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Foreword

This Economic Survey was prepared by Andrea Goldstein and Charles Dennery, under the supervision of Philip Hemmings. Research assistance was provided by Eun Jung Kim and editorial support by Michelle Ortiz and Emily Derry.

This Survey is published under the responsibility of the Economic and Development Review Committee of the OECD. The Committee discussed the draft Survey on 24 September 2024. The cut-off date for data used in the Survey is 12 November 2024.

Information about this and previous Surveys and more information about how Surveys are prepared is available at <https://www.oecd.org/en/topics/economic-surveys.html>.

On 20 February 2024, the OECD Council decided to open accession discussions with Indonesia. On 29 March 2024, the OECD Council adopted the Roadmap for the Accession Process of Indonesia [C(2024)66/FINAL], setting out the terms, conditions and process for the accession of Indonesia.

In accordance with this Roadmap, OECD technical committees, composed of expert policy-makers from each of the 38 OECD Members, will conduct an in-depth assessment of Indonesia's legislation, policies and practices against OECD legal instruments and OECD best policies and practices covering multiple areas of government policy, including economic policy but also labour market and social policy, education, and health.

The overarching objective of the OECD accession process is to promote Indonesia's convergence with OECD standards, best policies and best practices, resulting in better outcomes for OECD Members as well as for Indonesia and its citizens. Throughout the accession process, the OECD will work closely with Indonesia to support the adoption of long-lasting reforms for this purpose.

Publication of this document, and the analysis and recommendations contained therein, do not prejudice in any way the results of the review of Indonesia by the Economic Development Review Committee as part of its process of accession to the OECD.

Table of contents

Foreword	3
Executive Summary	9
1 Deepening the macroeconomic foundations for inclusive growth	15
The economy remains strong	16
High interest rates have supported the Rupiah and reduced inflation	21
Raising more revenues and making spending more efficient is essential	25
Findings and recommendations	35
References	36
2 Accelerating growth and attaining socioeconomic convergence	38
Economic convergence has stalled	39
Productivity levels are modest and integration in global value chains is limited	41
Increasing employment rates and strengthening human capital	44
Policies to strengthen the business environment	48
Findings and recommendations	61
References	62
3 Making the digital transformation work for all	66
With the appropriate reforms, digitalisation can accelerate economic growth	67
Strengthening broadband connectivity	68
Facilitating digitalisation in the business sector	75
Seizing the potential of e-government	78
Ensuring education and training is geared to digitalisation	83
Helping households and workers handle digitalisation	84
Findings and recommendations	86
References	87
4 Pressing ahead with the green transition	93
Introduction	94
Past progress and future challenges in emission reduction	95
Getting the right mix of instruments for decarbonisation	99
Decarbonising electricity generation	104
Promoting smart manufacturing	108
Reducing emissions in the transport sector	109
Shifting to cleaner household energy use and making buildings more energy efficient	114
Reducing emissions and protecting ecosystems in land- and sea-use	115

Preparing workers for the green economy	116
Adapting to a changing climate	117
Findings and recommendations	123
References	125

FIGURES

Figure 1. Growth has recovered	10
Figure 2. Economic convergence has stalled	11
Figure 3. The penetration of fibre remains low	12
Figure 4. Indonesia needs to further slow down and eventually reverse the increase in GHG emissions	13
Figure 1.1. Growth has recovered but economic activity remains below the pre-crisis trend	16
Figure 1.2. Indonesian exporters have benefited from high international demand for commodities	17
Figure 1.3. Inflation has normalised and unemployment is falling but informality has increased	18
Figure 1.4. Indonesia's balance of payment has been in surplus and reserves have increased	19
Figure 1.5. Surveys and high-frequency indicators point to robust domestic demand	20
Figure 1.6. BI has been successful at anchoring core inflation	22
Figure 1.7. Higher interest rates have supported the Rupiah	23
Figure 1.8. Credit and investment are dynamic, and asset prices are declining in real terms	23
Figure 1.9. Foreign ownership of government debt has fallen	24
Figure 1.10. Indonesia has returned its fiscal deficit to below 3% of GDP	26
Figure 1.11. Increased demand for public spending could put public finances under stress	27
Figure 1.12. The tax ratio remains low in Indonesia	29
Figure 2.1. In recent years GDP per capita has stopped catching-up with the OECD area	39
Figure 2.2. Poverty continues to trend downwards	40
Figure 2.3. Child malnutrition has steadily declined	40
Figure 2.4. Productivity performance has been weak	42
Figure 2.5. Participation in global value chains is low, and relatively few firms engage in foreign trade	43
Figure 2.6. The gender gap in labour force participation remains significant	45
Figure 2.7. Student performance in PISA tests is low and has declined in recent years	46
Figure 2.8. Despite progress, Indonesia's PMR scores still indicate a relatively restrictive environment for business	49
Figure 2.9. Corruption is still perceived to be widespread	53
Figure 2.10. Non-tariff trade barriers are broadly low but include numerous local-content requirements	55
Figure 2.11. Regulatory restrictions are high on services trade and foreign direct investment	56
Figure 2.12. Research and development activity is relatively low	60
Figure 3.1. The mobile market is saturated but fixed broadband penetration is low	69
Figure 3.2. Broadband speed is low	70
Figure 3.3. The digital divide between urban and rural areas is deep	71
Figure 3.4. Estimated probability of having access to internet	72
Figure 3.5. Firms' adoption of digital technologies is modest	76
Figure 3.6. Access to finance is a significant problem for SMEs	77
Figure 3.7. There is scope to further develop e-government	79
Figure 3.8. As elsewhere, cybersecurity incidents are common	80
Figure 4.1. Indonesia needs to sustain GHG emission reductions to reach net zero	94
Figure 4.2. Emissions continue to increase steadily, except those relating to land use	96
Figure 4.3 Further decoupling is needed to achieve net zero emissions while raising living standards	97
Figure 4.4. The contribution of market-based instruments to total climate action is limited	100
Figure 4.5. Implicit fuel subsidies have become more significant in recent years	103
Figure 4.6. In Indonesia, energy-related emissions dominate total GHG emissions	104
Figure 4.7. Indonesia has a long way to go in decarbonising energy supply	105
Figure 4.8. There is ample room for reducing GHG emissions from road transport	109
Figure 4.9. The car fleet is smaller than in ASEAN peers	111
Figure 4.10. Electric vehicles diffusion is slow in Indonesia	111
Figure 4.11. Using cars less would reduce Indonesia's high incidence of accidents and congestion	113
Figure 4.12. Investing more in rail would make train use more attractive	113
Figure 4.13. Climate change is a challenge for workers, but the green transition opens new opportunities	117
Figure 4.14. Floods are the most frequent climate-related events	119
Figure 4.15. Extreme weather and climate-related events damage the economy	119

Figure 4.16. The agriculture sector relies heavily on freshwater, while water stress is relatively moderate	120
Figure 4.17. Indonesia's insurance coverage for climate-related damage is higher than in peers	122

TABLES

Table 1. Steady growth is projected	10
Table 1.1. Growth will remain steady	21
Table 1.2. Events that could lead to major changes in the outlook	21
Table 1.3. Past OECD recommendations on monetary policy	25
Table 1.4. Past OECD recommendations on raising revenues	30
Table 1.5. Illustrative impact of structural tax reforms	31
Table 2.1. Past OECD recommendations on fighting informality and enhancing inclusion	45
Table 2.2. Past OECD recommendations on education and training	48
Table 2.3. Past OECD recommendations on State-Owned Enterprises and government intervention	49
Table 4.1. Main policy targets and measures for achieving the green economy transition	98
Table 4.2. Key green economy policy texts	99
Table 4.3. Comparing mitigation policy instruments	101
Table 4.4. Indonesia plans to expand the share of electricity generated from renewable sources	107
Table 4.5. Main initiatives in disaster risk management	118

BOXES

Box 1.1. Bank Indonesia's inflation targeting setup	22
Box 1.2. Islamic finance in Indonesia	22
Box 1.3. Indonesia's old-age pension systems	28
Box 1.4. Key factors for improving tax administration	32
Box 2.1. Reducing stunting	40
Box 2.2. Boosting tourism	44
Box 2.3. Primary and secondary education in Indonesia	47
Box 2.4. Recent regulatory reforms in Indonesia	50
Box 2.5. The Corruption Eradication Commission (KPK)	52
Box 2.6. Recent trade agreements completed or underway	53
Box 2.7. Supply and demand industrial policies in OECD and non-OECD countries	58
Box 3.1. Digitalisation strategies and policies	68
Box 3.2. What explains the divide in Internet access in Indonesia?	72
Box 3.3. Indonesia's unicorns and venture capital eco-system	75
Box 3.4. Protecting personal data – the experience of Australia and Singapore	80
Box 3.5. Using digital IDs to access e-government: the experience of Estonia and Denmark	81
Box 4.1. Indonesia's main policy plans and goals for the green economy transition	98
Box 4.2. Using a mix of policy instruments to cut GHG emissions at lowest cost	101
Box 4.3. Cutting energy subsidies while shielding the most vulnerable – the experience of 2013-2018	103
Box 4.4. The Just Energy Transition Partnership and the Energy Transition Mechanism	106
Box 4.5. Indonesia's air quality challenges	109
Box 4.6. Cutting emissions from shipping without raising the cost of transporting people and goods	110
Box 4.7. Indonesia's kerosene-to-LPG programme (2007-2012)	115

Basic statistics of Indonesia, 2024

(Numbers in parentheses refer to the OECD average)¹

LAND, PEOPLE AND ELECTORAL CYCLE					
Population (million)	277.5		Population density per km²	146.6	(39.2)
Under 15 (%)	24.9	(17.0)	Life expectancy at birth (years, 2022)	68.3	(79.6)
Over 65 (%)	7.0	(18.3)	Men (2022)	66.2	(77.0)
International migrant stock (% of population, 2020)	0.1	(13.9)	Women (2022)	70.4	(82.4)
Latest 5-year average growth (%)	0.8	(0.4)	Latest general election	February-2024	
ECONOMY					
Gross domestic product (GDP)			Value added shares (%)		
In current prices (billion USD)	1 371.6		Agriculture, forestry and fishing	13.1	(2.8)
In current prices (trillion IDR)	20 892. 3		Industry including construction	42.1	(27.2)
Latest 5-year average real growth (%)	3.4	(1.7)	Services	44.8	(70.0)
Per capita (thousand USD PPP)²	15.6	(59.0)			
GENERAL GOVERNMENT					
Per cent of GDP					
Expenditure	16.7	(43.9)	Gross financial debt (2022)	45.3	(109.5)
Revenue	15.0	(39.0)	Net financial debt (2022)	16.2	(66.9)
EXTERNAL ACCOUNTS					
Exchange rate (IDR per USD)	15 232.29		Main exports (% of total merchandise exports, 2022)		
PPP exchange rate (USA = 1)	4 821.59		Fuels	24.3	
In per cent of GDP			Metals	14.4	
Exports of goods and services	21.7	(31.3)	Vegetable	13.5	
Imports of goods and services	19.6	(31.2)	Main imports (% of total merchandise imports, 2022)		
Current account balance	-0.1	(-0.3)	Machinery and electronics	24.4	
Net international investment position (2020)	-26.4		Fuels	18.9	
			Metals	10.2	
LABOUR MARKET, SKILLS AND INNOVATION					
Employment rate (aged 15 and over, %)	65.7	(58.0)	Unemployment rate, Labour Force Survey (aged 15 and over)	5.3	(4.8)
Men	79.4	(65.5)	Youth (aged 15-24, %)	13.1	(10.6)
Women	51.7	(50.8)	Long-term unemployed (1 year and over, %)	1.1	(1.0)
Participation rate (aged 15 and over, %)	67.9	(60.9)	Tertiary educational attainment (aged 25-64, %, 2022, OECD: 2023)	13.1	(41.0)
Mean weekly hours worked	38	(37.3)	Gross domestic expenditure on R&D (% of GDP, 2020, OECD: 2021)	0.3	(2.9)
ENVIRONMENT					
Total primary energy supply per capita (toe, 2022, OECD: 2022)	0.9	(3.8)	CO2 emissions from fuel combustion per capita (tonnes, 2022, OECD: 2023)	2.4	(7.6)
Renewables (% , 2022, OECD: 2023)	22.8	(12.5)			
Exposure to air pollution (more than 10 g/m³ of PM 2.5, % of population, 2020)	98.5	(56.5)			
SOCIETY					
Income inequality (Gini coefficient, OECD: latest available)	0.361	(0.315)	Education outcomes (PISA 2022 score)		
Poverty gap at USD 3.65 a day (2017 PPP, %)	3.6		Reading	359	(476)
Public and private spending (% of GDP)			Mathematics	366	(472)
Health care (2021, OECD: 2022)	3.7	(9.2)	Science	383	(485)
Education (public spending, % of GNI, 2021)	3.3	(4.4)	Share of women in parliament (%)	21.6	(32.8)

1. The year refers to the latest calendar year (2023) unless otherwise indicated. 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.

2. OECD aggregate refers to weighted average.

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



Executive Summary

Key messages

- GDP growth has recovered but prudent monetary and fiscal policies are needed to retain macroeconomic stability. In the longer run, fiscal revenues must increase to cover growing societal needs and meet the challenges of climate change and population ageing.
- Faster growth is required to reach the government's goal of advanced-economy status by mid-century. Education, infrastructure and formal employment should be enhanced, while the environment for business can improve further.
- Digital infrastructure needs are only partly met. Digital access and adoption among business fall short, and related skills remain insufficient. Removing unnecessary regulations could spur the digital transition.
- Decarbonisation needs to be stepped up by further reducing coal-fired generation, expanding the share of renewables in the energy mix, reinforcing market mechanisms, and investing in mass transport.

GDP growth has recovered and macroeconomic policies should remain prudent

Monetary and fiscal policies should remain prudent and data-dependent. GDP growth has rebounded from the COVID-19 recession and inflation has declined markedly, but exposure to global uncertainty remains high. Government spending and revenue are low in international comparison and future spending pressures require an increase in tax revenues. The tax bases for VAT and income taxation should be broadened and spending should be made more efficient.

Output increased by 5.0% in 2023 (Figure 1).

Private consumption remains the main engine of growth, while export volumes have benefited from buoyant global demand for commodities. International tourism has largely recovered from the decline caused by the pandemic. Investment has remained dynamic, partly due to public infrastructure projects. However, growth in recent years has been insufficient to bring convergence in income towards advanced economies; GDP per capita has remained around one quarter of the OECD average since 2010.

Inflation has returned to target. Headline inflation peaked at 6.0% in September 2022 amid surging food and energy prices. High interest rates and currency strengthening have tamed price growth. In October 2024, headline inflation was 1.7%, within the central bank's 1.5% - 3.5% target band. Bank Indonesia's policy rate was lowered to 6% in September 2024.

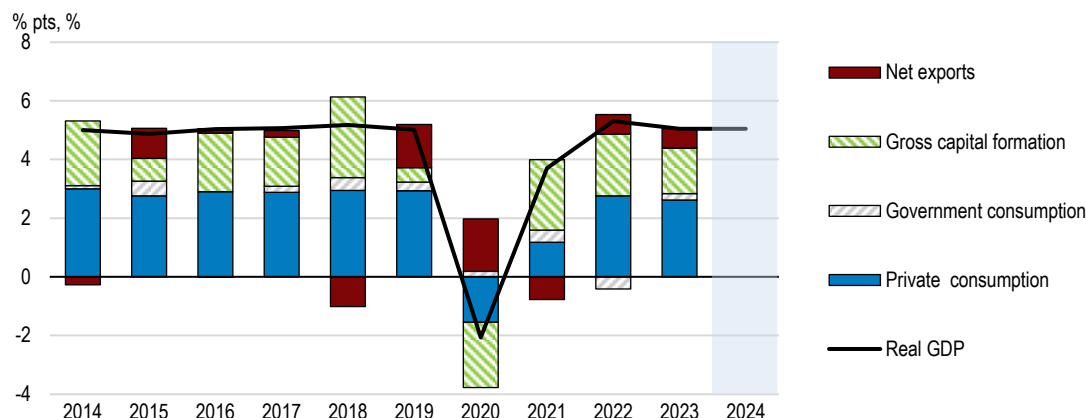
GDP growth is projected to remain robust, at 5.1% in 2024 and 5.2% in 2025 (Table 1). Consumption will remain strong and private investment is likely to pick up. The fiscal deficit will be widened somewhat

by public spending on the new capital city, Nusantara, but is projected to remain below the 3% limit. Bank Indonesia is expected to continue reducing the policy rate in late 2024 and in 2025. Renewed inflationary tensions and pressure on the Rupiah present downside risks which could slow down interest rate cuts.

While fiscal balances are set to remain within target over the projection period, they will come under strain over the longer term. Spending pressures will grow due to the green transition and increasing demand for public services by a more affluent and older population. There is scope for structural increases in revenues to cover greater spending needs. Broadening the tax base, including through fewer exemptions and stronger enforcement is needed, as well as increasing enrolment in old-age pension schemes. The planned rollout of the "free nutritious meal" programme in schools should be gradual and targeted on the poorest. Greater attention to the efficiency of spending is required, including through further reductions of energy subsidies and cost monitoring for new spending.

Figure 1. Growth has recovered

Contribution to real GDP growth



Note: Provisional economic forecast for 2024 by OECD in November 2024.

Source: OECD Economic Outlook 116 (preliminary); and OECD calculations.

StatLink  <https://stat.link/5tsqy1>**Table 1. Steady growth is projected**

Annual growth rates, %, unless specified

	2022	2023	2024	2025
Gross domestic product	5.3	5.0	5.1	5.2
Private consumption	5.0	4.9	5.1	5.1
Gross fixed capital formation	3.9	4.4	4.8	6.8
Exports	16.2	1.3	5.5	5.1
Imports	15.0	-1.6	6.4	6.3
Headline CPI inflation	4.2	3.7	2.3	2.2
Current account balance (% of GDP)	1.0	-0.1	-0.4	-0.3
General government budget balance (% of GDP)	-2.2	-1.5	-2.7	-2.5

Note: Provisional economic forecast for 2024 and 2025 by OECD in November 2024.

Source: OECD Economic Outlook 116 (preliminary); and OECD calculations.

Accelerating growth and attaining socioeconomic convergence

Real income per capita has more than doubled over the past quarter of century, and extreme poverty has declined. However, over the past decade economic growth has not been sufficient to bring further economic convergence in GDP per capita (Figure 2), reflecting slowing labour productivity growth. Indonesia has room to benefit more from integration in global value chains. Education, skills, and participation in formal employment should be enhanced, while the environment for business can improve further. Pro-active industrial and trade policies should be targeted, monitored, and time-bound.

Unemployment has receded, but the labour market remains fragile and informality is high.

The unemployment rate has fallen from 7.1% in mid-2020, at the peak of the pandemic, to 4.9% in mid-2024, below the pre-pandemic prevailing range of 5–5.5%. Indonesia should reduce the gender gap in the

employment rate, as well as informality, to make the most of its workforce. Shifting the funding of maternity leave from employers to social insurance would bolster formal employment among women.

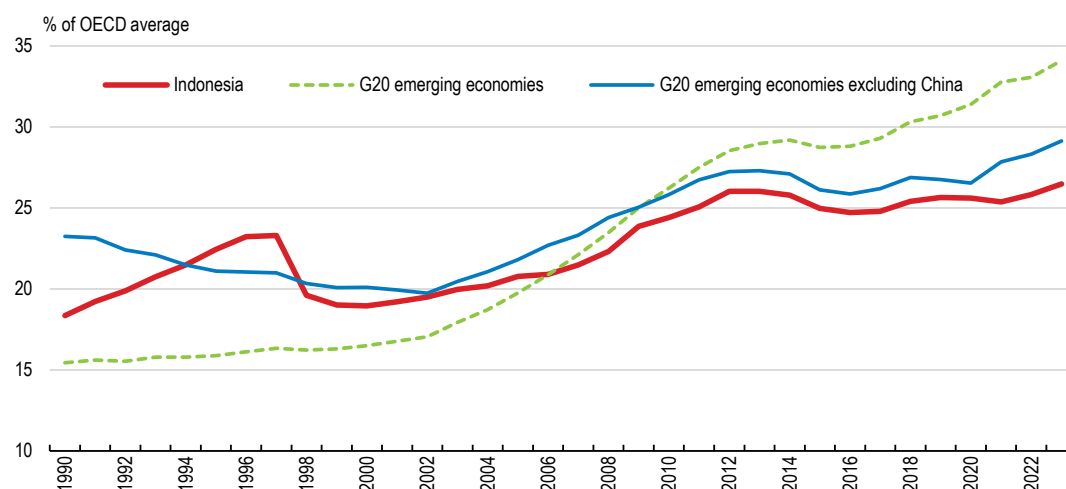
Reaping the demographic dividends from a young population requires quality education.

Basic education is almost universal in Indonesia, but the quality is often poor, with significant variation across provinces, contributing to a shortage of skilled workers. Campaigns to

strengthen skills training must be continued, including through incentives for employers. In primary and secondary education, harmonising curricula and increasing funding is essential.

Figure 2. Economic convergence has stalled

GDP per capita relative to OECD



Note: Data are based on nominal GDP adjusted for purchasing power parity (PPP, current international dollar). G20 emerging economies excluding Indonesia: Argentina, Brazil, China, India, Mexico, Russia, Saudi Arabia, South Africa, and Türkiye.

Source: OECD (2024), OECD National Accounts Statistics (database); and World Bank (2024), World Development Indicators.

StatLink  <https://stat.link/px8v5w>

Further improving the business environment would boost productivity and help achieve economic convergence. There is scope to lower barriers to foreign investment and trade, better enforce competitive neutrality, as well as rationalise and improve the governance of SOEs. Reducing non-tariff barriers to trade such as import and export licenses would broadly increase productivity and trade integration.

Greater efforts in combatting corruption and abuses of market power would also help foster a more competitive and productive business sector.

The government aims to expand economic activity around raw material extraction, but this policy requires caution. Industrial policies to spur domestic downstream nickel processing have attracted investors' interest. However, there are implementation risks, including overshoot in processing capacity and fiscal impacts.

Reaping the benefits of digitalisation

Indonesia has further scope to harness digitalisation. Geographic, gender and age-related gaps in individuals' access to, and adoption of, the Internet and related tools need to be closed. Access and adoption among business also lags developments in peer countries. Faster deployment of 5G technology and fixed broadband is key. Digitalisation skills are still insufficient and STEM education must be broadened.

The digital sector represents a growing share of the economy. Digitalisation is advancing and digital-technology unicorn companies are emerging. However, disparities persist across

individuals and firms in access to, and use of, digital technologies. Faster broadband deployment to overcome geographical, education, gender, and income gaps in the

adoption of digital technologies is a major challenge.

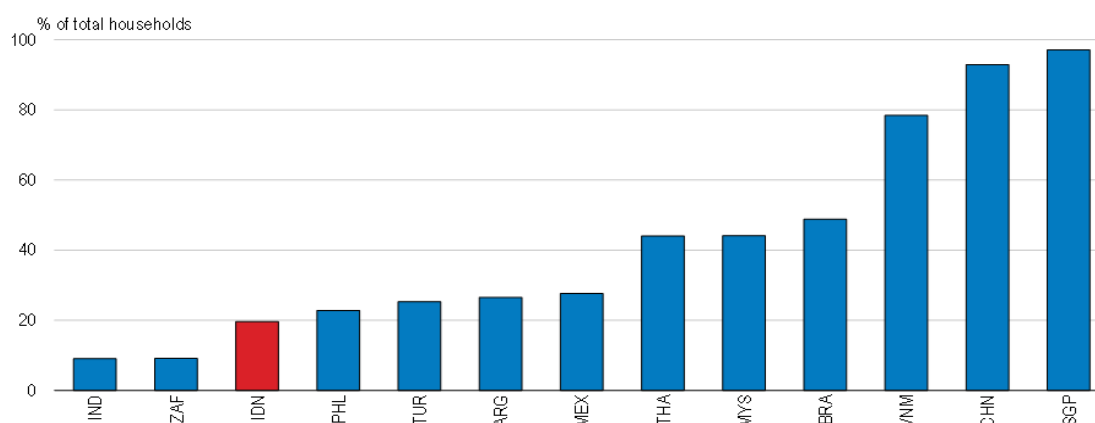
Investing in high-speed broadband is crucial (Figure 3). Improvements in Indonesia's mobile and fixed communications systems are compromised by complicated procedures for obtaining access to public infrastructure. In telecoms services, the absence of an independent regulatory body is a concern.

Aligning education and digitalisation is essential. The latest PISA scores show that many students have relatively low educational attainment and insufficient skills to make full use of digital technologies. The education system could also benefit from a greater use of digital tools.

Much of Indonesia's economy makes relatively little use of digital tools. Enhancing digitalisation across all business sectors, including agriculture, would help spur productivity and growth. Access to finance is difficult for digital firms that mostly have intangible assets that are not accepted as collateral. Further promoting the digitalisation of the business sector and SMEs is also needed. Removing regulations that weigh on digital firms (e.g. by limiting e-commerce activities) would help. Easing access to government data for business purposes could open new opportunities and generate additional benefits, provided digital security is better guaranteed.

Figure 3. The penetration of fibre remains low

Number of fibre-based subscribers as a share of total households, September 2023



Note: The fibre penetration rate is the share of the number of subscribers for Fibre to the Home (FTTH) and Fibre to the Building (FTTB) in the total households.

Source: FTTH Council Europe, FTTH/B Global Ranking 2024.

StatLink  <https://stat.link/sv8h3b>

Achieving the green transition

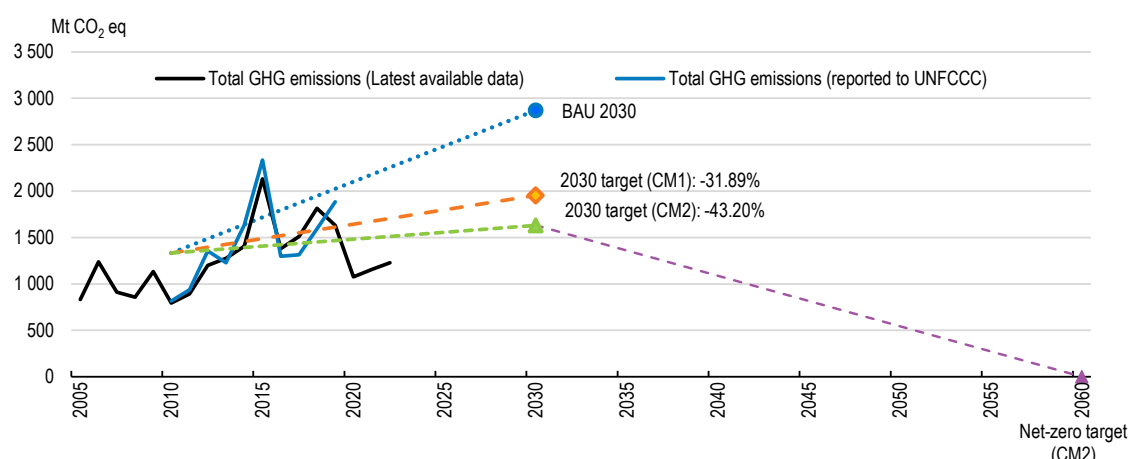
Indonesia is vulnerable to the impacts of global warming. In addition, the country's goal of reaching net-zero greenhouse gas (GHG) emissions by 2060 is challenging in the context of economic convergence. Decarbonisation needs to be further stepped up, in particular by accelerating the decommissioning of coal-fired power plants, expanding renewable energy generation, implementing carbon taxation, modernising the electricity grid, and investing in mass urban transport and rail transport. Mainstreaming climate-change adaptation requires strengthening institutional capacities, governance mechanisms, and planning and programming frameworks, also with international support.

Replacing fossil fuels so that GHG emissions peak no later than 2030 and reach net zero by 2060 (Figure 4) requires considerable investments. The economic and human cost of business-as-usual emission scenarios is large and Indonesia has committed to ambitious targets for reducing GHG emissions. The cost of mitigation efforts will be concentrated over the next few years. The Just Energy Transition Partnership can make Indonesia a model for ensuring a green transition.

Reducing the environmental impact of the energy sector is a policy priority. Shifting to low-emitting energy sources such as solar, wind and geothermal requires considerable investment, including in the electricity transmission system. To enhance private investment, it is important to ensure that the state-owned vertically integrated energy company acts responsibly as the sole off-taker on the energy market.

Figure 4. Indonesia needs to further slow down and eventually reverse the increase in GHG emissions

GHG emissions: trends and targets, 2005-60



Note: Business-as-usual (BAU) projections and countermeasures (unconditional and conditional mitigation scenarios, CM1 and CM2) from the Enhanced Nationally Determined Contribution Report by Indonesia to the UNFCCC (2022).

Source: Laporan Inventarisasi Gas Rumah Kaca (GRK) Dan Monitoring, Pelaporan, Verifikasi (MPV) 2023, Volume 9, Januari 2024; and MoEF (2022), Enhanced Nationally Determined Contribution (NDC) under the United Nations Framework Convention on Climate Change (UNFCCC).

StatLink  <https://stat.link/yjzb71>

The transition to a more price-based energy market needs to be accelerated. Regulatory responsibilities should be transferred to an independent authority with sufficient powers and financial resources. The implementation of an appropriate carbon tax should be accelerated.

Transport is the second-largest source of GHG emissions. Efficient and extensive urban and inter-city mass transport systems must be developed to lower emissions and cope with surging traffic. Accelerating the replacement of traditional combustion engine vehicles with zero- or low-emission alternatives will be essential.

Indonesia also needs to step up its adaptation policies. The risk and cost of more frequent flooding and drought will increase with climate

change. Better land-use regulations, as well as wider insurance coverage, can help mitigate the impact on businesses and people.

Resolute action to protect forests and the ocean must continue. The rate of deforestation is the lowest in 20 years. However, further efforts are needed to protect peatlands and forests as part of mitigation strategies and to help reduce the impact of climate-related natural disasters.

MAIN FINDINGS	KEY RECOMMENDATIONS
Maintaining effective macroeconomic policies	
Inflation has moderated, though inflationary risks persist.	Maintain prudent, forward looking, data-dependent monetary policy, making interest rate cuts conditional upon inflation developments.
Fiscal policy has been prudent over the past two decades and debt remains moderate. Yet, borrowing costs remain high and limited taxation revenues expose the country to debt rollover risks.	Avoid fiscal slippage, ensure the value for money of new spending commitments, and maintain the deficit to GDP ratio remains below the mandated ceiling.
Public provision of key services can be expected to grow over time reflecting increasing societal demand and rising investment needs as Indonesia's economy develops further.	Ensure a medium-term fiscal strategy that takes steps to increase revenues as a share of GDP in order to fund spending priorities, notably in education, infrastructure and reducing informality.
Fiscal revenues are modest in international comparison, including relative to other countries in the region. This limits space for counter-cyclical actions as well as future social and green spending needs.	Broaden the tax base, including by lowering the personal income tax basic allowance (PTKP) and upper thresholds of the tax schedule. Broaden the VAT base and lower the compulsory registration threshold.
Attaining long-run economic convergence	
Employers must provide 3-months paid maternity leave, but compliance can be low, especially in small firms. This contributes to lower levels of female labour force participation and formal employment.	Shift the funding of maternity leave from employer to social insurance or general taxation; focus support on low-wage earners.
School performance has fallen according to PISA indicators, and Indonesia remains significantly below other OECD economies. Different curricula apply to secular and religious schools with large heterogeneity.	Further improve education, including by harmonising the secondary-school curricula and ensuring consistency nationally, to provide a broader core knowledge across all pupils.
The scope of SOEs and their share of GDP are higher than the OECD average, as well as comparable emerging market economies.	Develop a state ownership strategy that defines more clearly the sectors where government ownership remains relevant.
The autonomy of the Corruption Eradication Commission (KPK) has been hindered by the 2019 reform, leading to perceptions of a lack of independence.	Safeguard the independence, autonomy and authority of the KPK to ensure the effective prevention, detection and investigation of corruption.
Trade restrictions remain widespread (including the recently introduced Commodity Balance Mechanism) and hinder participation in global value chains.	Reduce the number of sectors where import and export quotas apply; do not expand the Commodity Balance Mechanism to other goods.
Proactive policies have been introduced to develop domestic downstream activities. Some success has been achieved in developing nickel smelters and processing facilities, but implementation risks remain very significant.	Ensure industrial policy addresses market failures and subject policy measures to cost-benefit analysis in relation to precisely defined targets
Enhancing digitalisation	
Nationwide deployment of 5G infrastructure is particularly costly given Indonesia's archipelagic geography.	Subject digital infrastructure investments to granular cost-benefit analysis.
Rollout of high-speed internet infrastructure needs to be faster. The communication regulator has been suppressed. Direct and indirect state participation in communication operators generates potential conflicts of interest and risks undermining competitive neutrality.	Reduce barriers to broadband deployment through simplified procedures for obtaining permits for infrastructure installation, including for access to public infrastructure. Establish a fully independent and well-resourced communication regulator.
The business potential of digital transformation is not being fully exploited. Adoption of digital tools lags OECD countries, particularly among SMEs.	Further boost public support to SMEs, in cooperation with the business sector, through targeted programmes to facilitate the adoption of digital tools.
The foundation and specific skills for harnessing digitalisation are weak. The pool of ICT professionals is small and the gender composition is biased.	Give digital competences more prominence in the school curriculum, upgrade the digital skills of teachers and principals, and encourage girls' participation in STEM education.
Confronting climate change and the green transition	
The effective price of carbon is distorted by poorly targeted fuel subsidies. Subsidies on liquid petroleum gas (LPG) are meant to only benefit targeted households, but many other households also receive them.	Gradually reduce energy subsidies (including on LPG) and compensate vulnerable households through better targeted support.
Coal-fired power plants generate over half of Indonesia's electricity supply. Support for transition away from coal includes funds from the international multi-donor Just Energy Transition Partnership (JETP).	Accelerate early decommissioning of coal-fired power plants, conditional on funds' availability and energy security considerations.
There is scope to improve the structure of electricity supply. The State electricity company is the sole off-taker on the electricity market and regulation makes renewable power prices unattractive.	Transfer regulatory responsibilities to a new independent authority. Provide this body with appropriate technical capacity and financial resources. Establish a robust, stable, substantial, and multi-year pipeline of auctions for renewable-energy generation, with competitive and transparent tariff-setting.
Mass urban and intercity transport systems are underdeveloped. High reliance on road transport, especially internal-combustion engine vehicles, contributes to greenhouse gas emissions, high levels of road fatalities and traffic congestion, as well as poor urban air quality.	Increase investment in mass urban and intercity transport systems, subjecting projects to rigorous cost-benefit analysis. Gradually dissuade car use, for example by introducing road pricing and congestion charges.
Negative impacts of climate change can be reduced by adapting public infrastructure and reallocating activities away from more affected areas. Indonesia's coastal cities are particularly vulnerable to climate change.	Incorporate climate resilience planning for the future climate into infrastructure planning, procurement and spatial planning rules.

1 Deepening the macroeconomic foundations for inclusive growth

Charles Dennergy, OECD

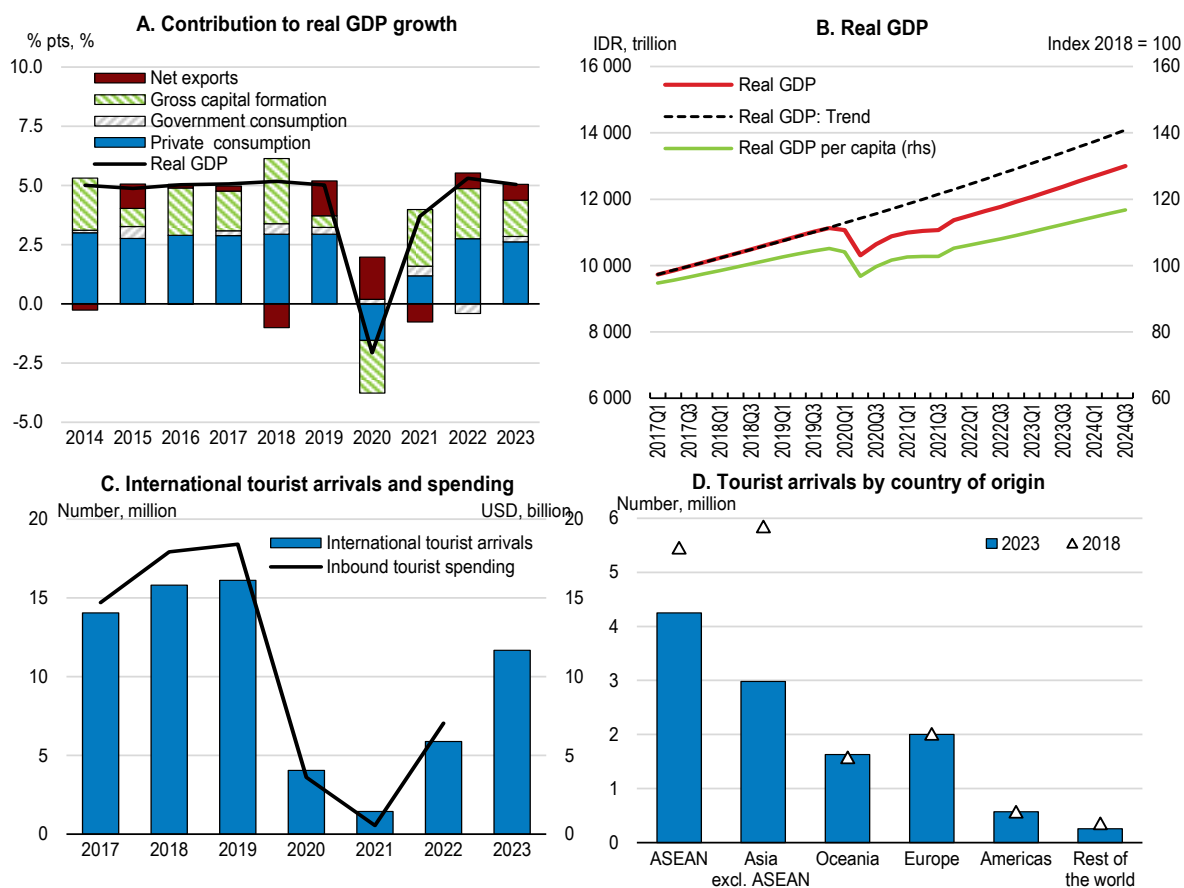
GDP growth has rebounded after the pandemic, led by buoyant consumption and strong export demand. High interest rates have produced a marked decline in inflation after the global surge in 2022, yet monetary policy should remain cautious and data-dependent. Fiscal policy should also remain prudent and the deficit limit should be upheld. Government revenues are low in international comparison and likely medium-term spending pressures will require an increase in tax revenues. The tax base for VAT and income taxation should be broadened and spending should be made more efficient.

The economy remains strong

Output growth has returned to pre-pandemic levels

Real GDP grew by 5.3% in 2022 and 5.0% in 2023, in line with the pre-pandemic average of 5% (Figure 1.1, Panel A). Similar rates of growth are expected for 2024 and 2025 (see below). However, as in many other countries, the level of economic activity has remained below the pre-pandemic trend (Panel B); the gap currently stands at about eight percentage points. Private consumption has been buoyant since 2022, while exports have been boosted by high international demand for commodities. Tourism (5% of GDP and 10% of employment in 2019, before the pandemic) has partly recovered, although tourist arrivals and spending from Asia (both ASEAN and non-ASEAN markets) remain well below pre-pandemic levels. After contracting strongly in 2020, gross fixed capital formation rebounded in 2021 and has remained strong since.

Figure 1.1. Growth has recovered but economic activity remains below the pre-crisis trend



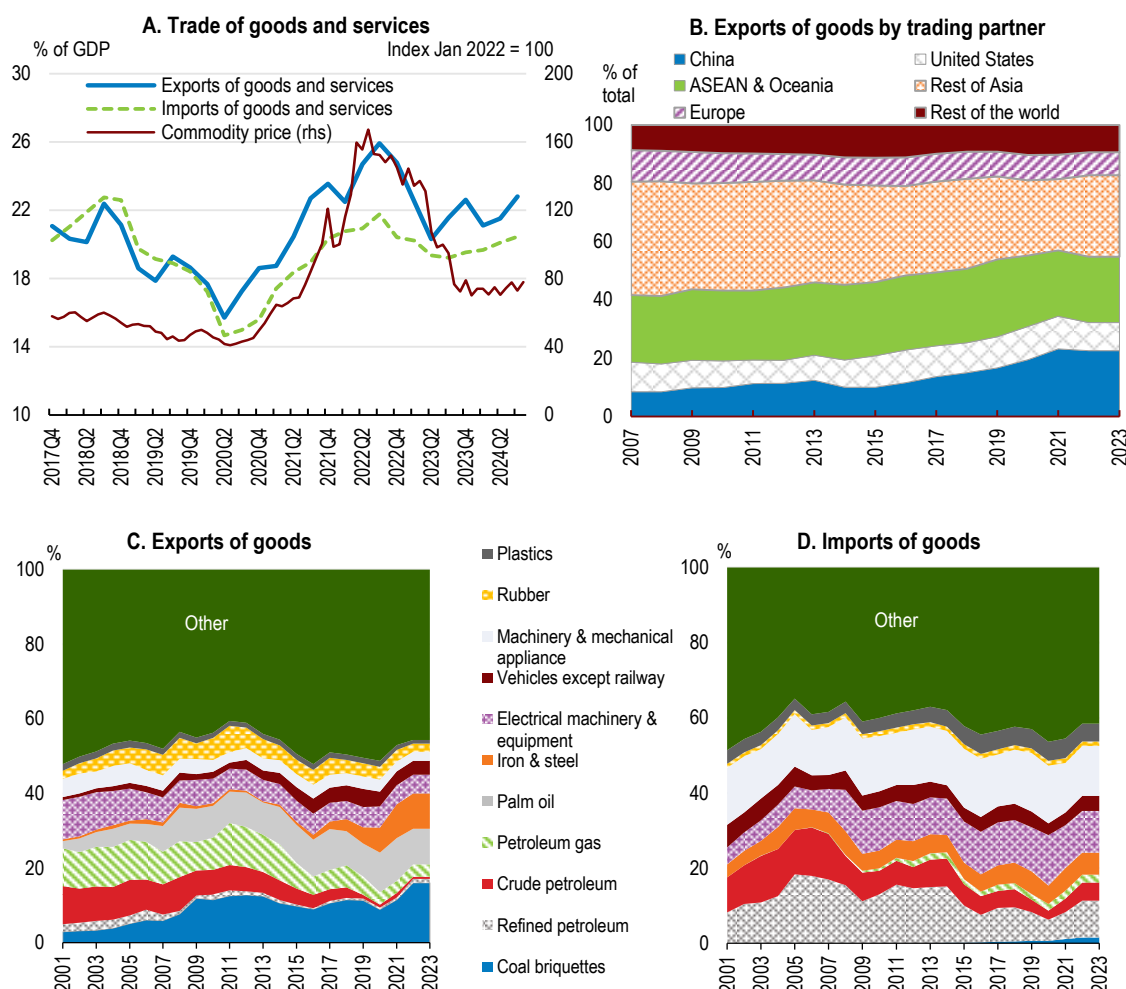
Note: The trend line for real GDP (Panel B) is calculated based on pre-crisis data from 2013Q1 to 2019Q4. The population data from Q1 to Q3 2024 are estimated. Inbound tourist arrivals refer to non-residents (foreign visitors and nationals permanently residing abroad) within Indonesia's economic territory. Source: OECD (2024), OECD Economic Outlook: Statistics and Projections (database); OECD National Accounts Statistics (database); Statistics Indonesia (BPS), Tourism Statistics (database); and World Tourism Organization.

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Rising global geopolitical tensions have had contrasting effects on Indonesia. Russia's war of aggression against Ukraine initially increased the price of energy, food and fertilisers, hitting purchasing power. Meanwhile, surging prices for commodities such as coal, palm oil and metals have improved the terms of trade. And, despite the slowdown in global trade growth (caused, *inter alia*, by lower global growth and trade

tensions, notably between the United States and China), Indonesia has benefited from strong commodity demand. Furthermore, modest trade ties with Europe (accounting for around 11% of exports and 5% of imports) make the country less directly exposed to disruptions in the Red Sea than other Asian economies. Exports surged in 2022 (Figure 1.2, Panel A). Lower international demand and commodity prices, combined with stronger domestic demand, reduced net exports in 2023. Commodities continue to dominate the composition of merchandise exports, but diversification efforts and down-streaming policies (Chapter 2) have led to increased exports in processed metal and motor vehicles in recent years (Figure 1.2, Panel C).

Figure 1.2. Indonesian exporters have benefited from high international demand for commodities



Note: In Panel A, the price indices for individual commodities (palm oil, coal, iron ore, gold, and nickel) are aggregated by using weights based on the share of each commodity in total 2021 exports of these commodities.

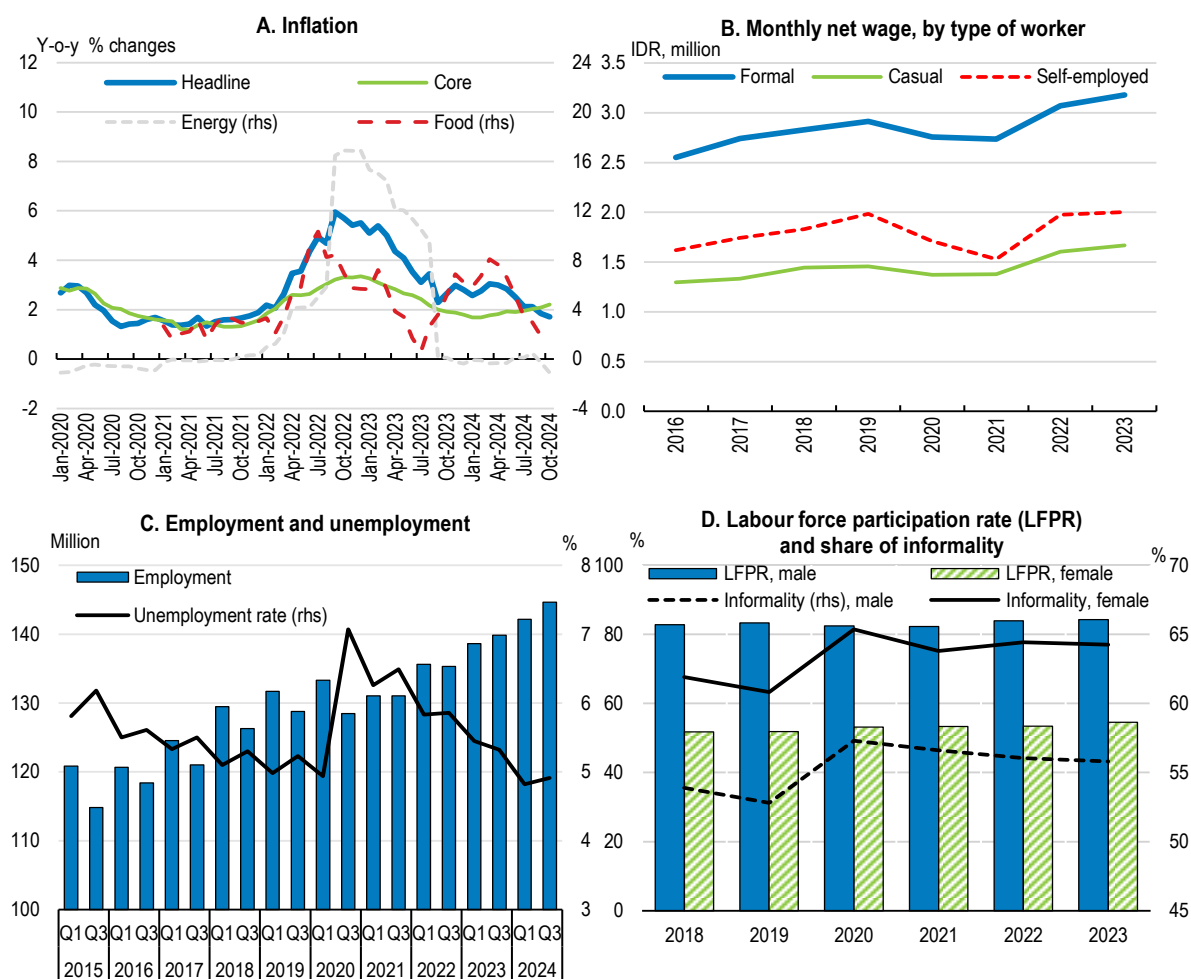
Source: OECD (2024), OECD Economic Outlook: Statistics and Projections (database); Ministry of Energy and Mineral Resources of Indonesia; and World Bank Commodity Markets Outlook; and OECD calculations based on UN Comtrade.

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Reflecting the war in Ukraine and the associated increase in global food and energy prices, headline inflation rose from 2.2% in January 2022 to a peak of 6.0% in September 2022. The relative strength of the Rupiah – as well as the presence of administered prices for fuel, electricity, and other commodities – cushioned the effects of the crisis. The government's decision to cut energy subsidies in September 2022 and partly replace them with cash transfers initially fed into higher headline inflation (for instance, gasoline prices increased by about 30% following the cut in the subsidy). Higher interest rates (see below) and close synergy between the central bank and the government helped tame price increases and headline

inflation fell to 2.3% in September 2023. Headline inflation rose to 3% in March 2024, largely due to the effects of El Niño on the rice harvest season, before falling back; in October 2024, it reached 1.7% (Figure 1.3, Panel A). Meanwhile, core inflation has stayed around 2% in recent quarters.

Figure 1.3. Inflation has normalised and unemployment is falling but informality has increased



Note: In Panel A, data are based on consumer price index with a base year of 2022 except for core, energy, and food inflation prior to January 2024 with a base year of 2018.

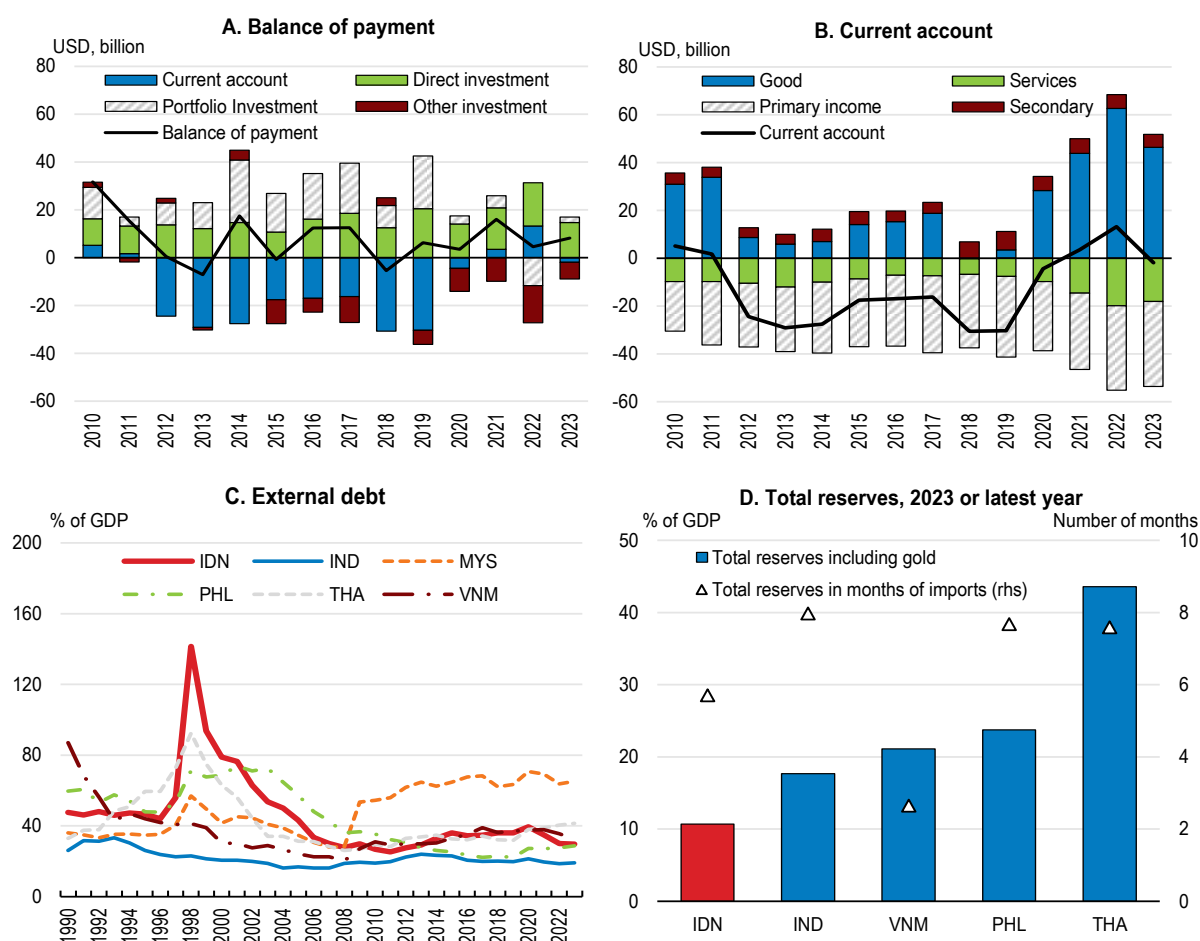
Source: CEIC; and Statistics Indonesia (BPS); and OECD (2024), OECD Economic Outlook: Statistics and Projections (database).

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While unemployment has declined to pre-pandemic levels, the labour market has not fully healed from scarring effects. The unemployment rate has fallen from 7.1% in the third quarter of 2020, at the peak of the pandemic, to 4.9% in mid-2024, just below the pre-pandemic range of 5–5.5% (Figure 1.3, Panel C). The labour force participation rate recovered and was the same in 2023 as in 2019 (69.3%, Figure 1.3, Panel D), with an additional 4.8 million workers being employed in mid-2024 (compared to a year earlier). However, the share of formal wage-earners declined between 2019 and 2023 (with an increase in the employment shares of both self-employed and informal workers). The increase in informal work signals a deterioration in labour market conditions and seems very slow to unwind. Labour market reforms carried out in 2020 and 2023, as well as other government initiatives, should eventually improve labour market outcomes and job quality (Chapter 2). Nominal wage growth in the formal sector has picked up (Figure 1.3, Panel B) but real wages have not recovered to pre-pandemic trend levels.

In recent years, the current account balance has often been negative, largely offset by positive net FDI inflows. The balance of payment surplus increased to USD 6.3 billion in 2023 (0.5% of GDP) (Figure 1.4, Panel A). The current account recorded a small deficit in 2023, after a USD 13.2 billion surplus (1% of GDP) in 2022 (Figure 1.4, Panel B). The lower trade surplus was the result of lower commodity demand and prices, along with the dynamism of domestic demand sustaining imports. The capital and financial account turned positive in 2023, while FDI inflows have remained strong (notably in manufacturing). After considerable outflows in 2022 caused by a lower risk appetite for emerging markets, Indonesia's portfolio investments rebounded in 2023. Reserve assets increased from USD 137 billion at end-2022 to USD 146 billion at end-2023 – on average over 2023, this represented 5.8 months of imports (Panel D). Asset reserves declined to USD 139 billion in May 2024 as the central bank intervened to maintain the stability of the Rupiah but have increased again, to USD 151 billion in October 2024.

Figure 1.4. Indonesia's balance of payment has been in surplus and reserves have increased



Note: In Panel A, data on capital account is not shown in bars, while it is included on data for balance of payment. In Panels A and B, provisional data for 2023. In Panel D, data for Viet Nam refer to 2022.

Source: Statistics Indonesia (BPS); IMF (2024), World Economic Outlook database, April; and World Bank (2024).

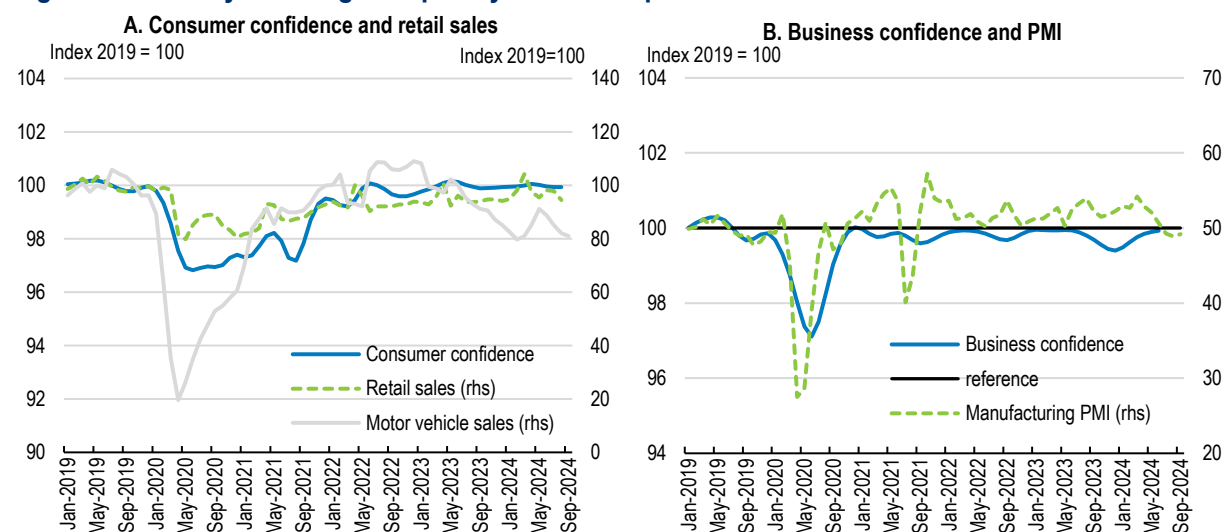
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Steady growth is projected but risks remain

Real GDP growth is projected to reach 5.1% in 2024 and 5.2% in 2025. Business and consumer confidence remains strong and private investment is expected to gain momentum. High-frequency spending indicators are generally less optimistic than survey measures. For example, new car and motorbike sales were lower

in the first three months of 2024 than in the corresponding months of 2022 and 2023 (Figure 1.5, Panel A). However, expiration of a post-Covid subsidy on some vehicle purchases, along with higher interest rates, likely explains this. Meanwhile, the purchasing-manager index (PMI) for manufacturing and the OECD's composite leading indicator point to more robust demand (Figure 1.5, Panel B). A resurgence of subsidies in 2024, planned expansion of the free school lunch programme, and investment in the new capital city, Nusantara, will make the fiscal stance more accommodative in 2024 and 2025. However, the deficit is expected to remain within the 3% limit over this period. Along with lower interest rates starting in late 2024, the fiscal stimulus will support domestic demand and output growth in 2024 and 2025. This fiscal position is broadly adequate, given the negative but closing output gap, and moderate core inflation readings.

Figure 1.5. Surveys and high-frequency indicators point to robust domestic demand



Note: In Panel B, PMI values below 50 indicate that a balance of firms reports a contraction in output.

Source: OECD (2024), OECD Main Economic indicators; CEIC and S&P Global.

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The labour share has fallen, reflecting the partial adjustment of wages to higher GDP per worker. This is expected to rebalance with real wages increasing more solidly over the projection horizon, while formal employment continues to gradually recover. Together with a more neutral output gap in 2024 and 2025, this will put some positive pressure on core and headline inflation, but annual headline inflation is expected to hover around 2.3% in 2024 and 2025 (Table 1.1). The trade deficit is expected to widen somewhat in 2024 and 2025, due to lower export prices and weak external demand while import growth picks up.

External uncertainties and risks are particularly prominent (Table 1.2). The economy remains reliant on international demand for raw materials and unprocessed commodities, notably from China, despite efforts to diversify markets and products (Chapter 2). Weaker than projected growth in China would hit export revenues and increase the trade deficit. Against this backdrop, fiscal and monetary policy settings should remain prudent.

Table 1.1. Growth will remain steady

Annual percentage change, volume (2010 prices)

	2020	2021	2022	2023	Projections	
	Current prices (IDR trillion)				2024	2025
Gross domestic product (GDP)	15 443.4	3.7	5.3	5.0	5.1	5.2
Private consumption	9 101.4	2.0	5.0	4.9	5.1	5.1
Government consumption	1 491.2	4.3	-4.5	2.9	7.5	0.1
Gross fixed capital formation	4 897.0	3.8	3.9	4.4	4.9	7.3
Final domestic demand	15 489.6	2.8	3.8	4.6	5.4	5.6
Stockbuilding ¹	-307.3	1.5	1.0	0.1	0.2	0.4
Total domestic demand	15 182.3	4.3	4.7	4.6	5.3	5.6
Exports of goods and services	2 676.5	18.0	16.2	1.3	5.6	5.3
Imports of goods and services	2 415.5	24.9	15.0	-1.6	6.4	6.5
Net exports ¹	261.0	-0.4	0.8	0.7	0.1	-0.0
Other indicators (growth rates, unless specified)						
Potential GDP		4.3	4.5	4.6	4.3	4.2
Output gap ²		-4.7	-4.0	-3.6	-2.9	-1.9
GDP deflator		6.0	9.6	1.5	0.9	2.3
Consumer price index		1.6	4.2	3.7	2.3	2.2
Current account balance ³		0.3	1.0	-0.1	-0.4	-0.3
General government fiscal balance ³		-4.4	-2.2	-1.5	-2.7	-2.5
Three-month money market rate, average		3.7	3.2	4.6	5.1	4.4
Ten-year government bond yield, average		6.4	7.0	6.6	6.2	6.0

Notes: 1. Contribution to changes in real GDP. 2. As a percentage of potential GDP. 3. As a percentage of GDP.

Source: OECD Economic Outlook 116 (preliminary) and OECD calculations (provisional OECD economic forecast in November 2024).

Table 1.2. Events that could lead to major changes in the outlook

Shock	Possible impact	Policy response options
New surge in food and energy prices.	Higher cost of living, and fiscal cost of subsidies.	Reform subsidies and make them more targeted.
Change in risk appetite for EMEs.	Decline in investors' appetite for risk could increase interest rates and lead to currency outflows.	Maintain prudent lending with adequate coverage ratio; keep an appropriate level of currency reserves.
Natural disasters.	Indonesia is prone to natural disasters (extreme weather, volcanic activity and earthquakes), which can entail large fiscal, economic and social costs.	Incorporate climate into financial stress tests and land planning regulations; promote insurance coverage.

High interest rates have supported the Rupiah and reduced inflation

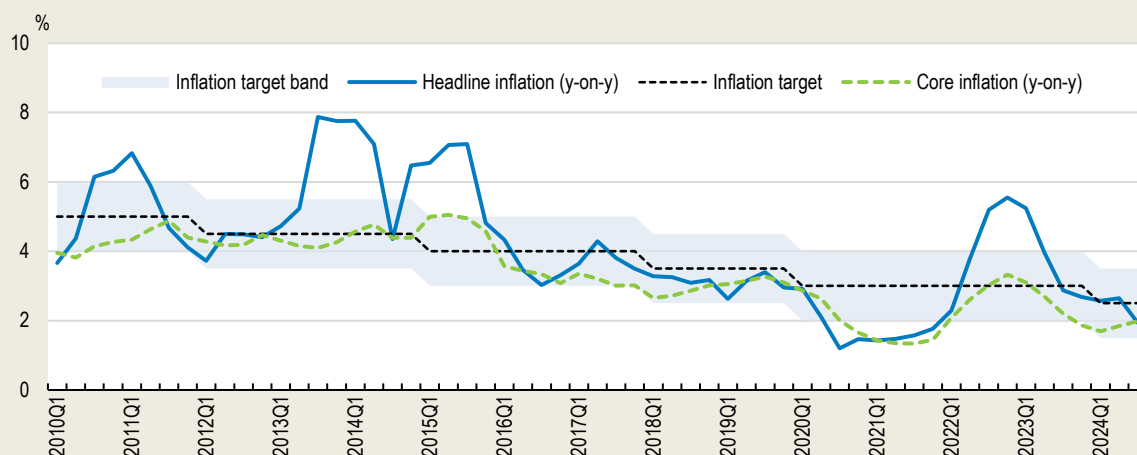
After the pandemic, monetary policy has tightened

In response to the COVID-19 pandemic, Bank Indonesia (BI) decreased its main policy rate to a record-low of 3.5% in February 2021, and loosened regulatory requirements for banks. BI also purchased government bonds (SBN) in the primary market (see below). In the immediate aftermath of Russia's war against Ukraine and the global inflation surge, core inflation readings remained moderate in Indonesia. BI initially refrained from increasing its policy rate, given anchored inflation expectations (Box 1.1) and the continuing need to support the economy. With the surge in domestic inflation, and policy tightening in other countries, BI eventually raised the policy rate from 3.5% to 5.75% between August 2022 and January 2023, turning the real interest rate positive (Figure 1.7, Panel B). The relative strength of the Rupiah in 2022 helped cushion the impact of global energy prices on domestic inflation. The policy rate was further increased in October 2023 and April 2024, then BI initiated a first rate cut in September 2024.

Box 1.1. Bank Indonesia's inflation targeting setup

Since 2005, Bank Indonesia (BI) – which was granted operational independence in 1999 – has operated in an inflation targeting regime, with a tolerance range of ± 1 percentage points. Initially set at 6% in 2005, this inflation target was increased to 8% in 2006 before decreasing gradually; between 2020 and 2023, it was set at 3% and in 2024, reflecting decisions made in 2021, it was further reduced to 2.5%. While headline inflation has occasionally overshoot over the past two decades (in response to global developments), BI has been successful at anchoring core inflation within the target range (Figure 1.6).

Figure 1.6. BI has been successful at anchoring core inflation



Source: OECD (2024), OECD Economic Outlook: Statistics and Projections (database); Bank Indonesia; and CEIC.

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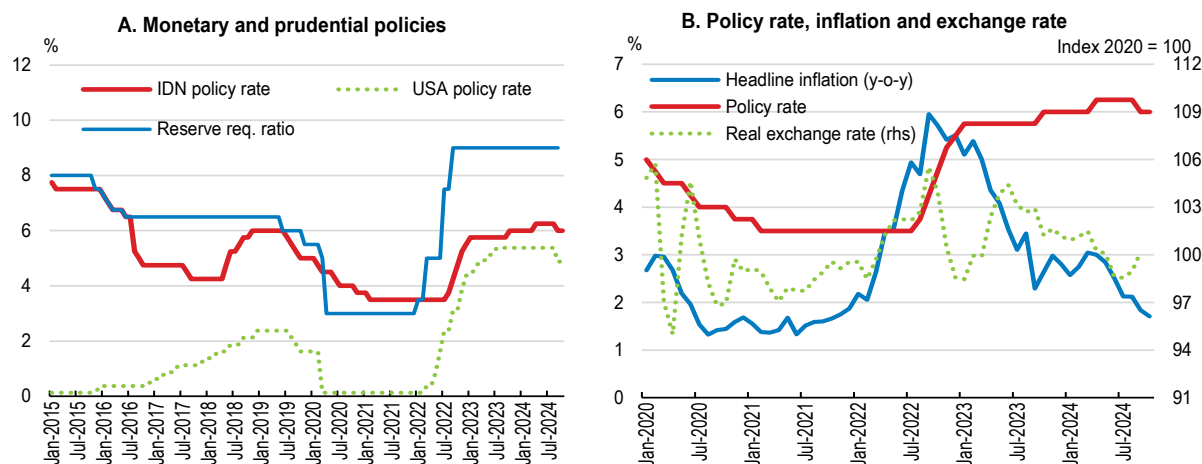
The reserve requirement ratio for conventional banks was reduced from 6% to 3.5% (of total Rupiah deposits) between 2019 and 2020 in response to the pandemic. It has since been raised to 9% in 2022 (Figure 1.7, Panel A) and has remained stable since. For shariah banks (Box 1.1) it now stands at 7.5%. The macroprudential liquidity buffer has remained at 5% of banks' assets (3.5% for shariah banks) since October 2023, though this ratio is relaxed for loans to priority and green sectors. BI's countercyclical capital buffers currently remain set at 0%. As such, while high policy rates have helped stabilise the exchange rate and inflation, BI has maintained looser liquidity policies, so as to partly shield domestic credit from external developments.

Box 1.2. Islamic finance in Indonesia

Indonesia is the second-largest contributor to global Islamic banking assets and is home to the world's second-largest Muslim population. In compliance with the prohibition of interest rates and speculation in Shariah law, Islamic finance uses real assets whose stream of income replaces the interest rate. There has been significant growth in Islamic banking assets (11.4% in 2023), outpacing that of conventional banking in Indonesia (6.4%). The regulatory environment is promoting more industry consolidation and sector competitiveness, especially for larger sharia business units. This should help tackle existing challenges the Islamic banking sector faces, such as stiff competition with conventional banks.

Source: (Fitch Ratings, 2024^[1])

Figure 1.7. Higher interest rates have supported the Rupiah



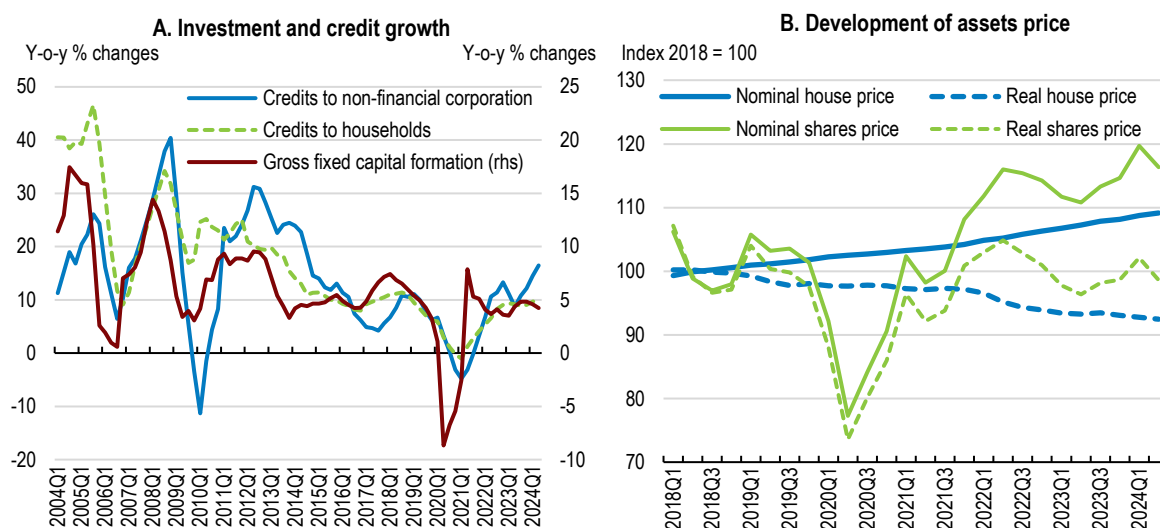
Note: Real effective exchange rates are compiled with the adjustment of nominal effective exchange rates by relative consumer prices. Nominal effective exchange rates are geometric trade-weighted averages of bilateral exchange rates. An increase in the exchange rate indicates a depreciation.

Source: OECD (2024), OECD Economic Outlook: Statistics and Projections (database); BIS; and CEIC.

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While private sector credit growth has rebounded since the pandemic (Figure 1.8, Panel A) and its level has increased from 26% of GDP in 2002 to 38% in 2022, it remains lower than in neighbouring ASEAN economies (World Bank, 2024^[2]). Equity and house prices have increased modestly in nominal terms over the past two years, thus declining in real terms (Panel B); this limits risks of market corrections.

Figure 1.8. Credit and investment are dynamic, and asset prices are declining in real terms



Note: In Panel A, household credit refers to consumption loans in the CEIC database.

Source: OECD calculations based on OECD Economic Outlook: Statistics and Projections (database) and Bank Indonesia; and CEIC.

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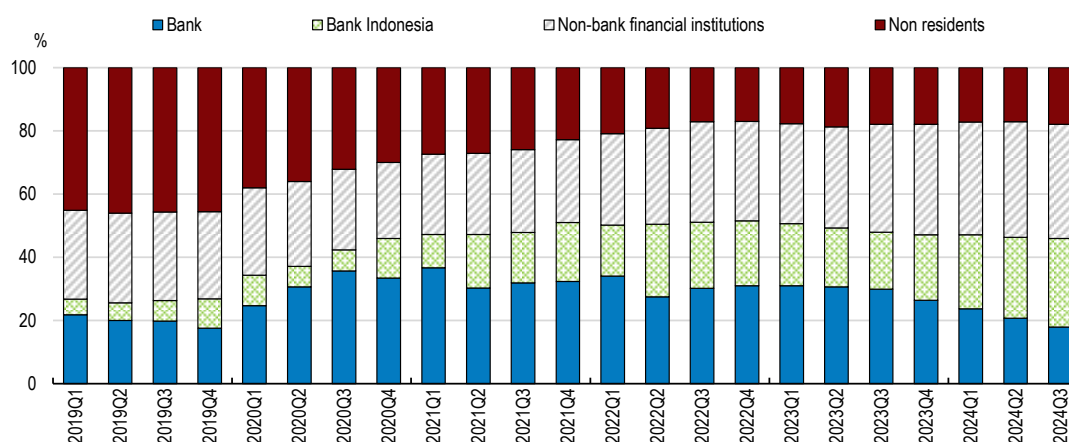
Financial risks appear to be contained but close monitoring is needed

Indonesia's prudent fiscal policy settings limit debt sustainability risks. After a suspension during the COVID-19 pandemic, the 3% deficit ceiling was reinstated and has been met since 2022 (see below).

Sovereign stress risk is low according to the IMF's Sovereign Risk and Debt Sustainability Framework (IMF, 2023^[3]). Sovereign debt spreads with US Treasury bonds remain stable compared with other ASEAN economies (Figure 1.9, Panel A). Foreign holdings of Rupiah-denominated government debt have decreased considerably since the pandemic, in absolute terms and in percentage of the total (Panel B). Since March 2021, BI has replaced foreign investors as the main holder of government debt (see below), and Indonesian banks have also increased their holdings from 4.8% of GDP in 2019 to 6.7% of GDP by end-2023. Likewise, pension funds and insurance companies have increased their holdings as they are required to hold at least 30% of their assets in government securities. Reduced foreign holdings of sovereign debt make Indonesia less vulnerable to rollover risk. However, as BI eventually winds down its holdings and withdraws liquidity, the capacity of the market to absorb additional debt may be tested if foreign investors do not return to act as the marginal buyer on the primary market.

Figure 1.9. Foreign ownership of government debt has fallen

Distribution of government bond holdings



Note: Quarterly data refer to the data on the latest available date of March, June, September, and December for each year. Data for Bank Indonesia includes government bonds used for monetary operations.

Source: Directorate General of Budget Financing and Risk Management (DJPPR).

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Indonesia's banks are well-capitalized, with a capital adequacy ratio of 26.0% as of March 2024. Banks have ample liquidity and foreign exchange exposures appear to be limited, with a net open position of 1.6% in November 2023. Real domestic credit growth, which increased rapidly from early 2021, has slowed down since mid-2022. The non-performing loans ratio peaked at 3.4% in mid-2021 and had declined to 2.9% by end-June 2024. The loans-at-risk ratio has fallen from 24.2% in early 2021 to 12.6% in August 2023. The IMF found systemic risk to be modest and stable in early 2023 (IMF, 2023^[3]). The IMF's growth-at-risk analysis also suggests moderate and manageable risks to output growth. The financial sector remains resilient despite 'high for longer' interest rates, as suggested by the IMF solvency stress test. IMF analysis suggests that the share of vulnerable firms (whose interest coverage ratio is below 1) could increase from 21% to 28% due to rising interest rates (IMF, 2023^[3]) but the risks to banks are manageable as they have increased loan provisions. Loan classification standards were relaxed during the pandemic, and after multiple extensions this credit restructuring policy was rightly terminated in March 2024.

The economy and the financial sector are also exposed to climate risks: the Financial Services Authority (OJK) established a climate risk stress testing programme in 2021 covering 47 financial institutions including banks, insurers, pension funds and securities firms. In March 2024, OJK issued new Climate Risk Management and Scenario Analysis guidelines, which *inter alia* require all banks to factor in climate risks in their lending decisions from 2026 onwards. Finally, as discussed below, the debt of state-owned enterprises has increased and warrants adequate monitoring.

Monetary policy should remain cautious

The monetary policy stance is currently balanced, with high interest rates but ample liquidity. The real rate is above the IMF's estimate of a 1-2% neutral rate (IMF, 2023^[3]). Further reductions in the policy rate should remain prudent and data-dependent. Indonesia has shallow foreign exchange markets, and the use of interventions may be warranted in response to some external shocks, such as shocks triggered by sudden changes in investor risk appetite (Basu et al., 2023^[4]). However, BI should remain cautious in using reserves to stabilise the exchange rate and should rely more on other monetary policy tools to attain its statutory goal.

BI's purchases of government securities on the primary market between 2020 and 2022 were conducted under a 'burden-sharing' agreement with the Ministry of Finance. BI agreed to take on the interest cost of this intervention by pledging to return the yield to the government in full at the bonds' redemption. Between end-2019 and end-2021, BI holdings of government bonds tripled from IDR 260 trillion to 800 trillion (5% of GDP in 2021), its share of total outstanding securities almost doubling, from 9.5% to 17.1%. The 2023 Financial Sector Omnibus Law (FSOL) states that Government Bonds (SBN) purchases in the primary market are only carried out: 1) during crises, 2) under prudent fiscal policy, and 3) in line with the financial capabilities of the central bank. BI also conducted this operation in a targeted, temporary and transparent manner. BI has appropriately ended its primary market purchases and in particular the burden sharing mechanism (Table 1.3), as recommended in the 2021 *Survey* (OECD, 2021^[5]). The burden-sharing mechanism was appropriate during the pandemic but should only be used against significant economic and financial stress, transparently and with well-defined exit conditions. Other central banks have used monetary financing tools during the pandemic under various institutional arrangements, and FSOL rightly provides safeguards to monetary policy independence.

Bank Indonesia's sovereign-debt holdings should consequently decline due to redemptions, though they could remain significant due to secondary purchases, in particular as collateral of BI's new Rupiah securities (SRBI, launched in September 2023). The SRBI is a tradable monetary instrument which uses government securities (SBN) as the underlying asset, instead of the previous non-tradable ones. These securities have proved attractive for foreign investors – who as of June 2024 owned around 26% of them – helping to support the financial account and the foreign exchange reserves. This has also led banks to swap long-term SBN for SRBIs. As a result, BI's net ownership of SBNs (excluding the SBN held for open market operations) has risen from 16.1% in September 2023 to 21.4% in June 2024, in contrast to its gross ownership which remains unchanged from 24.7% to 24.5%. Gradually reducing these large holdings of government securities could prove warranted.

Table 1.3. Past OECD recommendations on monetary policy

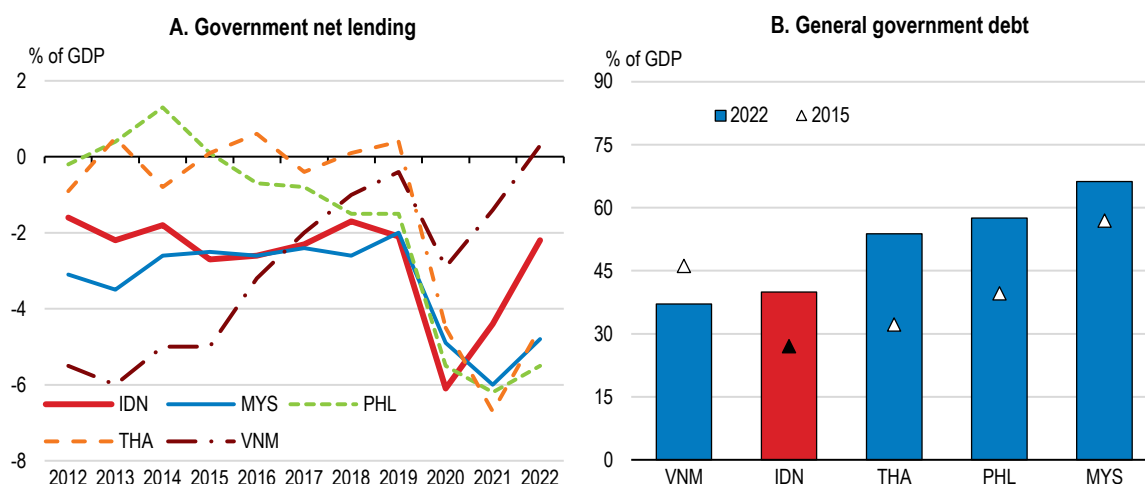
Past OECD recommendations	Actions taken since the 2021 survey
Phase out the 'burden-sharing' agreement, as envisaged.	This policy has been terminated, though BI's holding of government debt remain significant.
Bank Indonesia's independence should not be weakened.	A proposal to include parliamentarians in BI's monetary policy committee was introduced in Parliament, but successfully defeated. The Financial Sector Omnibus Law provides greater clarity and safeguards for emergency central bank interventions during crises.

Raising more revenues and making spending more efficient is essential

Under Law No 17 of 2003, the budget deficit must remain below 3% of GDP and the public debt below 60% of GDP. The deficit ceiling was only breached during the pandemic, with a temporary amendment to the law. Following general-government (OECD-defined) deficits of 5.7% of GDP in 2020 and 4.3% in 2021, fiscal consolidation led to a return to normalcy in 2022 with a deficit of 2.2% of GDP. For 2023 a deficit of

2.8% of GDP was budgeted (to support growth and purchasing power amid global uncertainties). However, tax revenues proved 12.6% larger than planned, resulting in a deficit of 1.7% of GDP (Indrawati, Satriawan and Abdurrohman, 2024^[6]) (Figure 1.10, Panel A). The deficit increases modestly in the 2024 budget to allow for new spending initiatives, but it is expected to remain within the 3% limit over the projection horizon (Table 1.1). Public debt as a share of GDP also increased during the pandemic but has stabilised since (Figure 1.10, Panel B) and is expected to decrease in the future, while local governments carry little debt.

Figure 1.10. Indonesia has returned its fiscal deficit to below 3% of GDP



Note: In Panel B, debt data refer to the total stock of debt liabilities issued by general government. Government net lending and the debt-to-GDP ratio may be different between IMF and OECD data due to different compilation methods.

Source: IMF Global Debt Database

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Upward trends in spending needs will add to fiscal pressures

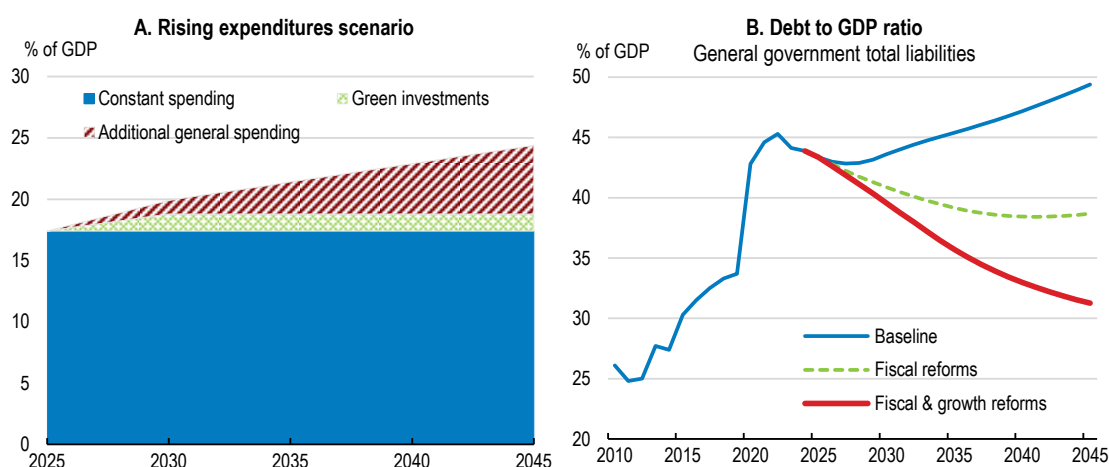
Indonesia's government expenditures remain low in regional comparison. For instance, as of 2022 spending was 17.4% of GDP, compared with 24.5% in Thailand, 24.7% in Malaysia, 18.7% in Vietnam and 25.9% in the Philippines. This low level of spending reflects the limited development of public provision in key areas, including health, education, social assistance, pensions and infrastructure. Provision can be expected to increase over time reflecting increasing societal demand as Indonesia's economy develops further. Demand for publicly supported health and pensions is likely to rise further as the population begins to age. Additionally, adaptation to climate change and related natural disasters and decarbonisation will require significant public investments over the next decades (Chapter 4).

Converging from current government spending levels (estimated at 17.4% for 2024) towards a regional average spending ratio of 23% over the next 20 years would represent an increase of 5.6 percentage points. Additional investments in emissions reduction and climate adaptation (Chapter 4) could add another 1.4 percentage points over the next ten years. Taken together, this 7 percentage-point increase of the spending ratio will require a significant increase in tax revenues and ensuring that spending is effectively allocated and spent (see below). The President-elect has proposed to substantially increase the tax-to-GDP ratio by 2029. He also aims to increase the country's GDP growth rate from 5% to 7%. Yet, if taxation fails to increase in line with increased spending, and if GDP growth does not accelerate, the debt-to-GDP ratio could rise by 6 percentage points by 2045. On the other hand, higher taxation and faster growth would ensure that the debt-to-GDP keeps declining from current levels (Figure 1.11). Furthermore, the current low effective rate of taxation generates a relatively high deficit-to-taxation ratio, which can lead to higher

volatility in investors' appetite for sovereign debt. Hence, the commitment to respect the ceilings for the public debt and fiscal deficit should be renewed and fiscal prudence remains warranted.

Indonesia still benefits from a demographic dividend, which however is due to end as the productive-age share of the population will decline after 2030, when ageing will eventually offset the fall in fertility. While the current pension system will not bring significant fiscal pressures over the next 20 years, this is partly because the coverage and pension pay-outs are low (see below). In the past, providing for old-age and disability was mostly left to families and communities. Even in the public sector and in state-owned enterprises (SOEs) where coverage is greater, pension provision is often inadequate and has to be complemented by personal savings. But as the population ages, families cannot be expected to address the needs of older and younger dependents. Hence it is important to widen social insurance coverage by enlisting small-and-medium enterprises (SMEs) and self-employed workers and ensure that the level of benefits is adequate (Box 1.3).

Figure 1.11. Increased demand for public spending could put public finances under stress



Note: In all scenarios, GDP growth and inflation are in line with OECD Economic Outlook projections to 2025. The baseline scenario assumes inflation (in the GDP deflator) of 2.5% from 2026, and GDP growth of 5% between 2026 and 2035, before decelerating to 4% between 2036 and 2045. The ratio of government spending to GDP is expected to increase by 0.5 percentage points annually between 2026 and 2030 as green investments increase substantially, and by 0.3 percentage points annually over the following fifteen years. However, government revenue is only expected to increase by 0.3 percentage points of GDP per year between 2026 and 2045. Hence, the deficit would increase by 1 percentage points of GDP over the next five years, from its current value. In the reform scenario, GDP growth and inflation remain unchanged, but increased taxation and efficiency savings help to absorb new spending without increasing the deficit. With reform and higher growth, GDP growth converges to 7% over the next decade, and the deficit does not increase thanks to fiscal reforms.

Source: OECD Economic Outlook, No. 115; IMF, World Economic Outlook database; and OECD calculations.

StatLink  <https://stat.link/s92xtc>

Box 1.3. Indonesia's old-age pension systems

Schemes for private-sector employees

Since 2015, social insurance in the private sector combines two old-age schemes:

- Retirement lump sum (JHT): Employers and employees contribute respectively 3.7% and 2% of wages. The employee may withdraw the accumulated funds (with accrued interest) at age 56 (or earlier in case of death, permanent disability, or leaving the workforce), as a lump sum payment. This scheme is mandatory for large, medium and small firms (covering about 18 million workers at end-2023), but affiliation is optional for micro firms and non-wage workers. Voluntary affiliation remains limited, at about 1% of non-wage workers and micro firms.
- Retirement pension (JP): Employers and employees contribute respectively 2% and 1% of wages. The scheme only applies to large and medium firms (covering about 14 million workers at end-2023), and the pension accrual rate is set at 1% for each year of contribution. Currently set at 58, the retirement age increases by one year every three years, towards 65 in 2043.

Different avenues are available to increase pension coverage. At a minimum, the JP enrolment exemption for smaller firms should be restricted to micro enterprises, and efforts to increase awareness of old age financial needs and the JHT among informal workers should be stepped up. If small firms and informal workers are unwilling or unable to contribute (especially if contribution rates eventually increase), the government might consider lowering contribution rates for them, and bearing the difference. With reduced or flat-rate contributions, the cost of providing social insurance to gig workers could be partially borne by the government (Kolev, La and Manfredi, 2023^[7]). Alternatively, the government could introduce a means-tested old age benefit to ensure a minimal degree of coverage for the workforce. The benefit could also be a complement to the existing schemes.

The pension system for private-sector employees looks to be financially viable for some time to come, but policy should nevertheless look at increasing pension contribution rates in the long run. The 3% contribution (employer and employee) towards JP pension annuities is expected to exceed the scheme's expenditures until 2053, and reserves will be exhausted around 2072. Eventually, contributions will need to increase: at 8.7%, contributions (JP and JHT combined) are the lowest in ASEAN, as is the pension coverage (Nguyen and Phiengphathai, 2023^[8]). Policy should anyway start paying closer attention to labour force participation among older cohorts. Absent improvements in workplace health and professional opportunities for seniors, contributions could prove insufficient for the old-age schemes, and contribution rates would need to further increase to keep pensions sufficiently adequate. Overall, providing adequate pensions is likely to require an increase in contributions over the next decades.

Schemes for public sector employees

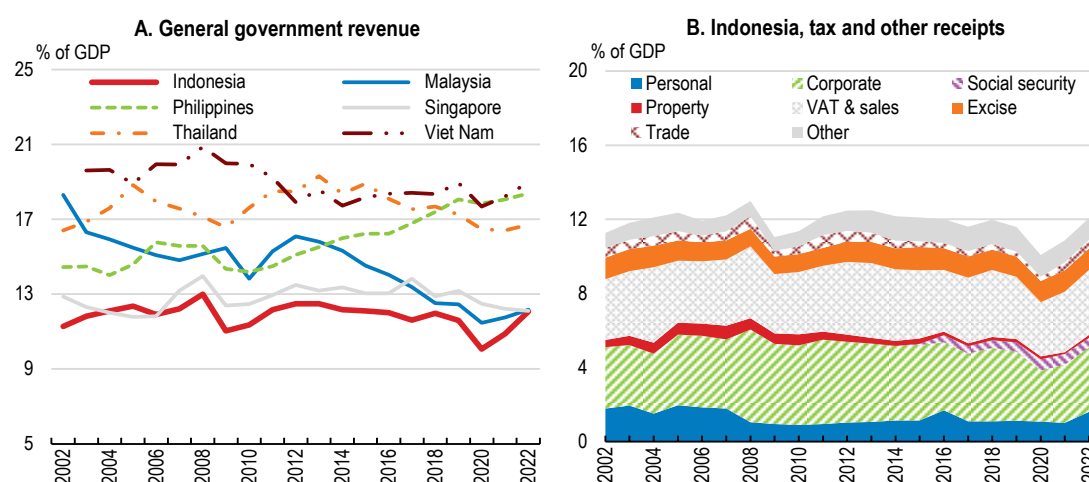
In the public sector (national and local civil service, military) and in many SOEs, workers are entitled to a pay-as-you-go (PAYG) defined benefit pension, as well as a lump-sum old-age savings payout. The pension is equal to 2.5% of the final basic salary, multiplied by years of services (up to 80%). The old-age savings payout is also proportional to the final basic salary and length of service. However, this high replacement ratio only applies to the basic salary and excludes performance pay and other allowances. As such, even in the public sector, pensions are often low, and insufficient in the absence of support from families or personal savings. The government has floated the idea of replacing the public sector PAYG system with fully-funded pensions, though this has not been implemented yet. Existing civil servants would stay in the old PAYG system (where they would be allowed to top up the contribution rates voluntarily), while the new fully-funded scheme would apply to new recruits. In the very long run, this has the potential of shielding the government from increased future unfunded pension costs as the population ages (and if the number of civil servants increases). However, during the transition (possibly 30 years), the government would pay the pensions of retired personnel, as well as the contributions of active personnel.

Source: OECD Pensions at a Glance (OECD, 2023^[9]); and (ILO, 2022^[10]).

Increasing tax revenues by making the tax structure more efficient

Levels of taxation have historically been low in Indonesia, limiting the ability of the government to finance priority initiatives. Echoing government spending (see above), Indonesia's tax revenues remain among the lowest in the ASEAN context (Figure 1.12, Panel A). Informality and a low degree of tax compliance are key challenges (Hapsari et al., 2023^[11]). In comparison with OECD and Asia-Pacific peers, in Indonesia a larger fraction of the budget comes from corporate income taxation (CIT), as well as VAT and other goods and services taxes (GST). However, CIT, VAT and GST receipts are among the lowest as a share of GDP, and other taxes (e.g., personal income, excise and property taxes) are extremely low (OECD, 2023^[12]). Volatility in tax receipts is increased by the influence of world commodity prices on extraction royalties and CIT in the commodity sector. Indeed, commodity prices have partly accounted for the decline in the tax revenues-to-GDP ratio before the pandemic and its recovery since 2022 (Figure 1.12, Panel B). The President-elect has set the goal of lifting state revenues from the current 13.5% to 23% of GDP by 2029.

Figure 1.12. The tax ratio remains low in Indonesia



Source: OECD (2023), Global Revenue Statistics Database.

StatLink  <https://stat.link/17fziy>

The 2021 Tax Regulation Harmonization Law (HPP Law) remains the most significant tax reform of recent years. This law included provisions to improve tax compliance and increase the tax ratio, alongside pandemic recovery measures. Motor vehicles buyers were prime beneficiaries of these economic recovery measures, with a temporarily reduced Luxury Sales Tax (subject to local-content rules and emission standards). This tax incentive has now been narrowed to electric vehicles. VAT on the purchase of residential property was also partially borne by the government, but after multiple extensions, this exemption has been narrowed (Table 1.4).

As regards long-term tax reform, the 2021 HPP Law introduced a new 35% personal income tax bracket for taxable income exceeding IDR 5 billion (USD 300 000). The Law also increased the corporate income tax rate from 20% to 22%. The VAT rate was increased from 10% to 11% in April 2022; an increase to 12% is scheduled for January 2025. The law also increased excise taxes on cigarettes and e-cigarettes. It also established a carbon tax through a carbon exchange (see Chapter 4); setting a rate of IDR 30 000 (USD 2) per ton for the coal sector in 2022, with expansion to other sectors planned for 2025. The reduced presumptive income tax levied on turnover of young small businesses at a rate of 0.5% (instead of the corporate income tax) has been maintained, while taxes on entertainment activities (bars, restaurants, discotheques) have increased. The HPP Law also streamlined the rules regarding tax withholding for shareholders and in-kind benefits for employees, with a narrower set of tax-exempt benefits.

Table 1.4. Past OECD recommendations on raising revenues

Past OECD recommendations	Actions taken since the 2021 survey
Freeze the basic tax allowance for individuals to broaden the tax base. Gradually lower thresholds for paying the top two rates of personal income tax.	The HPP Law increased the basic tax allowance of the personal income tax from IDR 50mln to 60mln, while other tax thresholds have stayed unchanged. An additional bracket in the personal income tax has been created for taxable income exceeding IDR 5bln, with a 35% rate.
Include fringe benefits and employer allowances in taxable income. Reduce differences in the tax treatment of personal savings across sources.	HPP has streamlined the taxation of in-kind benefits, with more limited scope for tax deductible (employer) and tax-exempt (employee) benefits.
Shift from tax holidays towards cost-based tax incentives. Impose sunset clauses on all new tax incentives to ensure regular reviews.	Many COVID-19-related tax holidays were subject to sunset clauses, though some have been regularly extended for short or long periods.
Tighten eligibility for the turnover tax (instead of corporate income tax) to very small firms and link registration to access to additional non-financial benefits.	Regulation 55 of 2022 has maintained the current turnover tax regime for businesses with gross revenue between IDR 500mln and 4.8bln (USD 30 000 to 300 000), for a maximum of four years.
Broaden the VAT base by removing most exemptions, especially for intermediate goods, replacing local sales tax with VAT, and lower the threshold for compulsory registration. Compensate sub-national governments for lost sales tax revenue. Over the medium term, raise the VAT rate.	VAT classification has been streamlined, including for financial services. The VAT rate was increased to 11% in April 2022 and is set to increase to 12% in January 2025. Temporary tax holidays for VAT on some residential properties have been introduced, notably in Nusantara.
Increase and harmonise tobacco excise across products.	Tobacco excise tax has been increased in 2023 and 2024 but hand-made clove cigarettes remain subject to significantly lower taxation. A new tax on e-cigarettes has been implemented in 2024.
Link the level of motor vehicle taxes to their carbon emissions. Continue to phase out energy subsidies, then increase taxation of energy. Introduce a simple carbon tax at a low rate.	The Luxury Sales Tax is based on the price and cylinder capacity of cars. A tax exemption was granted for low-emission cars compliant with minimum domestic content requirements after the pandemic, to support the industry. The tax holiday now applies only to electric-battery cars.

Raising tax revenues further is essential. As argued in past *Surveys* (OECD, 2018^[8]; 2021^[3]) and by the IMF (de Mooij, 2018^[13]), a medium-term revenue strategy would facilitate an increase in the tax-to-GDP ratio. Further reforms of VAT, excise, income, and property taxation as well as social security need to be key ingredients:

- VAT: Businesses with a turnover below IDR 4.8 billion (USD 300 000) remain exempt from VAT. This threshold is higher than in most OECD countries (OECD, 2022^[14]) and much higher than in Thailand and the Philippines, where it is about USD 50 000. Lowering the VAT liability threshold, as well as reducing the number of sectors where VAT is not applied, would increase VAT collections from both newly liable and already-liable ones.
- Other taxes on goods: Total excise taxation in Indonesia remains low in comparison with other ASEAN economies. Given air pollution externalities and emission reduction goals, there are some opportunities for win-win moves in raising fuel excise taxes and reducing subsidies on fuels, though political sensitiveness has to be overcome. While the Luxury Sales Tax (LST) is borne by affluent households, this tax is complex and induces under-declaration. Taxing car ownership, rather than car purchases, could make the system less prone to under-declarations. Excise taxation on cigarettes should also be further increased, to raise revenues and improve health, as smoking remains a massive health challenge in Indonesia and brings considerable economic losses (WHO, 2020^[15]).
- Personal income taxation (PIT): Thresholds remain very high: the basic allowance, at IDR 54mln, is about 65% of GDP per capita and the 25% tax bracket starts at incomes above IDR 250mln (300% of GDP per capita). As a result, the growing middle class is largely shielded from PIT: in 2017, only 10% of the population was actively paying PIT, against an ASEAN average of 15% (IMF, 2024^[16]). A reform of the tax treatment of in-kind-benefit will increase the tax base. Nevertheless, there is scope to reduce taxation thresholds. As argued in (OECD, 2021^[5]), the first PIT threshold should be frozen, so as to fall in real terms, while the higher thresholds should be lowered in value. Ensuring tax compliance and fighting tax evasion among very high earners could also further raise government revenue.
- Corporate income taxation (CIT): The CIT rate is set at 22% in Indonesia, which is in line with the international average of about 21% (OECD, 2023^[17]). Rather than raising the CIT rate, Indonesia has scope to broaden the tax base by reforming and narrowing the small business presumptive tax

regime, and by abolishing tax incentives or by making them less generous. Indonesia should also ensure that its tax incentives remain compatible with the Global Minimum Tax agreement.

- **Property taxes:** Since 2012, the land and building tax has been largely devolved to local governments, in line with international practice. At 0.3% of GDP, property taxation is low in comparison with the ASEAN average. The nominal taxation rate is 0.5% of the appraisal value, but this appraisal value is between 20% (for properties below IDR 1 billion) and 40% (above 1 billion) of the estimated sales value hence the effective rate is between 0.1% and 0.2% of the property's sales value. Allowing local authorities to increase appraisal values to 100% of the sales value and investing in centralised cadastre and valuation tools, could significantly raise revenues for local governments. Such valuation tools would also allow the gradual rollout of inheritance taxation.
- **Social insurance:** A rollout of social insurance is underway and provides an opportunity to raise revenue through social contributions, as taxpayers' willingness to pay can increase in exchange of future new rights for pension and insurance (OECD, 2019^[18]). Currently, businesses with 20 or fewer employees are subject to lower employer social contributions, and the informal sector is not covered. The social contribution exemption should be narrowed to those sectors which are most at risk of reverting to informality. Also, small-firm thresholds should be lowered or applied only to unincorporated firms, to reduce the incentives to split businesses in smaller units. By increasing the benefits associated with social contributions and awareness, workers could also have a stronger incentive to request to be declared and covered in full. Full coverage of all workers should remain the long-term objective of social policy.

Further strengthening enforcement is also needed. Tax avoidance remains common among larger firms and high-income individuals (Ibrahim, T and Rusydi, 2021^[19]), but improving tax capacity is also necessary if exemption thresholds are lowered for small firms and middle-class individuals (notably on VAT and PIT), as described above. Indonesia has made substantial progress over the past decade in improving tax enforcement, notably for CIT (Basri et al., 2021^[20]), and the President-elect has signalled further improvements as a priority. This will notably involve efforts in digitalisation and use of third-party data (Box 1.4). Taken together, these tax reform measures could significantly increase tax revenues (Table 1.5).

Table 1.5. Illustrative impact of structural tax reforms

Medium-term fiscal impact of structural tax reforms, in GDP percentage points

Increased social spending (<i>health, pensions, education, maternity, childcare, poverty eradication...</i>)	5.6
Investment needs for the green transition	1.4
Total additional spending	7.0
Value Added Tax (<i>reduce registration threshold and replace luxury sales tax with VAT</i>)	0.8
Fuel excise	0.5
Tobacco taxation	0.7
Corporate Income Tax (<i>reduce SME thresholds and reform small business regime and tax incentives</i>)	1.0
Personal Income Tax (<i>reduce basic allowance and higher tax band thresholds</i>)	0.7
Social Security Contributions (<i>broaden coverage to workers in smaller firms and gradually increase pension contributions</i>)	0.5
Property tax (<i>reform appraisal value and improve valuation tools</i>)	0.3
Tax administration (<i>improved compliance for VAT and PIT, digitalisation and third-party data, increased staffing</i>)	1.0
Subsidy reform (<i>reintroduce automatic rules, reduce price subsidies and shift to targeted subsidies for low-income families</i>)	1.0
Spending efficiency (<i>conducting spending reviews and ensuring efficient allocation of funds and incentives for local governments</i>)	0.5
Total increase in tax revenues and savings on spending	7.0

Source: (IMF, 2024^[16]) and OECD Staff estimates.

Box 1.4. Key factors for improving tax administration

To improve tax revenue collection, international experience suggests that the following elements are key:

- making full use of digitalisation, which requires sufficient connectivity and capable tax personnel.
- strengthening compliance risk management, including through automated risk profiling.
- adopting computer systems to process third-party data and prefilling returns.
- adequately staffing tax administration agencies with qualified and incentivised personnel.

Some examples of good practices include:

- Jordan: requires proof that taxes have been paid for business licence renewal.
- Uganda: phone text reminders to households and businesses about tax filing deadlines are estimated to have tax payments by 7% (Cohen, 2024^[21]).
- Costa Rica: emails reminding businesses about tax enforcement, underscoring the possibility of audit, business closure, and being shamed publicly is estimated to have increased the tax collection ratio by 3.4 percentage points (Brockmeyer et al., 2019^[22]).

Source: (World Bank, 2017^[23]) (IMF, 2024^[16]) (Okunogbe and Tourek, 2024^[24])

Arbitrating between conflicting spending priorities and reducing budget volatility

Limited fiscal space accentuates the need to arbitrate between spending priorities. Additional spending should only be funded via tax increases; hence the sequencing of new spending will need to be carefully designed, with an emphasis on education and health (see Chapter 2) as well as infrastructure. This sequencing of spending must be underpinned by sound cost-benefit analysis, and strict monitoring of costs.

The current cyclical position of the fiscal position also requires attention. As the amount of interest payment and subsidies depends on global financial conditions and commodity prices, the high share of variable expenses makes funding for other items of the budget more volatile, notably investments in infrastructures and human capital. As such, a reordering of the government's spending priorities would not only free up some of the current fiscal space, but it would also make investments more stable, avoiding the risks associated to stop-and-go cycles. Eventually, it would also free space for more countercyclical fiscal policies.

Ensuring efficient spending at the central and subnational level

Around the world, spending reviews have become an increasingly common tool of budget governance (OECD, 2021^[25]). Conducting them regularly has been identified by the OECD as a key feature of quality budget institutions (OECD, 2022^[26]), along with clear objectives, sound economic assumptions, multi-year expenditure baselines, top-down expenditure ceilings, informed spending decisions (for example, green or gender budgeting) and budget transparency. Consolidating all forms of expenses is also important, including loans or implicit subsidies, whose cost should be estimated, accounted, and/or funded upfront. Alongside external spending reviews, Indonesia would benefit from carrying its own regular spending reviews, possibly as part of the regular five-year middle term development plans, or more frequently.

The World Bank's exhaustive *Public Expenditure Review of Indonesia* (2020^[27]) highlighted the inconsistencies between the definitions of programmes, over time and between the planning and budget frameworks. These inconsistencies make it hard to properly assess public spending performance. Better coordination between the planning and finance ministries is also warranted. Some progress has been made in monitoring and reporting spending data, but scope remains to improve data systems further and enhance the quality and accountability of government spending. The *Review* also sheds light on

inefficiencies in fiscal transfers to subnational government. The General Allocation Grant (DAU) is based on districts' wage bills and the gap between fiscal needs and fiscal capacity. This provides an incentive to overspend on personnel, rather than earmark funds for investments. Districts would be more incentivised to fully use their taxation capacities if the fiscal gap was based on potential rather than actual revenues. The *Review* also suggested to experiment with performance-based intergovernmental transfers, though this would require strong implementation and governance capacity at the local level.

Coordination between the different levels of government is especially important for health and education services, where local governments are in the frontline. By law, 20% of the budget is earmarked for education, but performance gaps remain significant (see Chapter 2). Districts account for the bulk of education spending but differ in their capacity to manage education performance. Improving their fiscal and administrative capacity, and the coordination with the central government, would allow them to better deliver quality education. Public health expenditure is low in regional comparison; equipment, training and drugs availability are often insufficient, especially in remote areas. Addressing the financial and institutional fragmentation of the health system and introducing a better design of service delivery is also essential. Introducing more performance-based financing for health and education will help in making spending more efficient, but it will require good data and administrative capacity from local governments. For social assistance programmes, coordination with subnational governments and agencies should aim at increasing supply-side provision (along subsidising demand), notably in remote areas (World Bank, 2020^[27]). Digitalisation offers opportunities in this regard (Chapter 3).

A strengthening and enlargement of the free school lunch programme has been announced, where nutritious food is served in schools or can be taken home. This programme is commendable but subject to implementation difficulties, in terms of logistics and funding. Milk production is notably insufficient for instance (FAO, 2023^[28]), and delivering food across the archipelago will prove challenging. The programme will be implemented in phases and its cost is estimated at USD 4.3 billion in the 2025 budget, possibly increasing to up to USD 30 billion, or 14% of the government's budget. Hence a flexible and targeted approach will prove essential to ensure the programme's effectiveness and fiscal sustainability, as in other countries such as India, which in 2021 provided free lunches to 118 million students enrolled in 1.12 million schools. According to assessments, India has proved successful at keeping costs under control. A decentralised approach – the programme being conducted by state governments with help and subsidies from the central government – has helped to ensure flexibility and limit the exposure of the central government (Bakri, 2024^[29]).

Better targeting energy subsidies

Energy subsidies (electricity, fuel and liquefied petroleum gas – LPG) account for a significant share of the government's budget. While they were cut in the mid-2010s (see Chapter 4), they were increased in 2018 to stabilise end-user fuel prices, and in 2021 the subsidy-related government budget reached IDR 243 trillion (USD 16 billion). There has been some welcome refocussing of support to low-income consumers in 2022, yet the subsidies reached IDR 211 trillion (USD 14 billion) in 2023 for fuel, LPG and electricity, while direct cash assistance towards low-income households were not renewed. Currently, only the electricity subsidy policy for low-income households is well targeted; subsidised 3kg LPG cylinders are supposed to benefit poorer households, but many other individuals also receive them. However, the government has announced in early 2024 that these will eventually be restricted to the poorest households, through customer preregistration. Efforts should be made to ensure that this policy remains targeted. Eventually, the authorities need to move back to automatic formulas for fuel and electricity prices that allow global energy prices to pass through to retail prices and imply lower subsidies, to make the central budget less linked on commodity prices, and as a first step towards phasing out untargeted subsidies. Targeted cash assistance remains more cost-effective and redistributive than subsidies, but the priority should also be in helping poorer households in their transition towards cleaner technologies (see Chapter 4).

Limiting the fiscal exposure towards SOEs and infrastructure projects

Indonesia's large SOE sector (see Chapter 2) also exposes the government to fiscal risks. SOE losses have no immediate fiscal implications if they can borrow without being accounted for in the government's unconsolidated balance sheet. However, their rising debt stock can force periodic recapitalisation by the government, and the frontier between bailouts and government equity injection can be hard to draw (IMF, 2024^[16]). Some of Indonesia's SOEs have been hit hard by the COVID-19 pandemic and its aftermath. For instance, in mid-2023, the government recapitalised some SOEs in the construction sector, to the tune of USD 2 billion. In 2020, the electricity company PLN was also recapitalised by USD 2.4 billion. Such amounts, while modest as a fraction of GDP, account for a significant share of the government's budget. Given the limited ability of the government to increase tax receipts and the cost of raising additional debt, such contingent expenses can crowd out priority spending initiatives. A systematic consolidation of the debt and losses of all non-financial SOEs should be considered. This could increase transparency and reduce scope for government to make excessive use of SOEs to conduct off-balance investments and subsidies.

Financial management of SOEs needs to improve. As a general rule, subsidies for goods and services should be reduced to reflect true prices. When SOEs carry public interest activities (such as providing subsidised goods or services), the associated costs should be transparently and regularly passed on to the government, rather than absorbed as losses (warranting future recapitalisation) or indirectly subsidised. Such indirect subsidies have, at times, included favourable financing terms from state-owned banks, competition or regulatory leniency on other unrelated business activities, or subsidised inputs provided by other SOEs. When SOEs have explicit or implicit government guarantees, great scrutiny should be applied to ensure that they do not expand outside their core business. Finally, while the central government is not directly exposed to provincially- and municipally- owned enterprises, the same degree of scrutiny should be applied to limit the exposure of local government.

Risks to government finances from Public-Private-Partnerships (PPPs) need to be contained, notably in infrastructure projects. Operational risks require a fine *ex ante* assessment, to ensure that the risk-sharing mechanism between the government and the private partner remains appropriate and sound. Finally, the cost of some flagship infrastructure projects should be closely monitored, to ensure that government spending does not unduly favour parts of the country through off-balance PPP or SOE investments, at the expense of less developed regions, and other spending priorities.

Findings and recommendations

MAIN FINDINGS	RECOMMENDATIONS (Key recommendations in bold)
Upholding the credibility of monetary policy	
Inflation has moderated, though inflationary risks persist.	Maintain prudent forward looking, data-dependent monetary policy, making interest rate cuts conditional upon inflation developments.
Bank Indonesia has ended its primary purchases but remains the largest holder of government securities.	Evaluate the size of government bond holdings in the central bank's balance sheet.
Increasing tax revenues and maintaining sound fiscal policy	
Fiscal policy has been prudent over the past two decades and debt remains moderate. Yet, borrowing costs remain high and limited taxation revenues expose the country to debt rollover risks.	Avoid fiscal slippage, ensure the value for money of new spending commitments and maintain the deficit to GDP ratio below the mandated ceiling.
Public provision of key services can be expected to grow over time reflecting increasing societal demand and rising investment needs as Indonesia's economy develops further.	Ensure a medium-term fiscal strategy that takes steps to increase revenues as a share of GDP in order to fund spending priorities, notably in education, infrastructure and reducing informality.
Fiscal revenues are modest in international comparison, including relative to other countries in the region. This limits space for counter-cyclical actions as well as future social and green spending needs.	Broaden the tax base, including by lowering the personal income tax basic allowance (PTKP) and upper thresholds of the tax schedule. Broaden the VAT base and lower the compulsory registration threshold.
Tax avoidance remains common among businesses and high-income individuals as well as in the informal sector of the economy.	Improve tax revenue collection by making full use of digitalisation, third-party data, and automated risk profiling. Ensure adequate staffing of the tax administration.
Carbon taxation has recently been introduced through carbon exchanges for coal-powered electricity generation (Chapter 4) but remains low and limited.	Finalise the roadmap for carbon pricing and consider broadening taxation to new sectors as well as gradually increasing the level over time.
Property taxation rates, and revenues collected from them, are low in comparison with the ASEAN average. Property valuations for tax purposes are well below market prices.	Allow local authorities to increase appraisal values to the full estimated sales value. Invest in centralised cadastre and valuation tools.
The tobacco excise tax was increased in both 2023 and 2024 but remains low in international comparison. Smoking remains a significant health challenge in Indonesia and brings considerable economic losses.	Excise taxation on cigarettes should also be further increased and harmonized across products; including on hand-rolled clove cigarettes.
Arbitrating spending priorities	
Energy subsidies represent a sizable fraction of spending on social assistance and fluctuate over time with international commodity prices. See also Chapter 4.	Gradually reduce and better target energy subsidies. Ensure that regulated tariffs adjust symmetrically to global energy price movements.
Limited fiscal space accentuates the need to arbitrate between spending priorities, and new projects are exposed to a risk of cost overruns.	Ensure new spending projects are subject to comprehensive cost benefit analyses and monitor their costs.
The government plans to extend the free nutritious meal programme, with considerable implementation challenges for costs, sourcing and delivery.	Extend the free nutritious meal programme gradually across regions. Target it to individuals in greatest need and ensure value for money.
SOEs are sometimes used as vehicles for off-balance-sheet fiscal policy.	Ensure full transparency of the fiscal implications of SOEs' actions, including by providing greater disclosure of the link between government and SOEs.
Social insurance coverage and pensions	
Enrolment in the old-age cash lump-sum programme (JHT) is voluntary for micro firms and non-wage workers.	Raise awareness of the lump-sum pension scheme among non-wage workers and extend the scheme to micro firms. Consider covering the contribution, in part or in full, subject to fiscal capacity.
Coverage for the old-age pension scheme (JP) remains limited to medium and large firms.	Extend old-age pension coverage to workers in small firms by lowering the exemption size threshold for mandatory social contributions. Consider covering the contribution for smallest firms, subject to fiscal capacity.
Pension coverage and contributions may prove insufficient to tackle population ageing, despite the planned gradual increase in the retirement age to 65 by 2043.	Consider raising pension contribution rates in the long run.

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2 Accelerating growth and attaining socioeconomic convergence

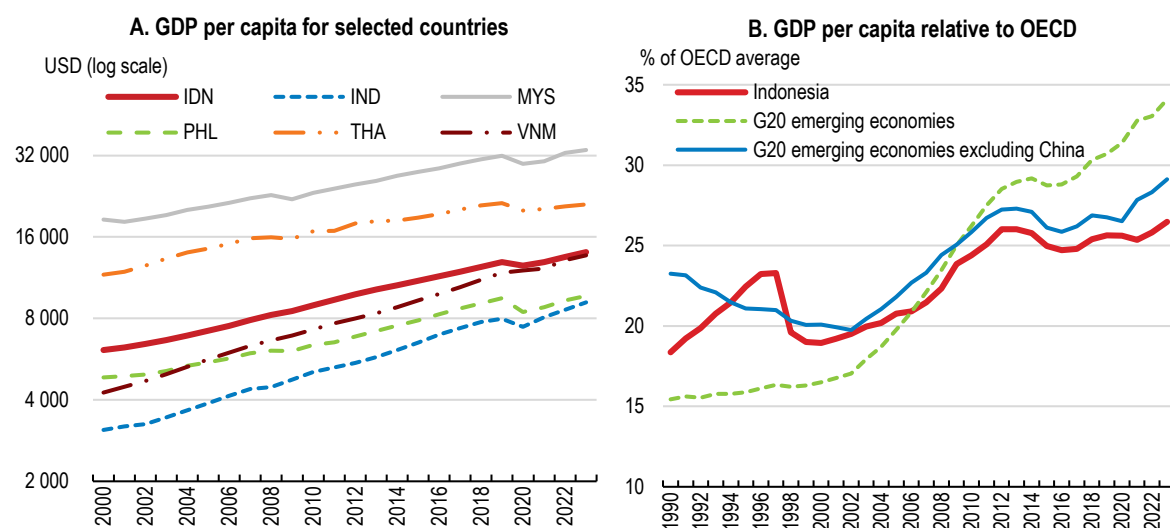
Chares Dennery, OECD

Indonesia has maintained steady economic growth over the past quarter of a century and has made sizable advancements in reducing extreme poverty and improving living standards over the longer term. Yet the rise in GDP per capita has not been as fast as in many peer countries and labour productivity trends have been somewhat disappointing. As such, more needs to be done to reach advanced-economy status by 2045, which the authorities are aiming for. Indonesia has room to benefit more from integration in global value chains. Education, skills and participation in formal employment should be enhanced, while the environment for business and competition can improve further. Industrial and trade policies should be targeted, monitored, and time-bound.

Economic convergence has stalled

Indonesia has maintained steady overall economic growth over the past quarter of a century. Indeed, the country's share of global GDP increased from 0.3% in 1998 to 1.3% in 2022. The rise in GDP per capita has been substantial (from USD 6 100 to USD 14 100, in PPP terms (constant 2021 USD), between 2000 and 2023), although this increase has not been as large as in some peer countries. Consequently, Indonesia has progressively fallen behind the other emerging economies in the G20, and China in particular. Correspondingly, economic convergence (Kremer, Willis and You, 2022^[1]) towards richer economies in the OECD has largely stalled over the past decade (Figure 2.1). Indonesia's GDP per capita has hovered around 25% of the OECD average since the early 2010s.

Figure 2.1. In recent years GDP per capita has stopped catching-up with the OECD area

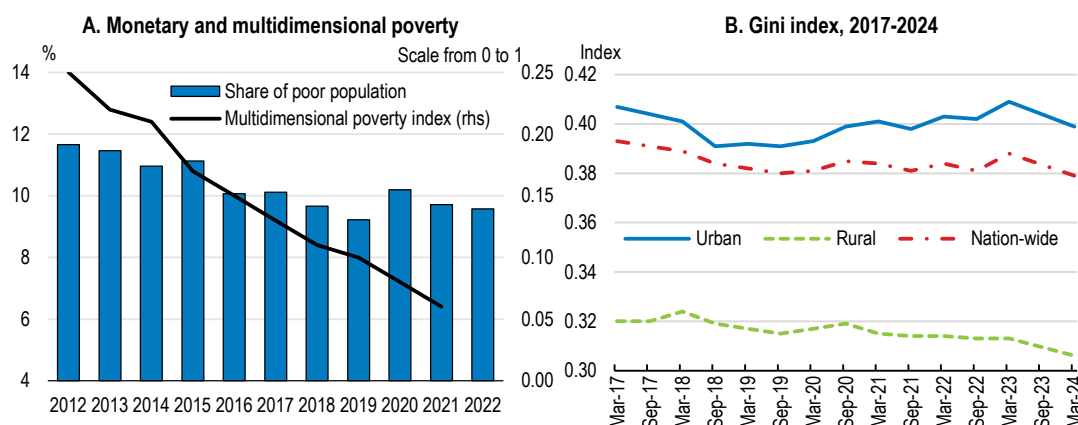


Note: Data are based on nominal GDP adjusted for purchasing power parity (PPP, constant 2021 international dollars in Panel A and current international dollars in Panel B). G20 emerging economies excluding Indonesia: Argentina, Brazil, China, India, Mexico, Russia, Saudi Arabia, South Africa, and Türkiye.

Source: World Bank (2024), World Development Indicators.

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Socio-economic progress on other fronts has been strong. Indonesia has made significant advancements in reducing extreme poverty. While the rate of poverty increased temporarily during the pandemic, it has since receded, and decline in multidimensional poverty has been steady despite the pandemic (Figure 2.2, Panel A). This has been due in part to higher labour participation and employment levels, a rise in minimum wages, and expansion of social assistance programmes. On the other hand, the share of informality and self-employment is higher than before the pandemic, and the boom in commodity exports has not been shared evenly; these two factors have contributed to increasing inequality in urban areas in 2020-23, but it has receded in 2024 (Panel B).

Figure 2.2. Poverty continues to trend downwards

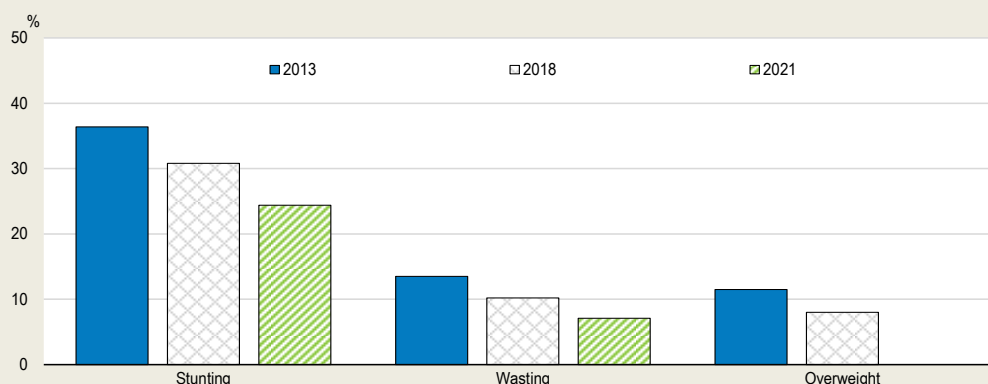
Note: In Panel A, poor population refer to people living below the national poverty line.

Source: Indonesian Nutritional Status Survey (SSGI); The PRAKARS (2023); Indeks Kemiskinan Multidimensi Indonesia 2012-2021; and BPS.

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Box 2.1. Reducing stunting

Stunting (impaired child growth and development due to malnutrition and frequent infections) has been a persistent issue in Indonesia for decades. It can lead to lasting impairments to physical and cognitive abilities and consequently lifelong disadvantages in terms of health, life expectancy, skills and labour market outcomes. Indonesia has made considerable progress over the past decade (Figure 2.3). Among children aged under 5 years, the prevalence of stunting has fallen from 37% in 2013 to 30.8% in 2018 and 21.5% in 2023. A key campaign in recent years has been the National Strategy to Accelerate Stunting Prevention, launched in 2017. The strategy commits 24 ministries and around USD 4 billion per year, as well as local governments, to tackle the root causes of stunting. One key element is ensuring more, and better, food for infants and young children at risk from stunting and their mothers. Other measures include improvements to sanitation, access to clean water and basic health services. Initially rolled out in districts with the highest incidences stunting, the strategy has been extended to all districts. As for similar campaigns in other countries, key elements have included engagement and oversight at the highest level of government, coordination across different levels of government as well as sufficient public financing and good data collection to help target households and areas most in need (Murthi, 2022^[2]).

Figure 2.3. Child malnutrition has steadily declined

Note: Data in 2021 for stunting and wasting come from the Indonesian Nutritional Status Survey.

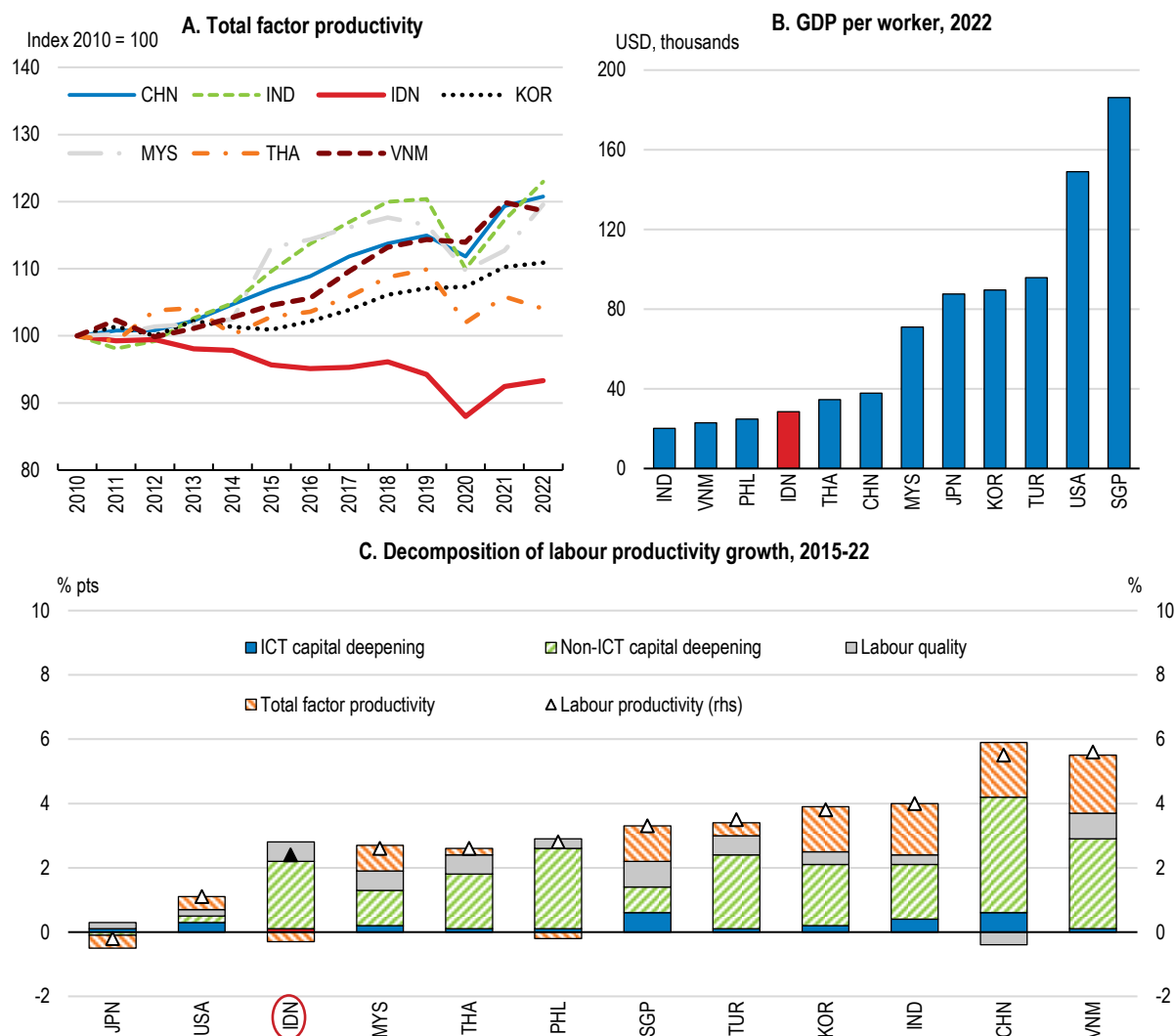
Source: UNICEF/WHO/World Bank Joint Child Malnutrition Estimates; and Indonesian Nutritional Status Survey (SSGI).

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The following sections of this chapter first underscore that weak productivity has played a role in Indonesia's limited catch up in average GDP per capita. The chapter also emphasises the potential role that further integration in global trade and value chains could play in improving economic performance. The remainder of the chapter considers policy options for strengthening long-run economic performance under two themes: employment and skills, and the business environment.

Productivity levels are modest and integration in global value chains is limited

Productivity is the main determinant of long-term GDP growth and Indonesia lags behind its peers. Contrary to other ASEAN countries, total factor productivity has been decreasing (**Error! Reference source not found.**, Panel A). Also, GDP per worker is relatively low compared with some peers, including Thailand and Malaysia. Labour productivity has also grown more slowly than in the rest of ASEAN5. With such considerations in mind, the government has established a National Productivity Institute (LPN) in 2023, with a mandate to promote productivity-enhancing reforms as in several OECD countries (Renda and Dougherty, 2017^[3]). The decomposition of labour productivity growth reveals the relevance of non-ICT capital deepening (Panel C). However, this does not mean that digitalisation is irrelevant as non-ICT investment often requires good digital infrastructure.

Figure 2.4. Productivity performance has been weak

Note: In Panel B, data are based on GDP at constant prices per worker using the 2017 PPP.

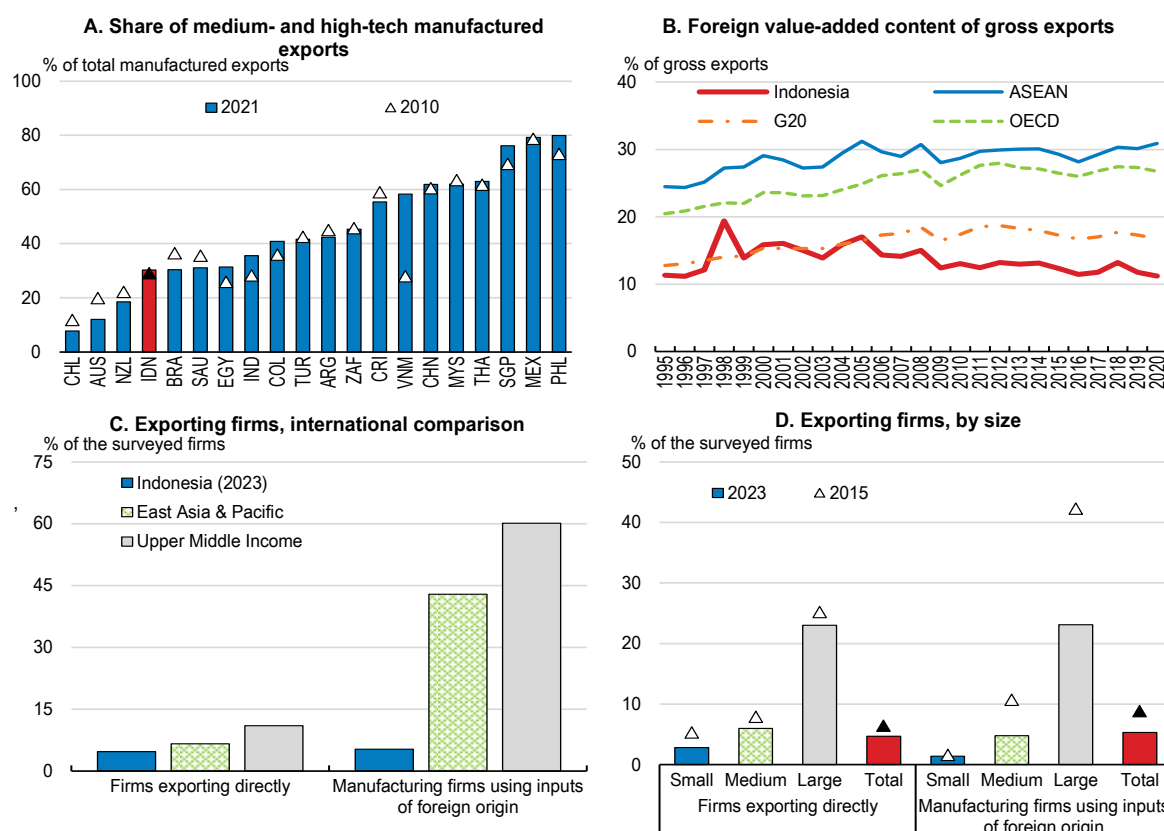
Source: APO Productivity Databook 2024.

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Indicators suggest Indonesia has scope for deeper, and more technologically advanced, trade. Exports and imports together represented 45% of GDP in 2022, versus 72% in the Philippines. Values substantially above 100% are seen in some other ASEAN peers. Similarly, foreign direct investment (FDI) inflows were equal to 1.9% of GDP, as against 4.4% in Vietnam and 3.6% in Malaysia. While the first indicator may reflect the large size of the domestic market, this very factor should make investing in Indonesia particularly important in the global strategy of MNEs. Additional evidence of scope to strengthen participation in globalisation is provided by the high-tech share of Indonesia's manufactured exports (Figure 2.5, Panel A). Indeed, the share has declined. In 2010, 12.1% of Indonesia's exports were high-tech; by 2019 the share was 8.1%. Other South-east Asian countries like the Philippines and Vietnam have, respectively, the highest share and the fastest growth of medium- and high-tech manufactured exports. Also reflecting relatively low participation in globalisation, the foreign content of Indonesian exports has long remained smaller than the ASEAN and OECD averages (Panel B). This share decreased from 15% to 11% between 2008 and 2020. Similarly, the share of domestic value added that is exported in the form of intermediate goods (natural resources) and is used in final goods production abroad shows a 'de-integration' trend. An enterprise survey by the World Bank points to relatively low engagement in foreign trade (Panel C and D).

Meanwhile, the potential to further develop tourism is large, Indonesia having 10 out of the 27 ASEAN5 sites on the UNESCO World Heritage List (Box 2.2).

Figure 2.5. Participation in global value chains is low, and relatively few firms engage in foreign trade



Note: In Panel C and D; the data show the number of firms surveyed where exports account for at least 10% of annual sales. The size of the firm is determined by the number of employees: 5 to 19 (small), 20 to 99 (medium), and 100 or more (large).

Source: OECD TiVA indicators (<http://oe.cd/tiva>) and TiVA country notes; World Bank Databank; United Nations Industrial Development Organization (UNIDO), Competitive Industrial Performance (CIP) database; and World Bank, Enterprise Surveys Database and Indonesia 2023 Country Profile.

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Box 2.2. Boosting tourism

In 2019, out of 16 million international arrivals (of which around 10 million international arrivals by air), about 6 million were recorded at Bali airport. The project “10 New Balis” was launched in 2016 and aimed to promote ten other destinations, later gradually narrowed down to five (Borobudur, Labuan Bajo, Lake Toba, Likupang, and Mandalika). The COVID-19 pandemic hit tourism hard, with 2023 arrivals merely recovering to their pre-pandemic levels, rather than the original forecasts. As highlighted in the World Economic Forum’s Travel and Tourism Development Index (World Economic Forum, 2024^[4]), Indonesia is relatively well placed to attract tourists, with a score of 4.46 (out of 7) and ranking 22nd in the world. Overall, the country performs better than the world average and the Southeast Asia average along most dimensions: it fares well in terms of prioritising tourism (3rd) and the natural resources it offers (8th). Yet, the Forum’s Index points to scope for improvement in health and hygiene (89th in the world), tourist services and infrastructure (86th), ICT readiness (73rd), as well as openness to travel and tourism (69th).

As noted in the 2018 *Survey* (OECD, 2018^[5]), establishing new tourism destinations is challenging. Attracting tourism typically requires improved transport infrastructure and hotels, but also high-speed internet capacity and a skilled workforce. It also requires increased capacity for waste management and water treatment and attention on preserving the natural environment, as uncontrolled tourism can lead to serious damage to water, soils and nature. Cooperation with, and assistance for, local communities, governments and stakeholders is essential to make tourism work in the long run.

Source: (World Economic Forum, 2024^[4]), Statistics Indonesia (BPS)

Increasing employment rates and strengthening human capital

Indonesia has room to increase labour force participation and to boost human capital. Key challenges include reducing labour-market informality, closing gender gaps, and improving education and training.

Reducing informality in the labour market

Informal employment in Indonesia remains widespread. Despite a declining trend in past decades, around 60% of the workforce is estimated to be in informal types of employment, a higher share than in neighbouring countries. Informal employment includes unpaid household workers, employees in the informal business sector, as well as informal workers in formal firms. Informality is particularly high in agriculture and low-skilled services, and for women (Hapsari et al., 2023^[6]). Productivity and salaries tend to be lower in informal firms, and provinces with greater informality also tend to be poorer. Social insurance programmes (old age, work accident, unemployment) have been introduced in recent years, but many of them only cover employees in larger firms. Informal and small-firm workers must rely heavily on family or community assistance, and during the COVID-19 pandemic some of them have left the labour market or moved to more informal occupations. More generally, Indonesia has long been characterised by a strongly dual labour market, with extensive employment and social protections in large firms, but with broad exemptions or enforcement difficulties in smaller firms and the informal sector.

An Omnibus Law on Job Creation was issued in March 2023, after the initial 2020 law had been suspended by the Supreme Court in 2021. The law includes measures to encourage the formal sector by making labour regulations more flexible in formal firms (and thus reducing the incentives to operate informally). In line with past OECD recommendations (Table 2.1), the law replaced municipal (and often also sectoral) minimum wages with provincial ones, based on inflation and economic growth; the law also brought greater flexibility for part-time work and overtime. Oversight for terminating employment was reduced, and the

maximum severance pay was reduced from 32 to 19 months, with an additional six months paid by a newly created unemployment insurance scheme. While the law rightly aims at reducing labour market duality, it is too early to gauge the scale of its positive impacts. The Omnibus law also included provisions to reduce business regulation (see below).

Table 2.1. Past OECD recommendations on fighting informality and enhancing inclusion

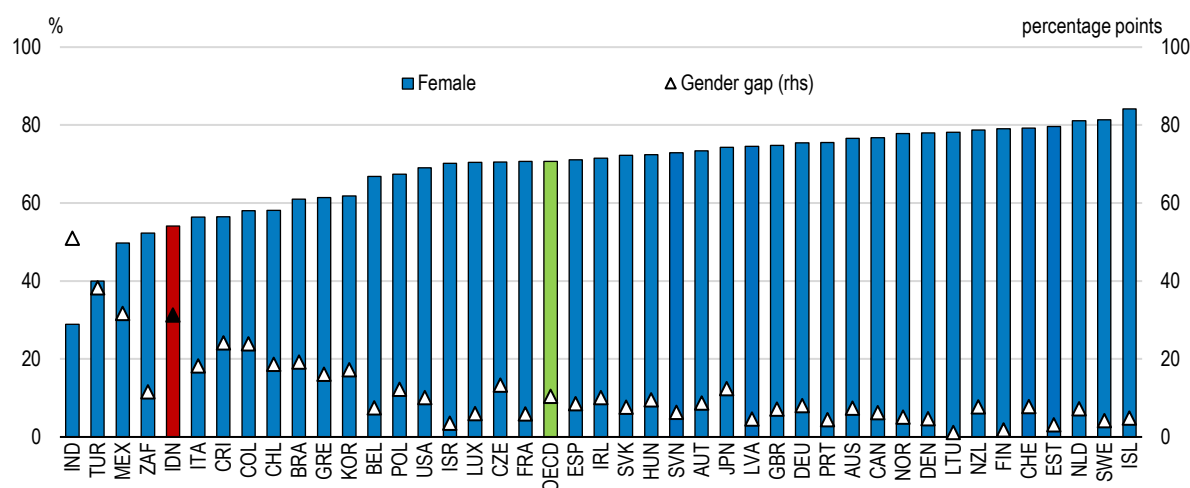
Past OECD recommendations	Actions taken since the 2021 survey
Pilot lower levels of employment protection and discounted minimum wages for youth in special economic zones. If successful, extend them.	Guidelines for green special economic zones, which include indicators to create inclusive growth, have been developed. No other action taken.
Review the level of statutory minimum wages in each province to better align them with local characteristics.	The formula for calculating provincial minimum wages has been amended to follow economic growth and inflation.
Promote female employment through public campaigns. Target more women in lifelong training programmes. Support the construction of more childcare facilities. Enforce laws promoting gender equality.	No action taken.
Expand the unemployment insurance scheme together with business associations and trade unions.	No action taken but the unemployment insurance scheme is scheduled to be reviewed periodically.

Narrowing gender gaps

The gender gap in labour force participation remains significant in Indonesia, and higher than in some other EMERG20 and most OECD economies (Figure 2.6). Women remain over-represented in informal jobs, and underrepresented in more qualified formal jobs, despite substantial improvements in education attainment.

Figure 2.6. The gender gap in labour force participation remains significant

Female labour force participation rate, 15-64 years, 2022



Note: 2019 for Indonesia. The gender gap corresponds to the percentage-points difference between male and female labour force participation rate. Source: OECD (2024), OECD Employment database.

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In the short run, promoting formal entrepreneurship opportunities – notably through financial education, micro-lending, and ease of business – can increase female labour force participation and formalisation of the self-employed (Mukhlisah, 2024^[7]). In particular, efforts to develop and formalise the care economy can empower women and make societies more resilient (OECD, 2024^[8]). Improving women's education and skills is key for access to formal, better-paying, jobs. Enrolment in tertiary education is already higher for women than for men, and it is all the more important to ensure women have avenues to deploy their skills

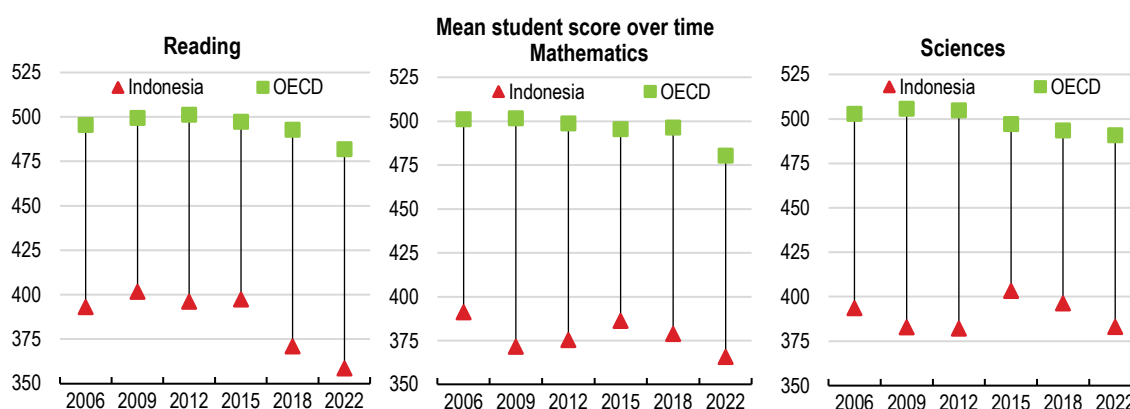
in the workplace. Adapting cultural norms is important as in Indonesia men are often still seen as more legitimate breadwinners and therefore deserving hiring priority (OECD, 2024^[8]).

Strengthening support for maternity leave and childcare services are part of the solution to increasing the employment of women. While the law provides for three months of maternity leave with full wages, the cost of this benefit is fully borne by the employer. This contributes to low compliance, especially in small firms (Setyonaluri et al., 2023^[9]). Also, workers in the informal sector receive some maternity health coverage, but no maternity leave. Shifting the financing of maternity leave to the government, in part or in full, would help increase coverage. Also, by making maternity less costly for employers, women may be more likely to be offered jobs. Policy should also ensure that mothers are not unduly penalised when they resume working after pregnancy or childcare leave. Early Childhood Development (ECD) was introduced within the 2003 National Education System Law but progress has been limited; the enrolment rate has been less than 40% (UNICEF, 2020^[10]). Greater access to affordable early childhood education facilities would help in this respect, when combined with enhanced efforts to guarantee the quality of both education institutions (accreditation is still optional) and teaching personnel.

Improving education

As elsewhere, learning deteriorated during the pandemic. The OECD's Programme for International Student Assessment (PISA) assesses the learning performance of 15-year-old students in mathematics, reading, and science. According to the latest results (OECD, 2023^[11]), performance declined in Indonesia between 2018 and 2022, as in most OECD countries. This is largely due to pandemic-induced school closures, though a decline was already observable in Indonesia before 2018 (Figure 2.7). In 2022 as in previous years, Indonesian students scored significantly worse than the OECD averages in mathematics, reading, and science. Variance by province is large: in 2018, average performance was about 40 to 50 points higher in Jakarta and Yogyakarta than the national average, across all three subjects (OECD, 2019^[12]).

Figure 2.7. Student performance in PISA tests is low and has declined in recent years



Note: The OECD's Programme for International Student Assessment (PISA) measures 15-year-olds' ability to use their reading, mathematics and science knowledge in tests based on real-life scenarios. The OECD aggregate covers 23 OECD countries. It does not include Austria, Chile, Colombia, Costa Rica, Estonia, Israel, Lithuania, Luxembourg, the Netherlands, the Slovak Republic, Slovenia, Spain, Türkiye, the United Kingdom, and the United States. Source: OECD, PISA 2022 Database, Tables I.B1.5.4, I.B1.5.5 and I.B1.5.6.

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Historically, infant malnutrition has contributed to poor education performance in primary schools, with intellectual abilities permanently scarred by stunting (Box 2.1). The strong push towards ending malnutrition, including through the free school lunch programme, will better prepare children for learning and growing. But improving education will also require large investments in infrastructure, teacher training

and retention, as well as reducing the number of students dropping out of school. As such the free school lunch programme should not be funded by cuts elsewhere in the education budget.

Recent education reform has aligned with recommendations detailed in the 2021 *Survey of Indonesia* (OECD, 2021^[13]) (Table 2.2). Measures underway include a roll out of an ambitious curriculum reform (*Merdeka Belajar*, or emancipated learning) that relies on digital teaching tools (OECD, 2024^[14]). It aims to shift education towards student-centred learning, critical thinking, creativity, problem-solving abilities, and holistic development. All secondary and post-secondary levels must introduce the reform's new curriculum by end-2024. The teachers' digital platform, Platform Merdeka Mengajar includes tutorials and resources on the new curriculum along with management and planning tool. A programme that trains "learning leaders" is being used as part of the campaign to ensure teachers are familiar with the new system.

Yet differences in student achievement at the national exam (Ujian Nasional, UN) remain significant across regions, between rural and urban areas, between public and private schools, and between secular and religious schools (World Bank, 2020^[15]). Implementing the curriculum reform uniformly across schools will be key to ensure that all pupils share a broader core knowledge to succeed (Box 2.3). Past efforts have lifted educational attainment but, as of 2022, only 57% of Indonesians aged 25 and above had completed a lower secondary degree. Public education is free and funded by local governments through grants from the central government. However, out-of-pocket expenditures remain considerable (these include books, stationery, school uniforms, and transport), especially in secondary schools. Sending one child to secondary school can represent 24% of household average expenditure (World Bank, 2020^[15]). Increasing resources available to schools and making education more affordable is among the key reasons why tax revenues should be lifted over time (Chapter 1). Further progress in digitalisation would also help in improving school performance (Chapter 3).

Box 2.3. Primary and secondary education in Indonesia

All Indonesian citizens must undertake 12 years of compulsory education, with six years in elementary school, three years in junior high school, and another three years in senior high school. While enrolment is nearly universal in primary and junior high schools (in 2022, net enrolment rates equalled 99% and 95% respectively), it remains more limited in senior high schools (with an 82% net enrolment rate).

Schools in Indonesia are either secular or religious (the latter are mostly Islamic). The Ministry of Education and Culture (MEC) supervises both secular and Sekolah Islam schools, with the same secular curriculum (to which Sekolah Islam schools add their own Islamic curricula). Madrasah, which are more strongly religious Islamic schools, are organised by the Ministry of Religious Affairs, and combine Islamic teachings with secular subjects, to varying degrees. Finally, there are Pesantren, which are independent, charity-funded schools, usually in rural areas and focusing on Islamic teachings; as such their supervision by the government remains more limited.

Source: Unesco Institute for Statistics

Indonesia has a relatively high share of youth that is not in education, employment or training. While the youth unemployment rate declined from 26% in 2005 to 13% in 2023, it remains above ASEAN peers such as Malaysia (10%), the Philippines (7%), and Thailand (5%). Data from the OECD's Programme for the International Assessment of Adult Competencies (PIAAC) show that Indonesian adults have some of the lowest skills across all countries surveyed (OECD, 2016^[16]). For instance, they are the lowest scoring of all adults surveyed for information-processing skills, which are among the most required in the future of work. To make sure Indonesia remains competitive and productive, adult learning should become one of its priorities, as the country does not have yet a strong skills development system. As argued in the 2021 *Survey*, local governments and businesses should be more involved in designing vocational courses so that these better reflect local labour market needs (OECD, 2021^[13]). Skills anticipation exercises help policymakers identify skills in need (OECD, 2023^[17]), and information collection can focus first on priority

sectors, as in Finland (CEDEFOP, 2019^[18]). As in Malaysia (OECD, 2019^[19]), the government should centralise information and list occupations that are skilled, in high demand and of strategic importance.

Improving tertiary education, both in universities and vocational schools, is important for making the workforce more productive, skilled, and adapted to the needs of the modern economy. The enrolment rate in tertiary education increased from 8.4% in 1990 to 42.6% in 2022 and is close to other middle-income countries. However, low past enrolment means the share of the adult population with tertiary education is small. As of 2022, the share of 25-64 year-olds who have completed tertiary education was 13%, the lowest share in the G20 (on a par with India). Attainment for women has been increasing rapidly; between 2015 and 2022 it increased from 15% to 21%. Further increasing tertiary enrolment among school leavers and widening access to tertiary education in the adult population will be important. More broadly, Indonesia has scope to raise the quality of its tertiary institutions. There are nine Indonesian universities among the world's top 1000, fewer than in any other EMERG20 country, with relatively poor research output and weak ties with the business sector (see the section below on innovation).

Table 2.2. Past OECD recommendations on education and training

Past OECD recommendations	Actions taken since the 2021 survey
Consider lowering the starting age of compulsory education.	No action taken.
Review the number of schools and envisage using multi-grade teaching.	No action taken.
Collect best practices to introduce performance metrics in the allocation of education funds at the school and district levels. Better take into account the number and characteristics of students when setting government transfers.	The 'Emancipated Learning' programme aims to better target poorer and less performing schools with higher school grants. Learning communities are also being developed to share teaching best practices.
Increase the number of teachers with permanent contracts. Reinforce the role of education credentials in hiring decisions for contract and honorary teachers.	A significant number of 'honorary teachers' have been converted to permanent contracts.
Invest more in information and communication technology infrastructure for pedagogical purposes in primary and secondary schools.	A digital 'emancipated teaching platform' has been developed, along with a digital 'education scorecard'
Review and improve the supervision of vocational schools and teachers. Increase the role of business associations and trade unions in managing and organising apprenticeships.	Tax incentives are provided to encourage apprenticeships and vocational training. More flexibility in adjusting the curriculum locally has been introduced in 2022, but local governments seldom use it.

Policies to strengthen the business environment

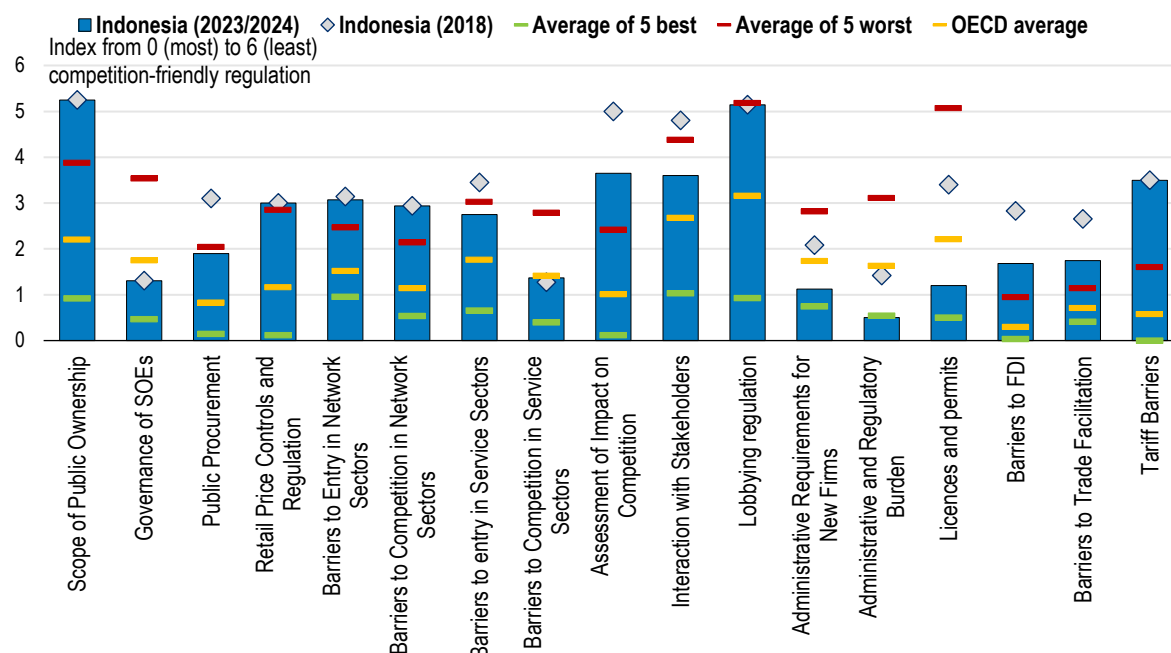
Pro-competition regulation, easier conditions for doing business and success in combatting bribery and corruption, can facilitate firms' entry and exit, encourage innovation and allow more efficient firms to succeed and grow. In turn, this can increase investment and employment, thereby lifting aggregate productivity, output per capita and living standards. For countries like Indonesia where many businesses are far from technological frontiers, the adoption of know-how and technology through diffusion and spillovers is a key channel for moving towards higher productivity.

Making markets more competitive through better regulation

The 2023 OECD Product Market Regulation (PMR) data point to a number of improvements in Indonesia's business environment (Figure 2.8). There have been several pro-competitive reforms implemented over recent years, often echoing recommendations of past *Surveys* (Table 2.3). In particular, barriers to trade and foreign investment have been reduced, as well as the administrative and regulatory burdens. Nonetheless, in most dimensions of the PMR, the business environment in Indonesia remains less favourable than in the average of OECD members. Much of this reflects a relatively high degree of state involvement in the economy (Figure 2.8). Barriers to entry and conduct are widespread in network sectors and many professional services and the regulation of lobbying activities remains very limited (Box 2.4). Furthermore, state ownership is widespread. This potentially ramps up market distortions, especially as the governance of state-owned enterprises (SOEs) is not fully aligned with OECD best practices aimed at ensuring a level playing field between SOEs and private firms (Asian Development Bank, 2022^[20]).

Figure 2.8. Despite progress, Indonesia's PMR scores still indicate a relatively restrictive environment for business

Product Market Regulation Index, by category



Note: All averages include only OECD countries. Information refers to laws and regulation in force on 1 January 2024 (1 January 2018 for 2018 values). Licences and Permits, Lobbying, and Public Ownership are not indicators, but components of other indicators. The name of some low level indicators has been edited for presentational purposes: Administrative and Regulatory Burden = Communication and Simplification of Administrative and Regulatory Burden, Administrative Requirements for New Firms = Administrative Requirements for Limited Liability Companies and Personally-owned Enterprises, Barriers to Competition in Service Sectors = Involvement in Business Operations in Service Sectors, Barriers to Competition in Network Sectors = Involvement in Business Operations in Network Sectors

Source: OECD 2023-2024 PMR database (May 2024).

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Table 2.3. Past OECD recommendations on State-Owned Enterprises and government intervention

Past OECD recommendations	Actions taken since the 2021 survey
Improve SOEs' corporate governance to align with global best practices. Reinforce financial reporting of operating companies before establishing sectoral holding companies.	Several regulations have been issued to increase SOEs' transparency and integrity, including Ministerial Decree No. PER-2/MBU/03/2023.
SOEs should always be subject to competition law and be held responsible when abusing their dominant market position.	Activities that are not deemed strategic are not exempt from competition law, but enforcement remains limited. SOEs have been mandated to implement the recent Competition Compliance Programme of the Competition Supervisory Commission (KPPU Regulation 1/2022).
Review existing restrictions on FDI, eliminate those that generate costs without producing benefits, and monitor the remaining ones.	The Omnibus Law on Job Creation has opened most sectors to FDI, but several regulatory restrictions and discriminatory measures remain.

Box 2.4. Recent regulatory reforms in Indonesia

Since 2020, Indonesia has carried out various reforms that have improved the regulatory conditions for business covered by the OECD's product-market indicators:

- *Price controls.* In 2022, price ceilings were removed for soybeans, sugar, shallots, meat, and chillies, and replaced by a reference price. Yet price controls remain, notably on some other staple goods (bulk cooking oil and rice), gasoline and liquid petroleum gas. Retail prices for domestic passenger transports (air, rail or coach) and some professional services also remain regulated.
- *Public procurement.* Since 2021, tender documentation must be published online and it is available free of charge. Yet, splitting tenders into smaller lots for goods, services and public works remains optional for contracting authorities, making bidding difficult for smaller firms. Furthermore, foreign participation in tenders faces considerable hurdles.
- *Assessment of impact of new legislation on competition.* Since 2022 there is a requirement for new primary legislation to be subject to either a Regulatory Impact Assessment, a Cost Benefit Analysis, or an analysis of Rule, Opportunity, Capacity, Communication, Interest, Process and Ideology.
- *Administrative requirements for new firms.* The number of administrative bodies to be contacted to establish a Limited Liability Companies decreased from seven to five and for Personally-owned Enterprises from three to two. This number is still relatively high.

The Omnibus Law on Job Creation not only increases labour market flexibility (see above), it also streamlines regulations in some sectors, and reduces restrictions on foreign direct investment; some of these elements were implemented as early as 2021. Furthermore, the law introduces a new risk-based assessment, relaxing environmental certification for a medium-risk business and requiring a business license for high-risk business. The authority for granting permits was handed from the local level to the central government. Initial impact assessments suggests that domestic and foreign direct investment – realised and planned – significantly increased in sectors liberalised by the reform (Montfaucon, Senelwa and Doarest, 2023^[21]).

Narrowing the scope of State-Owned Enterprises

State-Owned Enterprises (SOEs) continue to play a substantial role in Indonesia's economy. The scope of their activities and market share is higher than the OECD average, and often higher than comparable emerging market economies. As of 2021, SOEs overseen by the Ministry of State-Owned Enterprises (MSOE) held USD 600 billion in assets (52% of GDP in 2021). There are also numerous smaller enterprises owned by provincial or municipal governments. The SOEs are spread across many sectors, including manufacturing and four of the five largest banks. Notable SOEs include PLN (electricity), Pertamina (oil and natural gas), Garuda Indonesia (air transport), Telkom, Bank Mandiri, Bank Rakyat, Krakatau Steel, Pupuk (fertilisers), and Waskita (construction). The legislation on SOEs distinguishes between those that operate for profit and those conducting business on behalf of government. SOEs fall under two main types: *perum* (fully state-owned and expected to conduct business on behalf of the public interest) and *perseo* (for profit limited liability company with full or majority state-ownership). *Perseo* SOEs are expected to act as profit-maximising companies rather than government agencies.

Weak and declining financial and operational performance among SOEs is a key concern (Asian Development Bank, 2020^[22]). In 2019, 43 out of 114 of Indonesia's SOEs failed to meet even low thresholds for financial viability and the COVID pandemic and the global energy crisis have likely further aggravated the problems. One explanation is that, even when defined as "for profit", the SOEs are often the instrument

of government policies, for instance, providing goods, services or employment at subsidised rates. Compensation from government for these activities is sometimes delayed, weakening the SOEs financial position. Other concerns revolve around SOE investment and financing and the relation of these with government accounts. Using SOEs to raise funds for infrastructure investment can partially reduce pressure on the government's borrowing capacity, but the implicit or explicit state guarantees on SOEs borrowing represent a liability. Also, the role of government as shareholder can bring risks of moral hazard, especially when the firm is tasked with implementing some of the government's policies, rather than being free to pursue profit-maximisation.

SOE exemptions from antitrust law also raise issues. Under article 51 of the 1999 Competition Law, SOEs are exempted for activities tied to social assistance or national development objectives. While this exemption normally does not apply when SOEs or their subsidiaries engage in activities unrelated to their core national development business, SOEs can nevertheless cross-subsidize their operations in other competitive markets. This distorts competition and gives SOEs an unfair advantage over their privately-owned competitors. SOEs should be subjected to stronger scrutiny under competition law and the scope of exempted activities should be narrowed. Apart from the risk of abusive cross-subsidisation of activities, horizontal diversification can also lead to inefficiencies if the business logic of such diversification is poor. SOEs should refrain from entering or staying in markets that are poorly related to their core business.

There has been a welcome consolidation of the SOE sector. The authorities have long pledged to "rightsize" the SOE sector, largely through mergers. Past progress has been limited; in 2019 there were still 142 central government SOEs. However, a major consolidation in January 2023, shrunk the number to 41 and the goal is to reduce the number to 30 SOEs over the next decade. These SOEs are grouped into 12 clusters (telecoms and media, energy, tourism, insurance and pension funds, banks, food and fertilisers, infrastructure, plantation and forestry, mining, manufacturing, logistics, health). This consolidation has potential to increase the performance of the merged companies, though it requires a thorough and transparent assessment of their business and financial situation. However, consolidation will not resolve all the challenges of the SOE sector. As argued in past *Surveys*, there is value in developing a national ownership policy to guide the partial or full listing of more SOEs (OECD, 2021^[13]). At present there is no active privatisation programme, but the incoming President has signalled a desire to make progress on this front, notably for state-owned hotels. In addition, stricter application of global standards such as the *OECD Guidelines on Corporate Governance of SOEs* (OECD, 2024^[23]) would help SOE performance. Best practice in SOE's has multiple dimensions (OECD, 2024^[24]). As regards monitoring performance, Korea, New Zealand and Sweden have been cited as among the most advanced, with comprehensive performance agreements that extend across their entire SOE sectors (Brumby and Gökgür, 2021^[25]).

Combatting corruption must remain a priority

Fighting corruption is a long-standing government priority, although perceptions of corruption and challenges to public integrity remain prevalent (Figure 2.9, Panel A). A key institution has been the Corruption Eradication Commission (KPK), which deals with high-level corruption cases. The Commission has been key in changing public perceptions about graft (Box 2.5).

Box 2.5. The Corruption Eradication Commission (KPK)

Established in 2002, the KPK has prosecuted several ministers, governors and judges, as well as parliamentarians (national or regional) and high-ranking civil servants (Butt, 2019^[26]). From January 2022 to December 2023, KPK investigated 281 cases and prosecuted more than 200 corruption cases. The international anti-corruption body Transparency International (2021^[27]) ranked the KPK one of the best-known anti-corruption agencies in Asia in 2020. Aside from its prosecution role, the KPK also conducts monitoring, prevention and education. In preventing corruption, the KPK carries out risk assessment on government systems and provides recommendations to mitigate the risk of corruption.

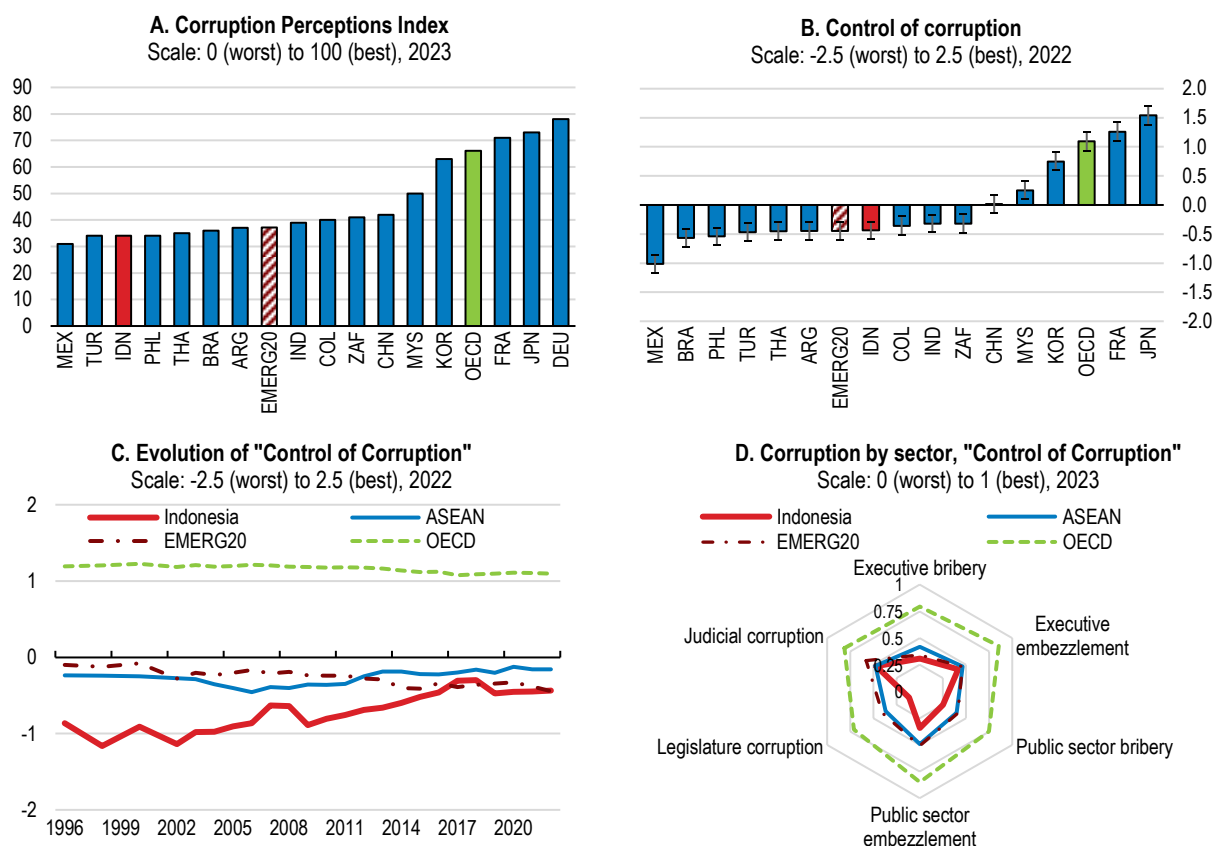
Legislation transforming the KPK from an independent authority to an executive agency in 2019 has raised concerns. The law placed the KPK under the oversight of a supervisory body, which must be notified (but does not authorise) activities such as wire-tapping, searches and seizures. The supervisory body can also hear complaints on ethics violations by employees of the KPK. The law also stipulated that KPK employees were part of the civil service. The KPK is free to select its employees but only from the pool of civil servants; in 2021, more than 50 KPK employees were removed after failing a civic knowledge test that was required to become civil servants. The legislation has been criticised by some as a move to politicize the agency and weaken its ability to prosecute corruption (Transparency International, 2021^[27]).

Overall, the loss of operational autonomy of the KPK seems to be of greatest concern, and *ex post* oversight would likely be more warranted than *ex ante* supervision. In order to address these concerns:

- The KPK should be free to hire the most suitable and qualified personnel and investigators, if need be, outside the pool of civil service employees; unless nepotism or irregularities are suspected, these decisions should rest with the Commission.
- Allegations against KPK employees (including police officers and prosecutors working for the KPK) could perhaps be better addressed by the Ombudsman than a multi-member board.
- While it is crucial that the KPK works efficiently with police agencies and prosecutors, this is better achieved by subjecting them to the KPK's authority in corruption cases than subjecting the KPK to the supervision of these agencies and their representatives.
- More generally, in the appointment of members of courts and independent authorities, parliament and government bodies should respect the independence of the appointees.

There is scope to also strengthen anti-corruption measures in the areas of international business transactions and lobbying. As argued in the 2021 *Survey* (OECD, 2021^[13]), Indonesia should criminalise the bribery of foreign public officials and enact corporate liability for corruption offences as a party to the UN Convention against Corruption and as a G20 member. These legislative changes are also part of the OECD Convention on Combating the Bribery of Foreign Public Officials in International Business Transactions (the Anti-Bribery Convention). Clearer definitions and regulations on lobbying and conflicts of interest should also be introduced, notably for members of Parliament and local politicians; currently direct bribery is prosecuted while trading of political influence is often not a criminal offence. As shown in the PMR lobbying indicator (Figure 2.8), Indonesia currently stands far from international best practice. In addition, increasing fines for corruption or ethics violations, and making convicted politicians ineligible to run for office, at least for a few years, could strengthen deterrence.

Figure 2.9. Corruption is still perceived to be widespread



Note: EMERG20 refer to G20 emerging countries excluding Indonesia (Argentina, Brazil, China, India, Mexico, Türkiye, and South Africa). Data for this group are calculated as an unweighted average. Panel B shows the point estimate and the margin of error. Panel D shows sector-based subcomponents of the "Control of Corruption" indicator by the Varieties of Democracy Project.

Source: Panel A: Transparency International; Panels B & C: World Bank, Worldwide Governance Indicators; Panel D: Varieties of Democracy Project, V-Dem Dataset v12.

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Opening up further to trade and foreign investment

Indonesia is engaging in a number of new trade agreements (Box 2.6), but considerable regulatory and policy-driven obstacles to trade will remain even if these are successfully concluded. Evidence suggests Indonesia's tariff and non-tariff measures hurt firm's productivity and employment, with a more severe impact on smaller firms (Gupta, 2023^[28]).

Box 2.6. Recent trade agreements completed or underway

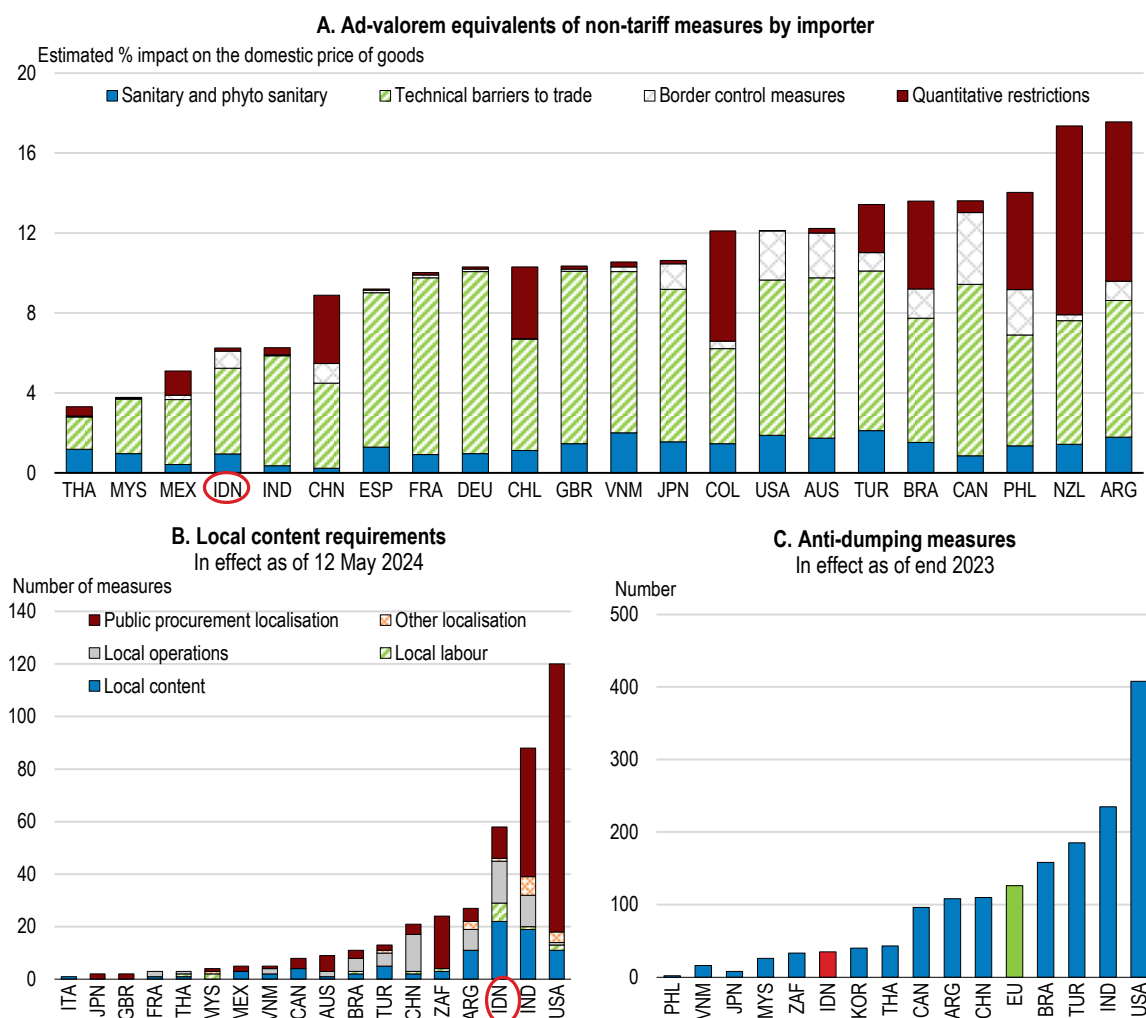
Indonesia has struck various bilateral and multilateral trade agreements recently and others are being negotiated. The Regional Comprehensive Economic Partnership – which includes the ten ASEAN countries, as well as Australia, China, Japan, Korea, and New Zealand – entered into force in January 2023 for Indonesia. The country also signed Comprehensive Economic Partnership Agreements with Australia and Korea in 2020. A free trade agreement with the European Free Trade Association (Iceland, Liechtenstein, Norway, and Switzerland) entered into force in January 2022. On the other hand, negotiations with the European Union (Indonesia's fifth-largest trading partner) have been underway since 2016 and have yet to be concluded. Some of Indonesia's industrial and trade policies have proved to be a roadblock in negotiations with partners.

Tariff barriers are low in Indonesia while the evidence is mixed for non-tariff barriers. According to the World Bank's World Development Indicators, Indonesia had an unweighted average tariff of 6% across traded goods, and a weighted average of 1.8%. Both averages are similar to the world averages and have been relatively stable over the past 20 years. As elsewhere, non-tariff restrictions can impede trade; for instance, unintentional (or perhaps otherwise) barriers in technical standards or in border processing. An estimate of the ad-valorem equivalent of non-tariff barriers (Cadot, Gourdon and van Tongeren, 2018^[29]) suggests, overall, they are relatively low in Indonesia (Figure 2.10, Panel A). As regards more specific non-tariff barriers, Indonesia applies only a small number of anti-dumping trade restrictions, fewer than the US or the EU (Figure 2.10, Panel C). However, Indonesia imposes a relatively large number of local content policies and criteria for public procurement (Figure 2.10, Panel B).

Indonesia is endeavouring to fine-tune its system of import and export licences. Import licenses have historically been used to promote import substitution industrialisation. More recently, export restrictions have been used to lower the price of food commodities and promote downstream processing industries (see below). A Commodity Balance Mechanism (NK), introduced under Presidential Regulation n° 32/2022, aims to balance the country's supply and demand for certain commodities (including meat, fishery, rice, salt, and sugar). Data provided by businesses are used to identify excess supply or demand and adjustments to quotas and licenses for exports and imports are made accordingly. One potential advantage of the NK system is shorter and more transparent permit processes. However, accurately identifying the state of demand and supply and responding in a timely way is inherently challenging, not least as past data may not be relevant for ongoing and future needs. In a welcome move, the authorities decided recently not to go ahead with a planned extension of the Mechanism to certain types of plastics. Plans for extending the Mechanism to other goods should also be reconsidered. A more open trading system, where demand and supply adjustment are largely driven by price movements, would be more efficient and transparent.

Indonesia has scope to reduce barriers to trade in services. Boosting trade in services, particularly in high-value-adding sectors, can bring additional benefits through knowledge transfer, for instance. The OECD Services Trade Restrictiveness Index (STRI) provides information on regulations affecting trade in services in 22 sectors. According to this indicator, Indonesia's international services trade is more restricted than that in other ASEAN economies such as Singapore, Malaysia, and Vietnam, and significantly more than the OECD average (Figure 2.11, Panel A). Furthermore, the OECD data suggest restrictions have increased between 2014 and 2023 across many sectors. Restrictions are particularly heavy in legal services, accounting, and telecoms. Restrictions on foreign entry feature in many sectors. Barriers to competition specifically hinder trade in telecommunications and air transport (Figure 2.11, Panel C).

Figure 2.10. Non-tariff trade barriers are broadly low but include numerous local-content requirements



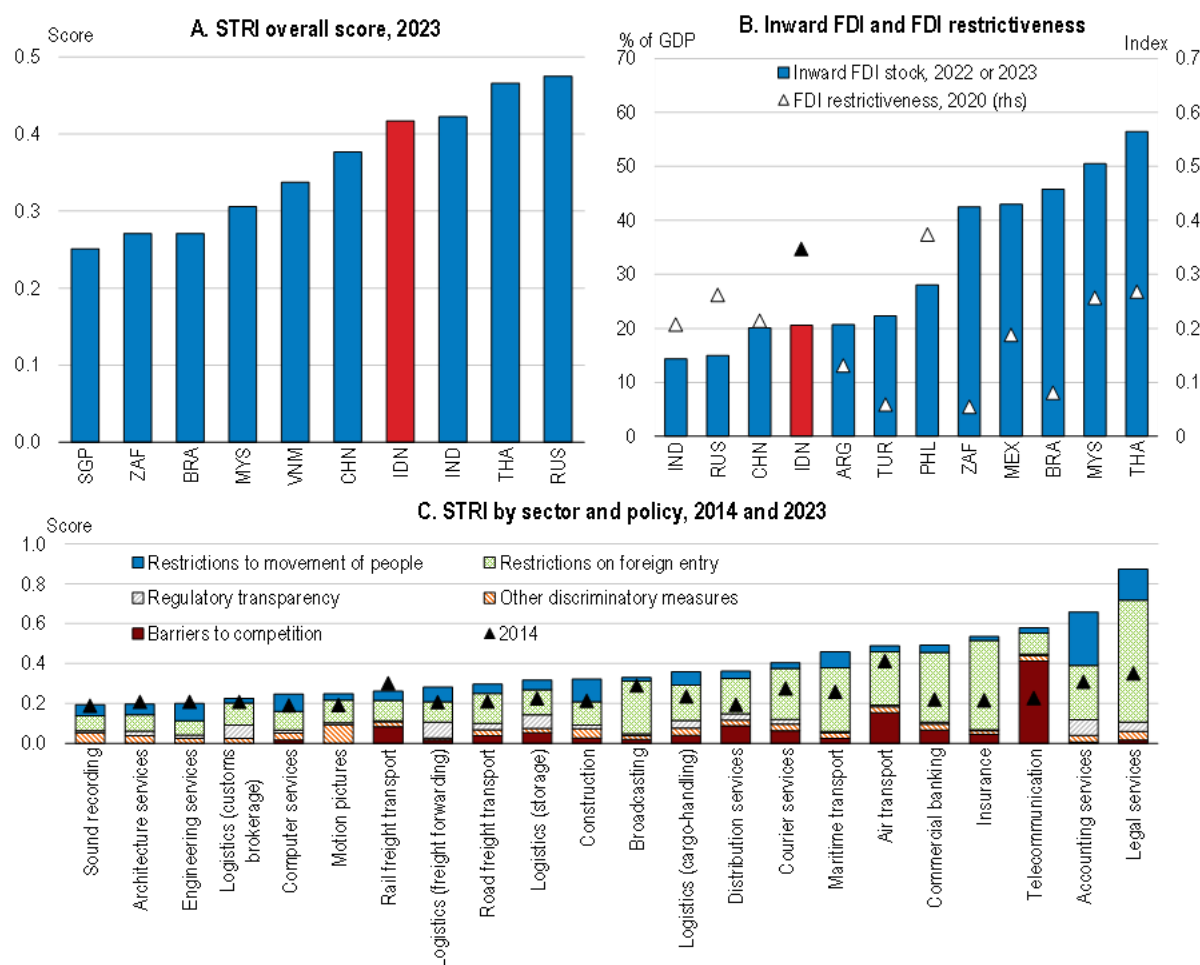
Note: In Panel A, the ad-valorem equivalent (AVE) of a non-tariff measure is the proportional rise in the domestic price of the goods to which it is applied, relative to a counterfactual where it is not applied, as defined in Cadot, Gourdon and van Tongeren (2018). In Panel B, OECD calculations based on Global Trade Alert database covering commercial policy interventions since November 2008. In terms of local operations, labour and content, each category includes requirements and incentives.

Source: Cadot, O., J. Gourdon and F. van Tongeren (2018), "Estimating Ad Valorem Equivalents of Non-Tariff Measures: Combining Price-Based and Quantity-Based Approaches", OECD Trade Policy Papers, No. 215; Global Trade Alert (www.globaltradealert.org); WTO.

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There has been an encouraging reduction in the scope of direct restrictions on foreign-direct investment (FDI). Inward FDI is relatively low in Indonesia, when compared to other ASEAN nations such as Malaysia or Thailand (Figure 2.11, Panel B). Prior to 2020, direct restrictions on FDI applied to numerous sectors of the economy. The Omnibus Law on Job Creation (see above) significantly narrowed the scope of direct FDI restrictions. Notably, heavy restrictions were lifted as regards investment in airports, mining, and construction services. Direct FDI restrictions now only apply to six fairly narrow product categories (cannabis, gambling, fishing of endangered species, coral extraction, alcohol, industries using ozone-depleting materials and chemical weapons). Inward FDI flows have increased substantially in recent years in some of the liberalised sectors, notably in the extraction and processing of base metals, though in other sectors results have been mixed (Montfaucon, Senelwa and Doarest, 2023^[21]).

Figure 2.11. Regulatory restrictions are high on services trade and foreign direct investment



Note: The STRI database records measures on a most favoured nation (MFN) basis towards third countries. Air transport and road freight cover only commercial establishment (with accompanying movement of people). The indices are based on laws and regulations in force on 31 October 2023. The FDI Regulatory Restrictiveness Index (FDI Index) measures statutory restrictions on foreign direct investment across 22 economic sectors. The index scale ranges from 0 (open) to 1 (closed).

Source: OECD STRI database, OECD FDI Statistics; OECD FDI Regulatory Restrictiveness Index; ASEAN Statistics; and World Bank.

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However, there remain many indirect discriminatory impediments on foreign direct investment that are not tackled by the 2023 Omnibus Law or by other measures. Impediments include increased capital requirements, local content rules (as mentioned above), and unequal access to public procurement (OECD, 2020_[30]). For example, in mining foreign investors are required to sell 51% of holdings to local investors within ten years. FDI restrictions in services sectors (see above) are also often indirect discriminatory impediments. The Indonesian economy would greatly benefit from reducing these discriminatory measures.

Down-streaming industrial policies must be closely monitored

As part of the national medium-term development plan (RPJMN) 2020-2024 (Indonesian Presidency, 2020_[31]), the Indonesian authorities have been providing tax and non-tax incentives and imposing export restrictions to encourage downstream processing of Indonesia's commodities, notably nickel. The aim is to reduce dependence on global commodity buyers, as well as to boost regional development and manufacturing employment. Indonesia accounts for nearly half of global output in nickel ore, which has

been the primary focus of such initiatives. Policy has oscillated between tariffs and export bans, in search of a formulation that prompts downstream processing while also continuing to attract investors' interest. An export tariff was introduced in 2012. An outright export ban was introduced in 2014 and replaced again with tariffs in 2017. The export ban was reinstated in January 2020, along with a domestic processing requirement on raw nickel ore. The export ban and domestic processing requirement appear to have had greater effect. FDI has increased substantially with numerous new nickel smelters operating, or under construction. Much of the investment originates from China. Exports of ferronickel and processed nickel have surged in value from USD 4.5 billion in 2019 to USD 19.6 billion in 2022, while nickel ore exports have stopped. The IMF estimates that less than one third of this increase is due to higher global nickel prices, with the rest plausibly coming from higher value added from smelting activities and higher export volumes (IMF, 2023^[32]). The authorities are contemplating policies to incentivise deeper nickel downstreaming – notably the production of electric batteries and vehicles – and extending down-streaming policies to other commodities (copper, bauxite, tin or agricultural goods).

Though the down-streaming strategy pursues some worthy goals – and industrial policies have played a major role in the industrial development of some countries like Korea in the past (Box 2.7) – the cost and benefits for the Indonesian economy should be thoroughly assessed and periodically reviewed. Evaluation of industrial policies is key to ensure they reach their intended impacts (Criscuolo et al., 2022^[33]): targeted industrial strategies can achieve structural transformation and growth, but evaluation and regular re-assessment of these strategies are needed. On average, fiscal incentives for extraction and processing has amounted to about 0.4% of GDP between 2016 and 2022; while this is small, it represents about 10% of the government's annual discretionary spending. The risk of building significant overcapacity in the targeted sectors is also sizable. This has, for instance, happened in the global steel industry subsidies from numerous countries have led to excess capacity (Mercier and Giua, 2023^[34]). Against the risk of resource misallocation and rent-seeking, the down-streaming strategy should include provisions such as sunset clauses to minimise any possible detrimental impact on competition. Another risk of this policy is reaction from trading partners (IMF, 2023^[35]). This has already happened in the case of nickel; the European Union has challenged the export ban and domestic processing requirement at the WTO (the case remains undecided).

More broadly, policy towards business should adhere to sound principles. The objectives of industrial policies supporting specific sectors, such as support for down-streaming, should be defined narrowly but also sensibly (Goldstein, 2002^[36]). Notably, there are risks in aiming for specific shares of employment in manufacturing or processing sectors as this can push business excessively towards using low productivity (but high employment) production techniques (Rodrik, 2015^[37]). Also, industrial policies should not detract from efforts to improve the general business environment, including through creating better jobs in services through pro-competition business regulations. This can be a more promising growth strategy than heavy manufacturing for absorbing new workers into middle-class occupations (Rodrik and Stiglitz, 2024^[38]).

Box 2.7. Supply and demand industrial policies in OECD and non-OECD countries

The case for industrial policies has gained new traction across OECD and non-OECD countries in recent years (Aiginger and Rodrik, 2020^[39]); this has been most notable in steel, green technology (wind, solar, electric batteries and electric vehicles) as well as semi-conductors. Industrial policies aim to structurally improve the performance of the domestic private business sector, typically in terms of productivity growth, innovation, sustainability, resilience, or strategic autonomy. In emerging economies, industrial policies often also aim to increase value added and/or employment in some or all manufacturing sectors. Criscuolo et al. (2022^[40]) and Juhász, Lane and Rodrik (2023^[41]) review the empirical literature on the effectiveness of industrial policy instruments, distinguishing between demand-pull instruments and two types of supply-push instruments: those that improve firm performance (“within” firm instruments) and those that affect industry dynamics (“between” or framework instruments).

Korea is often heralded as a model for successful industrial policies. Lane (2021^[42]) analyses Korea’s Heavy and Chemical Industry (HCI) drive of the 1970s and finds statistical support for positive impact on firm growth and productivity from measures such as directed credits, tax incentives and tariff exemptions for imported inputs. Kim, Lee and Shin (2021^[43]) find similar patterns for plant growth and output, but they suggest that HCI may have led to some misallocation. Choi and Levchenko (2021^[44]) also find that the HCI drive led to higher long-term growth for subsidised firms, and that the long-run welfare effect was between 3% and 4%. Recent studies have examined the effect of place-based policies in the European Union, aimed at boosting investment and employment in peripheral or distressed regions. Criscuolo et al. (2019^[45]) evaluate a British programme whose aim was to create and safeguard employment in manufacturing. The policy was successful in creating jobs and reducing unemployment, but with no spillover effect on total factor productivity. Cingano et al. (2022^[46]) study a similar programme in Italy, aimed at job creation, primarily in manufacturing. Eligible firms increased investment and employment, with little spillover to places and firms outside the programme.

The literature suggests industry policy that combines complementary instruments is more likely to be successful. R&D tax credits and subsidies are effective in stimulating R&D and innovation, while skill and knowledge transfer policies are key complementary instruments. Access to financing (loans, guarantees) and inputs (skill and knowledge transfer policies) are good complements to enhance technology diffusion. Evidence on the effectiveness of targeted grants and subsidies is more limited. The scarce existing evidence suggests that small firms benefit more from these instruments than large domestic businesses and foreign investors. Demand-side instruments play an increasingly important role in transformative industrial strategies, but evidence on their effectiveness is still lacking, even if public procurement have a role to play in stimulating innovation when demand emerges from the public sector (e.g., aerospace, defence, infrastructures).

Evidence also shows that improving the policy environment for business, notably as regards competition and trade policies, is key in enabling the most productive firms to grow and is an important channel for structural change. Competition policy promotes efficiency-enhancing resource reallocation and, indirectly, incentivises firms to innovate and adopt new technologies. Shielding domestic firms from international competitors through trade policies or other regulations is most often inefficient as it can encourage rent-seeking. Hence, industrial and competition policies often work against each other. As such, industrial policies require a constant assessment of their costs and benefits, against other less costly or less discriminatory policies. Governments should be vigilant against the risk of entrenching vested interests, and to avoid continued targeted support to unproductive sectors.

Source: (Criscuolo et al., 2022^[40]) and (Juhász, Lane and Rodrik, 2023^[41])

Encouraging innovation

Indonesia generally ranks poorly in terms of innovation readiness. In the World Intellectual Property Organisation's (WIPO) Global Innovation Index, Indonesia has climbed from 72nd in 2010 (INSEAD, 2011^[47]) to 61st in 2023 (WIPO, 2023^[48]). However, it remains the worst ranked ASEAN5 country and is also surpassed by Vietnam. Patenting activity in information and communication technologies is relatively low (Figure 2.12, Panel A). Meanwhile, expenditure on research and development (GERD) has grown from 0.09% of GDP in 2013 to 0.28% in 2020 (Figure 2.12, Panel B) but this is significantly below the ASEAN average of 1.07%. GERD has predominantly been government driven—public sector shares of GERD is 84.6%, whereas the private sector share is 7.3% (Figure 2.12, Panel C). Very little private R&D activity is undertaken in the manufacturing sector, except in large companies (Hill and Tandon, 2010^[49]).

Indonesia's low level of R&D is echoed in its research skill base. There were only 400 R&D personnel per million inhabitants in 2020, compared with 7 225 in Singapore, 2 024 in Thailand, 779 in Viet Nam, and 726 in Malaysia (Panel D). The number of STEM tertiary students remains low, though this is expected to increase. Indonesia is projected to produce 3.7% of global STEM graduates by 2030, making it one of the highest producers in the world (Oliss, McFaul and Riddick, 2023^[50]). In terms of scientific research, proxied by peer-reviewed academic publications, Indonesia has grown from 0.03% of the world total in 2003 to 0.96% in 2022, although mostly thanks to large increases in conference proceedings and low-impact publications. On the other hand, participation of women in R&D and innovation is relatively strong, although it can be further improved. Women comprise 44% of R&D personnel, 38% of researchers in business enterprises and in government, and 21% of researchers in higher education. Female researchers with doctorate qualifications stand at 36% and female researchers with master's qualifications at 49% (UNESCO-UIS).

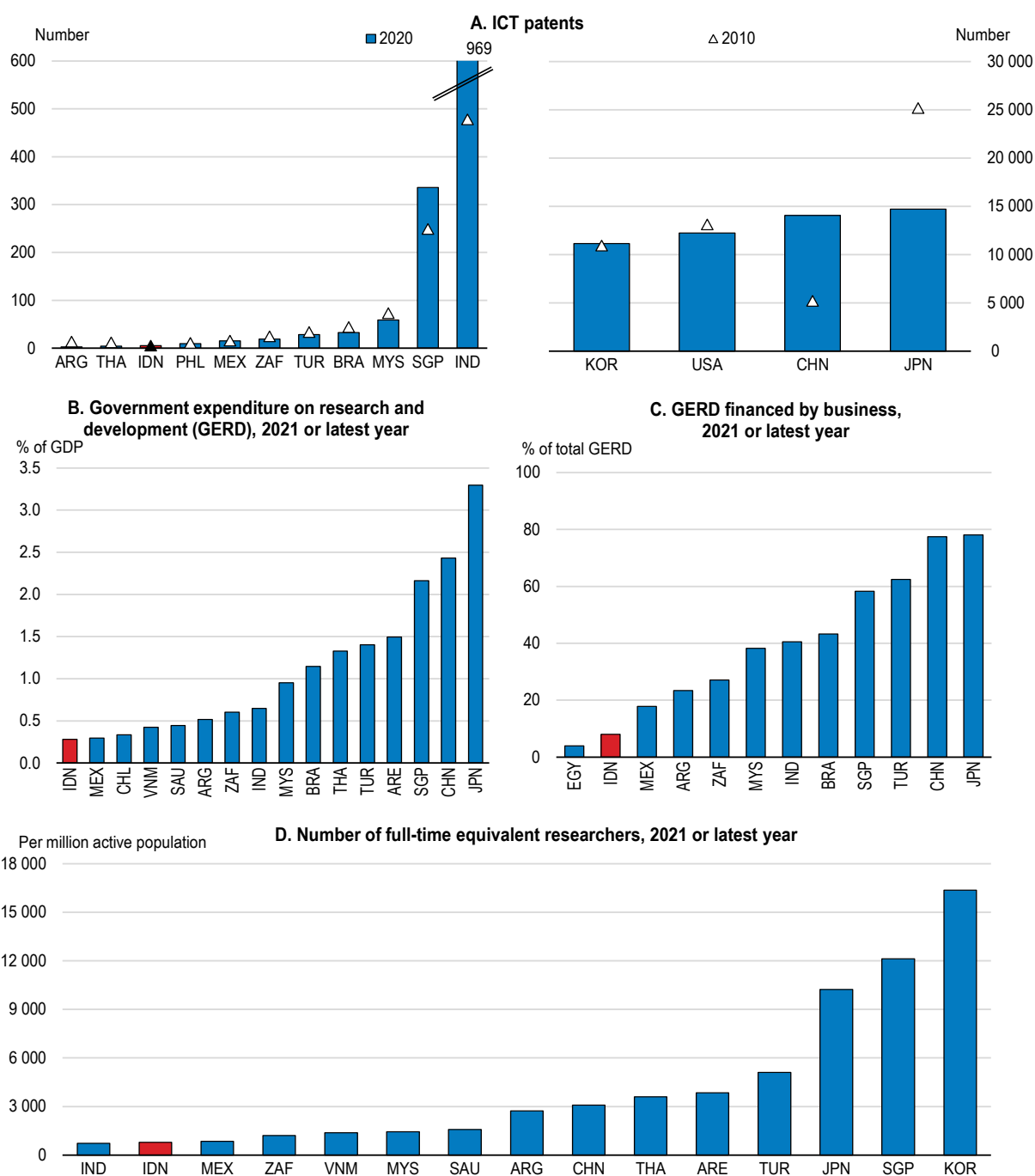
There is scope to strengthen Indonesia's protection of intellectual property rights (IPRs), including for software and other digital services. The 2016 Patent Law improved the general framework, although the patentability criteria for incremental innovations are ill-defined and the grounds and procedures for issuing compulsory licenses fail to fully protect the interests of innovative firms (US State Department, 2023^[51]). Overall, holders of intellectual property rights in Indonesia face challenges in protection and enforcement, as testified by widespread piracy and counterfeiting and the presence of the country in the European Commission's priority 3 watchlist (European Commission, 2023^[52]). Poor enforcement is of particular concern regarding dangerous counterfeit products (such as pharmaceuticals and spare parts) and should be addressed through deterrent-level penalties for IPR infringement in physical markets and online.

R&D funding has been criticised for being compromised by uncompetitive and opaque allocation mechanisms and ineffective management, as well as for being spread too thinly across projects (2018 study by the Corruption Eradication Commission). The R&D funding system, and in particular the Indonesian Science Fund, has also been compromised by slow disbursement, cumbersome administrative procedures, and single-year funding (Asian Development Bank, 2020^[53]). Science and technology have received increasing attention in the national policy agenda. In 2019, the law on the National System of Science and Technology (2019) introduced new tax incentives for R&D. In 2021 a new Ministry of Education, Culture, Research, and Technology (MoRTHE) was established, along with the new National Research and Innovation Agency (Badan Riset Dan Inovasi Nasional, BRIN). In 2023, BRIN received IDR 6.39 trillion (USD 408 million) from the state budget, equal to 0.03% of GDP. It will be crucial to avoid undue political pressures in BRIN's governance and programme of work. Also, the time taken to fund research needs to be shortened.

In addition to developing R&D funding support the Indonesian government has introduced a range of measures to encourage innovation and entrepreneurship. These include tax incentives, simplified business registration procedures and funding support for early-stage startups. A 300% super tax deduction for R&D activities was introduced in 2019, but uptake of the incentive has been very modest (Kristanti and Saptono, 2024^[54]). The "1000 Digital Startups National Movement" programme, launched in 2016, includes awareness, tutoring and mentoring support for digital startups. Other programmes for start-ups include Startup Inovasi Indonesia and Startup Studio Indonesia. The latter aims to nurture 150 early-stage businesses by 2024. Help

with financing includes the Merah Putih Fund, a government-backed financing vehicle bringing together five state-owned venture-capital companies.

Figure 2.12. Research and development activity is relatively low



Note: In Panel A, IP5 patent families refer to patents that have been filed in at least two IP offices worldwide, one of which among the Five IP Offices (namely the European Patent Office, the Japan Patent Office, the Korean Intellectual Property Office, the US Patent and Trademark Office and the State Intellectual Property Office of the People Republic of China). Counting patents according to the inventor's country of residence is the most relevant for measuring the technological innovativeness of researchers and laboratories located in a given country.

Source: OECD (2024), OECD Patents Statistics; UIS Database (2024), Science, technology and innovation; Global Innovation Index 2023; and OECD calculations based on UNESCO (2024), UIS Statistics and World Bank.

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Findings and recommendations

MAIN FINDINGS	RECOMMENDATIONS (Key recommendations in bold)
Addressing informality and gender gaps	
Informal employment remains widespread, with an overrepresentation of women. Reduction in informality can in part be achieved by improved tax collection (Chapter 1) but work on other fronts is needed too. The 2023 Omnibus Law on Job Creation encourages the formalisation by loosening labour regulations. Employers must provide 3-months paid maternity leave, but compliance can be low, especially in small firms. This contributes to lower levels of female labour force participation and formal employment.	Monitor the impact of the 2023 Omnibus Law, and further simplify labour market regulations if deemed opportune. Further simplify the regulatory environment for firms to encourage formalization.
Gender gaps in labour force participation remain high.	Shift the funding of maternity leave from employer to social insurance or general taxation; focus support on low-wage earners.
Improving education	
School performance has fallen according to PISA indicators, and Indonesia remains significantly below other OECD economies. Different curricula apply to secular and religious schools with large heterogeneity.	Further improve education, including by harmonising the secondary-school curricula and ensuring consistency nationally, to provide a broader core knowledge across all pupils.
Primary school attendance is nearly universal, but attendance and attainment are limited in secondary schools, partly due to out-of-pocket costs (transports, books, uniforms, etc).	Reduce out-of-pocket costs of secondary education for low-income families by expanding state funding over time.
PIAAC data shows that Indonesian adults have low skills, notably in information-processing. Vocational training represents a high proportion of secondary schooling but does not always correspond to local workforce needs. Local governments have flexibility to adjust the curriculum but seldom use it.	Expand vocational training and improve teaching quality. Give local governments and businesses a greater say and technical capacity in defining local needs for vocational training.
Lack of skills in the general population is a drag on productivity and puts workers at risk in the context of the green and digital transitions.	Conduct regular skill anticipation exercises, first in priority sectors. Provide a centralised and regularly updated list of occupations and skills that are in high demand and of strategic importance.
Developing a strategy for State-Owned Enterprises (SOEs) and improving their governance	
The scope of SOEs and their share of GDP are higher than the OECD average, as well as comparable emerging market economies.	Develop a state ownership strategy that defines more clearly the sectors where government ownership remains relevant.
A clear case for government ownership is lacking in some sectors.	Privatise or divest those SOEs where government ownership is not warranted.
Profitability remains low for SOEs and accountability is often subpar. New guidelines have been introduced for SOE governance. In addition, there has been progress in improving financial reporting.	Implement core provisions of the 2024 OECD Guidelines for SOEs, in order to improve SOEs' corporate governance.
SOEs are not exempt from competition law when conducting strategic interest activities yet abuse of dominant positions remains widespread. SOEs are mandated to implement the Competition Compliance Programme of the Competition Supervisory Commission (KPPU Regulation 1/2022).	Subject SOEs to competition law and intervene when abusing their dominant market position in non-strategic activities.
Upholding public sector integrity	
The autonomy of the Corruption Eradication Commission (KPK) has been hindered by the 2019 reform, leading to perceptions of a lack of independence.	Safeguard the independence, autonomy and authority of the KPK to ensure the effective prevention, detection and investigation of corruption.
Indonesia does not criminalise the bribery of foreign officials, as prescribed by the UN Convention against Corruption.	Align legislation more closely with the UN Convention against Corruption and maintain momentum in joining the OECD Anti-Bribery Convention.
Monitoring the efficiency of trade and industrial policies	
Trade restrictions remain widespread (including the recently introduced Commodity Balance Mechanism) and hinder participation in global value chains. Proactive policies have been introduced to develop domestic downstream activities. Some success has been achieved in developing nickel smelters and processing facilities, but implementation risks remain very significant.	Reduce the number of sectors where import and export quotas apply; do not expand the Commodity Balance Mechanism to other goods. Ensure industrial policy addresses market failures and subject policy measures to cost-benefit analysis in relation to precisely defined targets.
Trade in services remains highly restricted.	Remove unwarranted restrictions against trade in services.
Most sectors are now open to FDI, yet foreign-owned firms remain discriminated by a range of domestic preference policies.	Level the playing field further by reducing provisions in public procurement, antitrust and other domains that may favour domestic firms.
Improving innovation policies	
The 2016 Patent Law improved the general patent framework, although the patentability criteria for incremental innovations are ill-defined and the grounds and procedures for issuing compulsory licenses fail to fully protect the interests of innovative firms.	Better protect intellectual property rights by making penalties for infringements in physical and online markets more deterring.
Spending on R&D is low and the national system of innovation suffers from institutional inefficiencies. The funding of the National Research and Innovation Agency (BRIN, established in 2021) remains low and the allocation of funds to research too slow.	Shield BRIN's governance and action from undue political pressures and ensure speedy allocation of resources.

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3

Making the digital transformation work for all

Andrea Goldstein, OECD

Indonesia has made considerable advances in digitalisation and it ranks well in mobile telephony penetration. The rollout of 5G, however, has been slow and fixed broadband penetration and coverage is low. Notwithstanding the success of several unicorn companies and digitally based venture capital projects, the business sector in general makes a comparatively low use of digital tools. Digitalisation of government services is advancing but there is scope for more and better. Policy priorities to accelerate digital transformation should include ensuring independent regulation, improving digital skills across the whole population, enhancing e-delivery of government services, reinforcing cybersecurity, and better ensuring data privacy.

With the appropriate reforms, digitalisation can accelerate economic growth

The continuous integration of digital technologies, including broadband connectivity, artificial intelligence, and machine learning, into economies has the potential to bring about considerable benefits, in particular for emerging market economies, including Indonesia, where much technology in use is still distant from the frontier (OECD, 2020^[1]). High-quality broadband connections make it more efficient to conduct interactions within and among firms, as well as between firms and customers, thereby increasing total factor productivity. Affordable access to information and communication technologies (ICT) boosts automation of routine tasks and frees resources for other investments, including in innovation. More broadly, digitalisation can improve the delivery of education, health and other social services, smoothen the functioning of labour and financial markets, and make policymakers more accountable to voters.

Wider and deeper digitalisation can potentially accelerate growth and help Indonesia reach the aspirational goals set for the centenary of Independence in 2045 – which include becoming a high-income country free from poverty, as highlighted in the country’s long-term development plans (RPJPN) 2025-2045 (Indonesian Presidency, 2024^[2]). An expanded digital economy could add 11% to Indonesia’s GDP over the next two decades (Asian Development Bank, 2022^[3]). Recognition of the opportunity to reap further benefits from digitalisation, while also addressing its challenges, is illustrated in the many related policy initiatives underway. In addition to an overarching digital roadmap, strategic plans have been made to accelerate digitalisation in specific sectors, embrace artificial intelligence, and address cybersecurity. The policy effort is illustrated by the many Presidential and Government Regulations (Box 3.1).

In some respects, Indonesia’s digital transition is progressing well. Mobile telephony subscriptions per 100 inhabitants are comparable to those of peers (Figure 3.1, Panel B), and similarly for usage rates (ITU, 2024^[4]). Electronic commerce is well-developed and the digital ecosystem is vibrant, as shown *inter alia* by the considerable number of “unicorns,” i.e. startup companies valued at over USD 1 billion which are privately owned and not listed on a stock exchange (see below). In addition, as elsewhere, the pandemic has prompted advances in the application of online technologies for remote work, education, and medical assistance. Also, the availability of digital databases and trusted data exchange helped advances in e-government.

However, in some other dimensions Indonesia’s digital transition is too slow. This is partly due to the challenges of providing infrastructure and services across an archipelago of 17 000 islands. Fixed broadband penetration is relatively low (OECD, 2023^[5]) and the roll out of 5G mobile technology remains at an early stage, with coverage limited to 15% of the population in late 2023, according to GSMA Intelligence (2023^[6]), one of the lowest in Southeast Asia. Broader connectivity issues in remote areas, partly reflecting the specific technical and economic challenges of Indonesia’s geography, contribute to wide digital divides.

This chapter first outlines the main features of the connectivity landscape in Indonesia and highlights some of the key issues. It then examines digitalisation issues relating to private sector development, finance, e-government, education, online data privacy, and cyber-security.

Box 3.1. Digitalisation strategies and policies

Several policy plans have been unveiled in recent years that aim at deepening digitalisation, including:

- Digital Indonesia Roadmap, 2021-2024: a strategic blueprint focusing on four issues: digital society, digital infrastructure, digital economy and digital administration.
- Strategic Development Plan 2020-2024 (Ministry of Communications and Informatics): focuses on advancing digital transformation across business, society and government, enhancing the provision of communication infrastructure throughout Indonesia, and increasing transparency in public information and communication management.
- Making Indonesia 4.0: aims to accelerate digital transformation in five sectors (food & drinks, automotive, textiles, electronics, and chemicals) through tax and financial incentives.
- National Artificial Intelligence Strategy 2020–2045 (Strategi Nasional Kecerdasan Artifisial): focuses on four areas: ethics and policies; data and infrastructure; talent development; and industrial research and innovation.
- Cybersecurity Enhancement Strategy: focuses on protecting ICT infrastructure and sensitive data.
- National Strategy for Financial Inclusion provides the legal basis to set financial inclusion targets and is complemented by the Digital Finance Innovation Roadmap and Action Plan 2020-2024 and the Payment System Blueprint 2025.
- The Digital Industry Development Master Plan for 2023-2045 was prepared by Bappenas in November 2022.

These strategies have prompted numerous detailed policy actions, the most important of which include:

- Presidential Regulation No. 95/2018 on e-Government.
- Presidential Regulation No. 39/2019 on the consolidation and integration of various government data under One Data Indonesia (Satu Data Indonesia/SDI).
- Presidential Regulation No. 74/2017 on E-Commerce Roadmap.
- Presidential Regulation No. 82/2023 on Accelerating Digital Transformation and Integration of National Digital Services.
- Electronic Information and Transactions Act, Presidential Regulation, and Minister of Communication and Informatics (Kemenkominfo) Regulation.
- Private Electronic System Operators (Permenkominfo 5/2020).
- Governance of Electronic Certification Operations (Permenkominfo 11/2022).
- Law No. 27/2022 concerning Personal Data Protection.
- National Strategy of the Indonesian Digital Economy 2023 (Stranas Ekodig).

Strengthening broadband connectivity

Indonesia's telecoms network has yet to shift fully to 5G

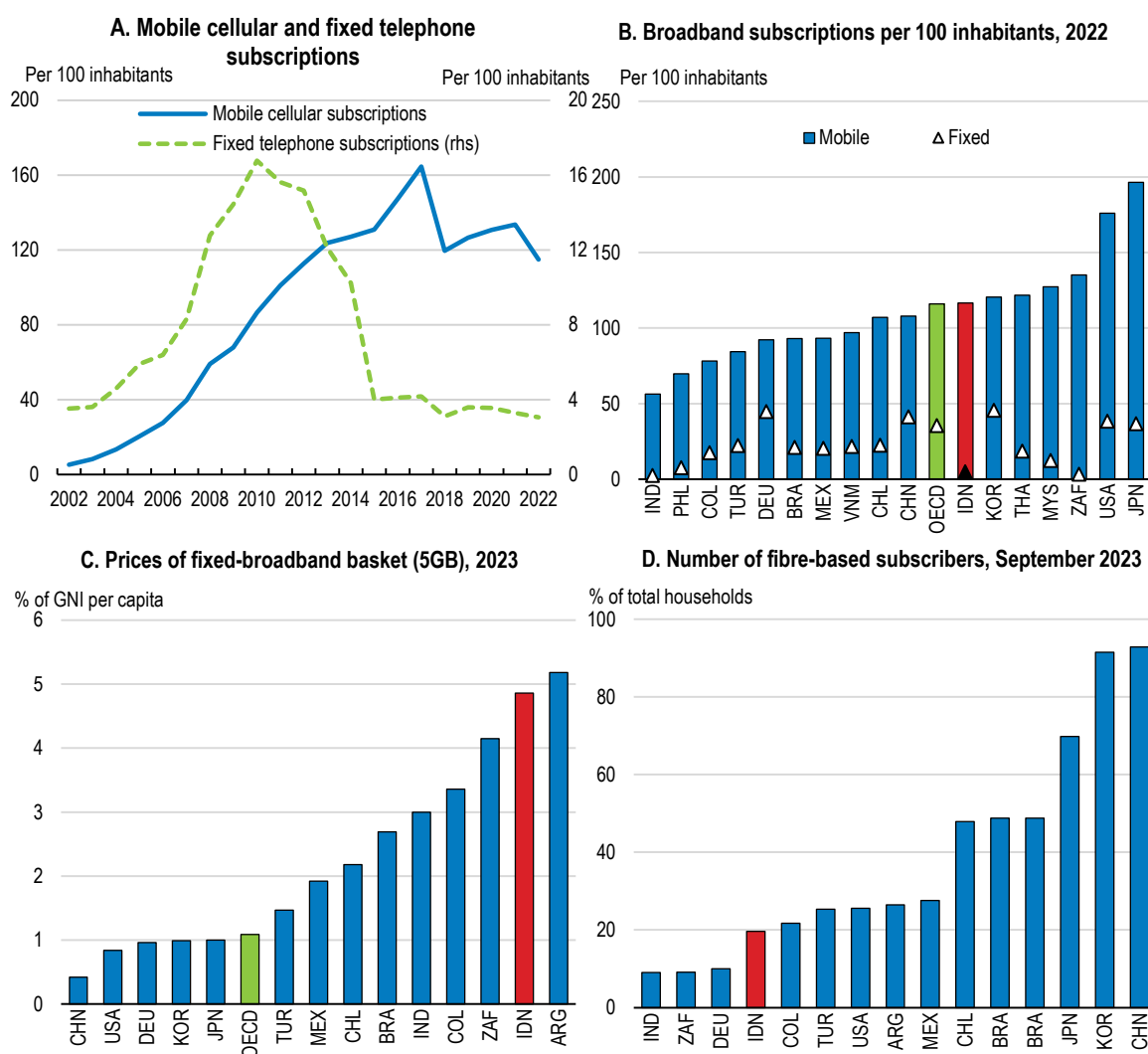
Over the past decade, Indonesia's communication market has grown rapidly. Between 2011 and 2017, the number of mobile subscriptions per 100 inhabitants grew from 101 to 163, before descending to 115 in 2022 as users switched from multiple pre-paid SIM cards to all-inclusive subscription packages (Figure 3.1, Panel A). According to the National Socioeconomic Survey (Susenas), the share of households accessing the internet (at a speed of 256Kbps in the past three months) nearly doubled from 42% to 82% between 2011 and 2022. The share of households with a broadband connection at home, which was as modest as 5% in 2011, as of 2022 was approaching the OECD unweighted average (87% vs. 91%) (OECD, 2024^[7]).

4G is the most widely used mobile technology in Indonesia, accounting for 85% of connections in 2022. This indicator is second only to Malaysia (94% of connections) in Southeast Asia (OECD, 2023^[5]). The 4G

network coverage is wide (97% of the population in 2022) and mobile broadband services are affordable (ITU, 2024^[4]). On the other hand, 5G services were first deployed in 2021, but rollout has been relatively slow, partly due to the country's geography. In December 2023, 5G population coverage stood at 16%, compared to 90% in Thailand (GSMA Intelligence, 2024^[8]). A government target to bring 5G coverage to 4G coverage levels by 2024/2025 seems unlikely to be met.

Broadband's greater capacity means it is particularly important for sectors that have large data and internet needs. In terms of infrastructure, broadband requires the deployment of future-proof, high-performance backbone and backhaul networks capable of delivering high-quality services to the end-user. In particular, it is necessary to deploy fibre backhaul networks closer to the end-user to enable 5G. The last mile to reach the end-user is completed by access networks of different technologies, wired or wireless, fixed or mobile (e.g. fibre-to-the-home, hybrid fibre-coaxial, fixed wireless access, satellite, 4G, 5G), complementing each other to deliver the required broadband services according to technical, geographical, or economic efficiency criteria.

Figure 3.1. The mobile market is saturated but fixed broadband penetration is low



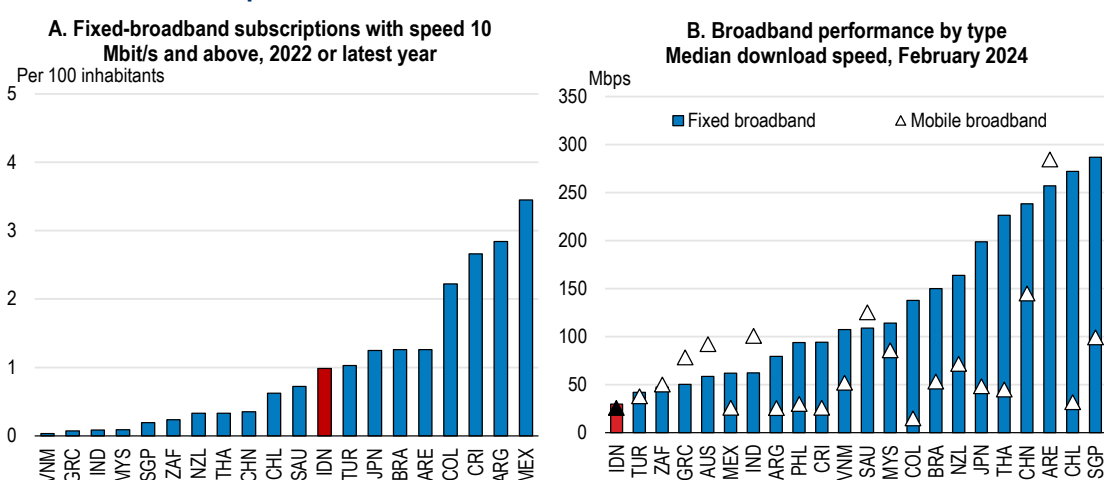
Note: In Panel C and D, unweighted average for the OECD aggregate. In Panel D, the fibre penetration rate is the share of the number of subscribers for Fibre to the Home (FTTH) and Fibre to the Building (FTTB) in the total households.

Source: The OECD Broadband Statistics Database, www.oecd.org/sti/broadband/broadband-statistics/, (OECD, 2024^[9]; 2023^[5]), World Bank, ITU World Telecommunication/ICT Indicators Database; and FTTH Council Europe, FTTH/B Global Ranking 2024.

StatLink  <https://stat.link/z2vsrx>

While mobile broadband penetration is high, fixed broadband penetration is low, both in international comparison (Figure 3.1, Panel B) and relative to Southeast Asia (OECD, 2023^[5]). In 2016, there were two fixed broadband subscriptions per 100 inhabitants, by 2022 they had only risen to 4.9 subscriptions. Take up has been largely via ‘triple-play’ service plans that bundle fixed broadband with fixed voice and internet protocol TV (IPTV) (Mendoza, 2023^[10]). In 2021, almost half of households (44%) cited high costs as the main reason for not subscribing to fixed broadband services (Wibisana et al., 2022^[11]). Widespread access to fixed broadband is necessary for ensuring a comprehensive communication infrastructure. Fixed broadband is complementary to mobile access technologies and can help increase capacity and performance of all broadband access technologies. Although mobile broadband prices are relatively affordable in terms of purchasing power (OECD, 2023^[5]), Indonesia is one of the most expensive emerging markets for fixed broadband (Panel C). Quality and speed are additional concerns. While the number of fixed broadband subscriptions per 100 inhabitants providing services at reasonable speed is similar to far wealthier countries (Figure 3.2, Panel A), in February 2024 Indonesia’s fixed broadband speed was the slowest in a comparison of selected emerging and ASEAN economies (Figure 3.2, Panel B). The deployment of high-speed fixed infrastructure is therefore important to increase fixed broadband performance, with 5G networks relying mostly on backbone and backhaul fibre networks (Figure 3.1, Panel D).

Figure 3.2. Broadband speed is low



Note: Data collected and aggregated by Ookla’s Speedtest® Methodology (Ookla, 2023^[12]). The term ‘speed’ refers to “advertised download speed” in ITU data and to the time needed to pull data from a server on the internet in Ookla data.

Source: ITU and Ookla®, (2024), Speedtest Global Index ® (<https://www.speedtest.net/global-index>).

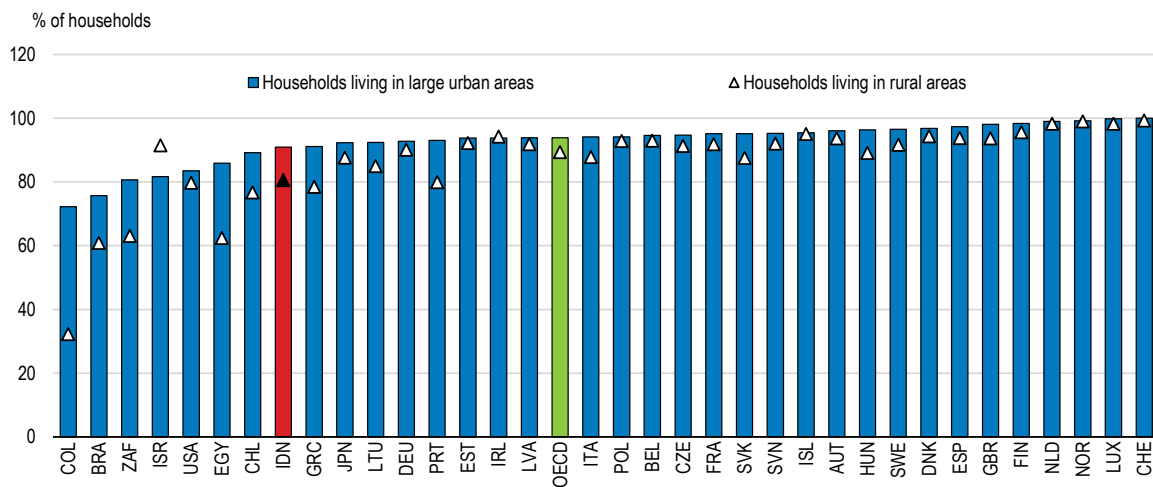
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Connectivity divides are geographic and socio-economic

Geography, as well as socio-economic factors, play a role in differences in digital take up in Indonesia. Take up is particularly low in Indonesia's "3T Regions" (i.e., disadvantaged, frontier, and remote regions). Indeed, the take up gap between Java and the rest of Indonesia, already large, is widening, as is the gap between urban and rural areas (Xuyao, Satria and Kurniawati, 2023^[12]). While some provinces such as Kep, Bangka Belitung and Jambi have substantially improved the penetration rate, others such as Papua Barat and Sulawesi have disappointed. The urban-rural differential is the eighth largest among 35 representative comparable countries (Figure 3.3). In terms of gender, despite digital access rising between 2020 and 2022 from 51% to 64% among the female population, the gap vis-à-vis the male population remained stable at six percentage points (OECD, 2024^[13]). Results from a statistical model indicates that age, education level and region are the most significant determinants of internet access (Box 3.2).

Figure 3.3. The digital divide between urban and rural areas is deep

Share of broadband connections, 2023 or latest year



Note: According to the OECD Regional Typology a region is classified as rural if more than half of the population lives in local units with a population density below 150 inhabitants per square kilometre and urban if less than 15% live in such low-density local units. Some differences in the definitions of urban and rural region could be found for Brazil, Chile, the United States, and Japan. See the source for more details.

Source: OECD (2024^[14]), "Disparity in broadband uptake between urban and rural households", *OECD Going Digital Toolkit*, <https://goingdigital.oecd.org/indicator/17> (accessed on 5 August 2024).

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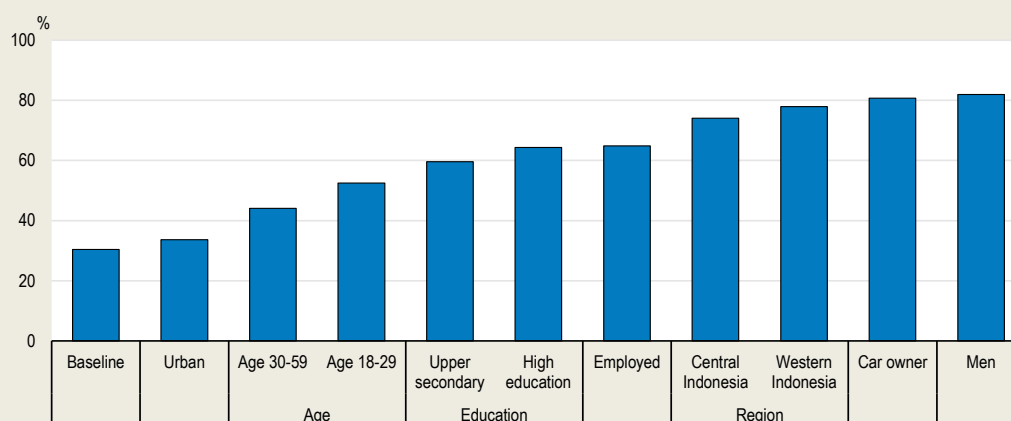
Box 3.2. What explains the divide in Internet access in Indonesia?

Microdata from 2022 National Socioeconomic Survey (SUSENAS) can be used to estimate the probability of having access to the Internet according to different characteristics. The results of a statistical estimation are shown below. The calculation includes individual (such as age, gender, education, employment, rural/urban location) and household characteristics (wealth, proxied by car ownership, and region) over a sample of around 670 000 individuals aged 18 to 75.

The estimated probability of being connected to the Internet for a non-working (either unemployed or inactive) woman aged 60–75 years, with low education, living in a rural area and in a household with no fixed assets, is 30% (Figure 3.4). By moving to an urban area, the same woman would increase her probability of using the Internet by only a few percentage points, whereas if she was an urban woman aged 18–29 with an upper secondary degree the probability would jump to 60%. Region of residence, wealth, and gender are also estimated to affect the probability: if this younger, urban, and higher educated woman was employed and living in Western Indonesia, the probability would be close to 80%. However, changes in this profile, such as owning a car and being a man, play a marginal role.

Figure 3.4. Estimated probability of having access to internet

Probability from baseline with incremental changes in individual characteristics



Note: The baseline refers to women aged 60 or above, with low education (i.e., low secondary or lower), not working (unemployed or inactive), living in a household with no car, in rural areas of Eastern Indonesia. The bar shows the estimated average probability of accessing Internet. Estimates are obtained through a probit estimation controlling for age, gender, education, employment status, rural location, car ownership and regional effects.

Source: OECD calculations using 2022 National Socioeconomic Survey (SUSENAS, 2022).

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Facilitating investment for broadband connectivity

Developing ICT infrastructure to support the digital transformation has been a major component of the national medium-term development plan (RPJMN) 2020–2024 (Indonesian Presidency, 2020^[15]). The Palapa Ring project, a nationwide high-speed backbone network which required the laying of more than 35 000 kilometres of land and sea fibre-optic cables, has substantially widened connectivity. The USD 1.5 billion project brought 4G internet services to all of Indonesia's 514 *kota/kabupaten* (cities/districts). But challenges remain. Especially in rural districts in 3T regions, profitability concerns discouraged operators using the Palapa Ring to provide infrastructure to connect the landing stations of submarine cables to medium and small towns (OECD, 2023^[5]). Satellite internet has engineering advantages in overcoming geographical challenges but is more vulnerable to weather conditions and requires high capital investment.

Three geostationary multifunction satellites (SATRIA, for SATeLiT Republik IndonesiA) are to be launched before 2030 to improve internet coverage in the 3T Regions.

Further investment will depend on progress in tackling two issues that increase the price and limit the quality of Indonesia's fixed broadband connectivity (OECD, 2023^[5]). First, fixed broadband operators have proven reluctant to share passive infrastructure, while this is a widespread practice among mobile networks. Insofar as ducts, poles, rights-of-ways, manholes, and civil works account for as much as three quarters of the installation and maintenance costs for fixed broadband, sharing costs among providers would be advantageous and result in higher investments (Wibisana et al., 2022^[11]). The Omnibus Law on Job Creation (see Chapter 2) also mandates passive infrastructure sharing and the next step in this regard is the issuance of implementing regulation. This will require effective leadership to coordinate the government agencies involved. In addition, there is value in streamlining environmental and other permits required for installing digital infrastructure into integrated licences. Secondly, Indonesia's licensing regime requires service providers to bid for service-specific licenses (OECD, 2023^[5]). Simplifying communication licensing regimes considerably reduces transaction costs, facilitates market entry and speed ups administrative processes for network deployment. As such, OECD countries have moved away from service-based licenses towards single-class licence models based on a "registry" (OECD, 2020^[16]).

Reforming communication regulation

Following liberalisation in 1999, around a dozen operators entered the market. Enhanced competition brought lower prices, but low margins depressed corporate results and led to progressive consolidation. In 2022, the merger of the second- and third-largest carriers to create Indosat Ooredoo Hutchison (Indosat) was approved. There are still four major carriers in operation, and this may be more than is optimal according to some experts. For instance, Elliott et al. (2023^[17]) claim "consolidation presents a trade-off for consumers: faster downloads at the cost of higher prices. [...] Total surplus is maximized at three firms."

Partly government-owned incumbents still play an important role in both the fixed and mobile markets. In fixed broadband, Telkom Indonesia accounted for about 80% of the residential market and 90% of the business market at end-2021 (OECD, 2023^[5]). Moreover, the government is the sole owner of "Series A" shares in both the state-owned fixed telephony carriers and in Indosat (in which PT Perusahaan Pengelola Aset, a state-owned asset management company, holds a 9.6% stake). Series A shares grant veto rights over some key business decisions and appointments, which means that in practice the government retains influence over the strategy of the main competitor to the largest telecom SOE (OECD, 2023^[5]).

At present Indonesia does not have an independent regulatory body for the telecoms sector. The Telecommunications Regulatory Body (Badan Regulasi Telekomunikasi Indonesia, or BRTI), established in 2003, was given independent powers to issue licenses and resolve disputes. Yet it was not fully independent of the Ministry of Communications and Informatics (Kominfo) (OECD, 2023^[5]). Furthermore, the selection and appointment criteria for BRTI leadership were unclear and staffing and budget were limited. BRTI was disbanded in 2020 following a governmental decision to streamline functions. This move is at odds with recommendations of the OECD's Council on Broadband Connectivity that call for regulatory decisions in the communication sector to be made "in an independent, impartial, objective (evidence- and knowledge-based), proportionate, and consistent manner" (OECD, 2021^[18]). Relying on independent economic regulators is a standard practice in OECD countries. For example, Mexico's Federal Telecommunications Institute (IFT), created in 2013, is assessed as an autonomous public agency, independent in its decisions and function, with its own legal status and resources (OECD, 2017^[19]; 2024^[20]).

Given the presence of incumbent state owned/controlled operators, it is important that Indonesia's communication regulation aligns with competitive neutrality principles (OECD, 2023^[5]). These principles aim to ensure that all players (e.g., public, private, Indonesian, or foreign) face the same set of rules around competition (OECD, 2021^[21]). There is indeed a risk that entities with state ownership may receive favourable treatment, for instance in access to essential facilities or government tenders. The authorities should

consider conducting a competitive neutrality review in the communication sector along the lines of the *OECD Competitive Neutrality Reviews: Small-Package Delivery Services in Indonesia* (OECD, 2021^[22]), which uses the OECD's Competition Assessment Toolkit to identify ways to encourage greater competition.

There are specific shortfalls in regulation of the communication sector (OECD, 2023^[5]). Indonesia lacks a phone number portability guarantee. It also imposes high barriers to foreign equity ownership (e.g., there are shareholding limitations on fixed telecommunication networks and internet telephony for public purpose, plus requirements to reserve certain management positions for Indonesian nationals). Furthermore, land ownership restrictions raise the cost of installing telecommunications towers and secondary spectrum trading is prohibited. Concerning number portability, the Chilean experience with the web-based facility “Me quiero salir” (I want to break free) created by SERNAC (the National Consumers' Agency) may be relevant for Indonesia. This service facilitates contract cancellation, making it easier to change provider (OECD, 2022^[23]). Barriers to interconnections among network operators, as well as some restrictions on cross-border data flows, also make Indonesia relatively closed to digital trade (OECD, 2021^[22]).

Improving spectrum management

Efficient spectrum management can be a key enabler for investment in communication services (OECD, 2022^[24]). In terms of assignment (i.e. making spectrum available in the market), experience across the OECD has shown that transparent and well-designed licensing regimes, including auctions, provide legal certainty, with the aim of fostering long-term investment and catering to innovation (OECD, 2022^[24]).

Indonesia faces issues with the availability and use of mobile spectrum. There is a shortage of spectrum for providing high-speed mobile broadband in urban areas (Zagdanski, Bahia and Castells, 2023^[6]). Government auctions of new spectrum have been postponed on numerous occasions and are currently expected to take place at end-2024 at the earliest. Advancing with the planned spectrum auctions would help resolve these issues and promote the deployment of mobile networks (OECD, 2023^[5]). In this vein, spectrum licences could be assigned for a longer period than the current ten years, to increase incentives to invest in network development. In most OECD member countries, spectrum licences have duration periods ranging from 10 to 30 years, with clear conditions for licence renewals and revocation (Crean, 2022^[25]).

Making the universal service fund more efficient

Universal telecoms service provisions are important in the Indonesian context, as a significant fraction of households are seen by authorities as commercially unviable customers. A universal service programme began in 2003. It was initially financed directly from the national budget, but in 2005 it switched to a funding model in which communication operators paid 0.75% (later raised to 1.25%) of gross revenues (GSMA, 2013^[26]). The fund is administered by the Telecommunications and Information Accessibility Body (BAKTI). BAKTI's main activities comprise: i) building base transceiver stations; ii) implementing the Akses Internet programme to provide free satellite Internet services to schools, health centres and other public buildings, and iii) initiating the Palapa Ring and iv) the SATRIA satellite programme.

Research points to scope for operational improvements and greater transparency in the management of BAKTI. A lack of capacity may have delayed disbursements and hampered effectiveness (UNESCAP, 2017^[27]). Based on fieldwork research in Southwest Sumba District, Hunsa and Budiman (2023^[28]) suggest that further efforts should be made to increase transparency over the choice of priority areas of BAKTI's interventions, visibility over medium-term plans, and communication and accountability vis-à-vis business, local communities, and other stakeholders.

Facilitating digitalisation in the business sector

There is plenty of scope for businesses to make greater use of digital tools

While Indonesia hosts a relatively large number of “unicorns” and a venture capital market is developing (Box 3.3), the wider business sector makes comparatively little use of basic, let alone advanced, digital tools and technologies (World Bank, 2021^[29]). According to one survey only 6% of firms used new technologies throughout their operations, 30% of them had adopted technology to an intermediate degree, and 64% had adopted basic technology only (Asian Development Bank, 2020^[30]). Around one in seven medium-, small- and micro-sized enterprise (MSME) are estimated to use the internet for marketing and delivering products and services (Wicaksono and Simangunsong, 2022^[31]). The share of firms that operate their own website is below the rate in ASEAN and G20 peers. However, along some other dimensions, such as using foreign-licensed technology or having an R&D budget, Indonesia is not the worst-ranked (Figure 3.5).

Box 3.3. Indonesia’s unicorns and venture capital eco-system

Indonesia possesses some favourable characteristics for successful business start-ups: a large domestic market, an emerging middle class and digital-savvy young population. It is home to eight ‘unicorns’ (start-up companies with reaching a valuation of USD 1 billion, not listed on the stock market), the second largest number in ASEAN after Singapore (which has 15 unicorns) (CB Insights, 2024^[32]). Two of them, GoTo and J&T Express, are “decacorns” (start-ups reaching a valuation of more than USD 10 billion).

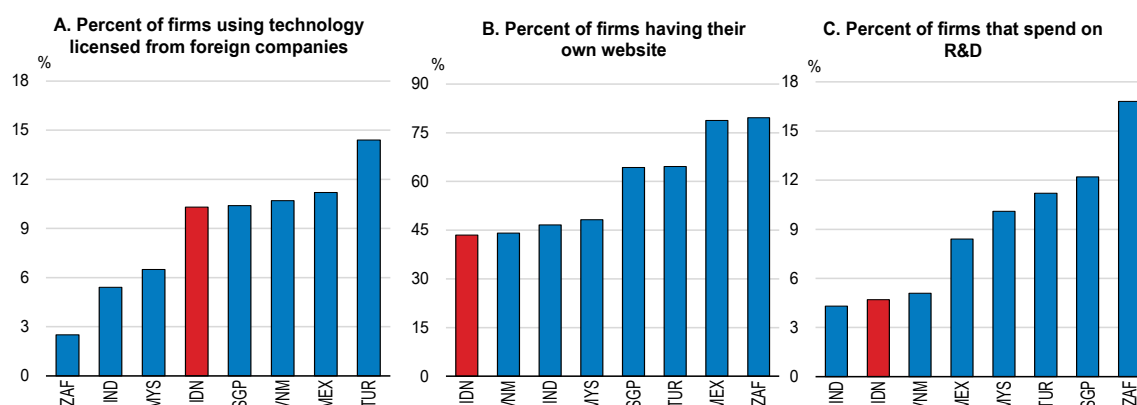
GoTo was created in 2020 from the merger of two of Indonesia’s oldest unicorns, ride-hailing and payments platform Gojek and e-commerce leader Tokopedia. GoTo is a super-app company (one of a handful in Asia), that provides multiple services including payment and instant messaging services. In 2022 GoTo is estimated to have had 63.8 million users, with 17.7 million merchants and to have accounted for between 1.8 and 2.2% of Indonesia’s GDP (LPEM FEB UI, 2023^[33]). GoTo was listed on the Indonesian Stock Exchange in 2022.

Indonesia’s venture capital market has been developing, together with private equity. Total value of deals reached USD 3.6 billion in 2021-22. Initially the focus of investment was on into platform businesses, particularly e-commerce, mobility and logistics. More recently interest has grown in climate tech, particularly electric vehicles and battery technologies.

There is substantial evidence underscoring the potential benefits of greater use of digital technologies in Indonesia, in particular internet use. Based on a survey of 1 100 firms, Damuri et al. (2018^[34]) finds that an online presence increases sales by 12%, more so for smaller firms. Falentina et al. (2021^[35]) find positive effects on local incomes, labour productivity, and exports in a study of internet use in the city of Yogyakarta. A study using the Indonesia’s labour force survey finds internet adoption in rural Indonesia was associated with a 29% increase in household income (Priyatna, 2022^[36]). Yan Ing and Zhang (2023^[37]) find that direct imports of automation equipment by manufacturing companies is associated with strong performance on several fronts, including output, employment, wages and productivity. Using the Indonesia Family Life Survey, Kharisma (2022^[38]) finds use of the internet strengthens social capital.

Figure 3.5. Firms' adoption of digital technologies is modest

2023 or latest year



Note: Data refer to 2022 for India, 2020 for South Africa and 2019 for Malaysia and Türkiye. The surveyed firms respond to the following questions: does this establishment at present use technology licensed from a foreign-owned company, excluding office software?; at the present time, does this establishment use its own website?; and during last fiscal year, did this establishment spend on formal research and development activities, either in-house or contracted with other companies, excluding market research surveys?

Source: World Bank Enterprise Surveys Database.

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Low adoption of digital technologies is particularly pronounced in agriculture (Mercy Corps and Rabo Foundation, 2021^[39]). Most farmers in Indonesia did not advance beyond primary school, are over 45 years old, and do not use the internet. Networks of peers, family or friends are the main information source, only about a fifth use social media to buy or sell, with under 5% active on e-commerce sites. Meanwhile, evidence suggests Internet use positively and significantly affects farmers' subjective well-being, in particular in the lowest income quintile (Rahman et al., 2023^[40]).

There are many policy initiatives aiming to facilitate the digital transformation of Micro, Small and Medium-sized Enterprises (MSMEs). The government has launched initiatives such as Making Indonesia 4.0 Roadmap (in 2018), E-Commerce Roadmap (2019), and Go Digital Vision (2020). KADIN CIPTA facilitates access to blockchain-based digital identity for industry and MSMEs that produce analytics and data available to third parties. The Promise II Impact programme of the ILO focuses on strategies to improve SMEs' productivity and scale and support the adoption of digital technology by regional development banks (BPD), rural banks (BPR) and buyers. The Ministry of Trade runs a programme to promote education and awareness among consumers regarding their rights in e-commerce.

Some aspects of regulation may be constraining digital adoption

Some regulatory initiatives have potential downsides for digital adoption. A case in point is Regulation 31 on "Business Licensing, Advertising, Guidance and Supervision of Business Entities Transacting Through Electronic Systems", issued in 2023. It introduces new requirements and restrictions for both onshore and offshore e-commerce businesses, including a minimum price for imported goods, a prohibition on social commerce platforms facilitating payment transactions, and ceilings on direct e-commerce purchases from overseas. Limiting social-commerce platforms to "showcase goods and/or services" effectively prevents any direct dealings between sellers and buyers and may damage the ability of e-commerce to support SMEs. There are also some other additional compliance burdens imposed on e-commerce operators. Violations may lead to administrative actions, including blocking of access to websites/platforms and revocation of business licenses. The impact of these regulations on e-commerce should be monitored, and the regulations should be amended if it is deemed necessary by this evaluation.

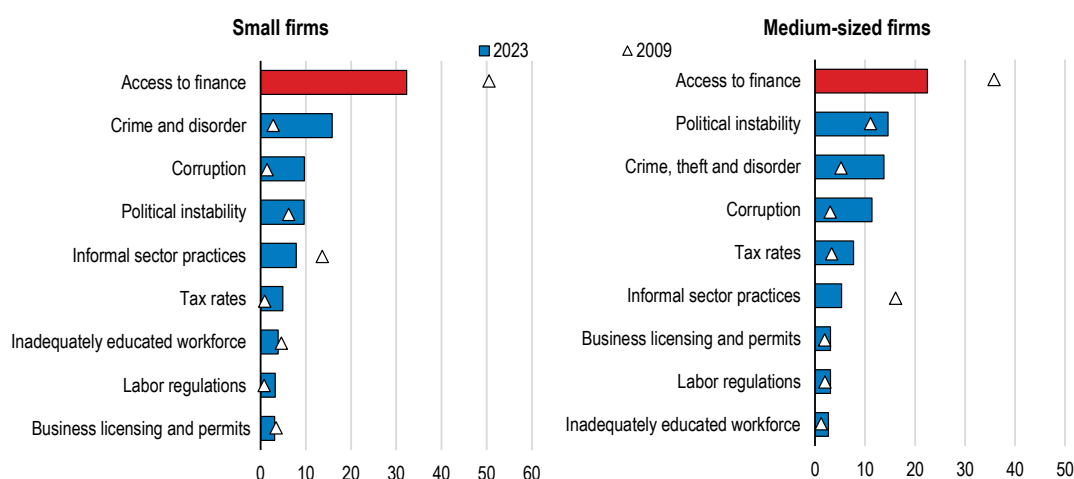
As discussed in Chapter 2, the OECD's Services Trade Restrictiveness Index (STRI) and Product Market Regulation (PMR) database indicate very high regulation in the services sector and across other sectors and regulatory areas. This is likely to be stifling technological adoption. Despite some liberalisation, restrictions are particularly prevalent in legal, accounting, telecommunication, and insurance services, with higher barriers to foreign investors' entry and ampler command-and-control regulations than in regional trade partners. The scope for better regulation (i.e., more conducive to competition) is particularly great in areas such as network sectors, public procurement, governance of SOEs, and regulatory impact assessments (Chapter 2).

Digitalisation can help increase financial inclusion

According to the World Bank Enterprise Survey, access to finance is the most commonly cited obstacle to doing business for SMEs in Indonesia (Figure 3.6). Digital enterprises are particularly affected as their assets are mostly intangible and hard to use as collateral. As of January 2024, lending to SMEs accounted for only 21% of all bank lending (and 7% of GDP). Credit constraints are amplified for female borrowers, who are more likely to lack collateral to secure loans, and for populations outside of Java. The main policy instrument, Kredit Usaha Rakyat (KUR), is a partial credit guarantee programme that helps to fulfil the collateral requirement hindering SMEs from accessing credit.

Figure 3.6. Access to finance is a significant problem for SMEs

Percentage of respondents



Note: SMEs cover small firms (5 to 19 employees) and medium-sized firms (20 to 99 employees). The surveyed firms answer the question on which element (out of a list of 15) is the biggest obstacle to them.

Source: World Bank Enterprise Surveys Database.

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Though financial inclusion is improving, it remains a major socio-economic challenge in Indonesia. According to the Global Findex 2021, bank account ownership increased from 20% in 2011 to 52% in 2021, largely due to increasing mobile money account ownership. According to the 2022 National Survey of Financial Literacy and Inclusion (SNLIK), the level of financial inclusion (as measured by the use of financial products and services) has reached 85%. Also, around 75 million Indonesians made a payment through mobile phones in 2021, 33 million more than in 2014. While these advances are noteworthy, bank account ownership in Indonesia significantly lags behind the rest of East Asia-Pacific and lower-middle income country averages (as of 2021, 81% and 62%, respectively compared with 52% in Indonesia). Savers' poor understanding of financial instruments and concerns surrounding online security and data breaches contribute to Indonesia's poor ranking (World Bank's Global Findex Database 2021).

The expansion of e-government (see previous sections) and the diffusion of digital wages can usefully prompt households to start using financial services. For instance, the digitalisation of government payments such as social assistance transfers will have motivated the opening of bank accounts. The switch to cashless payments by the two main transfer programmes (the conditional PKH and the education-focused PIP) has resulted in mass opening of saving accounts (World Bank, 2020^[41]). Similarly, progress has been made in promoting digital wage payments according to an ILO report (2023^[42]).

Government is pressing on with dedicated interventions, such as the National Strategy for Financial Inclusion 2020-2024 and the 2023 Development and Strengthening of the Financial Sector (P2SK) Omnibus Law. In addition, Indonesia has adopted stand-alone financial inclusion strategies for women and youth. Furthermore, women's financial inclusion has improved substantially, resulting in their financial literacy index surpassing that for men in 2022. The strategy for youth includes a survey to better understand their financial behaviour and a programme for national youth ambassadors operating as influencers in universities and social media.

Encouraging further growth of fintech

Fintech is among the sectors with considerable scope for growth in Indonesia. It has been growing rapidly, from 51 fintech players in 2011 to 334 by 2022 (Kumar et al., 2023^[43]). One segment of fintech comprises businesses creating new payment mechanisms. Open banking services, which allow customers to share financial information securely across banks and other financial institutions, are also developing. There are reportedly 30 million borrower accounts, 60 million payments accounts and 9 million retail investor accounts. The expansion of fintech is bringing competition between traditional commercial banks and emerging players, such as P2P (peer-to-peer) lenders and digital banks. Fintech digital investment (e.g., robo-advisor) has also grown rapidly, although from a low base (IMF, 2024^[44]).

Payment fintech is being facilitated by advances in technical regulation by Bank Indonesia (BI) in collaboration with the Indonesian Association of Payment Systems. In 2019 BI launched Payment System Blueprint 2025 that encouraged collaboration between banks and fintech; one measure was the introduction of QR (Quick Response) codes standards. Furthermore, BI is sponsoring the National Standard for Open API (Application Programme Interface) Payments (SNAP), which will further advance digital transactions. Lastly, there is a new BI initiative on digital currency (Proyek Garuda). Indonesia currently bans the use of cryptocurrencies as a means of payment but allows investment in them. BI aims to ensure the fast, safe, and affordable digital operation of the Rupiah.

Fintech can be encouraged further by maintaining regulatory clarity, shifting towards principle-based regulations, and supporting collaboration forums between regulators and fintech players. Also, strengthening regulatory sandbox programmes encourages experimentation. Sandbox programmes require attention to consumer protection and consumer feedback (concerning both the business idea and its regulation). Flexible regulation may also take the form of reduced financial-service licencing requirements, as in the Netherlands and the United Kingdom (these schemes usually impose a ceiling in terms of number of customers or sales).

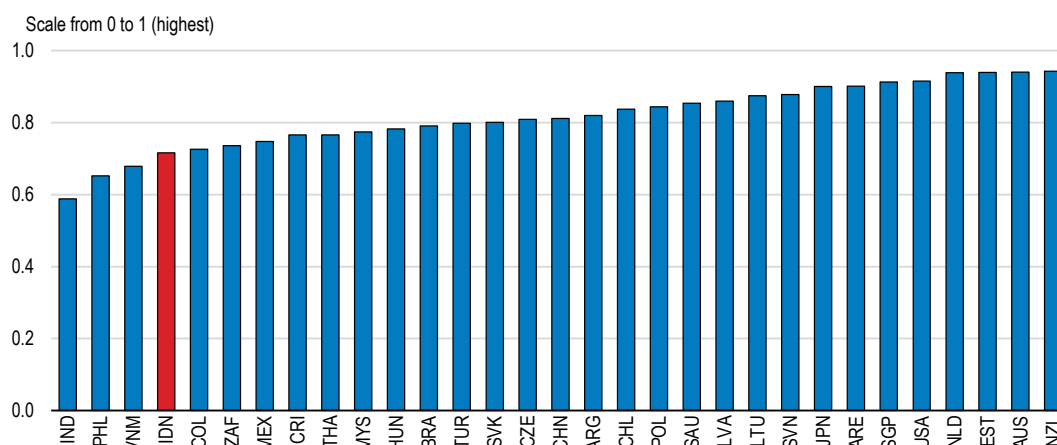
Seizing the potential of e-government

Governments can facilitate the economy-wide digital transformation by digitalising processes and the services supplied to businesses and households (Sorbe et al., 2019^[45]). Enhanced provision of e-government services can also strengthen fiscal revenue collection and expenditures allocation, improve public-sector efficiency, including in procurement. Individuals and businesses can benefit from more responsive, accountable, and efficient public services.

Indonesia has been making progress in introducing e-government. The pandemic prompted the introduction of digital administration in unemployment benefits, grants to the self-employed and to employers, and state-guaranteed loans. Also, the share of individuals using the internet to interact with public authorities increased rapidly during the crisis. However, Indonesia has considerable scope to further develop e-government services (Figure 3.7). In 2022, the United Nations E-Government Readiness Index ranked Indonesia as 77th out of 193 countries.

Figure 3.7. There is scope to further develop e-government

E-Government Development Index (EGDI), 2022



Note: The EGDI is a composite indicator which measures the readiness and capacity of national institutions to use ICTs to deliver public services. It is the weighted average of three normalized indices: 1) telecommunications Infrastructure Index; 2) Human capital Index; and 3) Online Service Index. The higher EGDI, the higher the level of e-government development in a country.

Source: UN e-Government Knowledge base (UNeGovKB).

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Ensuring safe and secure digital infrastructures

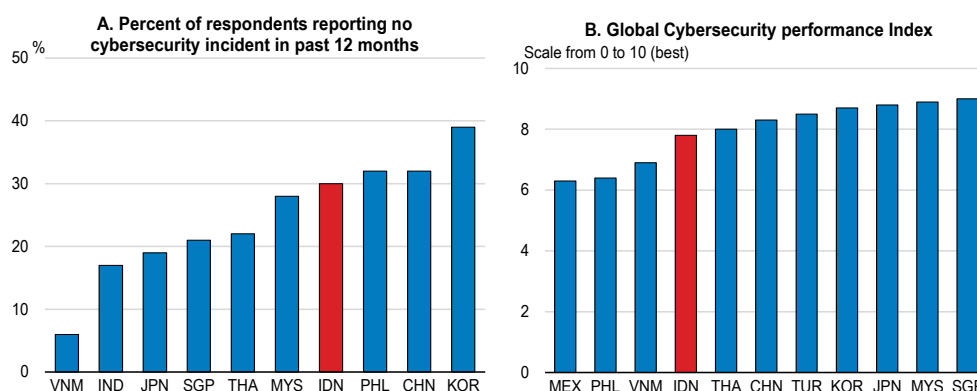
Digital security, as elsewhere, is a growing issue, though data suggest incidents are less common than in some peer countries. A survey of cybersecurity managers found that only around 30% reported no cybersecurity incident in the past 12 months (Figure 3.8, Panel A). This share was somewhat higher in Korea but was even lower in some other countries in the region. An indicator of commitment to cybersecurity (Panel B) suggests the country is performing worse than most countries in the region. Data leaks have hit various large institutions, including some major banks and the social security agency (Habir and Negara, 2023^[46]). In 2021, the National Cyber and Crypto Agency (Badan Siber dan Sandi Negara, BSSN) estimated the economic losses from cyberattacks at IDR 14.2 trillion (USD 860 million) (Sapulette and Muchtar, 2023^[47]).

Indonesia currently does not have a specific cybersecurity law. Provisions on cybersecurity are mainly covered in Law No. 19 of 2016 on Electronic Information and Transactions and Government Regulation No. 71 of 2019 on the Implementation of Electronic Systems and Transactions. There are also some further implementing regulations issued by the National Cyber and Code Agency (Badan Siber dan Sandi Negara - BSSN).

Data leaks have hit various large institutions, including some major banks and the social security agency. Indonesia's privacy policies include the 2022 Personal Data Protection bill (with a two-year transition period), which sets corporate fines (equal to up to 2% of annual revenue) for data breach. Individuals can be jailed for up to six years for falsifying personal data for personal gain or up to five years for gathering personal data illegally. Users are entitled to compensation for data breaches and can withdraw consent to use their data. The law draws inspiration from the European Union legislation, although the penalties are milder.

To augment these legal provisions, consideration should be given to establishing an independent commission for data privacy and information provision along the lines, for instance, of those established in Australia and Singapore (Box 3.4).

Figure 3.8. As elsewhere, cybersecurity incidents are common



Note: In Panel A, data are based on a double-blind survey conducted in July 2023 of 4009 leaders responsible for cybersecurity in their organizations, including executive leadership, security leadership, security management, and technical leadership for cybersecurity. The respondents interviewed were based in 14 economies. In Panel B, the Global Cybersecurity Index measures the commitment of economies to cybersecurity across several dimensions: legal measures, technical measures, organizational measures, capacity building, and cooperation. Source: Cloudflare Inc. (2023), Securing the Future: Asia Pacific Cybersecurity Readiness Survey; and Wiley, Digital Skills Gap Index 2021.

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Box 3.4. Protecting personal data – the experience of Australia and Singapore

The Office of the Australian Information Commissioner (OAIC) was established in 2010 (AIC Act) to promote and uphold privacy and information access rights. It is an independent statutory agency within the Attorney-General's portfolio and is headed by the Australian Information Commissioner. The Office's primary functions are privacy, freedom of information and government information policy. Responsibilities include conducting investigations, reviewing decisions, handling complaints, and providing guidance and advice. In 2022-23, the Office (with staff headcount of 177) finalised 2 576 privacy complaints, resolving 84% of them within 12 months, and handled 11 672 privacy enquiries.

The Personal Data Protection Commission (PDPC) was established in 2013 as Singapore's main authority in matters relating to administration and enforcement of its Personal Data Protection Act. The Commission's activities include overseeing the Do Not Call Registry, a system to prevent individuals receiving unwanted telemarketing messages. The Commission also conducts educational and outreach activities to help organisations adopt good data protection practices.

Similar to elsewhere, Indonesia has developed an internet policy that, inter alia, aims to ensure data privacy and limit harmful content. One measure is the Minister of Communication and Informatics Regulation No. 5 of 2020 on Private Electronic System Operators (MR5), which became effective in 2022. The Regulation includes requirements for Internet platforms to register under new licensing rules that aim to protect consumer data and ensure that online content is used in a "positive and productive" way and no content is available which "disturbs public order". The Regulation also includes a provision allowing the government to demand access to electronic data without needing a court order.

Digitalisation is improving the delivery of key government services

Digitalisation has progressed well in several policy areas. As discussed in Chapter 1, one such area is taxation. In public healthcare, the SatuSehat (One Health) platform, which was initially developed in 2020

for contact tracing and managing vaccination records, now includes telemedicine functions for virtual doctor visits, enables patients to store their health records, and tracks treatment adherence. In addition, digitalisation has helped BPJS Kesehatan, the single-payer national health social security programme, to extend coverage, from 133 million users in 2014 to 262 million in late 2023. SatuSehat's roll-out to cover more than 30 000 health facilities across the country should be accelerated and information systems, research, and health development should be better integrated (World Bank, 2024^[48]).

Digitalisation of the judicial system has been underway for some time, including online trials and a digital whistleblowing and oversight system (Support to the Justice Sector Reform in Indonesia, SIWAS). However, digitalisation does not necessarily resolve systemic shortfalls of the legal system, such as those in transparency, integrity, and accountability: sometimes it can amplify them. Given this, clarity should be ensured in the interpretation of the principle of "open trial to the public" in the context of online trials (UNODC, 2021^[49]).

Indonesia began developing digital procurement in the early 2000s. The National Public Procurement Agency (LKPP) has expanded its LPSE (Electronic Procurement Services) system across the country. According to a report by the Asian Development Bank (2022^[3]), LKPP was allocating about 86% of the procurement budget through electronic channels, with savings estimated at more than USD 10.7 billion in the 2015-18 period. However, similar to digitalisation in other areas, structural problems are not necessarily resolved. For instance, digitalisation can facilitate the opening up of procurement to SMEs, disadvantaged groups and local suppliers but may then require attention to quality safeguards.

Developing integrated one-stop digital services

With more transactions moving online, digital identity (ID) systems are gaining in importance. These systems allow people to securely, and conveniently, verify their identity to both government and private sector firms. In this regard, Indonesia has been consolidating the National ID (KTP), a unique number obtained at birth, with the Tax Identification Number, created upon registration in the tax system. The combined system, e-KTP, is accessed via a smartphone app. As of end-July 2023, 57.9 million accounts have been integrated, accounting for 82% of individual taxpayers.

Roll out of a new digital identity card is underway that is designed to eventually replace the e-KTP system. The Digital Population Identity (IKD) uses a single sign on (SSO) identifier and provides access to government services online. The IKD app can be used as a "digital wallet" to store identity documents, such child identity cards and birth certificates. The government is looking into adding features that support vulnerable communities, such as the elderly or people with disabilities. Take-up of the service has been sluggish: at end-2023, less than 8 million people had activated their IKD apps. As evidenced in other countries, the use of digital identity has been instrumental in a comprehensive e-government (Box 3.5).

Box 3.5. Using digital IDs to access e-government: the experience of Estonia and Denmark

Digital transformation in government services began in Estonia in the early 2000s. A principle of digital-by-default applies throughout government. It is estimated that 99% of Estonia's public services are online and that 98% of Estonian nationals use e-IDs. The latter are used to produce more than 10 million digital signatures per year. Using electronic signature saves an estimated 2% of Estonian GDP each year.

In Denmark, 95% of the population uses a digital ID (NemID). NemID is combined with an administrative portal (borger.dk) that is a one-stop-shop for most administrative processes. Citizens are also required to register their bank account details, allowing smoother collection of taxes and delivery of benefits. In addition, there is a messaging system for interacting with the government, Digital Post, which is used by 94% of the population.

Source: (OECD, 2019^[50])

There remains considerable scope for further co-ordination across government data and consolidation of online services. Co-ordination issues have arisen partly because Ministries have been launching digital initiatives somewhat independently. The Ministry of Communications and Informatics (Kominfo) estimates that there are 27 400 government online applications. The establishment of the SPBE (Electronic-Based Government System) Coordination Team is welcome but there are significant challenges (World Bank, 2022^[51]). The scale of the data governance structure illustrates the challenges with data and metadata standardisation (Tjondronegoro et al., 2022^[52]). There are currently 632 data trustees, including 84 ministries and agencies in 34 provinces. Low participation in data registration and discrepancies between data requirements and production hinder implementation of efforts to link up and standardise data. Further, policies are not fully harmonised between the central and regional levels of government and database experts are in short supply.

Successful digital transformation can be helped by awareness-raising and educational activities, both within public administration and towards the general public. In this regard, the strong commitment of political leadership determines the success of the entire process. Development of a comprehensive national digital transformation agenda would help, along with tasking a central government authority to spearhead the necessary political and bureaucratic support across multiple ministries.

Making the most of open government data

Similar to other countries, Indonesia is making more government data publicly available. This is motivated, *inter alia*, by a desire to encourage innovative data-based services and research. In 2019 a set of data harmonization regulations (Satu Data Indonesia) was introduced that strengthens the shareability, accuracy, timeliness, and accountability of data sets in government ministries and agencies. An online portal (data.go.id) provides access to the harmonized data. The data has, for instance, been used to identify fraud and corruption in government procurement and other budget processes. Government is collaborating with the National Research and Innovation Agency (Badan Riset dan Inovasi Nasional, BRIN) to optimise the use of open government data. As more open data in machine-readable format becomes available, initiatives are planned to engage community and neighbourhood groups. An influential and pioneering experience has been Pulse Lab Jakarta, founded in 2012 as a partnership between the United Nations and the government of Indonesia (Julliard, Sumadi and Karetji, 2021^[53]) and upgraded in 2022 into a regional open data hub.

However, progress in achieving wider goals in open government has proved challenging. As a partner country of the Open Government Partnership (OGP), Indonesia sets action plans on open government. The sixth OGP National Action Plan (2020–2022) included 24 commitments. An assessment of progress concluded that only half had been completed or substantially implemented. Moving forward, it will be important to reinforce government implementation commitment, for instance in the form of presidential decrees, to ensure priority budget allocations. The seventh Action Plan (2023–2024) includes commitments on open contracting, access to justice, and combatting sexual violence.

A whole-of-government policy approach for data management reduces fragmentation and facilitates cross-sectoral data sharing. Through Satu Data Indonesia has the key elements of data management. However, implementation is still at a preliminary stage. In practice, the availability of reliable data varies widely across government departments and the lack of data standards and interoperability hampers efforts to make government action more effective (Islami, 2021^[54]).

Ensuring education and training is geared to digitalisation

Levels of both general and digital-specific education and skill influence the development of digitalisation. These are also drivers of digital divide. In Indonesia, there remain sizeable shares of the population with relatively low education attainment and correspondingly low engagement with digital technologies.

General educational attainment and ICT-related skills remain low

Shortfalls in the general level of education limit the capacity of the population to use digital tools and services and hinder Indonesia's capacity to reap the benefits of digitalisation. The OECD's PISA scores highlight the issues (see Chapter 2). Furthermore, Indonesian student skills seem particularly weak in subjects most relevant for ICT and the digital economy. Almost no students in Indonesia were classified as top performers in mathematics, compared to an OECD average (9% of students) which is itself much lower than in the six Asian countries and economies participating in PISA (OECD, 2024^[55]). As discussed in detail in the previous *Survey* (2021^[56]), misalignments of training offer with labour market add to the problem of shortfalls in generic skills. The misalignment is possibly even larger in the case of specific digital skills.

Studies point to significant skill shortages in ICT-related employment in Indonesia and limited digital skills in the workforce. According to (ILO, 2021^[57]), Indonesia's ICT sector employed an estimated 1 million workers in 2020, with an additional 500 000 working as ICT professionals and technician roles across all sectors that use ICT. Shortages are particularly acute for jobs such as web developer/web programmers and graphic designers. (AWS/AlphaBeta, 2021^[58]) estimate that around 75% of Indonesian workers are digitally illiterate. A study by SMERU, Oxford, and UNESCAP (2022^[59]) estimates that fewer than 1% of Indonesian workers have advanced digital skills. It is telling that, while more than 96% of Indonesia's training institutions believe that their graduates are job-ready, barely a third of employers share this view (Jagannathan and Geronimo, 2021^[60]). Furthermore, women are severely underrepresented in Indonesia's tech industry. According to a 2020 report by McKinsey, women make up only 27% of the digital workforce, while the 2020 report by Women in Tech in Indonesia shows women hold only 12% of executive positions in ICT firms.

Technology and integration have increased the demand for higher-order general cognitive skills – such as complex problem-solving, leadership, critical thinking, and advanced communication – that are transferable across jobs. Therefore, modern tertiary education needs to cultivate in students a minimum threshold of foundational skills. The additional year of general education that was added to undergraduate programmes in China and Hong Kong in 2012 seems to have yielded some positive results (Lam, 2022^[61]).

Policy momentum to boost workforce training needs to be maintained

Government needs to continue campaigns to strengthen skills training in the workforce. Less than 10% of firms provide training to workers, compared with almost one-third in East Asia (World Bank, 2023^[62]). The government has launched a three-tier strategy to boost training for the digital economy. For professionals and managers there is a national scholarship (DTS) and the Digital Leadership Academy. The Pre-Employment Card Program (Kartu Prakerja) targets job seekers, workers affected by layoffs, and/or workers in need of skills training. It offers skills training, upskilling, and reskilling, with a focus on digital skills. Skills for Jobs Indonesia, launched in January 2023 in partnership with Microsoft, provides free-of-charge digital literacy, hard and soft skills, and job preparation training. Looking forward, priority should be put on improving the quality and relevance of training programmes being delivered at the local level, with more industry involvement, including through apprenticeship programmes to promote training (OECD/ADB, 2020^[63]).

Stronger training incentives for employers and individuals should be considered. Several OECD countries encourage workplace training via subsidies or tax breaks for employers (OECD, 2022^[23]). More such measures should be considered in Indonesia. In addition, incentives for individuals to take up training should be strengthened. For instance, personal account schemes allowing individuals to accumulate time

for training can help overcome time constraints for taking training courses. France has been using such accounts, enabling employees to use training hours to acquire recognised qualifications or basic skills (Perez and Vourc'h, 2020^[64]). Such systems need strong guidance to ensure training is in relevant labour market fields. They also need to subject training providers to robust quality assurance, and regularly evaluate the programmes.

Making greater use of digital tools in education

Indonesia is rolling out a major education reform that relies on the use of digital teaching tools. The reform, Merdeka Belajar (Freedom to Learn), was launched in 2021 (see Chapter 2 for further details) entails teachers using a digital platform Platform Merdeka Mengajar (Emancipated Teaching Platform) that includes tutorials and resources on the new curriculum along with management and planning tool. A programme that trains “learning leaders” is used as part of the campaign to ensure teachers are familiar with the new system.

Education policy also aims to increase use of ICT in vocational education and training. Specific projects include the development of two systems of ICT-based learning media, Pembatik and Membatik, the former specifically for teachers and latter for the general public. Another example is Rapor Pendidikan (Education Scorecard), a platform that provides performance information and helps schools and teachers to refine their teaching methods.

Rolling out digital education tools is particularly challenging in Indonesia. Teachers often lack the appropriate skills. In 2020, 67% of teachers reported difficulties in operating devices and using online learning platforms (UNICEF, 2021^[65]). Furthermore, training programmes to address this issue are often inadequate (Yarrow et al., 2022^[66]) and teacher absence from training can be high. Many schools do not have internet connections. Only 55% of schools operating under the Ministry of Education and Culture have some form of internet connection, for instance.

Digital skills in the government sector need strengthening

Several reports underscore shortfalls in the number of government employees with strong digital skills (SMERU/GIZ/BGS, 2023^[67]). Less than one in every 400 government employees have professional digital skills (Pranata Komputer, or Prakom, functional positions) and vacancies for Prakom posts are often not filled. Retention is challenging due competition from the private sector. Increased use of external services would help resolve this issue along with provisions for higher wages in government posts with hard-to-fill openings.

Helping households and workers handle digitalisation

All over the world, digitalisation is changing the nature of work (OECD, 2023^[68]). It is producing the automation of some tasks, creating new types of tasks, shifts to more flexible forms of employment (such as “gig economy” work) and new flexibilities in working practices. Employers are demanding specific skills and the design of labour market, education and training policies should respond effectively to current and forthcoming challenges. Among the digital occupations, software developers, programmers and engineers, data scientists and data engineers have experienced some of the most notable rates of growth in most countries (OECD, 2022^[69]).

Recent OECD research finds that 27% of jobs in Indonesia are in occupations at high-risk of automation (including from AI). A McKinsey report (Das et al., 2019^[70]) estimates that in Indonesia about 16% of the total hours worked could be automated, but also concludes that job losses would be more than compensated for by new labour demand. Working from home is particularly appealing in Indonesia’s large cities, especially Jakarta, as commuting times are long. Estimates of the average commuting time in Jakarta range from 80-120 minutes (Suharto, Kusuma and Wijaya, 2021^[71]). Digital technologies also lie

behind the rise of the gig economy (Permana, Izzati and Askar, 2022^[72]). Approximately 2.3 million Indonesians are estimated to provide services where digital platforms have become important, such as accommodation and transportation.

Alongside the benefits in terms of productivity and flexibility, digitalisation brings risks for employees. Moreover, awareness of social protection among gig-workers, mostly as ride-hailing drivers, food delivery riders and couriers, is scarce. In this regard, BPJS Kesehatan could cooperate further with online application-based companies to disseminate the importance of contributing to social security for such workers. As regards working from home, Indonesia faces similar issues as elsewhere with concerns about isolation, lack of team engagement, and occupational safety and health.

Governments can support adjustment to digitalisation by ensuring good-quality labour market information services and support. In this regard the government has built SIAPkerja, a digital system that integrates all services related to employment, including skills training, job placement and industrial relations. Similar initiatives to upgrade labour market services are undertaken in countries such as Spain, India, Uruguay, Morocco, and the Netherlands (OECD/ADB, 2020^[63]). In addition, Indonesia has integrated the Social Security Provider for Employment (BPJS Ketenagakerjaan) which manages the cash benefit payment, with the national job platform Karirhub-Sistem Informasi Ketenagakerjaan (Karirhub-Sisnaker).

Findings and recommendations

MAIN FINDINGS	RECOMMENDATIONS (Key recommendations in bold)
Strengthening broadband connectivity	
Nationwide deployment of 5G infrastructure is particularly costly given Indonesia's archipelagic geography.	Subject digital infrastructure investments to granular cost-benefit analysis.
Rollout of high-speed internet infrastructure needs to be faster. The communication regulator has been suppressed. Direct and indirect state participation in communication operators generates potential conflicts of interest and risks undermining competitive neutrality.	Reduce barriers to broadband deployment through simplified procedures for obtaining permits for infrastructure installation, including for access to public infrastructure. Establish a fully independent and well-resourced communication regulator.
Fixed broadband penetration is low and rural/urban disparities are large.	Consider amending spectrum framework and assigning additional spectrum to support 5G deployment.
The digital economy poses new challenges for competition policy.	Systematically review the competitive pressures on digital sectors by conducting market studies and applying the guidelines of the OECD's Competition Assessment Toolkit.
Facilitating digitalisation in the business sector	
The business potential of digital transformation is not being fully exploited. Adoption of digital tools lags OECD countries, particularly among SMEs.	Further boost public support to SMEs, in cooperation with the business sector, through targeted programmes to facilitate the adoption of digital tools.
One of the most important barriers to the growth of start-ups is access to finance.	Promote further the development of the fintech sector, venture capital, angel investors and alternative financing for start-ups and SMEs.
Digital services face several barriers, as in other service sectors (see Chapter 2). The 2023 STRI score is above the OECD average, and the score has increased slightly compared to 2022.	To facilitate the digital transformation, lower tariffs and non-tariff barriers, reduce trade costs, and promote greater regulatory interoperability. Assess the impact of the new e-commerce regulation.
Innovation centres and start-up incubators and accelerators suffer from limited management capacity, lack of dedicated full-time staff, and the failure to establish standard operating procedures and to secure sustained funding.	Recruit more experienced employees with expertise across the sector to facilitate collaboration within the innovation ecosystem.
Seizing the potential of e-government	
Poor safety and security limit the benefits from online transactions.	Guarantee independent oversight to strengthen the credibility of the Law on Personal Data Protection.
Digital security is lagging behind while the emergence of new types of threats can have a significant impact on financial stability.	Step-up investment in digital security and promote information across the society about how to manage risk.
Awareness of cybersecurity and privacy issues is scarce.	Integrate digital security and awareness throughout the educational system and in adult education. Develop subsidiary regulations and mobilize support for policy implementation.
There have been important advances towards integrated one-stop digital services, in particular the rolling out of a new digital identity card (IKD). However, rollout has been slow.	Reach 100% penetration of the Universal digital identity and accelerate activation of the e-KTP.
There remains considerable scope for further co-ordination across government data and consolidation of online services, as several ministries have launched their own ambitious public digital initiatives. The establishment of the SPBE (Electronic-Based Government System) Coordination Team is welcome but there are significant challenges.	Rationalize existing initiatives and freeze new ones, make progress in data and metadata standardisation, encourage participation in data registration and reduce discrepancies between data requirements and production. Reinforce the powers of the SPBE Coordination Team.
Digitalisation has enhanced transparency in public procurement. Some deficiencies remain, such as preferences granted to SOEs and local suppliers.	Create equal treatment of SOEs and the private sector with regard to government procurement. Align the delays to submit a bid with the size and complexity of the tender. This is particularly important in technically complex projects where it may take time to develop accurate cost estimates.
Policy initiatives to use big data in real-time decisions suffer from overlap across different ministries or government institutions.	Develop a comprehensive national digital transformation agenda and task a central government authority with multi-ministry oversight to spearhead the necessary political and bureaucratic support.
Ensuring education and training is geared to digitalisation	
The foundation and specific skills for harnessing digitalisation are weak. The pool of ICT professionals is small and the gender composition is biased.	Give digital competences more prominence in the school curriculum, upgrade the digital skills of teachers and principals, and encourage girls' participation in STEM education.
Up to 50% of jobs are at risk of automation. Semi- and non-qualified blue and white collars are particularly vulnerable. The quality and relevance of training programmes is very often poor.	Fully revise firm-provided training programmes to increase relevance and quality of training and better target participation to vulnerable workers.

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4

Pressing ahead with the green transition

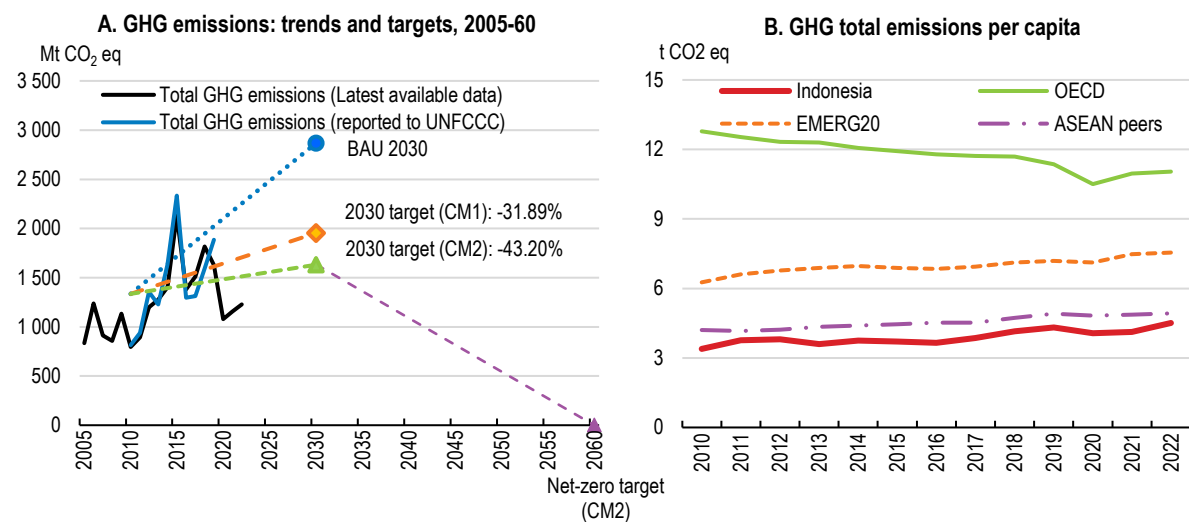
Andrea Goldstein, OECD

Indonesia has ambitious goals in transitioning to a green economy, most notably it aims to achieve net-zero greenhouse gas emissions by 2060 or sooner. The country is vulnerable to the environmental and social effects of climate change and faces challenges to enhance mitigation, improve adaptation, and increase resilience. Major issues in phasing out coal-fired electricity generation and increasing renewable energy capacity can be addressed through domestic policies, such as carbon taxation, public investment in transmission, and international support. Greater investment in public transportation as well as support for electric vehicles are also needed. Progress has been made in switching households to clean fuels in cooking, but further progress is needed, and buildings should be better insulated against heat. For climate change adaptation, Indonesia has well-established systems of disaster response that would still benefit from more granular coverage. Market-based policies can help to address the greater risk of drought in some areas of the country.

Introduction

Indonesia has ambitious goals in transitioning to a green economy, most notably aiming to reach net-zero greenhouse gas (GHG) emissions by 2060, after a peak in 2030 (Figure 4.1, Panel A). Recent years have seen an increase in net emissions (Panel B), although in per capita terms Indonesia produces roughly half as many GHG emissions as the OECD average. As for other emerging market economies, emission reduction will be challenging, insofar as the high rate of economic growth necessary to achieve convergence in living standards with OECD Members implies increases in emissions in the short term. Another challenge for Indonesia is its heavy dependence on coal for energy supply. Ensuring energy security as the reliance on coal decreases is a key aspect of the green transition. Meanwhile, Indonesia's large and fertile land mass provides opportunity to slow down net emissions through changes in land use, in particular by eventually reversing deforestation.

Figure 4.1. Indonesia needs to sustain GHG emission reductions to reach net zero



Note: In Panel A, business-as-usual (BAU) projections and countermeasures (unconditional and conditional mitigation scenarios, CM1 and CM2) from the Enhanced Nationally Determined Contribution - Report by Indonesia to the UNFCCC (2022). In Panel B, OECD calculations based on EDGAR. Weighted averages for the aggregates by using population data in 2022. EMERG20 refers to G20 emerging economies excluding Indonesia: Argentina, Brazil, China, India, Mexico, Russia, Saudi Arabia, South Africa, and Türkiye. ASEAN peers refer to four peer countries including Malaysia, Philippines, Thailand, and Vietnam.

Source: Laporan Inventarisasi Gas Rumah Kaca (GRK) Dan Monitoring, Pelaporan, Verifikasi (MPV) 2023, Volume 9, Januari 2024; MoEF (2022), Enhanced Nationally Determined Contribution (NDC) under the United Nations Framework Convention on Climate Change (UNFCCC); and EDGAR (Emissions Database for Global Atmospheric Research) Community GHG Database, https://edgar.jrc.ec.europa.eu/report_2023.

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In addition, Indonesia faces considerable challenges in climate-change adaptation. It is highly exposed to higher average temperatures and extreme and unpredictable weather. According to OECD estimates (2023^[1]), average daily temperatures in Indonesia are likely to be 1°C higher than in the period 1985-2014 by 2050 even if the global community manages to sharply lower emissions. Recent analysis projects GDP in 2050 to be up to 0.6% lower if global emissions are contained in line with the Paris Agreement (i.e. by containing the increase in global temperatures below 2°C) but up to 4.4% lower if global average temperatures rise by more than 3°C (Swiss Re Institute, 2021^[2]). Moreover, under a high emissions scenario, heat-related deaths among those aged 65 years could reach 53 per 100 000 annually by 2080, compared with a historical baseline of 1 death per 100 000 (WHO, 2015^[3]).

This chapter first considers past progress and future challenges in GHG emission reduction and domestic energy sourcing. It then considers key issues in the green transition, notably policy responses in manufacturing, the transport sector and sustainable buildings. A final section on adaptation covers disaster

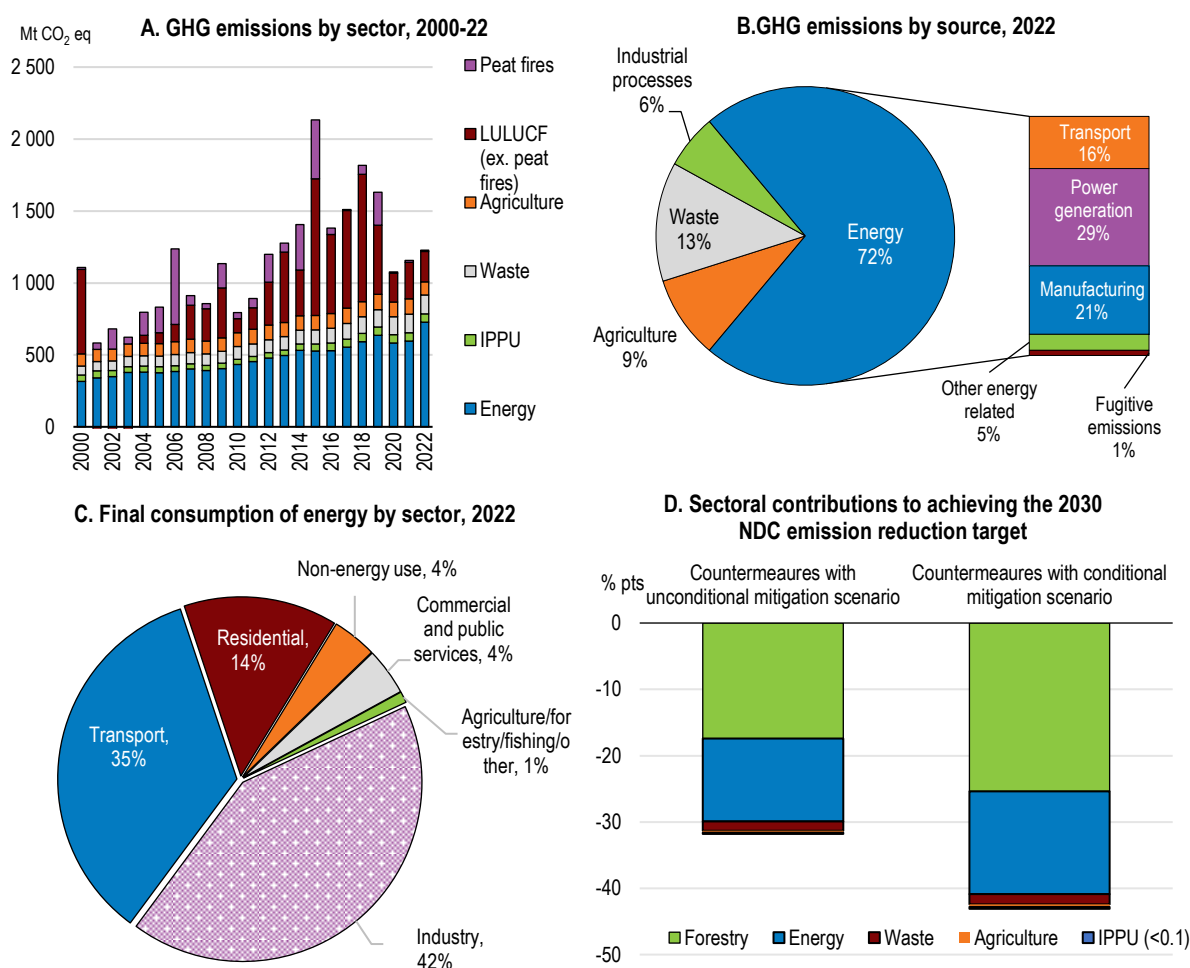
risk management, water resource issues, and how households and businesses can cope with climate change challenges. The chapter's focus on issues related to greenhouse gas emissions means that some green transition issues are not covered. Protecting the environment and reducing pollution includes challenges that are beyond the reduction of GHG emissions and climate-change adaptation. In particular, air pollution continues to weigh heavily on the health of Indonesians. Also, there is work to do in preserving Indonesia's rich land and maritime wildlife; Indonesia remains the second largest producer of plastic pollution, much of it ending up in rivers and oceans.

Past progress and future challenges in emission reduction

Reducing GHG emissions has been the core element of international climate change cooperation with the aim of stabilizing atmospheric concentrations to avoid “dangerous anthropogenic interference with the climate system.” Since 1997, industrialized countries and countries in transition to a market economy have committed to achieve quantified emissions reduction targets for a basket of six GHGs. One key element of this process has been the commitment of countries to regularly report their emissions to the UNFCCC. Ensuring strong commitment on reporting is important, including for Indonesia.

In recent years, energy-related activities, peat fires and other land use (notably forestry) have been the largest contributors to GHG emissions in Indonesia, though the latter have markedly declined (Figure 4.2, Panel A). This mainly echoes efforts to reduce the pace of deforestation. Indeed, the reductions relating to land use account for the slower growth rate in total net emissions seen in 2018-2022. Nonetheless, emissions have been on a strong upward trend again since 2020. Emission reductions relating to changes in land use are expected to make a sizeable contribution to meeting Indonesia's global commitments looking forward (see below).

Meanwhile, other GHG emissions continue to trend upwards – the decline during the pandemic was an exception (Figure 4.2, Panel A). These emissions mainly comprise energy-related activities, the largest component of which is power generation. Other energy-related components include transport and manufacturing. However, there is progress underlying increasing emissions: emissions intensity in the economy has been diminishing, i.e., emissions have been increasing by less than GDP. Between 2010 and 2022, emissions per unit of GDP fell by a little over 10% (Figure 4.3, Panel D). Part of this decline reflects the extension of modern energy services to dwellings and consequent decline in the use of biomass for residential cooking (IEA, 2022^[41]). Emission intensity is now roughly the same as in ASEAN peers such as Malaysia and Thailand (Figure 4.3, Panel C). Due to differences in geography and the availability of natural resources, as well as faster policy progress, other emerging economies have achieved faster reductions in emission intensity. For instance, emission intensity reduction in the ASEAN region as a whole has been close to 20% (Figure 4.3, Panel D).

Figure 4.2. Emissions continue to increase steadily, except those relating to land use

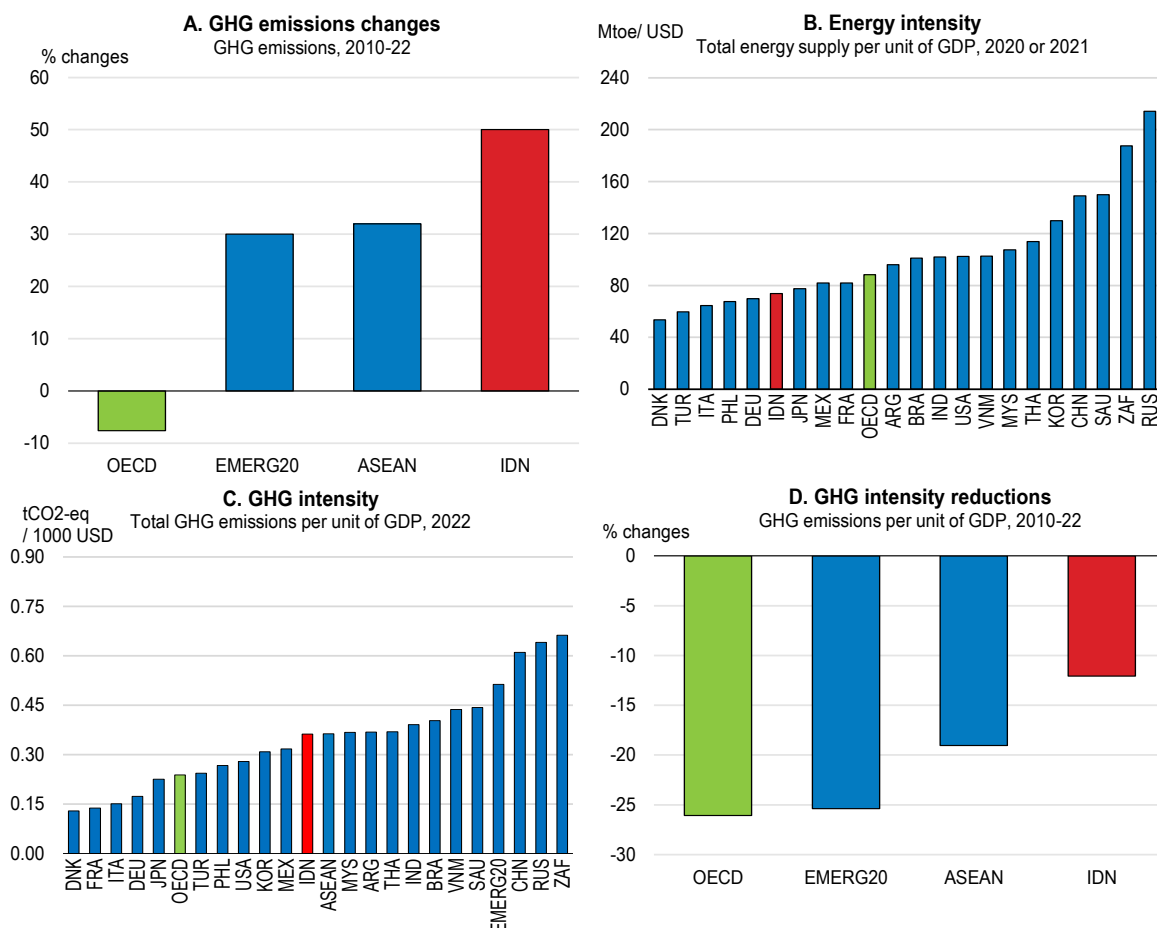
Note: In Panel A, IPPU refers to industrial processes and product use. In Panel B, the total emissions exclude LULUCF. In Panel D, forestry includes other land uses. The target with countermeasures with conditional mitigation scenario is set up to 43% reduction from the business-as-usual (BAU) projections.

Source: Laporan Inventarisasi Gas Rumah Kaca (GRK) Dan Monitoring, Pelaporan, Verifikasi (MPV) 2023, Volume 9, Januari 2024; MoEF (2022), Enhanced Nationally Determined Contribution (NDC) under the United Nations Framework Convention on Climate Change (UNFCCC); and IEA (2024), IEA World Energy Statistics and Balances (database).

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Indonesia has submitted ambitious plans to reduce GHG emissions relative to the baseline over recent years (Box 4.1). In 2021 it updated the 2016 Nationally Determined Contribution (NDC). The update commits to cut GHG emissions by 32%–43% (unconditionally and conditionally, respectively) by 2030, to also reach peak emissions in 2030 and to achieve net-zero by 2060 or earlier. Substantial investments are required. According to the national authorities, reaching the 2030 NDC target alone would require at least IDR 4.52 quadrillion (USD 310 billion, about 20% of 2023 GDP) in mitigation actions. In recognition of Indonesia's increased policy ambitions, the International Partners Group (composed of G7 countries, the EU, Denmark, and Norway) in conjunction with leading financial institutions pledged to support the country with an initial amount of USD 20 billion (see Box 4.4 on the Just Energy Transition Partnership), half of which will come from the private sector, sovereign wealth funds, and philanthropic foundations. Timely advance on these pledges will be important for helping Indonesia achieve its 2030 goal.

Figure 4.3 Further decoupling is needed to achieve net zero emissions while raising living standards



Note: OECD calculations for the aggregates. EMERG20 refers to G20 emerging economies excluding Indonesia: Argentina, Brazil, China, India, Mexico, South Africa, Saudi Arabia, Russia, and Türkiye. ASEAN refers to four peer countries including Malaysia, Philippines, Thailand, and Viet Nam. In Panel C and D, GDP is expressed in USD (PPP, 2017 constant).

Source: EDGAR (Emissions Database for Global Atmospheric Research) Community GHG Database; World Bank (2024), World Development Indicators; OECD (2022), OECD Environment Statistics (database); and Laporan Inventarisasi Gas Rumah Kaca (GRK) Dan Monitoring, Pelaporan, Verifikasi (MPV) 2023, Volume 9, Januari 2024.

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Box 4.1. Indonesia's main policy plans and goals for the green economy transition

The main policy goals and measures relating to the green economy transition are set out in the National Determined Contribution (NDC) documents (as part of the Paris Agreement on climate change) and the Long-Term Strategy on Low Carbon and Climate Resilient Development 2050.

Table 4.1. Main policy targets and measures for achieving the green economy transition

	First NDC	Updated NDC	Long-Term Strategy on Low Carbon and Climate Resilient Development 2050
Total greenhouse gas emissions	Reduce emissions by 26% (unconditional) or 41% (conditional) by 2030, compared to a BAU scenario	Reduce emissions by 31.89% for CM 1 or 43.20% for CM 2 by 2030, compared to a BAU scenario, and reach peak emissions in 2030	Net-zero emissions in 2060 or sooner, with rapid decrease after 2030
Energy industry	CM 1: 11% or 314 Mt CM 2: 14% or 398 Mt	CM 1: 12.5% or 358 Mt CM 2: 15.5% or 445 Mt	CPOS 2 116 Mt in 2050 TRNS 1 439 Mt in 2050 LCCP 572 Mt in 2050
Buildings			CPOS 272 Mt in 2050 TRNS 223 Mt in 2050 LCCP 120 Mt in 2050
Transport	CM 1: 0.10% or 2.75 Mt CM 2: 0.11% or 3.25 Mt	CM 1: 0.2% or 7 Mt CM 2: 0.3% or 9 Mt	CPOS 70 Mt in 2050 TRNS 66 Mt in 2050 LCCP 50.2 Mt in 2050
Forestry	CM 1: 0.32% or 9 Mt CM 2: 0.13% or 4 Mt	CM 1: 0.3% or 10 Mt CM 2: 0.4% or 12 Mt	LCCP net sink by 2030 (CPOS) and 76 Kg (LCCP) by 2050
Land use	CM 1: 17.2% or 497 Mt CM 2: 23% or 650 Mt	CM 1: 17.4% or 500 Mt CM 2: 25.4% or 729 Mt	LCCP net sink by 2030 Indonesia aims to protect 120.3 Mha of forest, including 14.9 Mha of peatland

Acronyms: BAU = business as usual; CM 1 and 2 = counter measures (unconditional and conditional commitments; CPOS = current policy scenario (i.e., extended unconditional commitment); TRNS = transition scenario and LCCP = low-carbon scenario compatible with the Paris Agreement.

Table 4.2. Key green economy policy texts

Texts (ordered by date)	Main provisions
Law on Forestry (No. 41/1999) amended in 2020)	Establishes a framework for sustainable forest management, including: i) designation of forest conservation zones and protected areas; ii) implementation of mandatory reforestation and afforestation projects; iii) permits for sustainable use of forest resources with strict quotas and monitoring; iv) community-based forest management programmes that involve local communities in forest protection.
Energy law (2007)	Prioritizes domestic products and services when developing generating assets, including: i) mandatory use of renewable energy sources in new energy projects; ii) financial incentives and subsidies for investments in green energy technologies; iii) implementation of energy efficiency standards and regulations for buildings and industries; iv) development of sustainable national and regional energy plans.
Law regarding Environmental protection and management (No. 32/2009) amended in 2020	Provides a comprehensive framework for safeguarding the environment, including: i) pollution control measures including limits on emissions and discharges; ii) mandatory environmental impact assessments (EIA) for all major projects; iii) comprehensive waste management regulations, including recycling and hazardous waste disposal; iv) programmes for the restoration and rehabilitation of degraded ecosystems.
Law No. 18 of 2013 regarding Prevention and Eradication of Forest Damage, as amended by the Job Creation Law	Strengthens regulations to combat forest destruction, including: i) penalties for illegal logging and forest encroachment; ii) requirements for companies to rehabilitate degraded forest lands; iii) community involvement in forest monitoring and enforcement; iv) strengthening forest management units and enhancing surveillance systems.
Government Regulation No. 79/2014 on National Energy Policy	Sets goals for: i) the share of renewables in total energy supply (at least 23% by 2025 and at least 31% by 2050); ii) electricity demand (2 500 kWh per capita by 2025 and 7 000 kWh by 2050); iii) final energy intensity (1% annual cut between 2015 and 2025).
Government Regulation on Environmental Economic Instruments (No. 46/2017) and Presidential Regulation 98/2021	Provides a national framework for carbon pricing instruments, including an Emissions Trading System (ETS) and commit to implement a trading system by 2025.
Government Regulation No. 24/2018 on Electronically Integrated Business Licensing Services (OSS)	Streamlines business licensing, including environmental permits, to promote sustainable investment practices. Integrates environmental impact considerations into the business licensing process.
Law No. 7/2021 on Harmonisation of Tax Regulations and Financial Sector Omnibus Law (2023)	Introduces a carbon tax set at IDR 30 000 (USD 2) per ton of carbon dioxide equivalent (CO ₂ e). The tax acts as a floor if carbon prices on the Carbon Exchange fall below this minimum. Under the Financial Sector Omnibus Law (2023), the Financial Service Authority (OJK) supervises carbon trading and the Carbon Exchange.
Government Regulation No. 22 of 2021 regarding Organization of Environmental Protection and Management	Defines the organizational structure for environmental agencies.
Government Regulation No. 23 of 2021 regarding Organization of Forestry	Defines the structure and mandate of forestry agencies, including: i) conservation programmes aimed at protecting biodiversity and forest ecosystems; ii) support for community forestry initiatives and sustainable use practices; iii) reforestation and afforestation projects to enhance forest cover and carbon sequestration.
2021-2030 Electricity Supply Business Plan (2021)	Between 2021 and 2030, renewables (of which almost half is hydro) are planned to make up more than half of capacity additions.
Presidential Regulation No. 112 of 2022 on Acceleration of the Development of Renewable Energy for Electricity Provision	The Regulation covers, among others, selling price of electricity from renewables and the phasing out of coal-fired power plants. The construction of new coal-fired power plants is allowed if they: i) were registered before the Regulation; ii) contribute significantly to job creation and national strategic interests; iii) commit to reduce greenhouse gas emissions by at least 35% within a period of 10 years compared to the average coal-fired power plant emissions in Indonesia in 2021; or iv) are set to operate until 2050 at the latest.
2019-2038 National Electricity General Plan (3 rd Draft, 2023)	Prioritizes renewable energy sources, particularly hydro power, for expanding electricity generation capacity. Sets the goal of raising to 22% the share of renewable energy in the power generation mix by 2025 under PLN.

Source: (OECD, 2021^[5]) and national authorities

Getting the right mix of instruments for decarbonisation

As elsewhere, Indonesia's mix of policies needed for a successful and cost-effective transition to net-zero GHG emissions must be aligned with the local context. Box 4.2 discusses available policy instruments and their potential contribution to design and implement cost-effective and socially acceptable mitigation. Emission pricing provides effective incentives to identify and deploy the lowest-cost policy mixes to cut

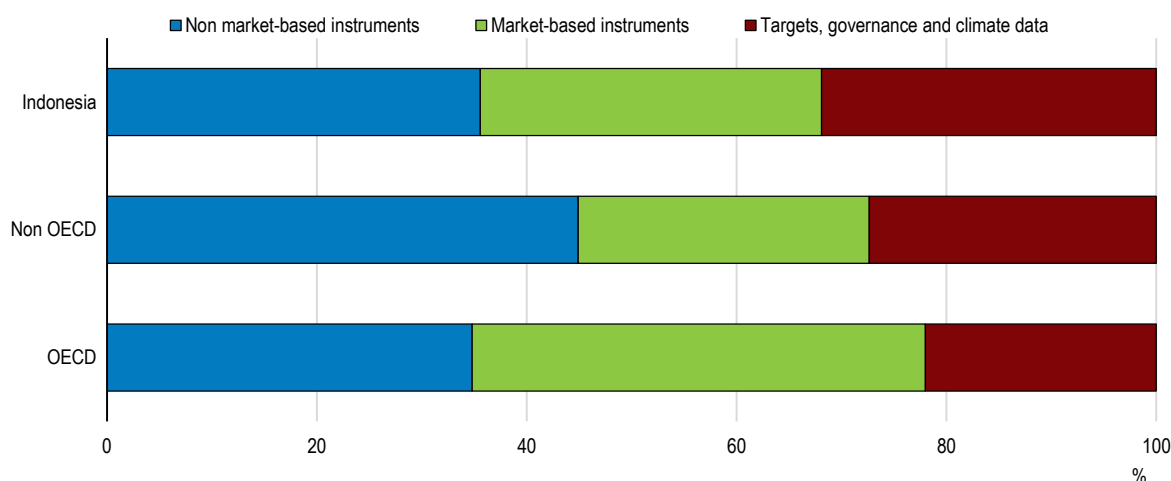
emissions across all sectors and is well-recognised as a cornerstone for achieving the green energy transition (OECD, 2023^[6]). However, impacts on the cost of production and on the prices of goods and services, need to be evaluated, and in some instances offset.

Carbon pricing and emissions trading

Introducing and gradually increasing carbon price is a key cost-effective policy instrument in mitigation policy packages, as it not only reduces emissions but also generates revenue to support the green transition. Vulnerable groups should be taken into consideration in the implementation of carbon pricing, for example through targeted support, to limit the welfare losses from the green transition. Pricing and tax instruments are under-developed in Indonesia's policy mix, although progress has been made in recent years, notably through Law No 7/2021 on Harmonisation of Tax Regulations (Table 4.2). So far, the mitigation strategy has favoured non-market-based instruments, especially minimum performance standards, labelling requirements, bans and phase-outs, over market-based instruments (D'Arcangelo, Kruse and Pisu, 2023^[7]). Market-based instruments contribute less to total climate action for Indonesia than for the OECD area, whereas the contribution of targets, governance and climate data is considerably larger. As of 2019, the environmentally related tax revenue (predominantly motor vehicle taxes) was equivalent to less than 1% of GDP, against an average of 2.3% across OECD and non-OECD economies (Lewis, 2019^[8]). Since 2021, motor vehicles producing emission above 250 grams per litre of fuel are subject to a 40% Luxury Sales Tax. The authorities explain that the slow rollout of emissions-based taxation is partly due to concerns about the price passthrough of higher taxes and operational costs to consumers. In September 2023, the Indonesian Stock Exchange launched the Indonesia Carbon Exchange (IDX Carbon). In less than a year of operation, trading volumes and values have risen, although both the number of projects and transaction frequency remain limited.

Figure 4.4. The contribution of market-based instruments to total climate action is limited

Climate policy mixes, 2022



Note: Based on Climate Actions and Policies Measurement Framework (CAPMF) which is a harmonised international climate policy database to date with 130 policy instruments and climate actions (grouped into 56 policies), spanning the period 1990-2022 and covering 49 countries (OECD, G20 and OECD accession candidate countries) and the EU 27. Market-based instruments are policy instruments that use markets, prices and/or other monetary means to provide incentives for producers and consumers to reduce or eliminate environmental and other externalities. Non market based instruments are instruments that work through the imposition of certain obligations or by installing non-monetary incentives to change behaviour. See the source for more details.

Source: Nachtigall, D., et al. (2022), "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203; and OECD Climate actions and policies measurement framework database, <https://oe.cd/dx/capmf>.

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Box 4.2. Using a mix of policy instruments to cut GHG emissions at lowest cost

Policy instruments to cut GHG emissions include regulations, taxes, and incentives for investing in clean equipment and innovation. The mix of instruments differs from country to country. For example, France focuses on regulations and investment aid directed towards transport, agriculture and residential housing (OECD, 2021^[9]). Denmark applies a GHG tax on transport fuels and non-district heating, while providing R&D incentives targeted at mitigation (OECD, 2021^[10]). Available policy instruments can be grouped into incentive-based instruments, standards and regulations, and complementary policies. Table 4.3 summarises the main characteristics of selected policy instruments.

Table 4.3. Comparing mitigation policy instruments

Policy instrument	Contribution to abatement cost effectiveness	Administrative and fiscal costs	Distributional and social concerns	Political acceptability
(a) Emission pricing and incentive-based instruments				
Carbon pricing, e.g., GHG tax or fuel excise taxes.	Minimises costs to the extent it equalises marginal abatement costs. Encourages innovation to reduce future abatement costs but does not address coordination failures.	Monitoring emissions for GHG tax implies potentially high administrative costs. Lower costs for fuel excise taxes. Increased revenue.	Regressive, unless flanked with compensation policies. May lead to carbon leakage.	Visible price increases can lead to low acceptability.
Subsidies, e.g., feed-in-tariffs.	Compatible with minimising abatement costs depending on design, but risk of 'picking winners'.	Targeting and establishing eligibility can lead to high administrative costs. Increased expenditure.	Regressive, as favouring those who can afford activities.	Cost reductions can lead to high acceptability.
(b) Standards and regulations				
Performance standards, e.g., zero-emission vehicles.	Cost effectiveness can be limited, as abatement costs are not being equalised. Can reduce future abatement costs by spurring innovation.	Certification can raise administrative costs, but overall administrative costs are low. Fiscal impact neutral.	Regressive if compliance requires investments.	High acceptability if price effects are hidden; required costly investments can reduce acceptability.
Information requirements, e.g., building energy efficiency certificates.	Does not equalise abatement costs but can help to guide or 'nudge' consumption behaviour towards low emission alternatives.	Low administrative costs. Fiscal impact neutral.	No concerns.	Fair acceptability.
(c) Complementary policies				
Public infrastructure investments, e.g., in railway or electricity network.	Can reduce overall abatement costs by overcoming public good or coordination problem market failures.	Moderate administrative costs. Increases expenditures.	No concerns if compatible with fiscal balance.	High acceptability.
Financial support policies, e.g., subsidised loans for renovations or vehicle purchase subsidies.	Can reduce overall abatement costs by addressing financial frictions and coordination problem market failures.	Moderate administrative costs. Increases expenditures, more for grants than for loans.	Regressive, as favouring those who can afford activities.	High acceptability.
Public procurement policies (e.g. government vehicle procurement stipulating the purchase of EVs).	Cost effectiveness depends on the area of procurement and policy detail.	Potentially moderate, for instance if policy involves adding procurement criteria.	No concerns.	Acceptability potentially compromised if there is substantial additional expense.

Source: Leidecker et al. (2023^[11]), adapted from D'Arcangelo et al. (2022^[12])

The development and implementation of a domestic Emissions Trading System (ETS) for the power and industry sectors can help meet Indonesia's enhanced NDC targets. Indonesia prices about 22% of its carbon emissions from energy use and none were priced at an Effective Carbon Rate above EUR 60 per tonne of CO₂ (OECD, 2023^[6]). Drawing on the lessons from the 2021 pilot scheme, the government intends to continue developing and implementing ETS along with the planned carbon tax, for which no implementation date has been set yet. The intensity based ETS for the power generation sector was launched in February 2023, making electricity the second sector after road transport to be covered by a carbon pricing instrument. A commitment to gradually increase carbon price and broaden its base will shape expectations and drive investment in clean energy. This more stringent approach should be complemented by other policy interventions, such as feed-in-tariffs for renewable energy and financing mechanisms for energy efficiency. The application of climate budget tagging allows to improve the allocation of public resources depending on policies' distributional impact (Boutron et al., 2023^[13]).

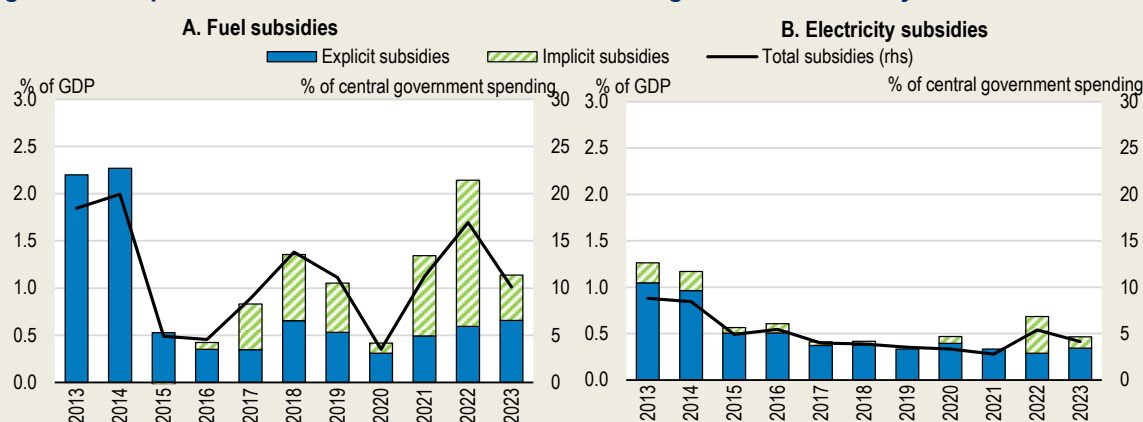
Reforming energy subsidies

Reforming energy subsidies and targeting them on vulnerable households is also key to encourage a transition away from carbon. Energy subsidies (electricity, fuel and liquefied petroleum gas – LPG) account for a significant share of the government's budget (see Chapter 1). Under Indonesian law, energy subsidies are meant to target the poor and vulnerable segments of the population, but many other households also benefit. Subsidies were cut in the mid-2010s, combined with targeted support measures for the most vulnerable households (Box 4.3). As a result, lower-income deciles now receive a higher share of these subsidies than in the past. However, targeting could be improved further, as all income deciles benefit roughly from the same proportion of total energy subsidies (World Bank, 2020^[14]). Energy subsidies also distort economic choices, acting as a drag to the energy transition. Shifting away from these subsidies to targeted cash assistance would reduce this problem and is potentially more cost-effective and redistributive.

Box 4.3. Cutting energy subsidies while shielding the most vulnerable – the experience of 2013-2018

In the early 2010s fuel subsidies absorbed over 20% of government spending, but 40% of subsidy benefits went to the top income decile and less than 1% reached the lowest decile. Fuel subsidies were reduced in June 2013 and again in November 2014. At the beginning of 2015, falling world oil prices provided opportunity for the government to abolish the petrol and diesel price-setting regime. In the new system, domestic petrol and diesel prices were linked to world prices through a semi-automatic formula, with only diesel getting a fixed subsidy of IDR 1 000 (at the time, USD 0.08) a litre. In the original formulation, the 2015 budget earmarked more than 13% of total government expenditure to fuel subsidies, but under the reformed system the share spent was eventually whittled down to 1%. The subsidy cuts on petrol and diesel in the mid-2010s allowed for substantial increase in spending elsewhere, notably areas linked to social protection and infrastructure. This “capital injection” helped increase investments in infrastructure, connectivity, food sovereignty, and other priorities identified in Indonesia’s medium-term development plan.

Figure 4.5. Implicit fuel subsidies have become more significant in recent years



Note: World Bank's estimates for 2022 and 2023. Explicit subsidies are transfers from the central government to PLN and Pertamina for providing energy at subsidised rates. Implicit subsidies are losses made by these SOEs when the explicit subsidy is insufficient to cover the gap between costs and administered prices.

Source: (World Bank, 2020^[14]), based on MoF, PT Pertamina and PLN statistics.

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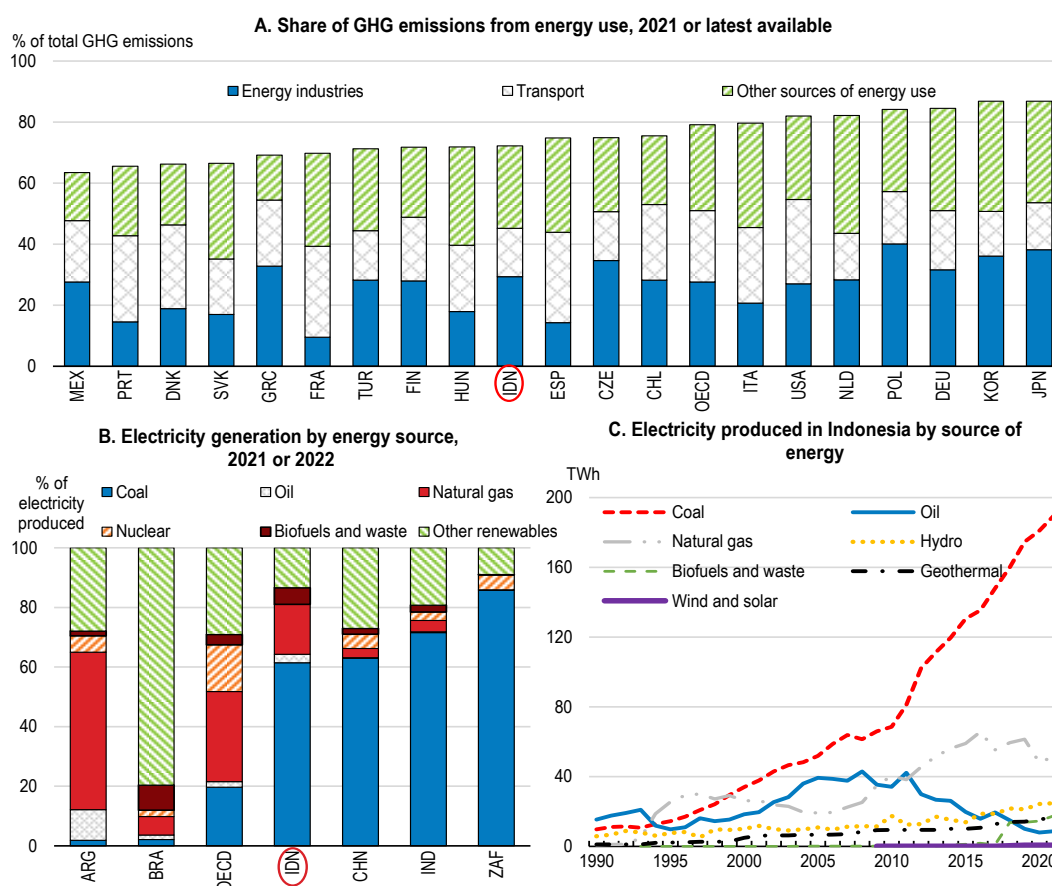
Reform of electricity subsidies has also been carried out. Until 2012 all electricity customers were subsidised, but this subsidy was gradually narrowed to the poorer 40% of the population, between 2012 and 2018. The government has announced in early 2024 that subsidised 3-kilogram (kg) LPG cylinders commonly used by households will eventually be restricted to the poorest households, through customer preregistration, but as of now it remains untargeted and distorts demands for unsubsidised 5.5kg and 12kg LPG cylinders.

However, since the late 2010s there has been some relaxation of efforts to contain subsidies. Retail prices for fuel and electricity were meant to adjust along semi-automatic formulas to global crude oil prices and electricity costs, but the government has not systematically followed these rules: retail fuel prices barely changed between 2016 and 2018 despite increasing global oil prices. As a result, the cost of subsidising fuel and electricity has been increasingly borne by Pertamina and PLN, the country's oil and electricity SOEs. In 2018, these implicit subsidies had increased to IDR 59 trillion (USD 4.2 billion) for fuel and IDR 71 trillion (USD 5 billion) for electricity (World Bank, 2020^[14]).

Decarbonising electricity generation

Indonesia's electricity generation and distribution is primarily provided by the state-owned enterprise Perusahaan Listrik Negara (PLN). Electricity generation accounts for around 30% of Indonesia's GHG emissions (Figure 4.6, Panel A). Excluding reductions relating to land use, the bulk of reductions under Indonesia's National Energy and Climate Plan are expected to come from energy use, primarily from electricity generation. Peak demand may triple between 2010 and 2030 in a business-as-usual case, primarily driven by air conditioning and with important contributions from lighting and refrigerators (McNeil, Karali and Letschert, 2019^[15]). Indonesia's reliance on fossil fuels for electricity production remains high (Panel B), while wind and solar are negligible in the generation mix as of 2024. Over the past decade or so, coal-based electricity production has accelerated markedly, gas-based has also increased, while the use of oil has declined (Panel C). Combined, hydro, bio and geothermal energy provide almost a fifth of total electricity production.

Figure 4.6. In Indonesia, energy-related emissions dominate total GHG emissions



Note: In Panel A, data refer to 2020 for Chile and Korea and to 2019 for Mexico. Data for Indonesia refer to 2022 and comes from the national source. In Panel B, other renewables include hydro, wind, solar, geothermal and other energies. In Panel C, coal includes peat and oil shale where relevant and hydro includes generation from pumped-hydro power stations.

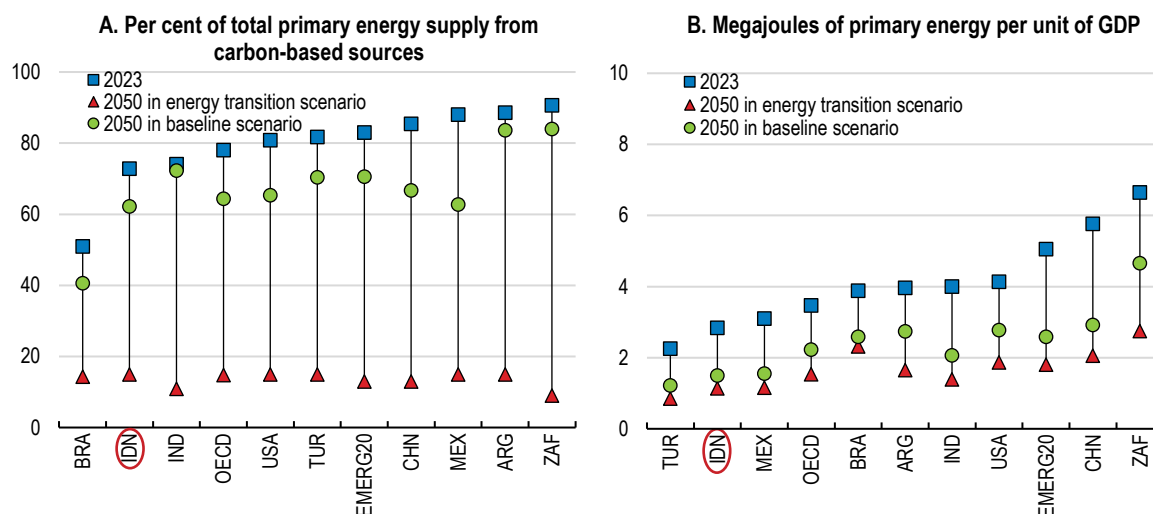
Source: OECD (2024), Environment Statistics (database); IEA (2024), Electricity Information (database); and Laporan Inventarisasi Gas Rumah Kaca (GRK) Dan Monitoring, Pelaporan, Verifikasi (MPV) 2023, Volume 9, January 2024.

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Analysis suggests the economic cost (measured as the level difference in GDP relative to baseline) of pursuing Indonesia's clean energy transition may be relatively small. OECD long-term scenarios suggest that by 2050, cumulative mitigation costs associated with the energy transition amount to less than 9% of

baseline GDP for Indonesia and 11% of GDP for the G20 emerging-market area (Guillemette and Chateau, 2023^[16]). The economic cost, in terms of lower output growth, from fast transition would be small and concentrated in the 2020s. Furthermore, a faster transition would bring higher growth over the following decades (Figure 4.7). By contrast, a slower transition would risk missing mitigation targets and would lead to the emission of about 230 million additional tonnes of CO₂ equivalent from energy use until 2050 – even if net emissions are cut to zero by 2050.

Figure 4.7. Indonesia has a long way to go in decarbonising energy supply



Note: Data comes from underlying data in figures 8 and 9 in the source. EMERG20 refers to G20 emerging economies including Indonesia: (i.e., Argentina, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, South Africa, and Türkiye). In Panel A, carbon-based sources include coal, oil and gas. In the energy transition scenario, coal is assumed to be eliminated by 2050, while the share of oil in primary energy is assumed to decline to 5% and that of gas to 10%, except when these shares are already below these targets at the start of the projection period, in which case they remain constant. In Panel B, GDP is expressed in USD at 2015 PPPs. Iceland is not included for the OECD aggregate, because it is considered as an outlier due to the large share of geothermal heat in its energy mix.

Source: Guillemette, Y. and J. Chateau (2023), "Long-term scenarios: incorporating the energy transition", OECD Economic Policy Papers, No. 33.

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In broader terms, the largest potential benefits of climate mitigation accrue from the removal of domestic policy distortions that contribute to emissions and create deadweight loss. For instance, gradually phasing out untargeted fossil fuel subsidies would reduce air pollution and emissions, thus improving health outcomes locally. On the other hand, pricing mechanisms would potentially have economy-wide impacts on households in terms of employment and wages, with the largest impact in energy-intensive sectors. In Indonesia, however, the social and economic cost of a carbon tax would be modest compared to the human and economic ones produced by air pollution and other factors. Limiting the social impact can be helped gradual phase-out of fuel subsidy reduction and by efforts to ensure vulnerable households receive sufficient support through other means (such as regular welfare). Overall employment in energy-intensive sectors is indeed rather low: 10% of total employment, though it is higher in coal-producing areas (World Bank, 2023^[17]).

Phasing out coal

As part of the Just Energy Transition Partnership (JETP) scheme (Box 4.4), two coal-fired power plants (CFPPs) out of 250 (representing about 2% of the national power capacity) are slated for early closure by 2040. More may close between 2030 and 2040, due to natural retirement, though CCFPs are relatively young in Indonesia. In 2020, around 60% of the fleet was younger than 10 years, and 23% older than 20 years (IEA, 2020^[18]). Estimates suggest the socio-economic benefits from closing coal power plants could be up to four times the costs (Cui et al., 2022^[19]), yet faster progress can be hindered by strong interest

groups locally. In the long run, retrofitting coal- and gas-fired plants to capture carbon or to run on hydrogen can further reduce emissions from natural gas, although costs can be high (IEA, 2022^[4]). Indonesia's CFPPs produce substantial emissions, while also contributing to overcapacity. The capacity margin in Indonesia, particularly in the Java-Bali system, is around 57% in 2022. This exceeds the operator's targeted capacity margin (30%) and is three to four times higher than international benchmarks needed to meet peak demand and maintain a 15% reserve margin. Both MEMR and IEA modelling analyses indicate no need for new CFPP after the current project pipeline, and project the phase out of unabated CFPPs (i.e., without substantial efforts to reduce the emissions produced throughout their life cycle) by the 2050s. Presidential Regulation 112/2022 organises the gradual phase-out of CCFPs, though new CCFPs can still be constructed if they were registered before the Regulation, or if they fall under specific conditions (Table 4.2).

Against this background, contractual adjustments are needed that simultaneously steer the coal- (and gas) fired energy sector towards eventual decommissioning (or adoption of emission-eliminating technologies) and ensure that plants operate more flexibly and at lower annual capacity factors. Accelerated retirements can also help to reduce overcapacity in the system, if conducted carefully to preserve investor confidence (IEA-MEMR, 2022^[20]). International support, based on a detailed assessment of plant balance sheets, should be provided to help Indonesia cover possible unrecovered capital (IEA-MEMR, 2022^[20]). Under the Energy Transition Mechanism (ETM) (Box 4.4), the ADB offers financial assistance to facilitate early retirement of the coal fleet and one deal has been concluded in 2023. The 660-megawatt Cirebon-1 CFPP in Western Java will likely be retired almost seven years earlier than scheduled. At the same time, connecting new coal-powered units should be restricted to the adoption of advanced cleaner technologies (Ramdhaningrum, 2024^[21]).

Box 4.4. The Just Energy Transition Partnership and the Energy Transition Mechanism

The Just Energy Transition Partnership

The Just Energy Transition Partnerships (JETPs) are a new plurilateral intergovernmental structure for accelerating the phase-out of fossil fuels and the rollout of renewable energy. JETPs coordinate financial resources and technical assistance from several partners to a recipient country for phase-out. The first JETP, worth about USD 8.5 billion, was announced at COP 26 in Glasgow in 2021, with South Africa. Three more JETPs have been agreed, with Indonesia (USD 20 billion), Senegal (USD 2.5 billion), and Vietnam (USD 15.5 billion). Financing from both public and private sources include grants, loans, and investments. These types of funding models are innovative insofar as they are “just” and imply a “partnership”. A “just” energy transition must be implemented in an equitable and inclusive manner about its social consequences. In affected populations and sectors, retraining and alternative business models not based on fossil fuels are to be created for this purpose. The use of “partnership” emphasizes that these agreements are tailored to the needs of the recipient country and that local decision-makers are actively involved.

The Energy Transition Mechanism

The Energy Transition Platform (ETP) is a special purpose platform tasked with the role of procuring the financing for eligible projects, undertaken to early retire existing CFPPs and develop new renewable power projects to replace the retired CFPPs. An SOE (PT Sarana Multi Infrastruktur) is tasked as the Platform Manager to operate the ETP, assisted by a Guidance Committee to determine eligible projects. Available facilities under the ETP are loan facilities, government investments, sovereign guarantees, public private partnerships and any other type of facilities. The ETP's funds may be sourced from the state budget or from international/governmental/multilateral institutions, local institutions, foreign commercial or non-commercial institutions, philanthropical agencies or climate and infrastructure funds. Under the ETM, the Cirebon-1 CFPP (660MW) is due to be decommissioned in 2035 instead of 2042.

Source: <https://www.whitecase.com/insight-alert/indonesian-energy-transition-snapshot>

Increasing renewable energy generation capacity

Solar and wind have considerable potential for Indonesia, whose archipelagic feature is somewhat similar to Greece where wind alone accounts for 21% of the generation mix (OECD, 2020^[22]). For Indonesia, the IEA expects a doubling of the share of renewables in power generation by 2030 to more than 35%. It also projects solar power can provide as much as 50-60% of electricity generation capacity needed to serve the much bigger demand for electricity by 2060 (IEA, 2022^[4]). The imminent operationalisation of the 10 Megawatt (MW) solar power plant in the new capital city testifies to Indonesia's commitment to renewable energy. The state-owned electricity company, Perusahaan Listrik Negara (PLN), unveiled plans to bolster renewable power capacity by 31.6 GW from 2024 to 2033 (Table 4.4). The potential for offshore renewable energy is also considerable though this requires investment in grid infrastructure to connect to centres of population. Greater deployment of small capacity offshore turbines and floating solar panels is potentially a solution for remote and sparsely populated areas.

Table 4.4. Indonesia plans to expand the share of electricity generated from renewable sources

	Indonesia	Singapore	Thailand	Malaysia	Philippines	Vietnam
Share of renewables	13.1% (2023)	4.4% (2023)	17% (2021)	19% (2021)	22.4% (2021)	30% (2021)
Target	24.2% (2030)	30% (2035)	68% (2040)	40% (2035)	35% (2030)	39% (2030)

Source: Ministry of Energy and Mineral Resources of Indonesia; Sustainable Energy Development Authority (SEDA) Malaysia; Department of Energy of the Republic of the Philippines; Singapore Energy Market Authority; Ministry of Energy of Thailand, Energy Policy, and Planning Office (EPPO); Vietnam's National Electricity Development Plan/Power Development Plan 8 (PDP8) and IEA.

Fewer barriers to installing renewable capacity and a better tariff setting system are needed. An IEA net-zero roadmap for Indonesia (IEA, 2022^[4]) underscores the need for simplified planning procedures and engagement with local communities to facilitate new renewable capacity. Policy also needs to establish a stable, substantial and multi-year pipeline of auctions for renewables, with competitive and transparent tariff-setting. Current electricity tariff regulations do not favour wind and solar. Under previous regulations, the tariffs received by producers were capped at around 85% of the state-owned vertically-integrated electricity company's (PLN) regional average generation cost (biaya pokok produksi, BPP). New regulation has replaced the BPP benchmark with annual ceiling prices that vary regionally. Independent (i.e. non-PLN) power producers bid for capacity below these ceiling prices under the PLN's procurement process. Coal producers are required to supply power at a maximum price (USD 70 per tonne for greater than 6 000 kilocalorie per kilogramme coal), which also limits the capacity for renewable generators to compete. The maximum purchase price is 100% of the USD 70 benchmark for hydro and geothermal, biomass and ocean wave and 85% of the BPP for solar PV and wind. Current tariff levels are viewed by most industry players as too low to spur growth in renewable capacity. Institutional fragility – notably the lack of an independent regulator with strong technical competency -- hinders the growth of private capital participation (Asian Development Bank, 2021^[23]). Local content requirements and high capital costs also dissuade investment. A long-proposed presidential regulation on renewables to reform the tariff system and address other barriers to deployment has yet to be fully implemented (OECD, 2021^[5]). In parallel to major reform practical steps that could be considered include, where feasible, mandating the use of renewable energy in public spending and investment.

Further investments in the electricity system will be needed to ensure supply is reliable as the role of renewable sources grows. Wind and solar output are intermittent and highly uncertain and, hence, non-dispatchable (Delarue and Morris, 2015^[24]). Insofar as it does not strongly align with electricity demand, increased generation from renewables will require more 'balancing capacity' from other sources, or complementary approaches, including storage (IEA, 2023^[25]). Electricity grid expansion will also help tackling the balancing capacity issue. More connections between Indonesia's islands grids are planned which will help exploit the large potential for renewable energy sources on many islands (OECD, 2020^[22]).

Better integrating Indonesia's electricity network with neighbouring countries will also add more balancing capacity by enlarging the pool of potential energy suppliers. The recently-initiated Brunei Darussalam–Indonesia–Malaysia–Philippines Power Integration Project will complement existing efforts towards realising the ASEAN Power Grid.

In the longer run and on larger islands, smart meters and dynamic pricing can help make electricity consumption more responsive to supply conditions and reduce system stress and the need for balancing capacity (IEA, 2022^[4]). Smart meters use wireless technology to inform consumers about their electricity consumption in real-time. Meanwhile, time-varying pricing (dynamic pricing) provides financial incentives to shift electricity demand to periods when supply is more plentiful. In mid-2020, PLN launched a plan to install 79 million smart meters over seven years, although the roll-out appears to run behind schedule. Dynamic pricing contracts have not yet been introduced and their take-up could be boosted by simplified electricity bills (ACER/CEER, 2021^[26]),

Promoting smart manufacturing

For Indonesia's industry, which for the past few decades has under-performed both regional peers and other sectors of the economy (World Bank, 2023^[17]), the green transition combined with smart manufacturing represent potential opportunities. The production of materials and goods account for a quarter of total national CO₂ emissions and reaching the Net Zero goals requires investments in low-carbon technologies, often imported, that can be costly, complex to operate and maintain and untested in developing countries. Weak awareness is also a concern: individual companies, especially small and medium-sized businesses, often underestimate the importance of fighting climate change and lack the expertise and knowledge for adopting greenhouse gas emissions accounting, setting reduction targets, and developing tailored strategies to reach them. On the other hand, the country enjoys favourable conditions to participate in key segments of global value chains, such as cell manufacturing, active materials, raw material mining and refining, and battery pack assembly. Indonesia has significantly increased high-quality nickel production in recent years, building on its strength in catering mainly for the stainless-steel sector.

In order to encourage large energy users to adopt more efficient practices, stakeholders have launched several initiatives. The main industrial energy efficiency policy is Government Regulation 70/2009, which requires all companies with an annual energy consumption exceeding 6 000 tonnes of oil equivalent (toe) to appoint an energy manager, develop an energy conservation plan, perform an energy audit and report energy consumption to government. Other initiatives include plans for sustainability reporting by business. However, existing regulations are not intended to cover less energy-intensive sectors, where the largest opportunities exist and where electric motor-driven systems are common. Minimum Energy Performance Standards (MEPS) are in place for air conditioning, but the absence of standards for electric motors means there is a huge opportunity for improvement (IEA, 2021^[27]). It is estimated that if Indonesia were to introduce a requirement that electric motors had at least IE2 level efficiency, the same as in China, it could avoid nearly 2200 GWh of industrial electricity use by 2030. In nickel, the Ministry of National Development Planning (Bappenas) has initiated the decarbonization roadmap with the support of WRI Indonesia (Bappenas, 2024^[28]). Food and beverages, textiles, construction, wholesale and retail trade, and electrical equipment and electronics have been identified by Bappenas for their potential in adopting circular economy principles and practices. The development of carbon pricing will eventually favour the adoption of more efficient manufacturing technologies.

Reducing emissions in the transport sector

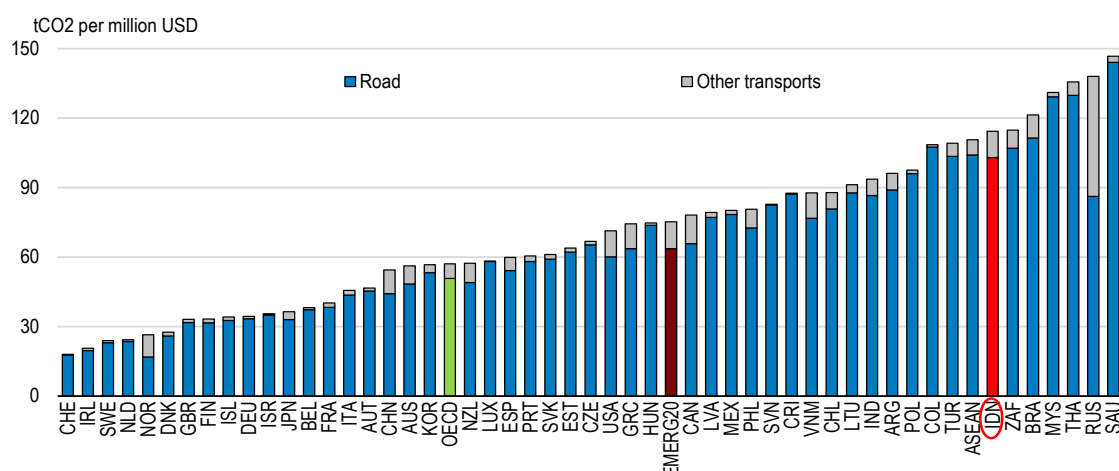
Transport, which accounts for around one third of final energy consumption and around one sixth of GHG emissions, is expected to increase fast as per capita income rises and mobility aspirations increase. Transport-related CO₂ emissions per GDP unit are twice as high as the OECD average (Figure 4.8). Motor vehicle transport, the main transport means for both passengers and goods in Indonesia, will need to transition to low- or zero-emissions. Furthermore, reducing the use of petroleum and diesel fuel vehicles, particularly in urban areas, is important to address Indonesia's air quality problems (Box 4.5). Greening the vehicle fleet can be accompanied by specific initiatives to make public transport more attractive or road transport more efficient. Technological advances can reduce future abatement costs for still hard-to-decarbonise transport modes, including for ferries which account for 12% of emissions from passenger transport in Indonesia (Box 4.6).

Box 4.5. Indonesia's air quality challenges

Swift intervention is needed to confront the air quality crisis. Indonesia is consistently ranked among the worst-performing countries in the Air Quality Index (AQI). In August 2023, airborne pollutants such as dust, soot, and smoke in the Special Capital Region (DKI) Jakarta were measured at 116.7 micrograms per cubic meter—over 23 times the safety threshold of the World Health Organization (ICLEI-SEAS, 2024^[29]). Several areas in DKI Jakarta have been designated as Low-Emission Zones since February 2021, with most areas in Jakarta targeted to be emission-free by 2030.

Figure 4.8. There is ample room for reducing GHG emissions from road transport

CO₂ emissions from combustion per unit of GDP from road and other transports, 2021



Note: EMERG20 refers to G20 emerging economies excluding Indonesia: Argentina, Brazil, China, India, Mexico, South Africa, Saudi Arabia, Russia, and Türkiye. ASEAN refers to four peer countries including Malaysia, Philippines, Thailand, and Vietnam.

Source: IEA (2023), GHG emissions from energy; and World Bank (2024), World Development Indicators.

StatLink  <https://stat.link/s6pejc>

Box 4.6. Cutting emissions from shipping without raising the cost of transporting people and goods

Maritime transport accounted for 2.5% of global emissions from energy in 2020. Ships owned by Indonesians account for 10.8% of the world's vessels, making it the number one country in this regard, although in terms of dead weight Indonesia accounts for a much lower share (1.3%) (IEA, 2022^[41]). Moving the sector to carbon neutrality is challenging as feasible fuel technologies for long distance bulk transport are yet to emerge (UNCTAD, 2023^[30]). There are currently no emission-reduction targets in Indonesia's enhanced NDC for the domestic shipping and maritime transport sectors. However, policy actions are being taken. The use of biodiesel in shipping is being encouraged by offsetting the difference in price between biodiesel and fossil diesel using funds collected from levies on palm oil exports and managed by the Oil Palm Plantation Fund Management Agency (BPDPKS).

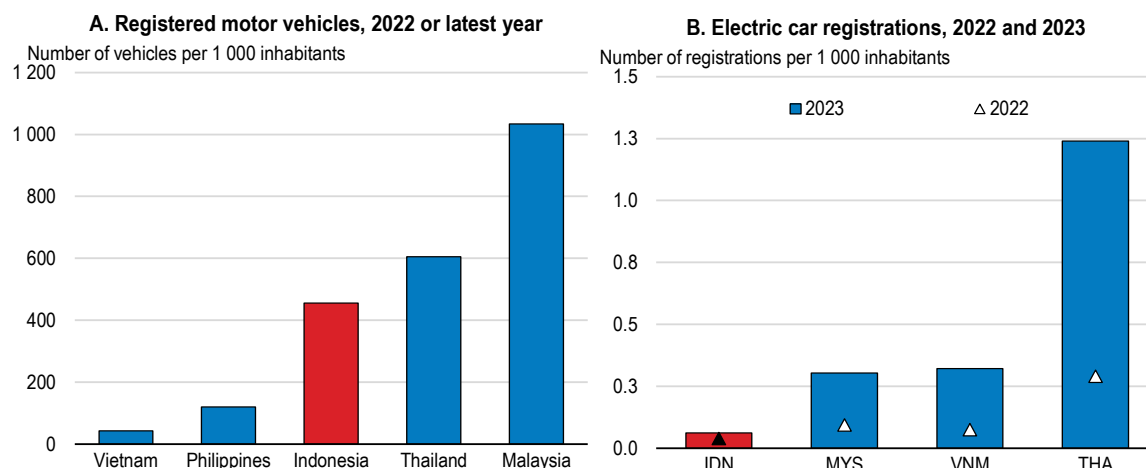
There is scope for electrification of some ferry routes. Of the ten most used ferry routes in Indonesia (which carried 74% of all ferry passengers in 2021) eight are suitable for electrification (as the journeys are relatively short). For example, electrifying the ferry between Java and Bali could significantly reduce emissions produced by 6.2 million passengers each year.

Source: <https://seads.adb.org/solutions/indonesia-can-lead-way-ocean-based-climate-action>

Transitioning to zero-emission vehicles

Greening the vehicle fleet is a gradual process, especially in emerging market economies as households and businesses have limited financial resources to invest in new vehicles. Moreover, electric vehicles (EVs) can contribute to decarbonise the economy only if electricity decarbonises first. In Indonesia, where car ownership trails behind richer ASEAN peers such as Malaysia and Thailand, buying used cars is common, with second-hand cars accounting for the majority of cars in circulation (McKinsey, 2021^[31]). While price gaps between new electric and combustion engine cars may disappear within the next few years (Lutsey and Nicholas, 2019^[32]), used combustion engine cars are likely to remain substantially cheaper for some time.

Indonesia lags behind other countries in adopting zero-emission vehicles. Both the share of zero-emission vehicles in the existing fleet (Figure 4.9) and in new registrations is among the lowest in the G20 (Figure 4.10). In 2022, EVs made up less than 2% of new cars on Indonesia's roads (IEA, 2023^[33]). The launch of several hybrid models drove the increase in EV sales to 5.9% by end-September 2023. Most EV cars are in the hybrid segment, dominated by Chinese and Korean brands. Government targets aim for 2 million passenger EVs and 13 million electric motorcycles (the largest market segment in the country and contributor to 26% of all transport GHG emissions) by 2030.

Figure 4.9. The car fleet is smaller than in ASEAN peers

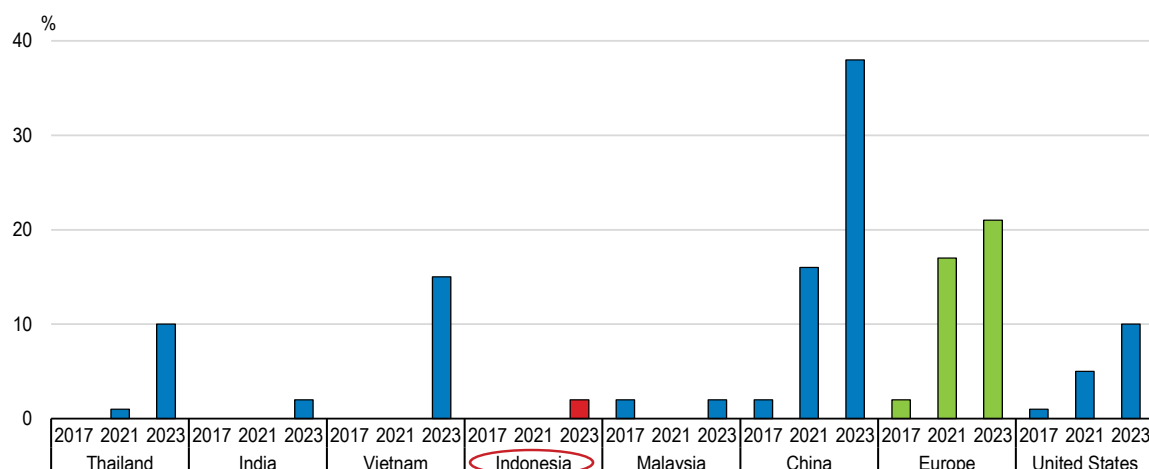
Note: OECD calculations based on ASEAN (2024) for Panel A and IEA (2024) for Panel B. In Panel A, the data refer to 2022, except for Vietnam which refers to 2020. Electric cars refer to battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV).

Source: ASEAN (2024), Transport Statistics (database); IEA (2024), "Global EV Outlook 2024: Moving towards increased affordability", April; and World Bank, World Development Indicators.

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Figure 4.10. Electric vehicles diffusion is slow in Indonesia

Sales share of electric cars



Note: Electric cars refer to battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV).

Source: IEA (2024), "Global EV Outlook 2024: Moving towards increased affordability", April.

StatLink <https://stat.link/obhmu3>

Various incentives have been introduced to boost both EV sales and domestic production. Tax incentives since 2022 have included reducing the VAT rate on EVs from 11% to 1% and removing the luxury tax. The Electric Car Down Payment, Sales Tax and Import Tax Waiver is due to end in 2025. The government is also offering around USD 500 towards the purchase of an EV. It aims to provide this for sales of 200 000 e-motorcycles and 35 900 electric cars, as well as the conversion of 50 000 combustion-engine motorcycles to electric propulsion. Local-content conditions are being introduced to qualify for the subsidy, which should be directed at light vehicles which are used extensively. Indonesia's Financial Stability Authority (OJK) is expanding its Sustainable Finance Taxonomy to cover transportation sector.

Higher taxes on combustion-engine vehicles, possibly as part of a feebate to subsidise EV purchase and buyback of older vehicles, should be considered. Rechannelling a tax on the purchase of high-emission vehicles emitters to EV purchase incentives (a feebate) has met with some success in several countries, for instance France, Thailand, and Singapore (Wappelhorst, 2022^[34]). However, the households that buy electric vehicles, and benefit from the subsidies, are largely higher income. Subsidising zero-emission rental services could provide better access for low-income households. Subsidising loans rather than providing grants for purchasing zero emission vehicles, as done in Scotland, addresses financial constraints by overcoming high upfront costs of electric vehicles and mobilises more private funding (ICCT, 2020^[35]).

Further development of the EV charging network is underway but has a long way to go. Perusahaan Listrik Negara (PLN), the state-owned power company, has been appointed to establish the EV charging infrastructure and aims to invest USD 1 billion by 2030. Leveraging more private capital and ensuring public support concentrates on areas where charging points are neither commercially nor financially viable, could further bolster network density. Regulatory measures could include making the installation of publicly accessible charging points obligatory for petrol stations or other focal points (IEA, 2021^[36]). Germany, for example, plans to negotiate voluntary commitments by petrol-station companies to equip 75% of petrol stations with charging points by 2026, and to mandate this if the goal is missed (Bundesregierung, 2020^[37]). The Indian model of scooter battery swapping stations could also prove useful in Indonesia's largest cities.

Tighter restrictions for using fossil-fuel cars in large cities would encourage more buyers to choose a zero-emission vehicle. Some such measures are underway. In the new capital city, Nusantara, the plan is for government vehicles to utilize environmentally smart technology. The DKI Jakarta government aims to have completed bus electrification by 2030. This plan will contribute to a 60% estimated reduction in vehicle emissions and a 28% reduction in noise pollution. Similar urban electrification targets for public transit could be adopted elsewhere and extended to taxis, ride-hailing cars, and motorcycles. Enforcing and expanding restrictions based on vehicle emissions, for example through road pricing, congestion charges, priority lanes, emission-free zones or parking regulations, would add to the benefits of zero-emission cars. Amsterdam, Oslo, Paris, Rome, London, and Milan are planning to phase out fossil-fuel cars and provide discounts or easier parking for electric vehicles (ICCT, 2020^[35]).

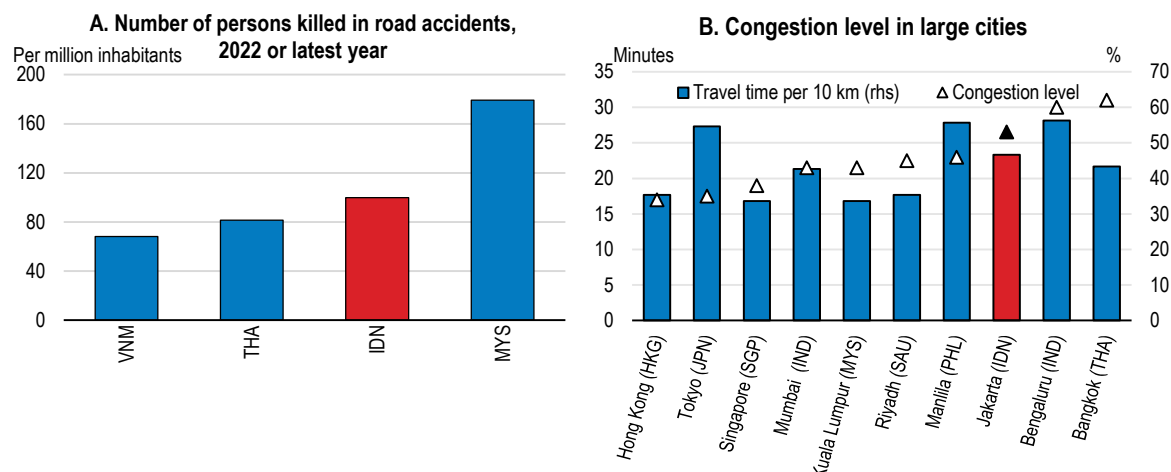
Encouraging a shift from road to rail

Scope for more intercity rail transport is considerable, particularly in Java, which is home to around half of Indonesia's population. The mainly single-track rail network accounts for about 7% of the non-metropolitan passenger market and only around 0.6% of goods transported (Asian Development Bank, 2016^[38]). A key issue is the relatively limited scope the rail network. In addition, poor maintenance, dilapidated rolling stock, slow trains, frequent delays, and insecurity contribute to users' dissatisfaction and further accentuates structural problems. It is estimated that shifting passenger and freight from road to rail would cut 83% of GHG emissions generated by transport between cities. Reductions in road transport would also help address air pollution, traffic congestion and road accidents, which are very high by global standards (Figure 4.11, Panels A and B).

Welcome improvement in the rail network is underway. An investment of around USD 90 billion planned in the National Railway Vision 2030 (RIPNAS, 2023^[39]). Much of the investment is in network renovation, notably installing double tracks on major trunk rail lines, reviving dormant tracks (there are some 2 500 km of unused track, mainly on Java), and promoting inter-modality. The state railway company, PT Kereta Api Indonesia (PT KAI), is investing in freight locomotives that operate with biodiesel blends up to B35 (i.e., a mixture of 35 % biodiesel and 65 % diesel fuel). The new Makassar–Parepare railway has received strong passengers' support, although freight users are still rather cautious due to single-track configuration, vulnerability to natural hazards, and uncompetitive pricing (Partnership for Australia-Indonesia Research, 2022^[40]). The Jakarta-Bandung project, operational since late 2023, is the first high-speed railway in Southeast Asia. PT KAI should be granted greater managerial autonomy, while the relationship between

it and government should evolve and create the foundations for expanded private participation. Given the poor results of the current, restrictive regulatory environment (Figure 4.12, Panel B), the use of competitive tenders to allocate public service contracts could sustain investment and improve service quality (Vitale and Terrero, 2022^[41]).

Figure 4.11. Using cars less would reduce Indonesia's high incidence of accidents and congestion

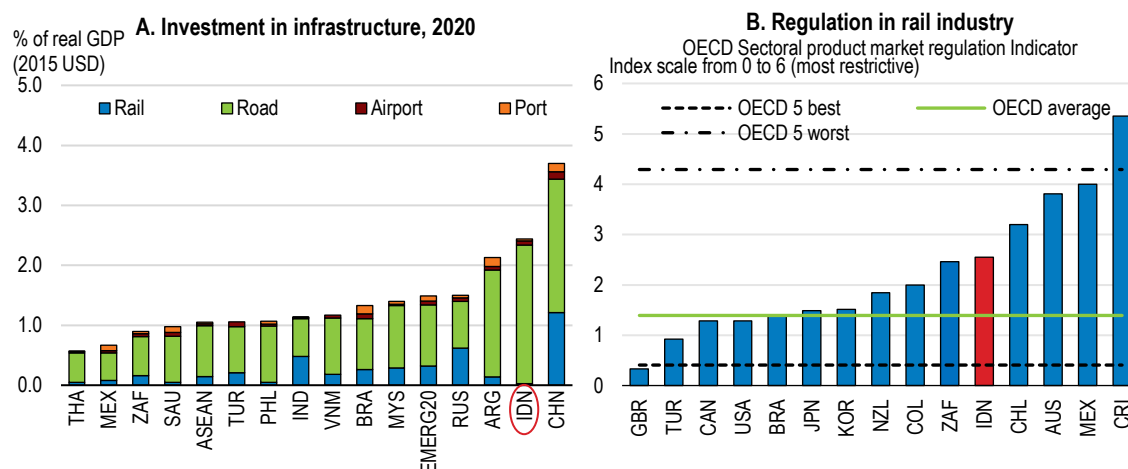


Note: In Panel A, data for Vietnam refer to 2020. In Panel B, the congestion level refers to the average additional time (in percent) lost to traffic, relative to driving in free-flow conditions.

Source: ASEAN (2024), Transport Statistics (database); World Bank (2024), World Development Indicators; and TomTom Traffic Index 2023.

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Figure 4.12. Investing more in rail would make train use more attractive



Note: ASEAN refers to four peer countries including Malaysia, Philippines, Thailand, and Vietnam. EMERG20 refers to G20 emerging economies excluding Indonesia: Argentina, Brazil, China, India, Mexico, South Africa, Saudi Arabia, and Türkiye. In Panel B, information refers to laws and regulation in force on 1 May 2024.

Source: Global Infrastructure Hub Infrastructure Monitor; and OECD PMR database and OECD-WBG PMR database for 2023/2024.

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Improving public transport systems

Making travelling by public transport more attractive, particularly in urban areas, would help cut car use. In Indonesia, many people prefer travelling by car because public transport is slow, does not cover the entire journey, or requires switching between different transport modes. Nearly 50% of female passengers experienced sexual harassment on public transportation, further dissuading use (Asian Development Bank, 2023^[42]). In major metropolitan areas, the public transport modal share can be as low as 3% (Asian Development Bank, 2016^[38]). This strong car (or motorcycle) preference reflects a policy bias towards individual mobility that contributes to Indonesia's bad performance in terms of road safety, injuries, and fatalities (WHO, 2023^[43]). There is scope to further invest in urban transportation, though limited resources require sound cost-benefit analysis.

There is scope to make different public transport modes work together more seamlessly with digital technologies, for example by promoting Mobility-as-a-Service or offering integrated ticketing and shared transport modes such as on-demand taxi-buses to cover the last kilometre (ITF, 2017^[44]). Better incorporating transit in urban development planning would make using public transport cheaper by bringing terminals closer to where people live, work, and shop (ITF, 2021^[45]). Non-motorised transport (i.e., walking and biking) could be encouraged through changes in land-use regulations, investment in walkability and dedicated road lanes, and public awareness campaigns. A concerted policy push is needed, so that public transport reaches critical mass.

Shifting to cleaner household energy use and making buildings more energy efficient

Buildings and related domestic activity are responsible for 19.5% of Indonesia's energy consumption, mostly in the form of cooking and water heating (IEA, 2021^[46]). Thanks to the progress in broadening access to electricity (switch to electrical lighting is practically complete), emissions from lighting with kerosene and other combustible fuels have been largely eliminated over the last decade. According to the most recent annual socio-economic survey, only 0.8% of households reported using a non-electrical source as their main source of lighting (BPS, 2022^[47]).

Also, a majority of households are now using liquefied petroleum gas (LPG) instead of biomass (usually wood) for cooking. Biomass generates several times the emissions per unit of heat compared with LPG. Switching away from biomass in cooking brings other benefits (including less exposure to wood smoke and less time spent gathering fuel), especially for women and children, who traditionally perform most household work. Indonesia's kerosene-to-LPG programme that ran from 2007 to 2012 promoted significant shift to LPG (see Box 4.6). As of 2021, almost 85% of Indonesian households used LPG as their primary cooking fuel (BPS, 2022^[47]). Nonetheless, as of 2022 around 41 million Indonesians were still without access to clean cooking (IEA, 2023). Indonesia is a major supporter and contributor to the on-going global discussions on clean cooking. It is engaged in high-level international policy dialogues (such as through the Health and Energy Platform of Action and the G20-endorsed Initiative on Clean Cooking and Energy Access) and research and innovation programmes (through the Modern Energy Cooking Services and the Clean Cooking Alliance).

Box 4.7. Indonesia's kerosene-to-LPG programme (2007-2012)

Indonesia's kerosene-to-LPG conversion programme for cooking between 2007 and 2012 is widely acclaimed. As part of the fuel subsidy and energy reform program, the government supported the liquid propane gas sector, including manufacture of smaller LPG containers. It also conducted awareness campaigns and provided subsidies targeting poor consumers. As a result, 50 million households switched to LPG cooking, mainly from wood-based cooking, over the five years of the programme.

Ensuring buildings are better insulated against the heat will increase in importance as climates change further. Renovating existing residential buildings and raising the energy efficiency of new housing would additionally help to reduce households' energy bills and the high incidence of energy poverty. Law No. 36/2005 introduced obligatory energy conservation measures for buildings larger than 500 m². The measures included mandatory energy audit and preparation of energy conservation plans and reports. Subsequent revisions of the law have extended the obligation to complex buildings (these include offices, industrial facilities, and buildings consuming more than 6 000 tons of oil equivalent per year).

There is scope to expand energy-efficiency actions on existing buildings. Most policy, such as the National Green Building Guidelines, applies to new buildings and could be extended to existing commercial buildings/retrofits that currently only require audits and implementing green requirements when feasible. The public sector, which owns 22% of the building stock, should catalyse efforts in investing in energy efficiency. This may prompt greater compliance with regulation among landlords in the private sector. Cities and regions can also plan a way forward by creating a common vision for a broad array of public and private stakeholders, devising effective regulatory frameworks for decarbonising buildings, and introducing a monitoring and evaluation scheme for policy outcomes (OECD, 2022^[48]).

Obstacles to investing in energy-saving renovation need to be overcome. Supporting loans with on-bill repayment can address the challenge of access to finance. Poorer households may be assisted through grants. Agreeing on renovations may be easier when upfront costs are fully financed through future energy savings (Nita, 2023^[49]). Also, there may be scope to further support renovations in multi-owner buildings by changes to the relevant legal arrangements, for example to promote majority-based decision-making and individual metering (Edwards, 2020^[50]). Energy service companies can provide financing to commercial owners with larger renovation projects, where savings are high enough to repay the costs of setting up these services (Nita, 2023^[49]). General incentive for energy-saving renovation may lie in tax measures, for instance by a reduced rate of the land and buildings tax (Pajak Bumi dan Bangunan, PBB) for buildings passing certain energy efficiency criteria. In addition, information campaigns can help overcome lack of awareness or scepticism on the opportunities and benefits of retrofits.

Reducing emissions and protecting ecosystems in land- and sea-use

Indonesia's agricultural sector produces GHG emissions, but it also has substantial capacity as a carbon sink. Emissions include, for instance, methane emissions from rice cultivation. Meanwhile, Indonesia's capacity as a carbon sink is compromised by deforestation and peatland degradation from fires. As shown above (Figure 4.2), recent years have seen a decline in the contribution to emissions from peat fires and from deforestation. The rate of deforestation is the lowest in 20 years. This is a welcome sign of policy success. As an example of policy efforts, according to Bappenas, the surface reserved for social forestry has expanded ten-fold from 500 000 hectares in 2014 to 5 million hectares by 2023.

To achieve the FOLU (Forestry and Other Land Use) Net Sink 2030 objectives, policy aims to further reduce deforestation, increase reforestation and promote sustainable peatland management. Restoration of 2 million hectares of peatlands and rehabilitation of another 12 million hectares of degraded land is planned. At the heart of this effort is the Sustainable Landscapes Project, a collaborative initiative involving Bappenas, the

Ministry of Environment and Forestry, the National Institute of Public Administration (NIPA), and the Indonesian Environment Fund (IEF). However, as with land-use policies elsewhere, executing the planned changes and ensuring that implementation is sustained is challenging. Tackling illegal deforestation requires further clarification of land rights and vigorous law enforcement (OECD, 2019^[51]).

Indonesia is one of the most important countries globally for ocean-based climate change mitigation. It is the largest archipelagic country in the world, with an offshore area three times the size of its land area. Given Indonesia's extensive coastline and coastal population, rising sea levels and coastline erosion will make some coastal areas, including Jakarta, unsuitable for living or business activities and damage existing infrastructure. More than a fifth of the coastline is vulnerable to a 1 metre rise in sea level – estimates range from a rise of 0.2 metres to 2 metres by 2100.

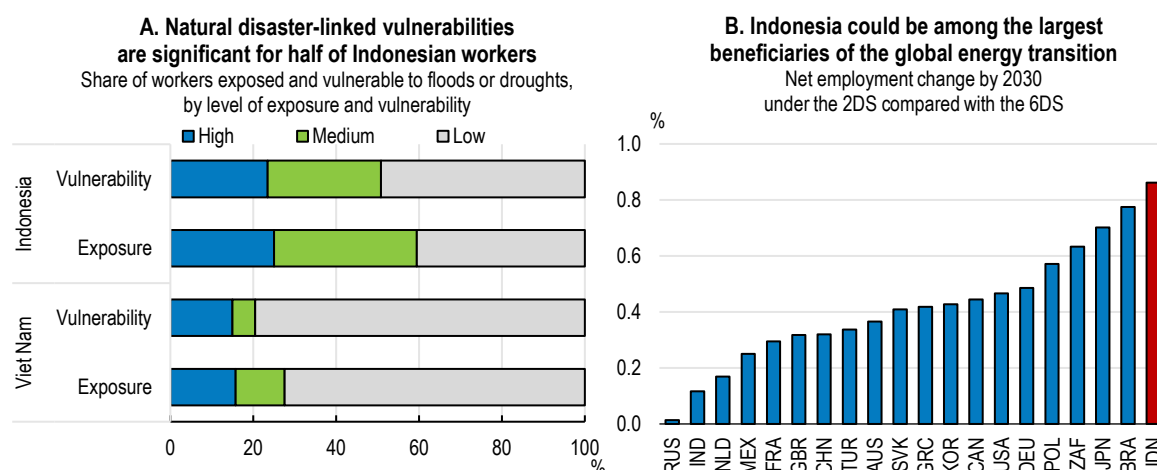
Indonesia's policy as regards oceans and related activities could be developed further. Its NDC includes ocean-related measures: blue carbon, offshore renewable energy, and shipping. However, there is scope for greater coverage. For instance, reporting on mangrove deterioration is included in NDC reporting, while degradation of seagrass meadows is not (Climateworks Centre, 2023^[52]).

Preparing workers for the green economy

Indonesia's decarbonization efforts will bring substantial economic change to some sectors and regions, with both positive and negative implications for workers. This may require some policy intervention to ensure a smooth adjustment (OECD, 2024^[53]). Not all workers will have the skills to transition to new jobs. In specific localities, heavy job loss due to climate change policies (for instance, the closure of coal mines) may require offsetting interventions to avoid long-term unemployment and socio-economic costs. In other localities, demand for copper and nickel may boost employment. This intervention can, under certain circumstances, facilitate the transition of workers to "green" jobs, with the exception of those in highly automatable occupations, who may require more extensive re-skilling (Fankhaeser, Sehlleier and Stern, 2008^[54]). A simulation exercise conducted for Indonesia illustrates that a global energy transition would result in employment losses concentrated in the fossil fuel value chain (i.e., related to coal), while employment gains would occur across multiple sectors such as electricity and gas, construction, and mining of metals (OECD, 2024^[55]). Using the JETP current investment scenario, an additional renewable generation capacity of 52.2 GW will be built as well as approximately USD 19.7 billion worth of transmission infrastructure, translating into roughly 383 000 jobs between 2023-30 (JETP Indonesia, 2023^[56]).

Climate change may negatively affect a wide range of sectors, beyond energy and natural resources (Figure 4.13). For instance, the shift to zero-emission vehicles will impact the motor repair sector. The sizable shares of Indonesia's workers in such industries will require support to reskill and shift to new work opportunities. Indonesia's large number of self-employed or workers in very small enterprises are likely to need particular support. Extreme and less predictable weather may modify tourism patterns, bringing further structural change.

Figure 4.13. Climate change is a challenge for workers, but the green transition opens new opportunities



Note: In Panel B, this exercise compares a “business-as-usual” emission scenario (referred to as a 6 degrees scenario – 6DS) with a “sustainable development” scenario (referred to as a 2 degrees scenario – 2DS) in 2030. The first scenario should be interpreted as a particularly pessimistic pathway, where CO₂ emissions reach 44 gigatonnes globally in 2030. In this scenario, global average temperature is on a path to increase by approximately 5.5°C by 2050 and then stabilise at approximately 4°C by 2100. The second scenario is the “sustainable development” or 2DS. It consists of a hypothetical pathway where there is at least a 50% probability of the average global temperature not increasing by more than 2°C compared to pre-industrial levels. This means reducing the 34 gigatonnes of CO₂ emissions recorded globally in 2019 to 27 gigatonnes in 2030, which is 39% lower than in the 6DS.

Source: OECD (2024), Towards Greener and More Inclusive Societies in Southeast Asia, Development Centre Studies.

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To mitigate the adverse social consequences of the energy transition, policy makers should provide early support before layoffs, implement social protection measures, and invest in local development for negatively affected areas, with effects depending on policy choices, industry mix and workers’ skills. This underlines the importance of further building the capacity and effectiveness of active labour market policies (ALMPs), in particular to develop green skills, which currently are still lacking, and provide social support functions such as career planning, job placement, upskilling and reskilling, and financial assistance. Indonesia already has systems in place that provide these types of activation service. For instance, the Pre-Employment Card Programme (Kartu Prakerja) is a competency development programme that combines temporary social assistance with skills development to help laid-off workers and job seekers (OECD, 2024^[55]). Therefore, part of the policy solution will lie in ensuring current ALMPs have capacity for the green transition. The ongoing preparation of the Human Resource Development Roadmap for Green Jobs provides a unique opportunity to ensure policy coherence in government intervention.

Adapting to a changing climate

Adaptation efforts help reduce current and future vulnerability and exposure to the social, economic, and environmental impacts of climate change, including slow- and sudden onset weather extremes. To help countries build resilience, the OECD Recommendation on the Governance of Critical Risks (2014^[57]) calls on governments to identify and assess risks taking interlinkages into account, invest more in risk prevention, develop flexible capacities for preparedness, response and recovery, and establish transparent and accountable risk management systems.

Enhancing disaster risks management is a priority

Indonesia is vulnerable to a range of natural hazards, including but not limited to weather related hazards. It lies on the Pacific “Ring of Fire”, one of the planet’s most exposed zones to phenomena related to tectonic plate movements; volcanic eruptions, earthquakes, and tsunamis. Two of the most catastrophic natural

disasters in human history – the Tambora eruption in 1815 and the Indian Ocean tsunami in 2004 – took place in Indonesia. The country is home to 76 active volcanoes. However, over 90% of recorded disasters are hydrometeorological in nature, including floods, landslides, strong winds, droughts, and hurricanes (Figure 4.14) and the ensuing economic losses are considerable (Figure 4.15).

Forest fires bring particular challenges. For several days in 2015, forest fires in Indonesia emitted more carbon dioxide than the entire United States economy and are estimated to have caused more than USD 16 billion in economic losses, with more than 100 000 premature deaths (Edwards, 2020^[50]). El Niño events explain most of the year-on-year variation in fire, but variance at village levels can be explained by remoteness, development, and use of fire for land clearing before planting crops in traditional agriculture. Urbanisation and population growth have increased exposure to extreme heat days. Indonesia ranks among the countries with the highest observed annual changes in rainfall causing the north to become wetter and the south drier. Since the 1990s, relative sea-level rise has on average risen by approximately 4.97 millimetres per year, putting the 175 million people living on the coast (70% of the total population) at risk (OECD, forthcoming^[58]).

Climate resilience has been identified as an important objective by the national government and is one of the pillars of Indonesia's new long-term development plan (RPJPN) 2025-45, notably by building infrastructure to reduce disaster risks. The National Disaster Management Authority (BNPB) (established in 2008) coordinates the relevant line ministries and agencies at all stages of disaster management: pre-disaster preparedness, emergency response, post-disaster recovery, and risk transfer mechanisms. The BNPB's budget has been expanding since the late 2010s. Indonesia's proactive approach to disaster risk management reflects a commitment to safeguarding its people and assets against the unpredictable nature of disasters (Table 4.5). This holistic and data-driven approach ensures that the country is better prepared to face future challenges, thereby minimizing the economic and social impacts of disasters. However, there is scope to improve some aspects of the disaster management system. In particular, (Juwitasari, 2022^[59]) points to need to increase the density of Indonesia's early warning system (EWS) network such that there is at least a station every 50 to 100 kilometres. There is also need for more timely, standardised, and comparable data on risks, occurrences, impacts, and financing related to disasters and disaster management (OECD, forthcoming^[58]).

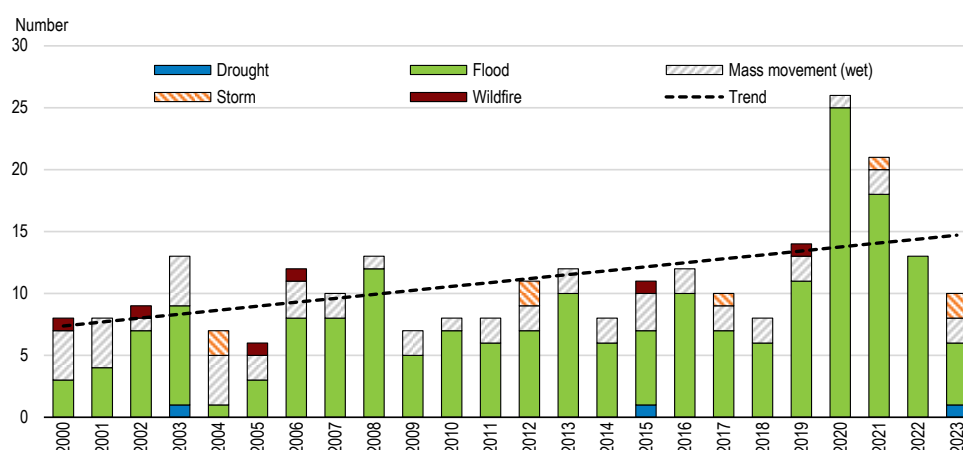
Table 4.5. Main initiatives in disaster risk management

Implementation of Disaster Pooling Funds	In accordance with Presidential Regulation Number 75 of 2021, Indonesia has established disaster savings funds, which are mainly sourced from the State Budget (APBN) and Regional Budgets (APBD). This fund is designed to bolster fiscal resilience against disaster risks.
Risk Transfer Mechanisms	To further safeguard against disaster-related losses, Indonesia is implementing risk transfer strategies through the purchase of insurance and other financial instruments.
Allocation of Disaster Reserve Funds	Every year, the APBN allocates a portion of disaster reserve funds to risk retention. By maintaining reserves and leveraging the funds, governments can provide immediate relief and support recovery efforts.
Development of Risk Modeling by DJPPR	The Ministry of Finance, through its Directorate General of Budget Financing and Risk Management (DJPPR), is developing models to better understand and manage disaster risks. The models' outputs, including the Maximum Possible Loss (MPL) and Average Annual Loss (AAL), are used to better target disaster risk management strategies at the local level.
Formulating a Disaster Risk Financing	Building on the insights gained from risk modeling, the Ministry of Finance (DJPPR) is developing a comprehensive disaster risk financing strategy. This strategy will include a detailed implementation roadmap.

Public infrastructure and housing need to become better adapted to climate-related extreme weather events (OECD, 2018^[60]). As Indonesia's population becomes more affluent, combined with rising temperatures, the use of air conditioning and other home appliances will increase (CMCC, 2022^[61]). Earlier evaluation of the potential effects of climate change in public infrastructure project design and selection can reduce the longer-term costs of increased emissions. Additional measures could incorporate adaptation concerns into infrastructure planning and procurement procedures (OECD, 2018^[60]).

Figure 4.14. Floods are the most frequent climate-related events

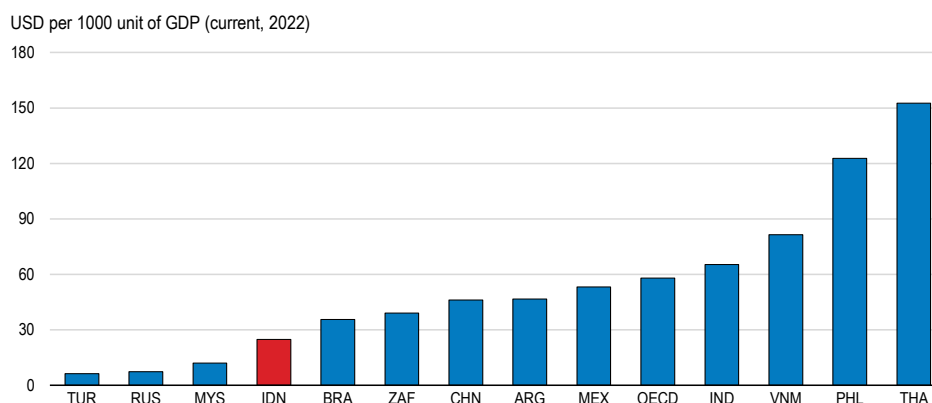
Climate-related events by type and trend, 2000-23

Note: Based on CRED/UCLouvain (2024), the International Disaster Database (EM-DAT, www.emdat.be).

Source: OECD, "Adapting infrastructure to changing climatic conditions: The case of Indonesia", OECD Environment Policy Papers (forthcoming).

StatLink <https://stat.link/7Ibjzc>**Figure 4.15. Extreme weather and climate-related events damage the economy**

Estimated cumulative losses per thousand unit of GDP between 1980 and 2023

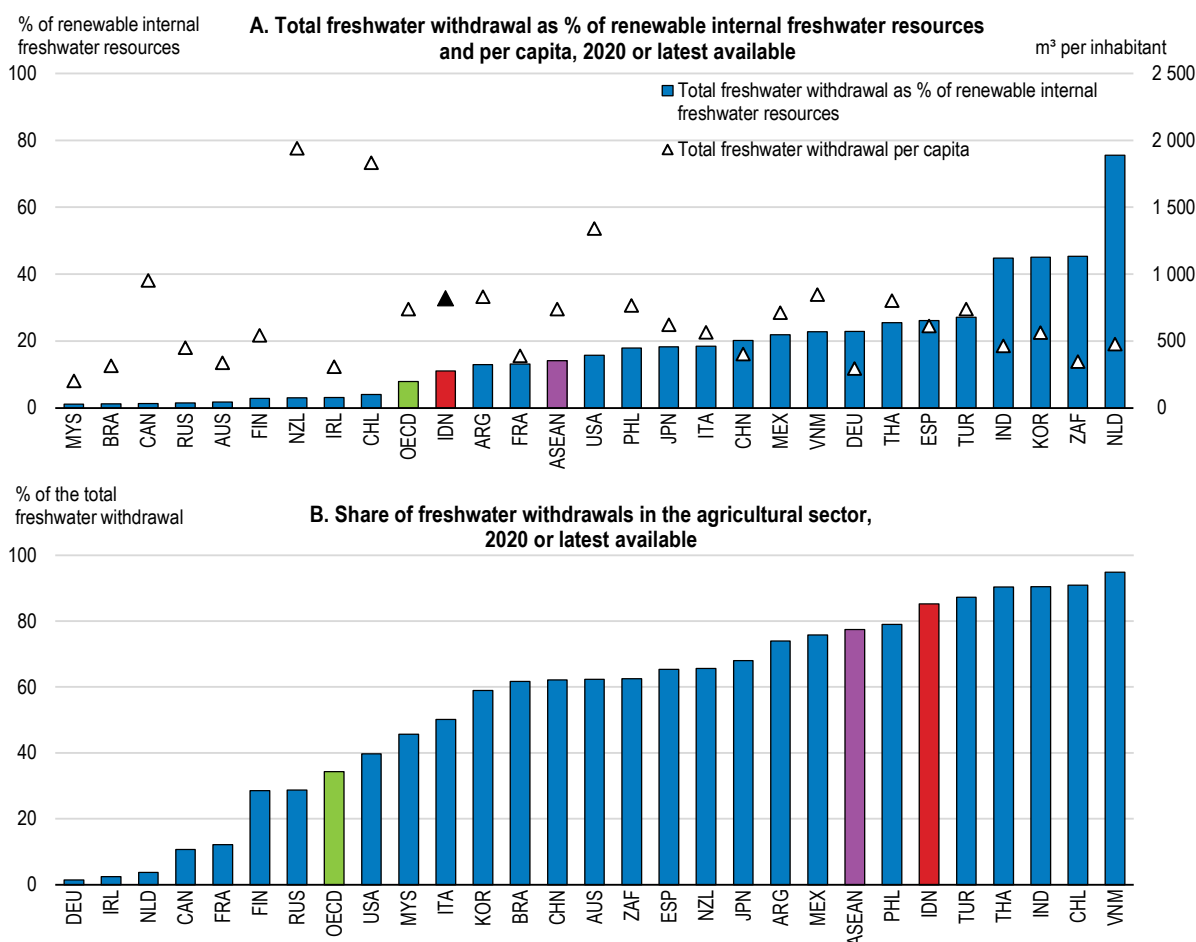


Note: Data on cumulative losses are based on climatological, meteorological, and hydrological disasters. The figures vary according to the proportion of damage that is insured and do not therefore reflect the real cost of damage.

Source: OECD calculations based on CRED/UCLouvain (2024), the International Disaster Database (EM-DAT, www.emdat.be), Accessed on 22 May 2024.StatLink <https://stat.link/0zjs6d>

Improving water management

Climate change projections point to an increasing severity of weather-related disasters. Precipitation trends in Indonesia are complex, though overall it seems likely that rainfall will rise, also in intensity, but that droughts as well may become more frequent (CMCC, 2022^[61]). Droughts greatly impact agriculture but also the wider community. Some areas of Indonesia are already susceptible to water shortages. For instance, in major tourism destinations large demand pressures can strain water provision. Indicators suggest overall water scarcity is moderate in Indonesia in international comparison (Figure 4.16, Panel A). However, OECD assessment points to increased frequency of water scarcity in much of Java along with Bali, Nusa Tenggara, and Sulawesi. Projections to 2045 indicate further intensification due to climate change, land degradation and unsustainable water usage (OECD, 2023^[11]).

Figure 4.16. The agriculture sector relies heavily on freshwater, while water stress is relatively moderate

Note: Annual freshwater withdrawals refer to total water withdrawals, not counting evaporation losses from storage basins. Withdrawals include water from desalination plants in countries where they are a significant source. Renewable internal freshwater resources flows refer to internal renewable resources (internal river flows and groundwater from rainfall) in the country. Withdrawals for agriculture are total withdrawals for irrigation and livestock production. ASEAN refer to four peer countries including Malaysia, Philippines, Thailand, and Vietnam.
Source: World Bank (2024), World Development Indicators based on food and Agriculture Organization of the United Nations; and OECD calculations.

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Increased frequency and duration of droughts amplifies the need to ensure efficient water use. In general, water in Indonesia is used less efficiently than in other countries. For example, water abstraction is high and is mostly for irrigation in agriculture (Figure 4.16, Panel B). Nearly half of irrigation systems are considered ‘in bad condition’, and a non-negligible part is categorised as ‘ruinous’ (World Bank, 2022^[62]).

There is also a problem with groundwater level decline, linked to insufficient monitoring and illegal abstraction, e.g., for industry or high-rise buildings (OECD, 2019^[51]). According to the Asian Development Bank (2024^[63]), approximately 77% of households in Indonesia have access to basic sanitation facilities such as septic tanks, but only 7% have access to safely managed sanitation that ensures the proper disposal of household waste to wastewater treatment plants. Better reflecting water scarcity in water prices would encourage businesses and households to use water more efficiently and reinforce cost recovery (OECD, 2019^[51]). There is also potential to develop nature-based solutions that involve the planned and deliberate use of ecosystem services to improve water quantity and quality and increase protection and resilience to climate change (OECD, 2023^[11]).

Several water management reforms have been introduced recently, including revisions of the legal and regulatory framework relating to the implementation of the 2019 Water Law and the 2020 Omnibus Law. Adoption of four draft government regulations on drinking water, water sources, water resource management, and irrigation is ongoing. Establishing an independent economic regulator that supervises and reviews tariff reforms would be major breakthroughs in securing a stable revenue stream for water providers and setting tariffs at cost-recovery levels (OECD, 2023^[11]). Recent discussions on a nationwide, uniform water tariff warrant caution. Depending on the way it is set (i.e. whether it is a uniform tariff level, tariff formula, tariff structure, uniform at bulk water supply or at retail), the uniform water tariff may jeopardise the cost recovery of water services.

Helping people and businesses cope with climate change damages

Given the repeated and intensifying nature of climate related extreme events it is important to promote climate adaptation across all of government and society. This requires conducting downscaled and regularly updated climate risk assessments, which help understand the exposure and vulnerability of social, economic and environmental assets and hence assists the prioritisation of adaptation interventions. Effective adaptation also requires clear roles and responsibilities and all levels of government and non-governmental actors. An over-reliance on the government to conduct emergency response and to fund the recovery and rehabilitation of assets disincentivises adaptation investments.

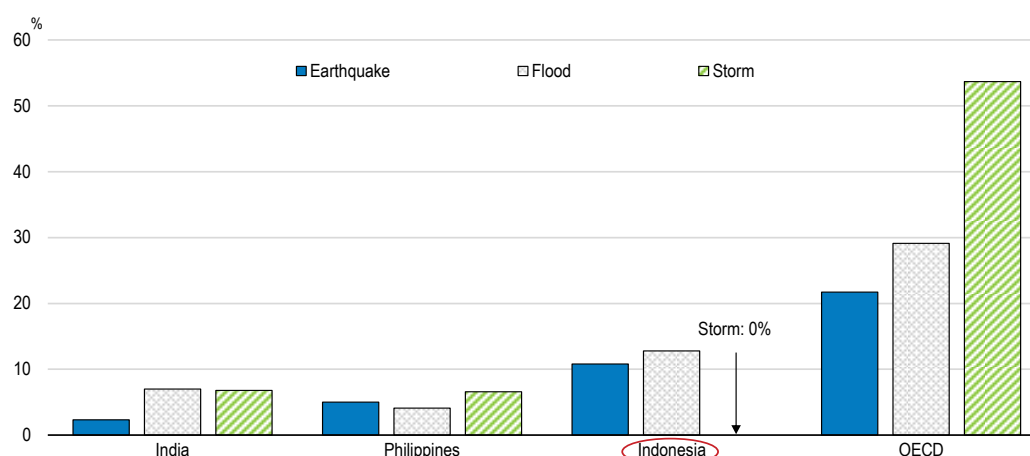
For the financial burden to manage the costs of disasters not to rest on the government's shoulders it is important to identify effective risk transfer instruments. Where the government provides compensation for damages it is important to design compensation mechanisms that build back better and that avoid paying for repeated damages to the same assets in the same locations. Private insurance does not necessarily dovetail with government compensation or provide coverage in other types of events. This uncertain coverage limits support for economic recovery from disasters (OECD, 2023^[64]). In Indonesia, insurance coverage for damages from extreme weather events is low compared to the OECD average, but higher than in other middle-income countries (Figure 4.17). The government can take the lead in these circumstances, as shown by the State Asset Insurance programme which was launched in 2019 to cover over 1 300 Kemenkeu-owned buildings and was expanded to 10 ministries/agencies in 2020. By 2023, it has insured over 5 000 public assets with a total sum insured of USD 2.5 billion. The programme is part of the Disaster Risk Financing and Insurance (DRFI) Strategy, whereby the government is taking a more proactive approach.

There is scope to expand climate-related private catastrophe risk insurance in Indonesia. Law No. 4/2023 concerning the Development and Strengthening of the Financial Sector (UU P2SK) paves the way for expanding the coverage of existing compulsory insurance to include fires and natural disasters (Wasono, 2023^[65]). However, more frequent extreme weather events will raise costs for insurance and could challenge insurability. In general, expanding measures for mandatory insurance to existing buildings and more areas could reduce insurance costs through risk pooling and limit fiscal exposure for compensating losses (European Commission, 2018^[66]) (OECD, 2021^[67]), although distributional effects may be negative. An example of government intervention to help ensure insurance coverage is the Danish Storm Council, an independent body that helps with technical expertise to assess damages and provide compensation for climate-related damage to individuals and firms protected by fire insurance (OECD, 2021^[67]). Indonesia's insurance markets, at any rate, are still at an early development with less than 3% of the population covered by building insurance. Increasing market penetration is key. Governmental support of private risk financing should be considered, for example through re-insurance (G20/OECD, 2012^[68]). Insurance companies, for their part, should promote risk awareness and financial literacy, offer affordable products, and fully exploit digitalisation (OJK, 2023^[69]), building on compulsory insurance as mandated by Financial Service Omnibus Law (FSOL) and the Rice Farming Insurance Product (Asuransi Usaha Tani Padi).

More broadly, there may be significant returns to ramping up public awareness of climate-change risks and the exposure of certain areas. Cognitive biases can limit awareness of such risks and delay response. Policies can help to overcome these biases by providing information and encourage limiting exposure (Economides et al., 2018^[70]). Informing firms and households of adaptation options can steer them towards adopting protective behaviour, such as limiting outdoor activities during heatwaves or preparing for floods. Developing a communication strategy to assure the information reaches people in the most affected communities would allow to better leverage existing knowledge to improve the impact of these plans. The integration of climate change adaptation into development planning is another area where progress has been recorded, although obstacles remain such as a lack of effective coordination, unavailability of detailed information and vulnerability assessments at national and sub-national levels, and challenges in tracking adaptation-related investment (Green Climate Fund, 2021^[71]).

Figure 4.17. Indonesia's insurance coverage for climate-related damage is higher than in peers

Share of catastrophe losses insured by type of risk, 2000-2019



Note: OECD calculations. The share of catastrophe losses insured may be lower in some countries due to limits in the availability or collection of relevant data on insured losses. If only events with reported data on insured losses are included in the calculation, the estimated share of losses insured increases to 10.8% for India flood and 8.5% for India storm; 11.4% for Indonesia earthquake and 15.0% for Indonesia flood; 20.0% for Philippines earthquake, 4.5% for Philippines flood and 9.4% for Philippines storm. For OECD countries, the difference is only marginal if events without a reported insured loss are excluded.

Source: OECD (2020), "Leveraging the role of property catastrophe reinsurance markets: The Case of India, Indonesia, Myanmar and the Philippines".

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Findings and recommendations

MAIN FINDINGS	RECOMMENDATIONS (Key recommendations in bold)
Getting the right mix of instruments for decarbonisation	
The effective price of carbon is distorted by poorly targeted fuel subsidies. Subsidies on liquid petroleum gas (LPG) are meant to only benefit targeted households, but many other households also receive them.	Gradually reduce energy subsidies (including on LPG) and compensate vulnerable households through better targeted support.
Carbon pricing markets remain at an early stage of development.	Introduce a carbon tax and commit to gradually increasing the carbon price and broadening its base.
Decarbonising electricity generation	
A carbon exchange has been introduced for coal-fired power plants, but direct carbon taxation mechanisms have yet to be implemented.	Complement the carbon tax with other policy interventions, including feed-in-tariffs for renewable energy and financing mechanisms for energy efficiency.
Coal-fired power plants generate over half of Indonesia's electricity supply. Support for transition away from coal includes funds from the international multi-donor Just Energy Transition Partnership (JETP).	Accelerate early decommissioning of coal-fired power plants, conditional on funds' availability and energy security considerations. Consider retrofitting coal- and gas-fired power plants with carbon capture or to run on hydrogen as technologies develop further.
There is scope to improve the structure of electricity supply. The State electricity company is the sole off-taker on the electricity market and regulation makes renewable power prices unattractive.	Transfer regulatory responsibilities to a new independent authority. Provide this body with appropriate technical capacity and financial resources. Establish a robust, stable, substantial, and multi-year pipeline of auctions for renewable-energy generation, with competitive and transparent tariff-setting.
Renewable sources account for only a small share of electricity generation. As elsewhere, periods of peak electricity demand do not align with peak supply from renewable sources, but this could be partly tackled through better storage and interconnection technologies.	Increase investment to improve grid stability, including through more interconnections between islands and with the ASEAN Power Grid.
Reducing emissions in the transport sector	
Indonesia's road vehicle fleet is relatively old, transition to low- and zero-GHG emissions vehicles has been marginal so far.	Better target subsidies for electric vehicles (EV) purchases and tax exemptions and increase investment in the EV ecosystem.
Mass urban and intercity transport systems are underdeveloped. High reliance on road transport, especially internal-combustion engine vehicles, contributes to greenhouse gas emissions, high levels of road fatalities and traffic congestion, as well as poor urban air quality.	Increase investments in mass urban and intercity transport systems, subjecting projects to rigorous cost-benefit analysis. Gradually dissuade car use, for example by introducing road pricing and congestion charges. Expand priority lanes and emission-free zones for low-emission vehicles.
The mainly single-track railway network is less dense and used less than in most OECD and peer countries. Users are dissatisfied with the quality of rail services. Investment in rail as a share of GDP is low.	Substantially increase investments to improve the quality of railway services, expand the rail network (including but not limited to high-speed services) and increase its use.
Shifting to cleaner household energy sources and making buildings more energy-efficient	
Public policies have helped transition from using biomass for cooking to liquid petroleum gas, which produces less GHG and is less health damaging. Yet around 12% of households still use biomass fuels.	Track progress in clean cooking deployment, including through periodic surveys, and in reducing the cost of switching to cleaner fuels; make this information publicly available.
Many households receive subsidised LPG stoves and cylinders, with insufficient targeting toward the neediest; the fiscal cost is substantial.	Improve targeting of LPG subsidies to the most vulnerable households and communities.
Access to finance deters investment in building retrofits, along with a lack of information about the potential energy savings.	Expand renovation measures especially for government and commercial buildings. Improve enforcement of existing building codes. Provide subsidised loans with on-bill repayment schemes to mobilise more private capital.
Emission-reduction and ecosystem protection in land- and sea-use	
Effective public policies have reduced deforestation to its lowest rate in 20 years. Ambitious emission reduction objectives require further deforestation cuts.	Press on with reducing net deforestation, including through increasing reforestation, and promoting sustainable peatland management. Closely monitor implementation.
Welcome efforts are being made to address emission and ecosystem issues in the ocean and to tap into opportunities for offshore wind power.	Work further on expanding the scope of ecosystem monitoring, for instance as regards the inclusion of seagrass meadows in NDC reporting. Ensure full exploration of opportunities for offshore wind and solar generation.

Adaptation policies to prepare people and the economy for a changing climate

Awareness of climate change and the potential implications and solutions is limited in some segments of the population.	Further develop public education and communication strategies to raise awareness on climate change risks and solutions.
Indonesia has extensive disaster management systems. Nevertheless, the early warning system is under-equipped.	Improve warning systems, enhance zoning and permitting rules, and invest in equipment that reduces damages from more frequent and intense forest fires and other natural catastrophes.
Negative impacts of climate change can be reduced by adapting public infrastructure and reallocating activities away from more affected areas. Indonesia's coastal cities are particularly vulnerable to climate change.	Incorporate climate resilience planning for the future climate into infrastructure planning, procurement and spatial planning rules.
Climate change is projected to reduce freshwater availability in some parts of the country. Fresh water abstraction is relatively high, and water is used less efficiently than in other countries.	Adjust water prices to better reflect water scarcity and supply costs. Consider replacing social water tariffs with income transfers not directly linked to water consumption.
Insurance coverage for damages from extreme weather events is low and compensation delays and amounts are uncertain.	Develop insurance markets for extreme weather events and consider government support, for example through re-insurance.
Benefitting from the green transition, in terms of more and better jobs, requires appropriate reskilling and upskilling programmes.	Boost active labour market policies, training and re-skilling, targeting workers whose jobs are more at risk, with the participation of the private sector.

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INDONESIA

Indonesia's economy has rebounded from the COVID-19 recession and inflation has declined considerably, but exposure to global uncertainty remains high. Monetary policy must remain prudent, forward looking and data-dependent. Fiscal policy needs to ensure the budget deficit remains below the mandated ceiling. Government spending and revenue are low in international comparison and future spending pressures require an increase in tax revenues over the medium term. Indonesia has scope to boost productivity and long-term growth prospects though encouraging women's employment alongside continued improvement to educational attainment, and improvement to the business environment. Greater efforts in combatting corruption would help foster a more competitive and productive business sector. Indonesia has further scope to harness digitalisation. Geographic, gender and age-related gaps in individuals' access to, and adoption of, the Internet and related tools need to be closed. Indonesia is vulnerable to the impacts of global warming. The country's goal of reaching net-zero greenhouse gas emissions by 2060 is challenging in the context of economic convergence and the country's reliance on coal.

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