality housing (Figure 5.9). Compared to neighbouring countries with a similar legacy, however, little progress has been made in upgrading thermal efficiency (Figure 5.10, Panel A) (Tamás et al., 2014[23]; Weiner and Szép, 2022[21]). Currently, approximately 65% of the housing stock is considered obsolete from an energy efficiency perspective (Ritter, 2022[24]).

Figure 5.9. There is a large stock of old and poorly insulated houses



Note: In Panel B, data for thermal transmittance value are for 2017, and data for the share of residential building by period are for 2014. Thermal transmittance is the rate of transfer of heat through matter. The lower the thermal transmittance coefficient, the better the insulation performance of the surface, e.g. door or window.
Source: OECD Affordable Housing Database; and EU Buildings Database.

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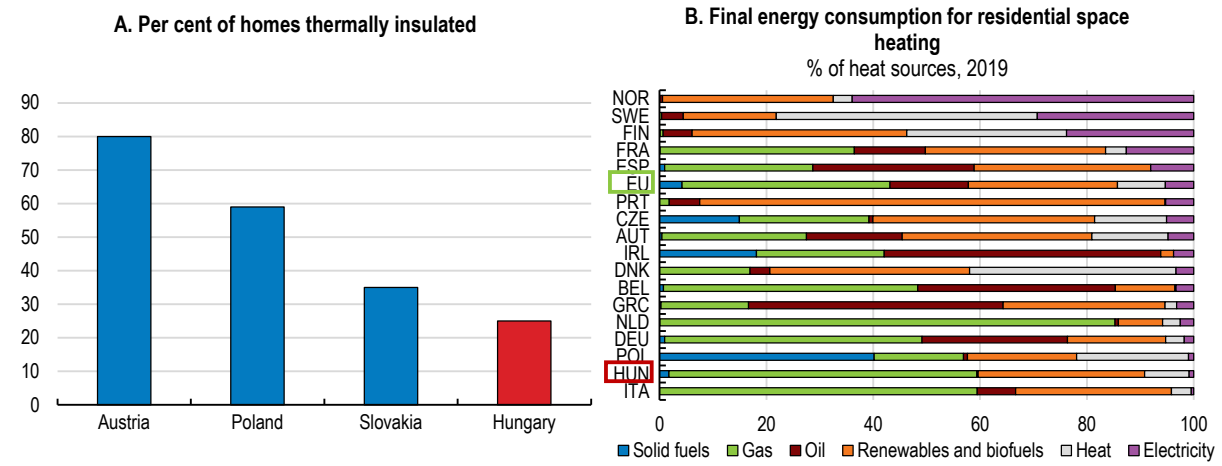
Figure 5.10. Housing insulation lags neighbouring countries and electrification is minimal



Source: REEK; Eurostat; and OECD calculations.

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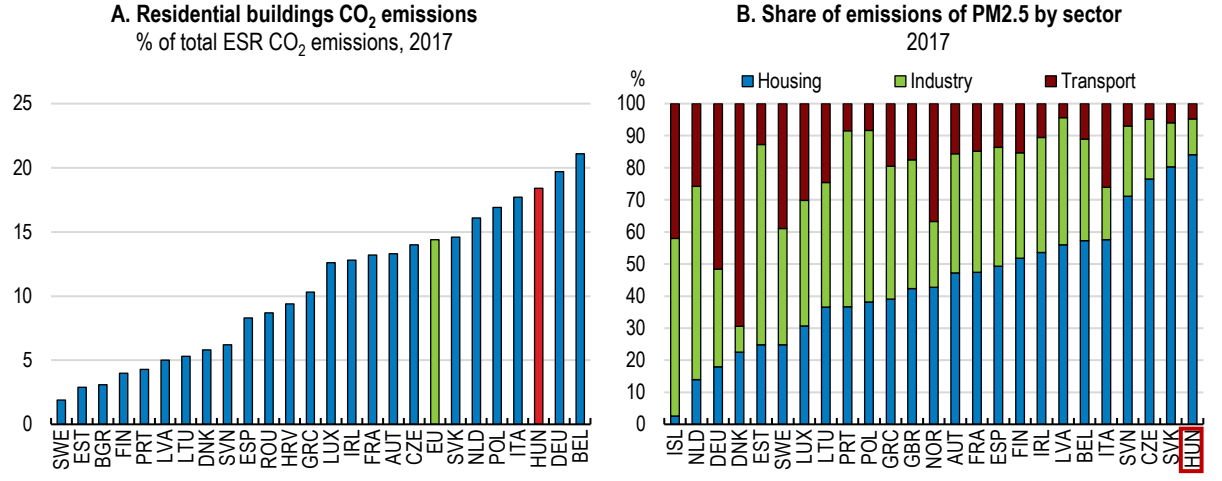
Outdated heating systems contribute to local air pollution

Low-emission intensive heating systems like electric heating are hardly used. In fact their penetration rate is among the lowest in Europe (Figure 5.10, Panel B) (Csoknyai et al., 2022[11]). By contrast, Hungarian households stand out for their high emissions both in terms of CO_2 and fine particles, and most of this is related to the heating of dwellings (Figure 5.1). Natural gas is the dominant heating method and appliances are generally old, with most exceeding 20 years. Older gas heating systems are usually less efficient. A modern gas boiler can achieve efficiency of 86%, up to 50% more than older models (Frédéric, 2015[25]). Besides gas heating, many households continue to use coal and wood for heating and cooking purposes and an estimated one third of household waste is illegally burned for heating purposes (OECD, 2021[26]).

Figure 5.11. Residential buildings contribute disproportionately to emissions and pollution



Note: The Effort Sharing Regulation (ESR) sets national targets for emission reductions from road transport, heating of buildings, agriculture, small industrial installations and waste management. These sectors were previously not included in EU Emissions Trading System (EU ETS).
Source: European Commission (2021), Possible extension of the EU Emissions Trading System (ETS) to cover emissions from the use of fossil fuels in particular in the road transport and the buildings sector, Luxembourg: Publications Office of the European Union; and OECD (2021), Brick by Brick: Building Better Housing Policies, OECD Publishing, Paris.

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Rebalancing incentives towards more efficient home heating systems could be achieved through a rise in energy prices in line with their carbon content and pollution impact. Switching from gas boilers to electric heat pumps for space heating would reduce CO_2 emissions by at least 20%, even when running on emissions-intensive electricity, and up to 80% with cleaner electricity (IEA, 2022[27]). However, heat pump technology may not be technically feasible in all buildings or too costly for some households. A major limiting factor in the adoption of heat pumps is poor home insulation, making it economically unviable relative to other sources (Manners, Yang and White, 2022[28]; Kelly, Fu and Clinch, 2016[29]). For households that cannot improve their insulation, and remain on gas, the replacement of inefficient and high-emission heating systems would be a first step and could be accelerated with subsidies. Furthermore, a ban on the most inefficient and polluting systems along with fines for local air pollution would cut emissions and improve air quality.

Higher energy prices would align private sector incentives with emission mitigation goals

The government has introduced a wide range of programmes aimed at encouraging households to make energy efficiency improvements, however these are undermined by low energy prices (Box 5.2). The budget of these programmes is dwarfed by the size of the price subsidies. Under the IEA's net-zero emissions by 2050 scenario, deep energy retrofits can cut household heating needs by as much as half (IEA, 2020[30]). While this may be an ambitious target, one illustrative example is that a renovation of 10% of the Hungarian housing stock could save as much energy as 20% of the overall current domestic electricity supply. Insulation is also an essential first step before decarbonising through electrification can begin. The current target is to reach 90% of nearly zero-energy buildings by 2050 (Ministry of Innovation and Technology, 2020[31]). However, the number of nearly zero-energy building has almost stagnated recently, with a minor increase from 0.3% of the stock in 2020 to 0.4% in 2021 which is far from the pace needed to reach the 2050 target.

Box 5.2. Housing renovation policies

Social and family policies with an energy efficiency component

Family Housing Support Programme: The programme provides preferential loans and grants for families with children, supporting homeownership and modernisation of dwellings. The budgetary cost between 2019-2022 was approximately 1.1% of GDP. From 2024, the Family Housing Support Programme Plus will replace the Family Housing Support Programme. Within the framework of the Programme, married couples can take out a fixed 3 percent loan of a maximum amount of HUF 50 million when they have a child.

Home Renovation Support: This targeted renovation programme, run between January 2021 and March 2023, supported the renovation of 370,000 family homes. Eligible measures included both energy efficiency and renewable energy investments. The programme cost approximately 1.6% of GDP.

Warm Homes Programme: Launched in 2014, the aim of the programme is to provide non-refundable grants to improve the energy efficiency of houses and assist the development of renewable energy. It has funded the modernisation of 210,000 family dwellings. The total budget amounted to HUF 40.3 billion of which HUF 35.6 billion, or 10 subprogrammes, were financed from the Green Economy Financing Mechanism (from the sale of CO_2 allowances).

Prenatal Baby Loan: Although not primarily aimed at the housing sector, under this scheme families expecting or raising children are eligible for a free-purpose HUF 10 million loan with zero interest. In the case of a family of three or more children, the loan is converted to a grant. Families can combine the funds with other targeted programmes for house purchase and renovations. Between 2019-2022, the cost was approximately 0.6% of GDP.

Green Bond Framework Programme: Proceeds from the Green Bond issuance are focused on increasing energy efficiency in the housing sector, as part of the Climate and Nature Protection Action Plan. Between 2017-2020, proceeds were used, in part, to replace household appliances to decrease electricity consumption.

The government has taken steps to address energy price regulation by easing price controls in 2022, in reaction to the energy price surge. The reduced utility price remains in place for the average residential consumer, as defined by consumption of 1729 cubic meters of gas per year. Any excess is exposed to a significantly higher price, 7-9 times the regulated price (Csoknyai et al., 2022[11]). Furthermore, non-residential customers, such as municipalities, are now excluded from the scheme. Electricity was subject to a similar abrupt change in scheme. These changes led to a surge in demand for insulation, wood burning fuel heating systems, heat pumps, solar panels and firewood. Demand for wood stoves and solar panels increased tenfold while that for heat pumps increased sixfold (Csoknyai et al., 2022[11]). Hungary could build on these positive developments over the medium-term with a progressive easing of the price control system through further lowering the allowance, more income related targeting and setting expectations towards a sizable reduction in its scope over time. This would further incentivise insulation and energy efficiency investments.

Some of the resources currently spent on price subsidies could be allocated to upgrade the housing stock of financially constrained households. This can improve public acceptance of a reduction in energy price supports as part of a policy package. The payoff from investments in energy efficiency improvements may take a long time to materialise fully, which can be a challenge for financially constrained low-income households and limit their capacity to provide co-financing. Many specific housing renovation programmes are currently operated on a co-financing basis, which may also explain why they often do not reach low-

income households (Gróf, Janky and Bethlendi, 2022[32]). Easing or eliminating co-financing requirements of renovation programmes for low-income households may enhance take-up.

Public support programmes could become more effective by prioritising investments in retrofitting the least energy-efficient housing units and focusing on the households most in need. Adjusting subsidies to the actual energy efficiency gains may improve the value for money of these programmes, in combination with an income ceiling for household eligibility and an overall cap on the support amount. For multi-family buildings, the effectiveness of insulation programmes can be limited by a split incentive problem where owners of apartments and individual tenants have different incentives to improve energy efficiency (Csoknyai et al., 2016[33]). Rethinking the current voting majority requirements by reducing the quorum for building improvements could help to mitigate this problem (OECD, 2023[34]).

Looking ahead, the further development of renewable energy sources will lead to more intermittent electricity supply throughout the day. The challenges resulting from intermittence may be mitigated by shifting consumption patterns in line with hours of peak supply. This would require a dynamic pricing strategy with retail electricity prices that fluctuate within the day. The planned roll-out of smart meters will be key to inform users about their electricity consumption and their most energy-intensive appliances, and to improve the alignment of electricity demand with supply.

Energy certification can improve incentives to insulate buildings

Energy certificates provide a simple and standard measure of building efficiency for buyers and renters. This can change the market value of a building, adding a 20% premium to the price of an average family home with good insulation, as the operating cost is influenced by its energy performance (Ertl et al., 2021[35]). Tenants and property owners do not necessarily know how poorly insulated their homes are, as energy certificates are only mandatory when renting or selling a property. Certificate coverage was less than a third of residential buildings in 2022. A new regulation, operational from November 2023, is a step in the right direction. It will see energy performance certificates apply to all newly constructed, sold and rented buildings with sanctions for non-compliance. There will also be a requirement for energy certification when public subsidies are granted for housing renovations. Looking forward these initiatives should be expanded more generally to cover all dwellings. This would close an information gap on the energy cost of properties allowing price signals to work more effectively and providing additional incentives for renovation. Wider certification would also provide a better and real-time overview of the state of dwellings for the government. This would allow monitoring progress on housing renovations and assessing the efficiency of the different support programmes.

Electricity demand from industry will increase strongly

The Hungarian economy has a modern and globally competitive manufacturing sector and is taking a leading role in the electric car industry in Europe, which will be vital for the green transition. However, the energy for industrial production is mostly based on fossil fuels, accounting for half of total coal consumption in 2020 (IEA, 2022[14]). Many industries have limited scope for electrification without adding considerably to operating costs. For aluminium smelters, an energy-intensive activity, the respective cost increase would be on the order of a quarter to a third. Reducing GHG emissions from heavy industry will therefore likely involve a mix of both cleaner production methods and a reallocation of resources towards cleaner sectors.

Emission-intensive heavy industry sectors have received substantial government support in the past. Subsidies and tax expenditures should be carefully evaluated and better targeted. This type of direct support for high-emission industries tends to lock in operations with high emissions, thus placing a higher reduction burden on other parts of the economy. An efficient distribution of emission reductions across sectors would instead call for all economic agents facing the same incentives under a polluter pays principle with uniform emission pricing. Increasing carbon prices over time in a predictable way, as has occurred in the Netherlands, could ease the transition. This would allow more time for industries to adjust

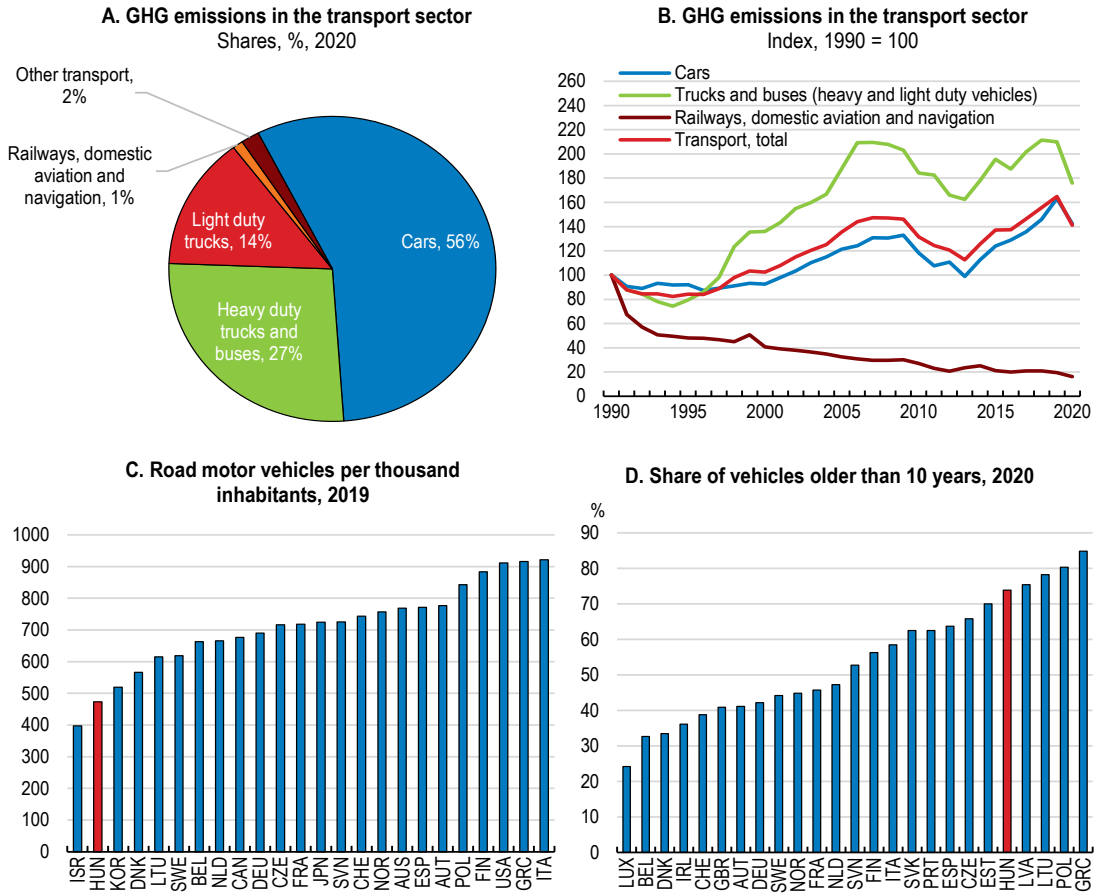
and for the development and adoption of promising but seldom used technologies like carbon capture (OECD, 2015[36]; Winkelman, Muller and Bontenbal, 2021[37]; Budinis, Fajardy and Greenfield, 2023[38]). Remaining firm support should be well targeted and incentivise emission reductions, for example by supporting the development of green technologies.

Hydrogen produced through electrolysis using electricity produced from renewables (green hydrogen) can play an important role in reducing greenhouse gas emissions from industries. It has the potential to replace fossil fuels in high-temperature industrial processes of hard-to-abate sectors such as steel production, in road freight traffic, and to store energy produced from intermittent sources. In most net-zero emission scenarios, green hydrogen plays a pivotal role, although the production of green hydrogen is still about three times more expensive than hydrogen made from natural gas (OECD, 2023[39]).

Reducing emissions from the transport sector

Emissions from the transport sector have increased since 1990 (Figure 5.12, Panel A and B). This is largely related to an increase in car ownership along with rising income levels, which has expanded access to flexible transportation and enhanced commuting options which in turn have increases labour market flexibility. As the car ownership rate is still low (Figure 5.12, Panel C), this trend is expected to continue. Nevertheless, Hungary has one of the highest shares of old cars in Europe, with an average age of 14 years (Figure 5.12, Panel D) (ACEA, 2022[40]). This reflects extensive purchases of imported used cars which are typically more polluting, with higher fuel consumption and fine particle emissions per kilometre than modern cars (Apte et al., 2017[41]). This issue is compounded by the fact that the average distance travelled by car in Hungary (17,000 km) is significantly higher than the Western European average (11,430 km) (ACEA, 2022[40]). Limiting emissions from the transportation sector will necessitate policies to encourage the renewal of the car stock, deter the use of cars when there is a public transportation alternative, improve the quality of public transportation, and limit urban sprawl.

Figure 5.12. Cars are the main source of emissions in the transport sector



Source: Eurostat Greenhouse gas emissions by source sector database; European Environment Agency; European Automobile Manufacturers' Association, Vehicles in Use - Europe 2022; OECD Transport database; and OECD calculations.

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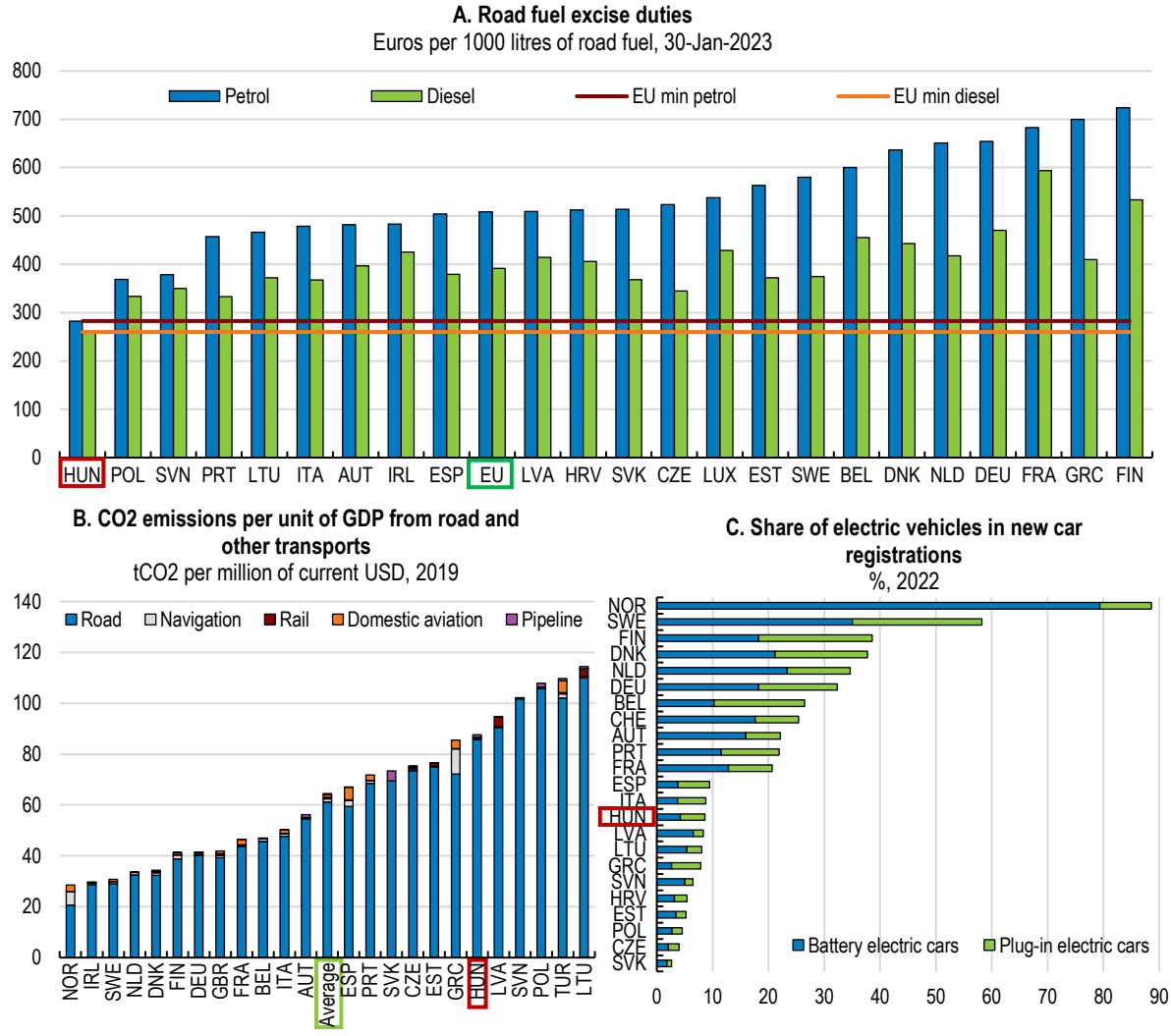
Tax incentives to reduce emissions in passenger transport are weak

Hungary has one of the lowest rates of excise duty on petrol and diesel in Europe. (Figure 5.13, Panel A). This contributes to high usage and one of the highest rates of emissions from transportation in Europe (Figure 5.13, Panel B). Raising fuel taxes would be a crucial step to reduce transport emissions. Beyond a general increase, there is also a case for raising the taxation of diesel fuel above that of gasoline to reflect diesel's higher carbon content and particulate matter emissions (ICCT, 2019[42]; Nieuwenhuis, 2017[43]). A high emission price on motor fuel has been important in the policy mix in other countries' successful emission reductions (D'Arcangelo et al., 2022). To improve acceptability, the revenue raised from increased fuel duties could be recycled to enhance existing subsidies for electrical vehicle use. Subsidies can encourage the scrapping of old and dirty cars when replaced by EVs, such as the "Prime à la Conversion" in France.

Figure 5.13. Transport emissions are high even though car ownership is low



Note: Panel B: Emissions from international transport and navigation excluded. Pipeline refers to long-distance transport of liquids or gas through a system of pipes. Average shown for countries included in the figure.
Source: OECD Transport database; European Commission taxes in Europe database; and European Commission and European Alternative Fuel Observatory (EAFO).

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Both regulation and taxation have a role to play to encourage the renewal of the car stock towards low-emission vehicles. Raising minimum standards for emissions as part of the mandatory inspections of cars would be a first step to speed up the renewal of the fleet and cut local pollution (Furu et al., 2022[44]). Moreover, linking *ad valorem* vehicle taxes to the environmental performance of cars would increase incentives for households to purchase electric or low-emission vehicles. A sizable share of cars enter the Hungarian market as company cars provided to households as benefits in kind. This implicit subsidy encourages car ownership and use. Removing the favourable tax treatment of company cars would eliminate a distortion in remuneration choices that favours in-kind pay. This benefit should be reviewed so that in-kind benefits are taxed at the same level as wage income, which would eliminate the current incentive towards private car use.

An electronic toll system is in place for motorways and main roads where vehicles are subject to a time-based toll with vignettes valid for a week, a month or a year (13 months). However, time-based toll systems

are weakly linked to distance travelled and emissions. Introducing distance-based tolls for smaller vehicles, as is done for heavy goods vehicles exceeding 3.5 tonnes, and linking them to the environmental performance of vehicles would better account for the full environmental cost of road transportation (OECD, 2021[45]). Digital technologies can substantially reduce the cost of implementing distance-based tolls.

Developing the adequate charging infrastructure is key for electric vehicles

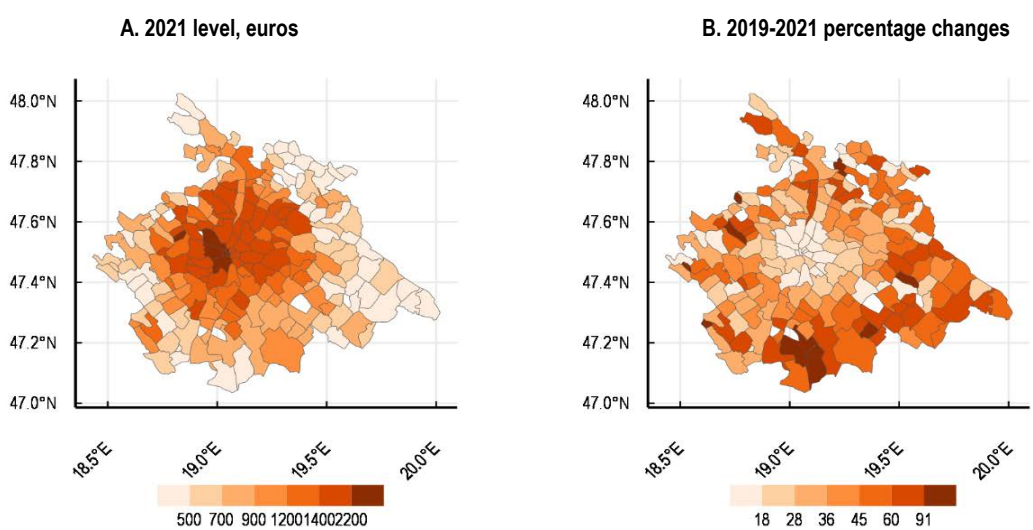
Despite a range of incentives, the uptake of electric vehicles remains low, accounting for less than 0.5% of all passenger vehicles in the stock and around 2% of newly registered vehicles (Figure 5.13, Panel C). Electric vehicles are supported by a zero tax rate and direct subsidies of up to HUF 1 million – similar to measures in many other European countries (European Automobile Manufactures Association, 2020[46]). Subsidies could be increased with revenues from higher fuel taxes. Furthermore, subsidies on more luxurious EVs can be capped so as to make incentives more progressive (D'arcangelo et al., 2022[8]).

Hungary has more charging stations than other east European countries, but much less than Western European countries. The density of charging stations in some Western European countries is 50 times higher than in Hungary (Electromaps, 2023[47]). Moreover, the stations tend to be clustered around larger cities and major traffic corridors, leaving smaller towns and remote areas relatively underserved. Looking ahead, increasing the use of electric vehicles could be supported by a better developed network of charging stations.

Urban sprawl is contributing to increased emissions from transportation

On the back of strong economic growth, the area around Budapest has seen a rapid expansion in suburbanisation, leading to increased emissions from transportation. Despite a population decline nationally, over the past 20 years the region surrounding Budapest has grown by over 20%, with an accompanying 17% increase in greenhouse gas emissions. Budapest itself accounts for over a quarter of all emissions (European Union, 2021[48]). This development has brought increased congestion with the estimated carbon footprint per journey increasing by 32%. Budapest is now in the top 8% of the most congested cities in Europe (Kovács et al., 2019[49]; TomTom, 2023[50]). The spatially dispersed development pattern is reflected in recent house price changes (Figure 5.14).

Figure 5.14. Average house price per square meter by postcode, Budapest



Source: Cournède, B. & Ziemann, V. (2023). Brick by Brick: Better Housing Policies – Volume II. OECD Publishing, Paris.

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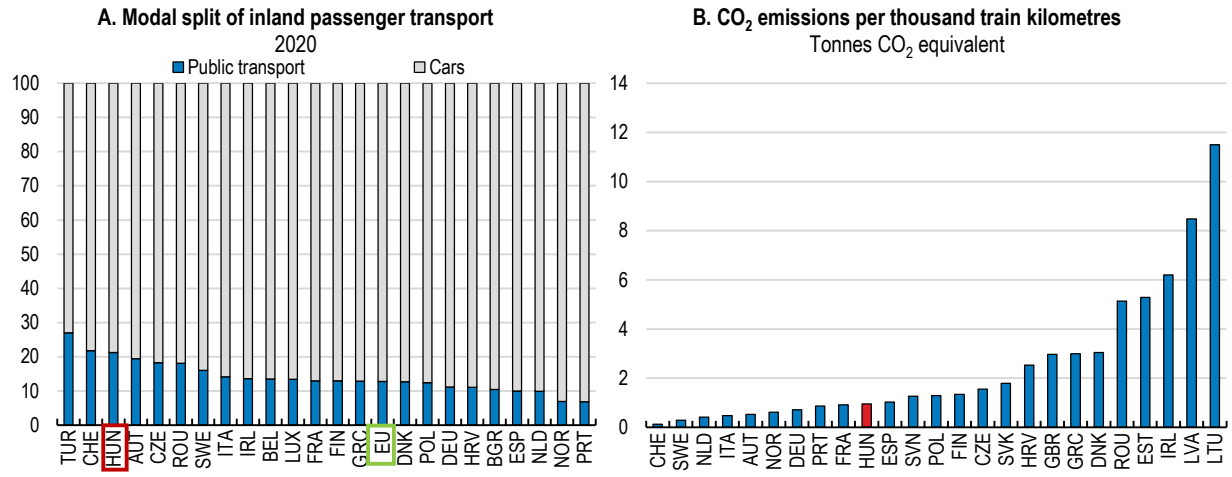
Land use policy has contributed to urban sprawl. In reaction to a regulation change in 2005, aimed at tightening planning rules, municipalities moved to rezone vast swathes of land from agricultural to residential. This has left Budapest with 250 km² vacant land available for future development, approximately the same amount of land that was consumed between 1990 and 2012 (Kovács et al., 2019[49]).

Policy should focus on discouraging further urban sprawl by strengthening the system of congestion charges and giving lower charges to higher-occupancy vehicles. This could be combined with time-based fees for parking places and a distance-based road toll system. This would help to raise the cost of car commuting relative to public transportation. A tightening of land use regulation would also help to prevent further urban sprawl. Dense developments facilitate low-carbon lifestyles and create a critical mass for public transportation. Carbon pricing, excise duty, parking fees and congestion charges would increase the cost of commuting and rebalance incentives towards the city centre. This should be combined with land use management that facilitates access to local services (ITF, 2023[51]). An extension of metro lines would allow more of the growing population to access this system (OECD, 2021[26]). Brownfield sites could be further developed to facilitate densification close to existing public transportation infrastructure. As in many eastern European countries, due to a legacy of state-run industry, Budapest has a large number of brownfield sites, estimated at 68 km², or 13% of the metropolitan territory (Perić, 2016[52]). Furthermore, dense urban development patterns can provide the economies of scale required for economically viable district heating projects and utility services (OECD, 2020[7]; ITF, 2021[53]).

Further measures to reduce inner-city transport emissions include strengthening public transportation with a focus on improving efficiency and availability. Hungary has a high share of public transport users (Figure 5.15, Panel A). Rail travel has low GHG emissions, given that three quarters of journeys are electric (Figure 5.15, Panel B). Developing “Park and Ride” facilities would allow the growing population in the regions outside of Budapest to utilise the existing public transportation network. To encourage use, more emphasis could be placed on raising rail punctuality of currently 90%, including by upgrading the ageing rolling stock (MÁV-START Zrt., 2023[54]). Despite this growth, there is a lack of resources to improve transportation, e.g. the Budapest Mobility Plan and the Sustainable Urban Mobility Plan (SUMP) are underfunded. This can perpetuate car dependence and high-carbon commuting patterns. The Green Bus Programme can lead to lower emissions from local public buses and cut air pollution in urban areas. Most of the approximately 2,900 buses in towns and cities with more than 25,000 inhabitants are outdated. The subsidy covers 80% of the purchase of vehicles and 60% of the development of the necessary charging infrastructure. As of 2023, 139 electric busses have been acquired at a cost of HUF 20 billion. Along with improving bus and rail services, integrated ticketing systems and better interconnections between various modes of public transportation would encourage greater use. In addition, soft transport modes, such as cycling and walking, could be encouraged by developing the associated infrastructures (ITF, 2021[53]). Infrastructure improvements can also help to reduce the relatively high number of fatalities in cycling, the 3rd highest in Europe over the period 2016-2018 (European Commission, 2020[55]).

Figure 5.15. Public transport use is high and railway emissions are low



Source: OECD International Transport Forum Statistics; World Bank; Eurostat; EU transport in figures 2022; and OECD calculations.

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Hungary has one of the lowest rates of teleworking in the European Union both overall and within occupation categories (Milasi, González-Vázquez and Fernández-Macías, 2020[56]). Adaptation of digital technologies in smaller firms lags behind other countries and mobile internet prices are high (see Chapter 3 this survey). Through addressing deficiencies in the digital infrastructure, teleworking can be further expanded as a means to reduce car use and commuting pressures (see Chapter 2 of this survey and also OECD, 2020[53]).

Agriculture and waste management contribute to emissions and pollution

More intensive production in agriculture has increased emissions and water pollution

Emissions from agriculture (excluding LULUCF) account for 12% of greenhouse gas emissions (Figure 5.3). An intensification of agricultural production and destruction of wetlands has increased emissions. The main source of GHG emissions in agricultural production in Hungary is nitrous oxide, the share of emissions from this source is among the highest in Europe. Nitrous oxide emissions arise from intensive fertiliser use in crop production (Godlinski et al., 2010[57]). Some types of fertilisers contribute to emissions due to their nitrogen content as well as their release of carbon. Such emissions have tripled since 2005 (MIT, 2020[58]). Furthermore, recent studies indicate that ammonia emissions from agriculture contribute about half of the concentration of urban fine particle pollution (OECD, 2018[17]). Adequate taxation of the use of fertilisers can lead farmers to internalise these negative external effects and discourage their use (Henderson et al., 2021[59]). Proposals to encourage more use of organic fertilisers and discourage the excessive use of fertilisers by keeping less fertile land in its natural state, should be developed and implemented. However, many agricultural incentives are currently defined by the EU's Common Agricultural Policy (CAP), thus limiting the scope of policy action of national governments.

One area where the government can take action is on the destruction of wetlands, which is releasing 5.2 $MtCO_2$/year due to drainage, more than absolute emissions from drainage in France, despite a six times smaller territory (FAO, 2023[60]). Pricing carbon emissions from land-use change and forestry may offer one way to reduce them. For example, such emissions are included in the New Zealand Emission Trading Scheme (NZ-ETS) (OECD, 2023[61]). Landowners are thereby liable for reductions in carbon stored and credited for carbon uptake. A similar scheme could alleviate pressure on wetlands by adding a cost to destruction and an incentive for preservation.

In addition to capturing CO_2, Hungary's wetlands are among the most important habitats in Europe for birds, particularly migratory species. Despite representing only 3% of the EU territory, Hungary harbours 17% of the priority species in the EU Habitats Directive (OECD, 2018[17]). Nonetheless wetlands can be exposed to pressure from the intensification of irrigation, the expansion of land used for biomass as well as from altered rainfall patterns as a result of climate change. One way to counterbalance the agricultural use of these areas would be to promote ecotourism, as this would create an economic incentive to protect Hungary's habitats. Vast grasslands, caves, rivers and wetlands with an abundance of biodiversity give Hungary an opportunity to developing ecotourism where the natural setting is the primary attraction (Hungarian Tourist Agency, 2017[62]). The government's Tourism 2.0 strategy identifies biodiversity conservation as one of the pillars of sustainability in tourism. Strong natural capital and active tourism can also promote active lifestyles (Active and Ecotourism Development Center, 2022[63]). Ecotourism can be supported by promoting the integration of tourism into the wider economy, including with primary industries such as agriculture and forestry at the destination level.

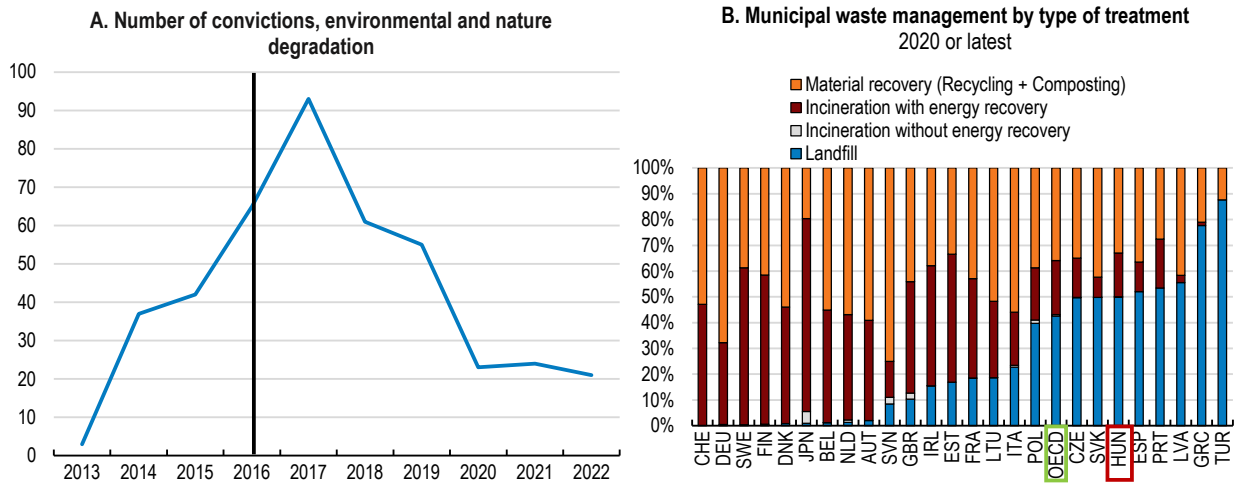
Agriculture also contributes to water demand and pollution, further straining water management systems. This will likely be exacerbated by climate change. The most significant pressure on water resources in Hungary is agriculture, with 41% of water sources affected by physical alteration (OECD, 2019[64]). In addition to increasing emissions, the intensive use of nitrogen fertilisers in Hungary is an important source of groundwater contamination (European Environment Agency, 2022[65]). The intensity of water use in agriculture is set to increase; the government has set a goal to expand the irrigated area by 100,000 hectares by 2024. The current irrigation system only covers 2% of the production area and is outdated (OECD, 2018[17]).

Agricultural policies should be reviewed as in many cases they are contrary to environmental water management objectives. The incentive under the CAP is to remove water from flooded areas as quickly as possible as only productive land can receive payments (OECD, 2021[66]). Recent CAP reforms do however allow payments for unproductive/flooded land and this should be fully exploited to preserve ground water stocks and natural water storage on land. Hungary can work with European partners on a reform of this aspect of the CAP and use the new scope to make improvements. A more consistent application of fines for water pollution would assist in improving water quality. A more uniform cost for water abstraction across all sectors, while reflecting regional environmental conditions and service provision costs, would align environmental and economic incentives among users.

Enhanced environmental inspections would ensure enforcement of existing laws

Convictions and fines for environmental degradation have declined since the 2016 abolition of the National Environmental Inspectorate (Figure 5.16, Panel A). Former functions of the inspectorate have been divided into county and district government offices, which often have insufficient human and technical resources (OECD, 2018[17]). Inspection frequency is low in comparison with good practices in other EU member states. Strengthening the system of environmental inspections, including through better targeting of environmental inspections and enhanced training for inspectors, would improve compliance. This could be complimented with increased fines for breaches.

Figure 5.16. Environmental convictions been falling, and waste management relies on landfill



Source: Hungarian courts. OECD Environment Statistics database; and OECD calculations.

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Low regulated prices have created economic losses in waste management

Emissions from the waste sector account for 5% of greenhouse gas emissions (Figure 5.3). Low prices prevail in waste management and contribute to high landfill use where fees do not cover the costs of operation, let alone the cost of offsetting the associated environmental damages (Figure 5.16, Panel B). Curtailing landfill use would reduce emissions as each additional metric ton of municipal solid waste diverted to recycling reduces emissions by 1.3 to 2.7 metric tons of CO_2 on average across the OECD (OECD, 2012[67]). Currently, 84% of the waste management sector's GHG emissions come from landfill sites (MIT, 2020[58]). However, in 2013, public waste management fees were frozen and are now below costs. Operators' losses were HUF 9 billion in 2020 (MEKH, 2022[68]). To ensure continued operation the government paid a service fee to operators.

A new waste management system replaced the previous one as of July 2023 to encourage the re-use and recycling of waste. A single concessionaire has been selected to collect all waste and operate all recycling facilities in the country under a 35-year contract with the government (Portfolio, 2023[69]). This concessionaire has to prepare a 10-year rolling development plan and update it every year to reach the objective of less than 10% of waste ending up in landfills by 2035, compared to 50% currently. At this stage, waste management is financed by a fee set by the public authority overseeing the concessionaire, and by producers, as part of the extended producer responsibility. Looking ahead, it will be key to ensure that this financing mechanism covers all operating and investment costs incurred by the concessionaire, and allows reaching the 2035 recycling objective.

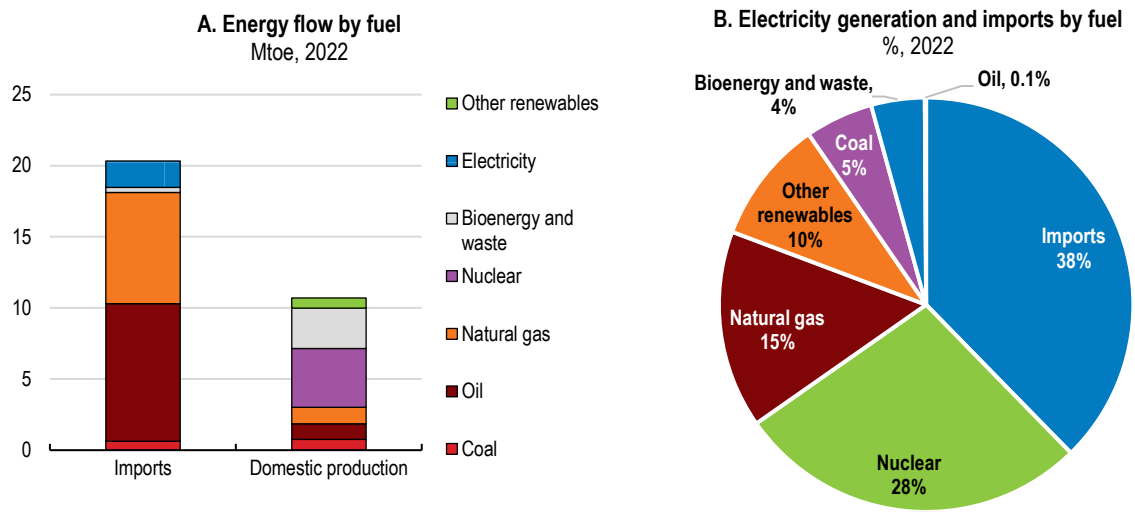
The increase in the quantity of waste generated over the last years can be largely explained by an increase in construction waste (OECD, 2018[17]). With the scale of housing renovation implied by green transition goals, combined with the age and poor insulation performance of the current stock, there is a risk that this volume will substantially increase in the coming years. Stricter regulations on the sorting and recycling of construction waste should be enforced before the renovation of the housing stock accelerates. The planned updating of the 2004 regulation covering construction waste should cover these issues.

Shifting towards low-carbon energy supply

With over half of CO_2 emissions originating from energy use (Figure 5.3), moving towards low-carbon energy sources will be fundamental to achieving emission targets. Electrification will be a key instrument,

but this will cause a large increase in electricity demand that will need to be met with a strong supply expansion. The currently high dependence on fossil fuel imports from Russia and electricity imports from neighbouring countries may imply risks, especially as neighbours will face rising electricity demand due to their own green transition (Figure 5.17).

Figure 5.17. Hungary relies significantly on high carbon fuels and energy imports



Source: IEA world energy balances; and OECD calculations.

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Illustrative potential changes in the supply and demand of energy reveal the scale of the challenge (Table 5.1). Hungary is planning to become a leading battery producer through a number of large-scale investments in battery production for electric cars (Dunai, Yang and Nilsson, 2022[70]). In 2022, an investment equivalent to 4.3% of GDP was announced, aiming to build a 100 GWh battery plant in Debrecen. This would be Europe's largest electric car battery factory (Portfolio, 2022[71]). While batteries and EVs will be essential to decarbonise transport both in Hungary and globally, the production of batteries is electricity-intensive (Degen and Schütte, 2022[72]). Increased electricity demand from the Debrecen plant along with an illustrative electrification of 10% of energy use in transport and industry would amount to 60% of the current nuclear capacity (Table 5.1).

One way to limit the rising electricity demand would be improvements in energy efficiency, for example, this could come from better insulation of housing (see above). Despite significant uncertainties, estimates suggest that retrofitting 10% of the housing stock would come at a cost of 3.2% of GDP (Table 5.1). The scale of prospective electricity needs and the costs of dwelling renovations strengthen the case to expand low-carbon electricity production and increase energy prices to incentivise energy savings and efficiency improvements.

Table 5.1. Illustrative effects of policy changes on Hungary's electricity needs

Scenario	Effect on electricity demand and supply
	% of current domestic electricity generation
Drivers of additional demand	
Electrification of 10% of all industrial energy currently not electrified	17%
Phase out coal-based power plants	9%
Planned investment in battery manufacturing (In Debrecen only)	8%
Electrification of 10% of the car stock	3%
Renovation of 10% of the housing stock (electricity equivalent)	- 20%
Drivers of additional supply	
Planned Paks II nuclear power plant (eventually replacing the existing nuclear supply)	48%
Double current solar energy production	7%

Note: Assumptions for the transportation scenario are 17.3 KWh/100 km of electricity consumption for the car stock (Government of Hungary, 2021[73]). Average car travel is taken as 17,000 km a year (Herczeg, 2018[74]). Renovation of 10% of the housing stock including better insulation, new windows and modernised boilers would save 6,700 GWh yearly (Csoknyai et al., 2022[11]). For transportation, if 10% of the car stock were electrified demand for electricity would increase by 1,100 GWh yearly (Herczeg, 2018[74]; Government of Hungary, 2021[73]).

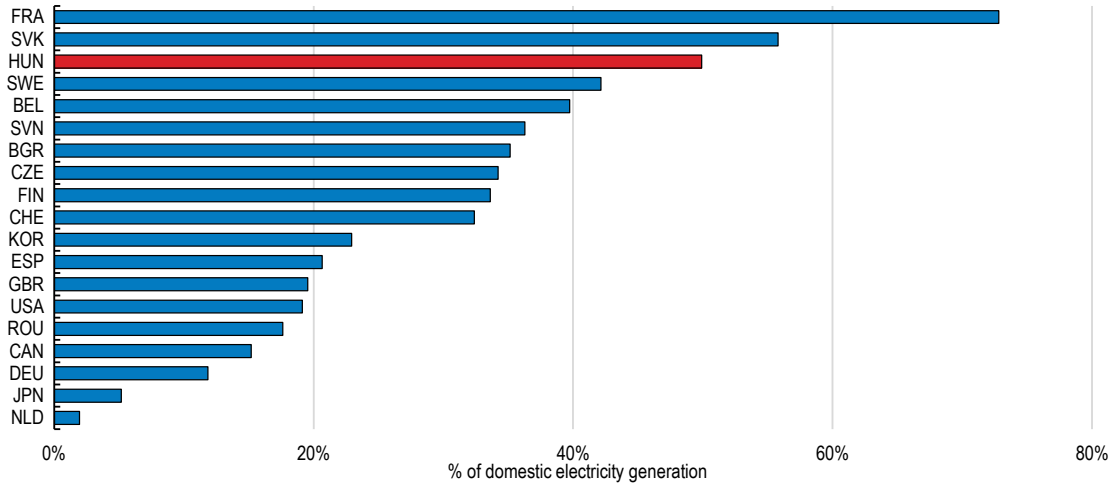
The current strategy to meet both energy security and supply needs is based on a major investment in nuclear energy, which is already the largest source of electricity generation, and an expansion of renewable energy sources. This will allow phasing out coal-based electricity supply, which currently accounts for 9% of electricity generation. Hungary has a target to phase out coal from its electricity mix by 2030 (IEA, 2022[14]).

Nuclear power is set to be a pillar of the green transition

The cornerstone of the future low-carbon energy strategy is a €12.5 billion, 7% of 2022 GDP, investment in a new nuclear energy plant. Nuclear energy is already a critical source of low-carbon electricity generation in Hungary (Figure 5.18). The current nuclear power plant Paks I provided almost half of domestic electricity generation in 2020. The new investment, the Paks II project, will eventually replace the current four reactors in Paks I with two new generation III+ reactors. The original four reactors have already had their lifetimes extended beyond the original 30-year limit to 50 years of operation and are expected to be decommissioned in the 2030's, except if a further extension is permitted. Paks II, which is expected to be operational in 2030, will not substantially increase electricity supply in Hungary once Paks I ceases operation (IEA, 2022[14]).

Compared to renewable energy sources that produce electricity in an intermittent way, nuclear electricity production is more stable over time while also being low carbon, although there are environmental concerns related to the storage of waste. Nuclear energy provides multiple times the electricity of solar energy, even if the peak capacity of solar under ideal weather conditions is currently more than 50% that of nuclear in Hungary (IEA, 2022[14]). The nuclear project is in line with the International Energy Agency's Sustainable Development Scenario if countries are to meet their objectives under the Paris Agreement (IEA and NEA, 2020[75]).

Figure 5.18. Nuclear power is vital in domestic electricity generation



Note: 2017 data for Switzerland.
Source: IEA (2019), Nuclear Power in a Clean Energy System, IEA, Paris.

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Delays and cost-overruns are typical risks in nuclear plant construction

While Paks II represents an ambitious long-term commitment to securing a stable source of low carbon electricity and will maintain skills in a key low-carbon technology, nuclear projects have often been subject to cost increases and delays (Table 5.2). Internationally, delays have become more significant over time and particularly afflict new reactor designs, reflecting the increasing complexity of nuclear technology and more stringent safety and environmental standards. This requires more labour- and material-intensive processes, raising construction, operation and maintenance costs (Portugal-Pereira et al., 2018[76]). Hungary has selected to construct two new design Gen III+ VVER-1200 reactors, first made operational in 2017. No construction cost data are available for comparable projects by the same provider and data quality makes comparison to those completed elsewhere difficult (Wealer et al., 2019[77]). If delays were to materialise, this would risk creating prolonged electricity shortages which could harm decarbonisation progress and could be economically damaging (Box 5.3).

There is a question whether cost overruns could harm decarbonisation objectives by crowding out investment in renewables. It may turn out difficult not to divert resources given the sunk costs that will have been incurred and the share of domestic electricity reliant on completion. The experience of OECD countries with third-generation reactors indicates a possibility of significant cost overruns relative to the planned €12.5 billion. Based on an estimate of cost per unit of electrical capacity from a range of similar projects, which has increased by a factor of 4 over the last 15 years, the cost of Paks II risks being in the region of €16-18 billion (IEA, 2019[78]). For example, the Vogtle plant in Georgia, USA, a third-generation reactor like Paks II, has doubled in budget and construction time. Building modules offsite for eventual on-site assembly was expected to reduce cost during the construction of the Vogtle plant, and the same construction arrangement is planned for Paks II. Offsite construction proved infeasible and quality, design and fabrication problems in components became a key source of cost overruns. By some estimates, construction costs account for 70-80% of the levelised (break-even) cost in third-generation reactors, and returns on investment will likely be low (Khatib and Difiglio, 2016[79]). Downside risks are large and can include project cancellation. In 2017 the construction of two third generation reactors in South Carolina were cancelled, despite assistance from the US federal government, and USD 9 billion of investment written off because of cost overruns (IEA, 2019[78]). A further risk to operation is related to fuel supply. A diversification of suppliers and longer contracts could reduce supply uncertainties.

Table 5.2. Delays and cost overruns are common in nuclear construction

Type	Country	Unit	Construction start	Initial announced construction time (years)	Ex-post construction time (years)	Power (MWe)	Initial announced budget (USD/kWe)	Actual construction cost (USD/kWe)
AP 1000	China	Sanmen 1, 2	2009	5	9	2 x 1 000	2 044	3 154
	United States	Vogtle 3, 4	2013	4	8/9*	2 x 1 117	4 300	8 600
APR 1400	Korea	Shin Kori 3, 4	2008	5	8/10	2 x 1 340	1 828	2 410
EPR	Finland	Olkiluoto 3	2005	5	16*	1 x 1 630	2 020	>5 723
	France	Flamanville 3	2007	5	15*	1 x 1 600	1 886	8 620
	China	Taishan 1, 2	2009	4.5	9	2 x 1 660	1 960	3 222
VVER 1200	Russia	Novovoro-nezh II-1 & 2	2008	4	8/10	2 x 1 114	2 244	**

Source: IEA (2020), Projected Costs of Generating Electricity 2020, IEA, Paris.

Given the high risk and potential consequences of delays, the case for more contingency planning is compelling. Extensions of existing plants are usually less costly than new constructions. Even with improvements in the cost of renewable energy sources, nuclear extensions will remain one of the most cost-effective ways of providing low-carbon electricity through to 2040 (IEA, 2019[78]). The proposed additional 20-year extension of the lifetime of Paks I is expected to take up to 5 years and will require the support of the International Atomic Energy Agency. The extension can follow practice in the United States where the Nuclear Regulatory Commission (NRC) is focusing on “subsequent license renewals”, which would authorise plants to operate for up to 80 years (IEA, 2019[78]).

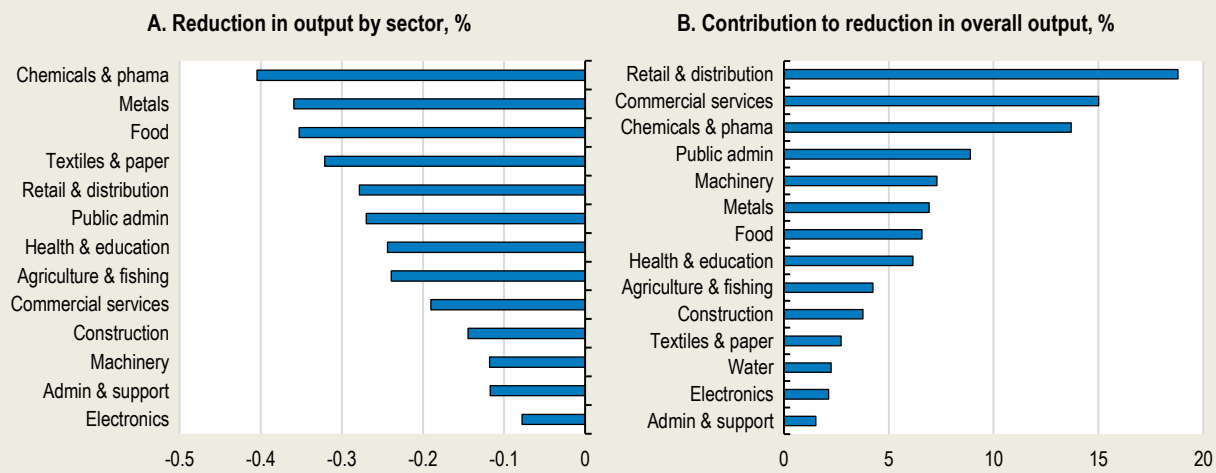
Box 5.3. Potential sectoral impacts of an electricity supply reduction

Nuclear energy accounts for almost half of domestic electricity supply. Any delay in the completion of the nuclear plant could cause a significant economic disruption. This box presents the potential impact, at the sectoral level, from an illustrative 20% reduction in electricity supply.

Simulations are conducted using an input-output model, with OECD Trade in Value Added data. The formulation is supply driven: changes in sectoral output are calculated based on exogenously specified changes in sectoral inputs and is particularly appropriate in this analysis, because it represents a shock to a difficult to substitute primary input. Using the supply-side input-output approach implies that the results represent a short-term impact. Longer-term adjustment mechanisms, such as the substitution to alternative energy sources, are not present in the analysis and output coefficients are fixed. The model assumes perfect demand adjustments to changes in supply.

Simulations show that an electricity supply shock of 20% would decrease overall output by 0.6%. Two indicators are calculated to illustrate the impact on output in other sectors (aside from electricity generation): (1) the reduction in output for each sector, and (2) the sectoral contributions to the reduction in overall output net of that of the electricity sector (Figure 5.19). The disruption would extend beyond manufacturing and would have the potential to impair the provision of public services such as health and education. The results are assuming the case of no policy intervention in the form of rationing or redirecting energy supply to essential activities, to the detriment of others. While this is unlikely with a shock of this scale, the scenario does still highlight the magnitude of the disruption the government would be faced with.

Figure 5.19. Impact of electricity supply disruption on output



Source: OECD Trade in Value Added database (2021 edition); and OECD simulation analysis.

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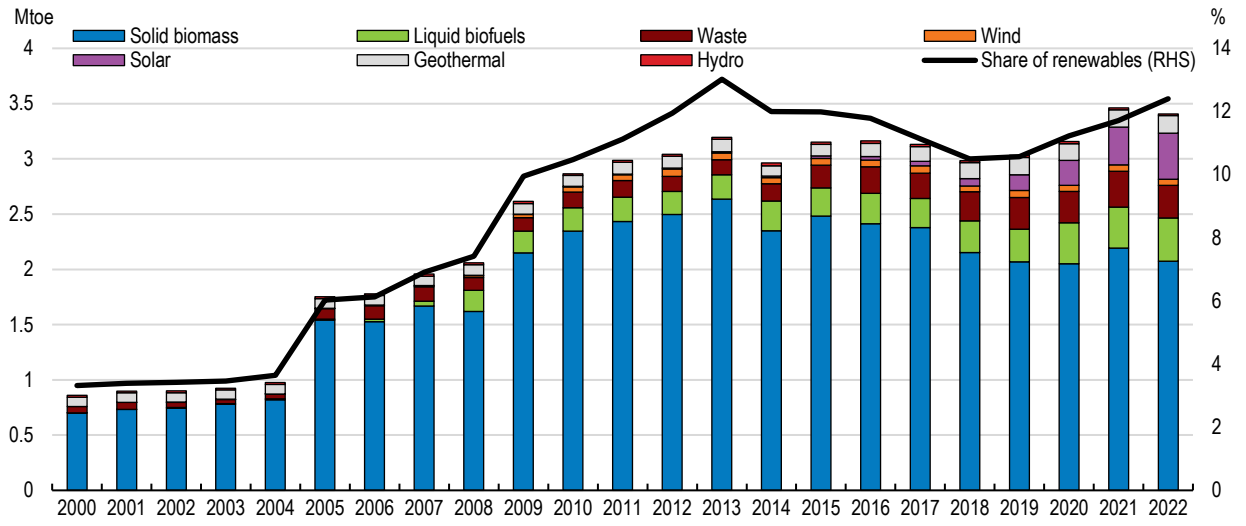
Renewable energy should be expanded

Renewables capacity will need to almost double by 2030 to reach the 20% target of renewables in gross electricity consumption (IEA, 2022[14]). This will require an expansion of all renewable sources, including wind, geothermal and solar energy generation. The future use of biomass, a major renewable source, is problematic due to the long period of time needed for carbon neutrality and the emission of fine particles.

Biomass use raises carbon emissions and air pollution

The tripling of the share of renewables in final energy consumption since 2000 has been driven almost entirely by an expansion in biomass use (Figure 5.20). Solid biomass, 85% of which is wood, accounted for around two thirds of total final energy consumption of renewables in 2020 (IEA, 2022[14]; Bio Screen CEE, 2021[80]). Of all biomass used, around three quarters is by households for heating (Bio Screen CEE, 2021[80]). A future expansion of biomass is set to become an important component of the net zero transition, with energy from biomass projected to increase by more than 50% in the decade up to 2030 (MIT, 2019[81]). Current plans aim to encourage more residential burning and, at larger scale, the development of biomass power plants and more use of biomass for district heating.

Figure 5.20. Biomass dominates renewable energy generation



Source: Source: IEA; and OECD calculations.

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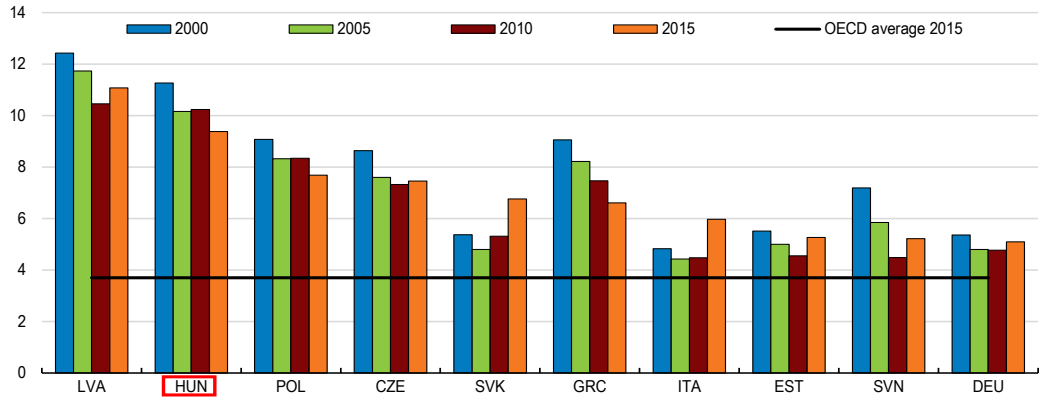
Switching to biomass increases emissions in the short and medium-term. Wood has approximately the same carbon intensity as coal per unit of energy. However, combustion and processing efficiencies are lower and so wood generates 82% more carbon dioxide per unit of energy than coal (Sterman, Siegel and Rooney-Varga, 2018[82]). Burning wood instead of coal creates an immediate increase in carbon dioxide emissions. That carbon debt can be repaid over time if the forests grow back, a process that is estimated to take up to 100 years. This long time-horizon creates a sizable problem for the reliance on biomass to reach 2030 and 2050 emission reduction targets (Sterman, Siegel and Rooney-Varga, 2018[82]). In addition, significant risks to the length of the payback period include fire, drought, insect damage, re-harvest, or conversion to other uses that can limit or prevent forest recovery. Expanding energy generation from biomass is therefore not a promising avenue to reach emission reduction targets.

In addition, wood combustion emits a range of fine particle matter pollutants including PM2.5 and PM10, which pose significant health risks (Box 5.4). Per unit of energy, particle emissions from burning wood are double that of coal, 200 times that of oil and 1250 times that of natural gas (DEFRA, 2017[83]). Hungary's population is already subject to extensive exposure to fine particles, at levels that far exceed the OECD average (Figure 5.21). In 2021, the European Court of Justice found that between 2005 and 2017, the daily limit value for particulate matter was frequently exceeded in the Budapest and Pécs regions and the Sajó valley (CJEU, 2021[84]).

Figure 5.21. Welfare cost of premature deaths from exposure to fine particles, top ten OECD countries

% of GDP equivalent, 2000-2015



Note: Data on mortality from exposure to fine particulate matter and ground-level ozone, and data on value of statistical life are sourced from Global Burden of Disease surveys.
Source: OECD (2018), OECD Environmental Performance Reviews: Hungary 2018, OECD Publishing, Paris.

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Life-cycle taxation principles can be applied to biomass. Ideally, a carbon neutral source would be one that sequestered as much carbon in its growth cycle as is released later when burned as fuel, with sequestering occurring simultaneously rather than over future decades. Emissions would be underpinned by a comprehensive lifecycle analysis, encompassing changes in the forest carbon stock alongside supply chain emissions. This would however be technically demanding. Furthermore, the taxation of biomass should account for its much more detrimental impact on public health through local air pollution even compared to fossil fuels. An appropriate carbon tax would level the playing field with other renewables and allow the market mechanism to better operate among differing technologies in determining the most economically efficient low-carbon fuel mix.

Moreover, older wood heating systems are emission-intensive. In a residential setting, open fireplaces emit almost double the number of fine particles per unit of energy as compared to boilers and stoves (DEFRA, 2017[83]). The variation in emissions from wood burning technologies is substantial. Advanced or eco-labelled appliances and wood pellet stoves/boilers emit substantially lower particles than older wood burners (DEFRA, 2017[83]). Several Nordic countries have implemented scrapping payments and replacement subsidies to encourage the replacement of boilers with new low-emissions eco-labelled products (Orru et al., 2022[85]). Regulation to ban the most polluting burners and subsidies for upgrading older systems would cut emissions and improve air quality. This could be complemented by full implementation of plans to strengthen fines for air pollution and a wider reporting of the findings of inspections.

Household biomass use is lacking well-defined domestic or European sustainability criteria. Indeed, 50–60% of firewood consumed is of unknown origin and potentially sourced from illegal logging (Weiner and Szép, 2022[21]). Hungary aims to further increase forest areas to reach 27% of forest cover by 2050, up from 22% today (MIT, 2020[58]). The application of sustainability criteria to biomass used in household heating could mitigate the problem of illegal logging. Furthermore, improved data collection on the biomass-to-energy cycle could ensure that biomass does not originate from biodiverse land or protected areas. A more consistent application of fines and legal consequences for illegal logging would also help to protect forestry resources.

Box 5.4. Health impacts of biomass burning

During wood burning, a number of harmful pollutants including carbon monoxide, volatile organic compounds (VOC), oxides of nitrogen, and fine particles (PM10 and PM2.5) are released. Small-scale wood burning in individual dwellings is responsible for emitting a large volume of fine particles (around a third of fine particles in Central and Eastern Europe).

Long-term exposure to fine particulate pollution is the largest environmental risk factor for human health, with an estimated 7 million deaths per year worldwide. Wood smoke specifically is estimated to cause at least 40,000 premature deaths per year in Europe. There have been upward revisions of deaths from air pollution arising from improvements in the ability to monitor air pollution and increased medical understanding.

The small diameter of fine particles causes inflammation and stress and have been shown to lead to a decline in lung function of healthy adults. Illnesses that are associated with fine particles range from lung cancer, bronchitis, and other respiratory infections, through to strokes, dementia, type II diabetes and Parkinson's disease.

The growing popularity of wood burning stoves for home heating has raised concerns about high concentrations of indoor pollution. Due to time spent indoors, risks to health may be greater than from exposure to outdoor air pollution. Wood burning has a significant impact on air quality inside homes. Peak levels of harmful fine particulates can be as high as 250-400% times the level of non-wood burning homes. These short-term intense exposures can be potentially more harmful than longer periods of above average exposure.

Sources: (Ni, Shi and Qu, 2020[86]; McDuffie et al., 2021[87]; Orru et al., 2022[88]; Chakraborty et al., 2020[89]; Dechezleprêtre, Rivers and Stadler, 2019[90]; Roy and Braathen, 2017[91]).

Solar and wind energy generation face infrastructure and planning constraints

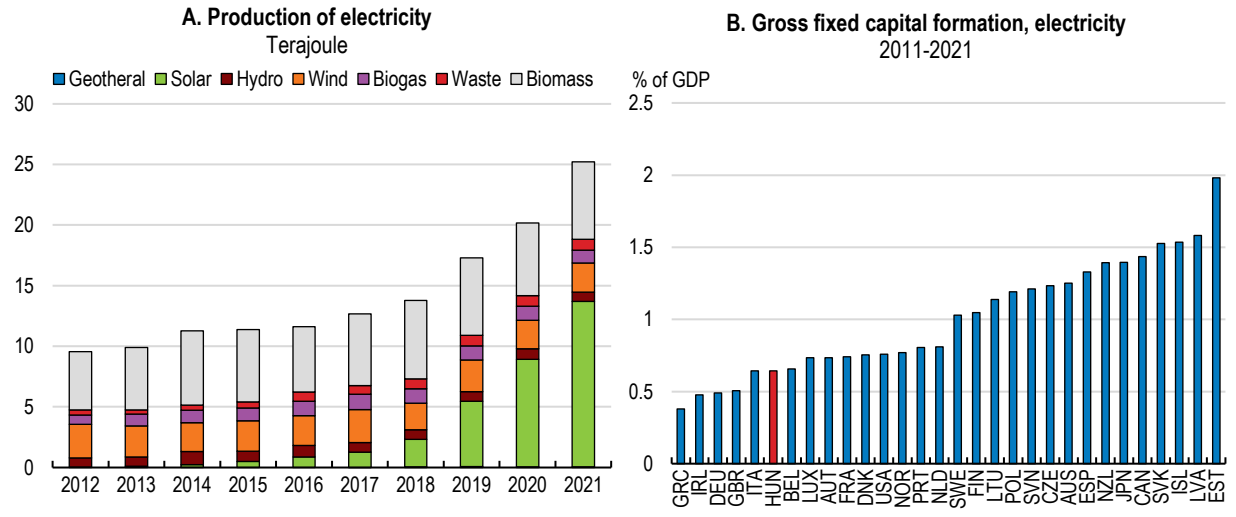
There has been rapid growth in solar generation. Installed solar energy generation capacity has doubled in the last two years, supported by a comprehensive system of public grants (MIT, 2019[81]) (Figure 5.22, Panel A). This expansion is part of a planned five-fold capacity increase between 2020 and 2030, to reach 12% of electricity consumption. In light of the intermittence of solar energy, the expansion in solar needed to replace high carbon fuels is considerable. With a typical 25 year lifespan the expansion of solar panels further motivates improvements in recycling and waste management (Chowdhury et al., 2020[92]).

In contrast to the trends in almost all other European countries, the development of wind as a renewable energy source has stagnated. A 2016 decree declared that wind turbines could not be installed within 12 kilometres of populated areas, leading to a *de facto* ban on installation (IEA, 2022[14]). Today, solar energy generates almost six times the electricity of wind in Hungary. However, given the geographical setting, estimates of renewable energy generation potential indicate that the solar to wind ratio should be closer to one, with sizable potential for wind generation in the north of the country (Campos, Csontos and Munkácsy, 2023[93]; Radics and Bartholy, 2008[94]).

The main measure for expanding renewables is the renewable energy support scheme (METÁR) of 2017, which combines feed-in tariffs and feed-in premiums for small and mid-size energy plants. Larger plants have to participate in a competitive bidding process in order to receive the feed-in premium. The new system is transitory as eventually competitive bidding will be in place for all new plants. The system has attracted many small solar plant applications. In 2019, only a single tender for larger plants has been issued. To accelerate the process, the government should follow through with its intention to issue tenders annually. Moreover, the current focus on solar installations should be broadened to include wind technology to ensure a market-based expansion of renewable energy sources.

The strong renewables expansion that Hungary needs will likely require reconsidering rigid planning regulation to allow the installation of wind turbines. Furthermore, investment support could be strengthened. Denmark has had a deliberate policy of allocating revenue from an additional tax on electricity consumption to the development of renewables, an "electricity pays for (renewable) electricity" principle. This investment subsidy, combined with feed-in tariffs, has been important in facilitating the rapid deployment of wind energy technology, and the subsequent reduction in costs would not have been possible otherwise (OECD, 2019[95]).

Figure 5.22. Solar capacity has expanded rapidly, but grid investment is low



Source: Eurostat; OECD national accounts database; and OECD calculations.

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Although government initiatives to increase solar generation have been a considerable success, historically low levels of investment in the electrical grid complicate further renewable expansion and create balancing issues for the grid (Figure 5.22, Panel B), (Zsiborács et al., 2021[96]). At the end of 2022, the government announced a suspension of connections for newly installed solar panels, as there was no capacity to take more supply onto the grid (Portfolio, 2022[97]). In May 2022 the transmission system operator MAVIR set the solar capacities that can be admitted to the grid at zero, again due to capacity constraints (MAVIR, 2022[98]).

Intermittent energy sources such as solar and wind, add grid costs that are several orders of magnitude higher than for electricity supplied by gas or coal (OECD and NEA, 2012[99]). These costs arise from extending the transmission system to connect with renewable sources, grid reinforcement, building new sub-stations, installing voltage transformers and securing back-up capacity for when renewables do not generate electricity. Estimates for the US indicate that a high renewables scenario would require a threefold increase in national transmission capacity to 2035 requiring up to ten thousand miles of new high-capacity lines to be built per year (Denholm et al., 2022[100]). Costs can be high and uncertain with planning permission needed for the vast expanse of new power lines (Mitchell-Ward, 2022[101]). The expansion of renewables also complicates the economic viability of nuclear electricity generation because it leads to increased price volatility. At the same time, and contrary to renewables, nuclear energy provides a constant baseload of electricity ensuring a degree of supply security that is not reflected in the price.

Given the dynamic growth of renewables, the condition of the grid, the mix of public and private ownership and the difficulty in expanding transmission, required cost estimates are significant. Government estimates put these at 1% of GDP (Government of Hungary, 2022[102]). However, other estimates place the cost at

5% of GDP (Janoskuti et al., 2022[103]). Current regulation prevents the network operator from raising network fees to cover these costs and frontload investments in infrastructure development. At this stage grid investments are expected to be covered by EU and government financing. Given the necessity of these investments to unlock renewable energy supply, and the significant cost uncertainty, the increase in network fees should be considered if EU and government financing proves insufficient.

Geothermal energy can decarbonise district heating systems

After Iceland and Italy, Hungary has the third largest potential for geothermal energy utilisation in Europe, and this potential can be further harnessed (Szanyi, Kovacs and Scharek, 2009[104]). Government estimates indicate that the amount of energy generated by geothermal for district heating could increase by a factor of seven (IEA, 2022[14]).

An important barrier to geothermal development is geological risk. Even after discovery of hot water, the rock structure can make economic exploitation unfeasible (Mountney et al., 2021[105]). Risk mitigation schemes with financial instruments such as risk insurance and capital grants are established in some European countries (Denmark, France, Germany, Iceland, the Netherlands, Switzerland, and Turkey) (Karytsas et al., 2022[106]). Although comparable schemes are not currently in place in Hungary, these is a partial reimbursement to cover drilling risk in the event of unsuccessful exploration. The government has proposed de-risking plans to facilitate the development of geothermal energy. The Implementation and expansion of these plans will be important to grow this energy source. A positive step in this direction is the March 2023 regulatory change to the Act on Mining. This simplified the licensing system for geothermal exploration and production of energy. This change has led to a substantial increase in geothermal projects with 89 new permits since March 2023.

Capital-intensive energy supply projects are hindered by low regulated prices as evidenced by the minimal foreign investment in this area. The low-price environment especially hampers projects with high initial capital costs such as geothermal and hinders development of the district heating system. Most foreign investors have withdrawn since the introduction of regulated energy prices (IEA, 2022[14]). Geothermal has a high potential for decarbonising district heating systems, however both geothermal and district heating are capital intensive technologies. Allowing energy prices to rise would allow market forces to operate and would create new possibilities for investments.

Mitigating the social and political economy impact of the green transition

Reducing emissions will involve a decline in some industries and labour reallocation

The transition to higher carbon prices and a move towards electrification will precipitate changes in the industrial structure, which will inevitably give rise to adjustment costs. Concerns around competitiveness, although sometimes overstated, are valid. Higher carbon prices can increase energy prices and reduce output, employment and exports in energy intensive industries. Significant GHG emission cuts have not prevented strong economic and employment growth in the last three decades. Nonetheless, more stringent policies to reach ambitious emission reduction targets will have effects on the allocation of labour and capital across sectors and firms. For example, workers will have to move from shrinking emission-intensive industries, where some firms will contract or exit the market, to growing low-carbon sectors, where new job and business opportunities will emerge (D'arcangelo et al., 2022[8]). In addition, more gradual and pre-announced changes in economic framework conditions would allow producers and consumers to adjust more smoothly, which would likely reduce the adjustment costs.

The overall job reallocation triggered by environmental policies will likely be relatively small compared to other major structural transformations, such as technological progress and globalisation, partially because employment in emission-intensive industries, which are most affected by higher carbon prices, is relatively

low (OECD, 2021[107]). Based on macroeconomic simulations, employment in sectors that may be subject to job losses by 2040 as a result of policies to reduce emissions in line with the Paris Agreement amounts to less than 3.5% in all Hungarian regions (OECD, 2021[108]). While overall numbers may not be large, at the local level and for specific skill groups, the impact can be sizable. The regions of Central Transdanubia and Northern Hungary will be proportionality more impacted due to their higher concentration of employment in chemicals and the coal industry.

The reallocation of labour across sectors and firms will lead to significant adjustment costs for displaced workers (OECD, 2021[109]). They will face income losses, have to search for a new job, learn new skills, and often have to bear, together with their families, the social costs of moving to other locations to find a new job (Grundke and Arnold, 2022[110]). Job creation in sectors that benefit from the green transition might happen in locations that are different from the locations suffering from the decline of carbon-intensive industries. Moreover, rising carbon prices will significantly affect the relative consumer prices of goods and services depending on their carbon content. As poorer households spend a higher share of their income on carbon-intensive items, distributional effects on the consumption side may be regressive.

Policies to reduce adjustment costs and smooth the transition

Public support for costly emission reductions will hinge on people's acceptance of the importance of limiting global warming (Dechezleprêtre et al., 2022[111]). This is potentially limited in Hungary where only 52% of people are in favour of stricter government measures that impose a change in people's behaviour to tackle climate change and just 11% support capping home temperatures at 19° C in winter. These shares are among the lowest in Europe for both policies (European Investment Bank, 2023[112]). Furthermore, there is a generally negative perception of taxes on fossil fuels (Umit and Schaffer, 2020[113]).

Identifying prevalent views among the public and designing framework policies accordingly may boost public support. Overly regressive and uncompensated policies can undermine public support for climate change mitigation and can make reaching green transition targets difficult or impossible. Climate policies' reallocative costs are likely to be large especially for disadvantaged groups such as low-skilled low-wage workers. Many view these outcomes as unfair and may therefore stoke opposition to the source policies, even if they are not directly harmed themselves (D'arcangelo et al., 2022[8]). Such opposition may be addressed by introducing revenue recycling and complementary support measures (Box 5.5). Hungary can recycle gas and electricity subsidies where some of the revenue savings from a phase out can be reinvested to increase public acceptance. For example, public information campaigns can significantly improve the acceptance of climate change policies if they are based on explaining their effectiveness rather than focusing on highlighting the consequences of climate change (Dechezleprêtre et al., 2022[111]).

Flexible labour market regulation and an effective social safety net focusing on the protection of workers and not of jobs would facilitate the transition of workers to new job opportunities in low carbon-intensity industries, especially when combined with efficient job placement services (Grundke and Arnold, 2022[110]). Improving policies in these areas is key for facilitating the green transition, but also other structural transformations (OECD, 2012[114]). The skills required in brown jobs are only partially transferable to green jobs, especially within the same working categories (Dechezleprêtre et al., 2022[111]). Skill transferability suggests that most of the training needed for green jobs may take the form of a 'top-up', allowing already qualified workers to adapt their skills and knowledge to suit green jobs' practices and technologies. Job-search and training schemes, such as those implemented in Germany (Ruhr region), Canada (Alberta) and the United Kingdom, have helped workers with brown jobs to find green opportunities with equivalent skills.

Public expenditure on active and passive labour market policies in Hungary is among the lowest in the OECD (OECD, 2020[115]). Active labour market policies could provide more support for mobility and upskilling. Compared with other countries, active labour market policies have little focus on training and job search assistance. Public employment services suffer from insufficient funding, a high caseload and

limited outreach. In addition, job counselling is often not tailored to the needs of the most disadvantaged groups (OECD, 2021[26]). Expanding the scope and efficiency of support policies can alleviate the disruption of transition to a low-carbon economy. The transition can also be eased through use of EU programmes. The Just Transition Mechanism is designed to support the areas most affected by the transition to climate neutrality and minimise regional disparities. Hungary has utilised the EU's Environment and Climate Action Programme (LIFE) to enable an equitable green transition of the Mátra region where coal is produced and used for electricity generation. The LIFE Programme allows local conditions to inform the implementation of the Just Transition Fund.

Box 5.5. Revenue recycling to improve public acceptance of climate mitigation policies

Indonesia

Indonesia is one of the world's largest GHG emitters. Coal, natural gas and oil consumption and production were supported by decades-long and generous fossil fuel subsidies. Subsidies contributed to increased use, worsening local air pollution, and climate change. The social-welfare redistributive rationale of aiding low-income households was only partly met, due to flawed targeting that resulted in middle- and high-income households being the major beneficiaries.

Government reforms of the program promoted energy pricing liberalisation and better targeting of subsidies. This has resulted in a reduction in consumption of subsidised fuels, as well as substantial budget savings, which the government reallocated to infrastructure, rural development, welfare, health, education and agricultural subsidies. To cushion the impact on the poor and increase acceptability, the reforms were complemented by mitigation measures (such as temporary cash transfers), and accompanied by public information campaigns highlighting their rationales and benefits.

Switzerland

In 2008 Switzerland implemented carbon pricing on heating fuels in order to meet its annual carbon target. The policy raised distributional and competitiveness concerns, which the federal government has attempted to address via redistributive mechanisms and earmarking of revenues to environmental goals. About two-thirds of the tax revenue were redistributed to households and firms through a lump-sum rebate of social security contributions of around EUR 80 per person and reimbursement of firms proportional to their wage bill. The remaining third of tax revenue is earmarked for retrofitting works and the development of sustainable heating fuels. Furthermore, the level of the carbon tax would depend on the country's climate performance and its success in meeting annual objectives. Prices would be frozen upon early achievement of abatement goals, adding another incentive for emission abatement and eliminating any perception of climate policy as a taxation measure.

Source: (D'arcangelo et al., 2022[8])

Climate-change adaptation and improved water management can strengthen resilience to water risks

Groundwater depletion and flooding are projected to increase

Progress towards net zero greenhouse gas emissions by 2050 must go hand in hand with a concerted effort to strengthen the resilience of people, economies and ecosystems to the rapidly increasing impacts of climate change (OECD, 2022[116]). Climate adaptation efforts help reduce the occurrence and extent of climate hazards as well as the current and future exposure and vulnerability of communities and assets to their impacts. Understanding climate risks is essential for determining priorities for adaptation and

informing policy action. For Hungary, one of the most pressing challenges posed by climate change is the increased strain placed on water resources through altered rainfall patterns, flooding and drought risks. Hence, enhanced water resource management needs to go hand in hand with climate adaptation efforts.

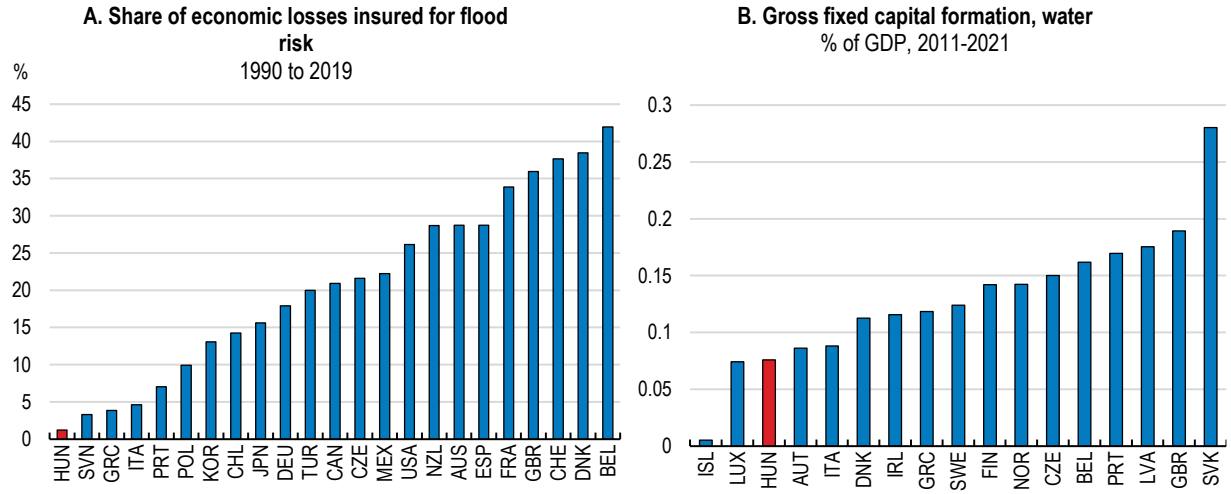
Beyond what is already envisaged in Hungary's National Climate Change Strategy (NCCS), climate adaptation action should build on comprehensive climate risk assessments and rely on a combination of structural and non-structural measures. For example, the consideration of existing and projected water related risks should be a requirement when making land-use planning decisions, especially when these entail new asset development. The risks and impacts posed by climate change should also be considered when planning and managing infrastructure, e.g. by mainstreaming climate adaptation in strategic plans, funding schemes, project design and appraisal, procurement processes and maintenance operations. Some progress has been made in this area with the 2014-20 Environment and Energy Efficiency Operational Programme (OP) containing nature-based adaptation solutions related to flood and flash flood risk management, municipal level adaptation-oriented green surface development and plans for groundwater level rehabilitation.

The conservation and restoration of natural ecosystems can help reduce the risks and impacts of water scarcity. Groundwater resources have been depleted over time and this trend is projected to intensify with climate change (Bisselink et al., 2020[117]; OECD, 2023[12]). Groundwater is a crucial resource in Hungary as it accounts for 95% of the drinking water supply (OECD, 2020[7]). However, from 2003 to 2020, Hungary recorded the second largest fall in ground water recharge in Europe (Xanke and Liesch, 2022[118]). The linked problems of protecting ground water resources, flood and drought management, can be tackled with water management adaptation measures. Restoration of wetlands and floodplains can reduce the risks associated with increased flood frequency through improved flow regulation (OECD, 2023[12]). An expanded area of wetlands and floodplains would allow for enhanced groundwater recharge (Salem et al., 2023[119]). Enhanced recharge can delay drought propagation and provide an efficient means of water supply during drought episodes (Chung, Kim and Senapathi, 2023[120]).

Despite close to a quarter of the land area at risk of flooding, Hungary has one of the lowest rates of flood insurance coverage in Europe (Figure 5.23, Panel A). An improved dissemination of information on climate-related risks would improve the insurance industry's assessment of climate risks and its ability to price these accurately. Expanding private insurance coverage can also limit the extent to which the government becomes the insurer of last resort, which can have high fiscal costs (OECD, 2023[121]). In some countries, catastrophe risk insurance programmes have proven successful in keeping insurance premiums for risks otherwise considered "uninsurable" affordable, while also backing up insurance providers through a state guarantee (OECD, 2023[122]). For example, France has developed a solidarity mechanism called CatNat. which is funded through a flat rate contribution by every household and vehicle insurance policy holder in the country (OECD, 2023[12]). As a result, 98% of French households are covered against most types of natural hazard damage with the proceeds reinvested in future risk prevention. The consideration of natural disaster risk should be a requirement when making land-use planning decisions for new developments.

Figure 5.23. Flood insurance coverage and investment in the water infrastructure are low

2011-2021



Source: OECD national accounts database; OECD (2021), Enhancing Financial Protection Against Catastrophe: The Role of Catastrophe Risk Insurance Programmes; and OECD calculations.

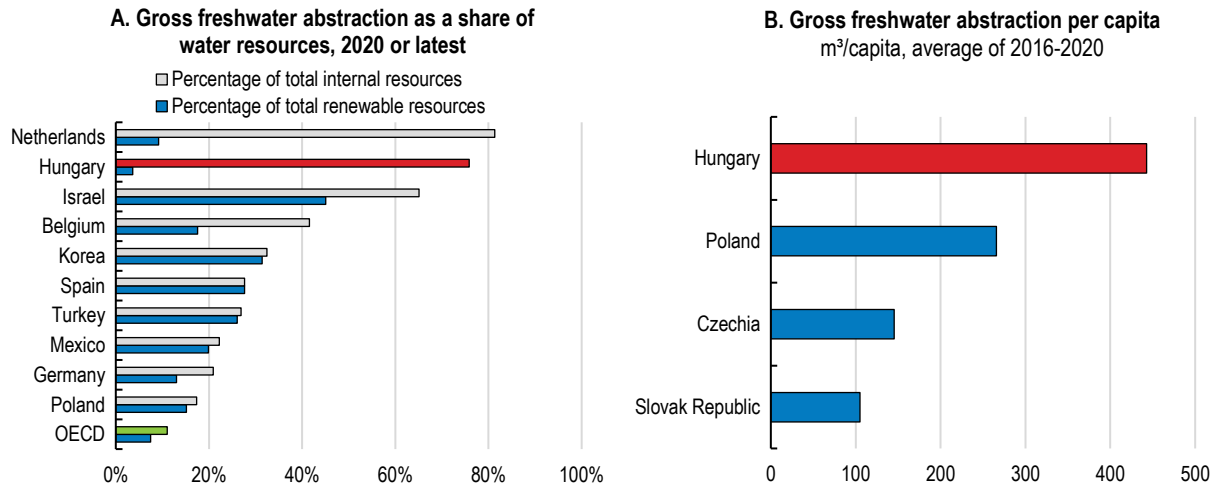
StatLink https://stat.link/8a4brt

Water infrastructure investment has been held back by low regulated prices

Adaptation challenges in water management make long-overdue improvements in water infrastructure even more pressing (Figure 5.23, Panel B). Low regulated water charges have created a loss-making environment and contributed to high rates of usage (Figure 5.24). Water supply and sanitation tariffs were frozen by law in January 2012 and further decreased by 10% in 2013. As a consequence, major water operator Alföldvíz has failed to make a profit in all but one year since 2013 (Kis and Ungvári, 2019[123]). Losses are exacerbated by a widespread failure to enforce payment of water bills. Providers have severely limited options to penalise customers who do not pay their bills as water cannot be withheld. To keep water provision operational the government has provided a subsidy to operators. Without subsidies the operating loss of the sector would have been HUF 31 billion in 2020 (MEKH, 2022[68]). Unpaid bills amounted to HUF 12 billion in 2020, almost 40% of the operating loss without subsidies.

A prolonged period of low investment has deteriorated the water infrastructure (Figure 5.23). As a result, technical surveys report that 56% of drinking water supply systems are at risk, pipe replacement is less than 20% of what is necessary to maintain the current system and the percentage of obsolete assets has grown over the years (Kis and Ungvári, 2019[124]). Necessary maintenance and new investment together are estimated to be at least 6% of GDP over 2021-2035 (MEKH, 2021[125]). Replacement and investment needs should primarily be paid by the water utility service fee, including through a more consistent enforcement of unpaid bills via an efficient legal system. A better-funded water provision system will be better equipped to meet the challenges posed by climate change.

Figure 5.24. Water usage is high in international comparison



Source: OECD Environment Statistics database; and OECD calculations.

StatLink https://stat.link/n5p4ed

Phasing out the current policy of holding water charges artificially low would allow prices to rise to cover both running costs and infrastructure requirements. Issues related to poverty and water access can be managed through the general welfare system with targeted cash transfers to households (Leflaive and Hjort, 2020[126]). Higher retail charges would also reduce water use and alleviate associated environmental pressures. The charging system could be simplified with a harmonisation of water tariffs as there are currently around 4,000 different water tariffs in operation across municipalities (Portfolio, 2023[127]). Only some variation in tariffs would remain to reflect local groundwater conditions. Given the energy use in the water sector, policies that would encourage more efficient energy use, such as increased prices, would also be of benefit.

Table 5.3. Policy recommendations from this chapter (key recommendations in bold)

Main findings	Recommendations
Energy/carbon prices	
Energy price caps have been costly for the government budget and low energy prices reduce incentives for energy efficiency.	**Restructure energy support by moving from price caps to more targeted cash transfers to support vulnerable households while reducing the overall fiscal costs.**
Carbon prices outside the EU-ETS are at or close to zero and do not provide a strong market-based incentive for emission reductions.	**Enforce emission reductions through a mix of regulations and carbon prices, and progressively align carbon prices in sectors outside of emissions trading to those in the EU-ETS.**
Buildings	
Building insulation is often poor and many heating systems are outdated, leading to high CO_2 emissions and air pollution from households.	Promote the insulation of dwellings and the replacement of inefficient and polluting heating systems, including through targeted subsidies. Make energy performance certification mandatory for all dwellings.
Transportation	
Low excise duties on petrol and diesel encourage car usage.	**Raise excise taxes on petrol and diesel.**
Hungary has one of the highest shares of cars over ten years old of any country in Europe with an average age of 14 years.	Raise minimum car emission standards.
Despite policy incentives, the uptake of electric vehicles remains low.	Link *ad valorem* vehicle taxes to cars' environmental performance.
The area around Budapest has seen a rapid growth in suburbanisation leading to increased congestion and higher transport emissions.	Raise parking fees and congestion charges.
Energy supply	
The current low-carbon energy strategy is based on the construction of a large nuclear plant, whose timely completion may be subject to risks.	Develop contingency plans for risks surrounding the PAKS II nuclear plant, including by further extending the lifetime of existing nuclear reactors.
Energy generation from biomass increases emissions and air pollution in the short and medium-term. A large share of biomass use is left without any sustainability safeguards.	Tax biomass use for energy generation in line with its carbon emissions and its impact on local air pollution. Raise fines and enforcement against illegal logging.
Geothermal potential is largely untapped.	Consider public insurance and capital grants to mitigate exploration risks, while easing the licensing process for geothermal energy projects.
Wind capacity expansion has come to a standstill in the last decade.	**Remove restrictive rules on windmill installation, particularly the distance to housing rules.**
Massive investments in the electricity grid will be needed to accommodate more renewable energy sources.	**Allow the grid operator to raise fees to cover operating costs and investment needs if EU and government financing is insufficient.**
Waste management	
Low regulated waste disposal charges contribute to high landfill use. The new concessionaire in charge of waste management is expected to significantly increase the recycling rate by 2035.	Monitor progress towards recycling objectives and ensure that the coverage of operating and investment costs incurred by the concessionaire is in line with these objectives.
The increase in the volume of waste over the last years has been driven by the construction sector. Large-scale renovations to improve housing energy efficiency will further increase the volume of construction waste.	Enforce stricter regulations on the sorting and recycling of construction waste as soon as possible.
Water management	
Low regulated water charges generate losses and encourage high usage. A lack of investment has deteriorated the water infrastructure.	Align water charges with actual costs, including those of required infrastructure investments.
Flooding is projected to increase and flood insurance coverage is low.	Expand insurance coverage against flooding.
Environmental policy	
Convictions for environmental degradation have declined since the 2016 abolition of the environmental inspectorate.	Enforce higher frequency of environmental inspections and better training for inspectors.
Due to the reallocation effects that they usually imply, climate policies may face opposition by the general public.	Run public information campaigns explaining the rationale and the effectiveness of climate policies.

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After a strong demand-based recovery following the COVID-19 pandemic, economic activity declined amid high inflation. Growth has restarted in mid-2023 and inflation is receding, but fiscal and monetary policies need to work hand-in-hand to fight remaining inflationary pressures and recreate fiscal space to finance future spending needs.

Productivity growth has slowed since the mid-2000s and structural reforms that facilitate new firm entry and exit and a wider take-up of digital tools are needed. Recent reforms to the anti-corruption and public integrity framework will sustain investor confidence if they are fully implemented.

Social transfers keep income inequalities and poverty low but should be better targeted to those most in need. Women face large employment and pay gaps compared to men and intergenerational mobility is limited. Further expanding access to childcare facilities for young children and improving the education system would help to address these challenges.

Hungary's green transition can build on past progress but needs to accelerate. This will require more electricity supply from low-carbon sources, with price signals acting as a catalyst. Restructuring energy support by moving from price caps to more targeted cash transfers to vulnerable households would strengthen incentives for energy efficiency improvements and reduce fiscal costs.

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