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**INDONESIA  
ECONOMIC  
PROSPECTS**

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# A GREEN HORIZON

## Toward a High Growth and Low Carbon Economy



**INDONESIA ECONOMIC PROSPECTS**  
*A Green Horizon: Toward a High Growth and  
Low Carbon Economy*

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## Preface

The Indonesia Economic Prospects (IEP) is a bi-annual World Bank report that assesses recent macroeconomic developments, outlook and risks, as well as specific development challenges for the Indonesian economy. In doing so, the IEP aims to inform the public policy debate and is geared towards a wide audience, including the general public, the government, the private sector, civil society organizations, and other domestic and international stakeholders.

The IEP has two main parts. Part A highlights key developments in the Indonesian economy over recent months, and places these in a longer-term context. Based on these developments, and on policy changes over the period, the IEP regularly updates the outlook for Indonesia's economy. The ongoing COVID-19 pandemic highlights the continued need for sound macroeconomic monitoring to help the economy weather the impact of the crisis. Part B provides an in-depth examination of selected economic and policy issues, and an analysis of the country's medium-term development challenges. Part B of this edition is on the low carbon transition in the power sector.

The IEP is a product of the World Bank Jakarta office and receives strategic guidance from an editorial board chaired by Satu Kahkonen, Country Director for Indonesia and Timor-Leste. The report is prepared by the Macroeconomics, Trade and Investment (MTI) Global Practice team, under the guidance of Lars Christian Moller (Practice Manager) and Habib Rab (Lead Economist). The report is led by Abdoulaye Sy (Senior Economist) and prepared by a core team composed of Angella Faith Montfaucon, Anthony Obeyesekere, Asha Williams, Assyifa Szami Ilman, Bayu Agnimaruto, Csilla Lakatos, Dwi Endah Abriningrum, Francesco Strobbe, Gracia Hadiwidjaja, Imam Setiawan, Indira Maulani Hapsari, Josefina Posadas, Kathleen Victoria Tedi, Lamiaa Bennis, Mochamad Pasha, Neni Lestari, Ou Nie, Ralph Van Doorn, Ratih Dwi Rahmadanti, Salman Alibhai, Sara Giannozzi, and Virgi Agita Sari. Deviana Djalil provided administrative support and coordinated the organization of the report launch event. Dissemination is organized by Jerry Kurniawan and Nugroho Nurdikiawan Sunjoyo under the guidance of Lestari Boediono Qureshi. The report was formatted by Arsianti and edited by Yuen Yee Tam.

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The findings, interpretations, and conclusions expressed in this report do not necessarily reflect the views of the Executive Directors of the World Bank or the governments they represent, or the Australian government. The World Bank does not guarantee the accuracy of the data included in this work. The data cut-off date for this report was Dec. 5, 2021. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of the World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

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- July 2020: [The Long Road to Recovery](#)

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## Abbreviations

ABIP	Australia-World Bank Indonesia Partnership	MIC	Middle Income Countries
ADB	Asian Development Bank	MOF	Ministry of Finance
AFC	Asian Financial Crisis	MOI	Ministry of Industry
ASEAN	Association of Southeast Asian Nations	MSMEs	Micro, Small and Medium Enterprises
BAU	Business as Usual	MSOE	Ministry of State-Owned Enterprises
Bappenas	Badan Perencanaan Pembangunan Nasional	MTI	Macroeconomics, Trade and Investment
BI	Bank Indonesia	NDC	Nationally Determined Contribution
BPS	Badan Pusat Statistik	NEET	Employment, education, or training
CCGT	combine cycle gas turbines	NPL	Non-Performing Loan
CCS	Carbon Capture and Geological Storage	NSFR	Net Stable Funding Ratio
CGE	Computable General Equilibrium	NTMs	non-tariff measures
CIT	Corporate Income Tax	OECD	Organisation for Economic Co-operation and Development
COP	Conference of the Parties	OL	Omnibus Law
DER	decentralized energy resources	PaMS	policies and measures
DMO	Domestic Market Obligation	PISA	Programme for International Student Assessment
DTKS	Data Terpadu Kesejahteraan Sosial	PIT	Personal Income Tax
EAP	East Asia Pacific	PKH	Family Cash Transfer
EGR/EOR	Enhanced Oil and Gas Recovery	PLN	Perusahaan Listrik Negara
EFI	Equitable Growth, Finance and Institutions	PP	percentage points
EMDEs	Emerging Market and Developing Economies	PPA	power purchase agreements
ETM	Energy Transition Mechanism	PSO	Public Service Obligation
ETS	emissions trading scheme	PV	solar photovoltaic
FDI	Foreign Direct Investment	ROA	Return on Assets
FOLU	forest and other land use	ROE	Return on Equity
FSOL	Financial Sector Omnibus Law	RE	renewable technologies
FTAs	free trade agreements	REDD+	Reducing Emissions from Deforestation and Forest Degradation
GDLG	Gender Disaggregated Labor Data	REER	real effective exchange rate
GDP	Gross Domestic Product	RE+FLEX	renewable and flexibility
GEP	Global Economic Prospects	RUEN/KEN	National General Plan for Energy/National Energy Policy
GHG	greenhouse gas	RUKN	The country's National Generation Plan for Electricity
GTAP	Global Trade Analysis Project	RUPTL	national electricity plan
HiFy	High Frequency Survey	SAIDI	System Average Interruption Duration Index
ICT	Information & Communication Technology	SAM	Social Accounting Matrix
IEP	Indonesia Economic Prospect	SEAs	strategic environmental assessments
IFC	International Finance Corporation	SFA	stochastic frontier analysis
IFLS5	fifth wave of the Indonesian Family Life Survey	SME	Small Medium Enterprise
ILO	International Labor Organization	SNI	Indonesia National Standards
LAR	Loan at Risk	SOE	State-Owned Enterprise
LAYS	learning adjusted years of schooling	SUSENAS	National Socioeconomic Survey
LCR	Liquidity Coverage Ratio	THL	Tax Harmonization Law
LCCR	low carbon and climate resilience	UDB	Unified National Database
LTS	Long-term Strategy	VAT	Value-added Tax
MANAGE	Mitigation Adaptation and New Technologies Applied General Equilibrium	VRE	Variable renewable energy
MEMR	Ministry of Energy and Mineral Resources	WDI	World Development Indicator
		WRI	World Resources Institute

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# Executive summary: A Green Horizon: Toward a High Growth and Low carbon Economy

## Part 1

**The economic rebound continued in 2021 but was moderated by the COVID-19 Delta wave.** The highly transmissible Delta variant led to increased viral transmission in June-September 2021 and held back the reopening of the economy. According to official statistics, 2.4 million Indonesians contracted COVID-19 and 91,000 died during this period. Growth slowed to 3.5 percent yoy during the third quarter, after accelerating to 7.1 percent in the previous quarter. Notwithstanding, the economy showed signs of resilience. Exports and manufacturing activity remained relatively buoyant compared to mid-2020 when mobility restrictions were tighter and external demand and commodity prices were weaker.

**The labor market was less affected than in 2020 but remained less buoyant than before the pandemic.** Unemployment did not increase markedly during the Delta wave while labor force participation was stable. The unemployment rate barely increased from 6.3 to 6.5 percent in February-August 2021, partly due to seasonal factors, while it rose sharply from 5.3 to 7.1 percent in August 2019-2020. Although they have moderated since mid-2020, labor income losses remained prevalent, including among the bottom 40 percent of households. According to the World Bank High Frequency Survey (HiFy), the share of household primary breadwinners that are earning less than before COVID-19 declined from 63 to 45 percent between May 2020 and October 2021. World Bank simulations show that the government's expanded social assistance programs have likely mitigated risks of rising poverty.

**The public health response allowed Indonesia to flatten COVID-19 cases earlier than regional peers, but morbidity was relatively high.** The authorities accelerated the vaccine rollout among vulnerable groups and in areas with high viral transmission such as cities and economic centers. As of December 5, 2021, about 71 percent of the target population are fully vaccinated among provinces in the top 25 percent by inoculation rate. Authorities also tightened mobility restrictions and improved the rate of testing which, however, remained low overall. Although official COVID-19 cases declined earlier in Indonesia compared to the Philippines, Malaysia, and Thailand, morbidity was relatively high during the peak of the wave as many hospitals reached near full capacity and oxygen needs rose sharply. Accelerating the vaccine rollout

in the more remote and less densely populated part of the country remains a key challenge: as of December 5, 2021, only 24 percent of the target population are fully vaccinated among provinces in the bottom 25 percent by inoculation rate.

**Budget flexibility enabled authorities to swiftly respond to the Delta wave.** The government increased the 2021 COVID-19 fiscal package by 0.3 percent of 2020 GDP to 4.8 percent of 2020 GDP in July. Allocations for health and social assistance were increased by 0.3 and 0.2 percent GDP, respectively, while support to firms was reduced by 0.2 percent of GDP. Support to Indonesian firms was comparable to peers but benefited large firms disproportionately. Cash transfers and loan payment deferrals were better targeted at Micro, Small and Medium Enterprises (MSMEs) than tax relief and wage subsidies while support to access credit was low overall.

**Recovering tax revenues and conducive financing conditions supported the fiscal response.** On the revenue side, tax collections have started to rebound but the tax-to-GDP ratio was still 2.7 percent below pre-pandemic as of September 2021. The unprecedented fiscal response since the start of the pandemic has required higher financing of the government budget from the central bank, commercial banks, and other domestic investors. Bank Indonesia's holdings of local currency government bonds increased from 0.8 to 3.9 percent of 2020 GDP in January 2020-October 2021. These holdings increased from 4.8 to 10 percent of GDP for commercial banks while they only declined slightly from 7 to 6.2 percent for non-resident investors. These shifts and the overall conducive global financial conditions have helped stabilize bond yields but from relatively higher pre-pandemic levels than peers due to Indonesia's shallow debt market. Central government debt increased from 30.2 to 42.4 percent in 2019 2021 but remained low relative to peers and the official debt ceiling (60 percent of GDP).

**Monetary policy remained accommodative amid weak domestic demand and stable external conditions.** Bank Indonesia (BI) kept its benchmark policy rate unchanged at 3.5 percent since January 2021 after cutting it by a cumulative 150 basis points during the pandemic. This is consistent with the large negative output gap, accommodative global financial conditions, stable portfolio flows, and low inflation. Headline and core consumer

price inflation were stable at 1.4-1.5 percent yoy in January-September while several emerging markets experienced increased price pressures amid rising commodity prices and supply chain disruptions. The muted consumer prices were due to a combination of weak demand and limited pass-through of higher producer prices and global energy prices. The real policy rate remained therefore well into positive territory and relatively high compared to peers. This is explained by the authorities attempt to balance between two policy objectives: stimulating the economy, which calls for lowering the policy rate, and pursuing external stability, which involves maintaining a higher policy rate to attract foreign bond investors (World Bank IEP June 2021).

**Vulnerabilities to tightening external financing conditions are moderate but could increase with sudden shifts in investor sentiment and inflation.**

The moderating external vulnerabilities are related on the one hand to declining external financing needs and exposure, and on the other to overall strong monetary policy space. External financing needs have declined with the narrowing of the current account deficit from 2.7 to 0.4 percent of GDP in 2019-2020 (0.3 percent of GDP in H1 2021). The stock of rupiah assets held by non-residents also dropped from 136 to 95 percent of official reserves in Q4 2019-Q3 2021, compared to 216 percent in Q2 2013 before the 2013 Taper tantrum. Monetary policy space to manage external financing pressures while supporting the recovery is relatively strong given the stable rupiah, adequate level of reserves (9-10 months of imports in 2021) and high real interest rate and inflation differential with advanced economies. Recent evidence indicates that beyond macroeconomic fundamentals, capital flows are highly influenced by external factors. For instance, adverse developments globally or in other emerging markets could lead to sudden shifts in investor sentiment and increase capital flow volatility. Moreover, higher global food and energy prices and persistent supply chain disruptions could increase inflationary pressures and expectations.

**Private credit growth has increased in recent months but remained weak despite overall healthy bank balance sheets and moderate corporate vulnerability.**

Credit to the private sector expanded by 2.2 percent in September 2021, after contracting in October 2020-May 2021, but remained well below its pre-crisis level of 8 percent in September 2019. Capital adequacy, non-performing loans (NPLs), loan provisioning, bank liquidity and profitability have remained healthy. Notwithstanding, the loans-at-risk ratio – defined as the sum of NPLs, restructured loans and special mention loans – increased sharply from 11.6 to 22.6 percent in March 2020-June 2021 and warrants close monitoring. Data from listed firms show that corporate vulnerability has stabilized after increasing in 2020 at par with peers. Possible causes of lackluster credit growth could involve both the demand side (economic conditions and policy support) and the supply side (concerns over borrower risks, bank asset quality and profitability). Survey data, however, do point to stable household demand for credit.

**The economy is projected to rebound by 3.7 percent in 2021 and grow by 5.2 percent in 2022 assuming Indonesia does not experience a new severe COVID-19 wave (Table ES1).**

The current 2021 projection is lower than that in June (4.4 percent) reflecting the impact of the Delta wave. The 2022 projection is largely unchanged. The projection assumes that the vaccine rollout will progress with most provinces reaching 70 percent vaccine coverage in 2022 and that Indonesia will not experience a new severe COVID-19 wave. It also assumes that domestic monetary and fiscal policy remains accommodative, and that global trade growth and commodity price increases moderate amid tightening global financial conditions. Private consumption and contact-intensive services sectors are expected to rebound more strongly as wider vaccination improves consumer sentiment and some pent-up demand is released. Per capita GDP growth is projected to slow from 3.8 per year in 2015-2019 to 3.4 percent per year in 2021-2022.

**Table ES.1: The Recovery is Projected to Strengthen but Uncertainty Remains Exceptionally High**

		2019	2020	2021	2022	2023
<b>Real GDP growth</b>	(Annual percent change)	5.0	-2.1	3.7	5.2	5.1
<b>Inflation</b>	Percent	2.8	2.0	1.6	2.2	2.5
<b>Current account balance</b>	(Percent of GDP)	-2.7	-0.4	0.2	-1.2	-1.6
<b>Fiscal balance</b>	(Percent of GDP)	-2.2	-6.1	-5.0	-3.9	-3.0
<b>Public debt</b>	(Percent of GDP)	30.2	39.4	41.8	43.7	44.3

Source: BI; Central Bureau of Statistics (BPS); Ministry of Finance; World Bank staff calculations

**The baseline projection is subject to substantial downside risks.** There is considerable uncertainty about

the pandemic, global financial conditions, financial sector performance and the scarring effects of the crisis. A

slower-than-expected vaccine rollout or spread of new variants such as Omicron, combined with weaker global growth could lower Indonesia's growth to 3.3 percent in 2022 as detailed in the main report. In the near term COVID-19 could become endemic which would raise new challenges such as maintaining adequate vaccination and other health measures for a protracted period. This would erode policy space and undermine longer-term growth.

**The economic and social injuries from the lengthening pandemic risk leaving lasting scars without continued adequate policy response.** The channels include depressed investment due to persistent low demand, supply, and growth expectations as well as slower human capital accumulation and productivity growth due to school closures and protracted unemployment. These effects tend to lower potential growth, reduce poverty reduction, and widen inequality in the medium term. World Bank estimations show that COVID-19 is accentuating the longer-term decline in potential growth. Potential growth dropped by 0.1 percentage point (pp) in 2020 after declining by 1.3 pp in 2010-2019. It is also estimated that school closures up to June 2021 lowered schooling by 0.9 to 1.2 learning adjusted years of schooling. Analysis of the National Socioeconomic Survey (SUSENAS) shows that youth and young graduates were more likely to take a job in the informal sector, become unemployed or inactive during the pandemic. For instance, the share of youth not in employment, education, or training (NEET) has almost doubled in 2020-2021 to 16.4 percent. These short-term effects tend to persist without adequate policies due to hysteresis in the initial probability of employment as well as the erosion of skills, productivity and future earnings associated with informal work and inactivity.

**Looking ahead, policymakers will face four key challenges:** (i) *containing the pandemic*: the pandemic is not over. Omicron and other variants could spread, and COVID-19 could become endemic; (ii) *maintaining adequate monetary and financial policies*: the economy is still below potential. Global financial conditions are likely to start tightening before Indonesia and other emerging markets have recovered; (iii) *enhancing fiscal space*: fiscal policy has the dual objective of meeting pandemic response needs while containing financing needs and public debt in the medium term; (iv) *advancing structural reforms to boost inclusive and green growth*: igniting structural drivers of growth is important at a time when macroeconomic policy space is narrowing, the pandemic is weakening longer-term drivers of inclusive growth such as human capital and productivity and the urgency to address climate change is increasing.

### ***Containing the Pandemic***

**It is important to accelerate the vaccine rollout in lagging areas, ensure adequate testing-tracing-treatment and other health measures.** The government's prioritization of vulnerable health groups and geographic locations with high transmission rate helped rapidly achieve high vaccination rates. Higher vaccination in remote areas will require not only maintaining adequate vaccine supplies but also addressing distributional bottlenecks and vaccine hesitancy. Improving testing and tracing remains crucial to target health measures and contain the pandemic. As evident during the Delta wave, sufficient hospital beds, critical care equipment such as ventilators and oxygen and skilled human resources are essential to improve patient treatment and reduce morbidity.

**Recent government initiatives to promote regional cooperation on the production of vaccine and therapeutics are important to manage the pandemic in the medium term.** Managing a longer pandemic and endemicity, for instance, will require large supplies of vaccines and therapeutics. Although global vaccine production is expected to increase, global vaccine cooperation has been difficult and uncertain. Regional cooperation could be an alternative path to ensure adequate and reliable access to vaccines and therapeutics. The government's recent agreements to establish vaccine and antiviral manufacturing plants in Indonesia are important steps in this direction.

### ***Maintaining Accommodative Monetary and Financial Sector Policies while Preparing to Adjust***

**The authorities have space to maintain an accommodative monetary policy stance while preparing to manage a tightening of global financial conditions.** The negative output gap, moderate vulnerability to tightening global financial conditions and strong monetary policy space call for maintaining low nominal interest rates and exchange rate flexibility. However, it is important that authorities continue to monitor external and domestic pressures and adjust their strategy to evolving circumstances. A well communicated and credible central bank strategy is also crucial for the effectiveness of monetary policy.

**Exit strategies for macroprudential easing, particularly loan forbearance measures, will need to be carefully designed and the insolvency strengthened to facilitate private sector debt restructuring.** Exit from macroprudential easing faces difficult trade-offs between exiting too early which could increase bankruptcies and exiting too late which could fuel zombification (i.e. unviable firms kept alive by policy support). Several considera-

tions are important to the design of exit strategies. Unwinding could start with overly generous measures, using economic and health indicators as triggers, avoiding undue financial stability risks, and setting up contingency plans for banks that may become distressed during the exit phase, and establishing close coordination between all financial sector authorities. Reducing the complexity and cost of the bankruptcy regime will be important to avoid liquidation of viable firms and facilitate capital reallocation.

### *Enhancing Fiscal Space*

**The priority is to enhance fiscal space to meet pandemic needs and ensure medium-term fiscal sustainability.** The short-term priority for fiscal policy is to remain focused on containing the pandemic, providing relief to households and viable firms, and stimulating the economy. At the same time the government's commitment to lowering the deficit to the legal ceiling (3 percent of GDP) in 2023 is important to contain financing needs and improve investor sentiment at a time of tightening global financial conditions (World Bank IEP June 2021). As discussed further below, better targeting and reprioritization of spending as well as implementation of tax reforms can help achieve these two objectives.

**Better targeting and reprioritization of fiscal support can help create fiscal space for immediate needs.** For example, fiscal support to viable firms could be better targeted to MSMEs while financing for large firms can come from commercial bank lending. This will help reduce short-term fiscal needs, improve the effectiveness of the fiscal response, and stimulate private credit. Social assistance could be improved through better program targeting and delivery by updating and expanding the DTKS database consisting of the poorest 40 percent, improving the identification of households in needs through universal digital identification, and more regular program monitoring.

**The recently adopted Tax Harmonization Law (THL) is a critical step to help redress the structural challenge of low tax collections.** The tax-to-GDP ratio was just 9.8 percent in 2019 and dropped to 8.3 percent in 2020. World Bank analysis estimates the tax collection gap between Indonesia and peers at 6 percent of GDP. The THL is expected to raise tax revenues by 0.7 to 1.2 percent of GDP per annum in 2022-2025. Achieving these results will require effective implementation, including by: (i) preparing the implementing regulations for the VAT on small firms and e-commerce platforms, the carbon tax, and the tax amnesty, (ii) developing proposals to introduce new excises (e.g. sugar-sweetened beverages) or

enhance existing ones (e.g. tobacco), and (iii) accompanying the tax amnesty with measures to maintain declared assets and incomes within the tax net. Further tax and business environment reforms, including those discussed below, will be needed to close Indonesia's tax gap.

### *Advancing Structural Reforms to Boost Inclusive and Green Growth*

**Indonesia has embarked on important structural reforms during the pandemic that stand out in the East Asia and Pacific region and among emerging market economies.** The recent adoption of the Omnibus Law for Job Creation (OL) and the THL are critical to address Indonesia's pre-pandemic competitiveness gaps in infrastructure, health, labor and product markets, and attractiveness to foreign investment.

**Other reforms are needed to respond to the COVID-19 crisis and build a more competitive, resilient, inclusive, and greener economy.** Structural reforms are important at a time of narrowing macroeconomic fiscal space. They are also critical to remedy scars from the crisis and put the economy on a more inclusive and sustainable growth path. Analysis of Indonesia's competitiveness gaps and the implications of COVID-19 highlight several policy priorities:

- (i) *Business environment:* The quality of product market regulation is relatively low due to a combination of high market involvement and interventions by the State – such as SOE presence, price controls, heavy regulatory burden - as well as barriers to firm entry, investment, and trade. The implementation of the Omnibus Law on Job Creation is addressing some of these issues but complementary trade reforms such as reducing non-tariff barriers are equally critical to level the playing field.
- (ii) *Financial sector:* The Financial Sector Omnibus Law (FSOL) is a window of opportunity to address gaps in financial sector depth and stability. The law can help promote legal certainty, clarity, and confidence in the legal frameworks on financial innovation, macro prudential mandates, and supervision. Moreover, completing the revision of the Bankruptcy Law, developing industry-funded resolution mechanisms are important to strengthen the insolvency framework and the crisis preparedness and resolution framework.

- (iii) *Digitalization*: Improving access to the internet for all by enhancing regulation and competition in the digital infrastructure sector, digital skills and services, and e-government can help close the digital divide and boost the development of the digital economy.
- (iv) *Human capital*: Reversing learning losses and building a more resilient education system will involve providing more remedial classes, investment in school water and sanitation infrastructure and better preparedness for effective distance learning. Beyond education policies, risks to higher longer-term poverty and inequality could be addressed by improving the coverage and adaptability of social assistance, such as cash transfers and active labor market programs, and social insurance such as unemployment insurance for self-employed, informal workers and gig-workers. As highlighted by the pandemic, strengthening the health sector is critical to improve human capital as well as economic and social resiliency.
- (v) *Lower carbon transition*: Indonesia is among the top ten greenhouse gas emitters in the world due mainly to land and energy use. Growth has also been increasingly carbon intensive. As discussed further below, decarbonizing the energy sector by accelerating the government's commitments will require enabling private investments in cleaner sources of power such as renewable energy and reforming coal, fuel, and electricity subsidies.

## Part 2

**The Government has made important recent commitments to reduce greenhouse gas (GHG) emissions.** The 2021 Nationally Determined Contribution (NDC) includes an unconditional GHG emissions reduction target of 26 percent by 2030 relative to business-as-usual. It also sets a conditional reduction of 41 percent by 2030 provided there is adequate international financial and technical support. The government has also set its net-zero emissions target to 2060 or earlier. To achieve these objectives the government aims to cut GHG emissions from the two leading sources: (i) forest and other land use which accounts for 57 percent of emissions, and (ii) the energy sector which represents 33 percent of emissions. Emissions from forest and land use (respectively energy) are expected to decline by 24 percent (resp. 16 percent) by 2030 relative to business-as-usual under the conditional NDC target. At the same time, the government is keen to mitigate potential low carbon transitions costs in terms of

growth, jobs, and poverty reduction. This paper focuses on the low carbon transition in the power sector.

**The decarbonization of the power sector is expected to make significant contributions to Indonesia's climate mitigation goals.** The national electricity plan (RUPTL 2021-2030) sets out major low carbon transition targets for the sector. The share of renewable energy in total electricity production is expected to increase from 12 to 23 percent in 2020-2025 to reach the NDC commitments. According to the Ministry of Planning, reaching net-zero emissions would require the renewable energy power generation capacity to reach 60 percent by 2030 and 82 percent by 2053. In 2021, the power utility also committed to a coal moratorium which involves two actions: no new coal-fired power plants will be commissioned after 2022 and all coal-fired power plants will be shut down by 2056 or earlier.

**At the 26<sup>th</sup> Conference of the Parties (COP26) in Glasgow, Indonesia made additional commitments to phase-down coal.** The government tabled the phase out of coal in the 2040s provided there is adequate international financing and technical support. Indonesia also announced its intention to increase retirement of coal fired power plants by 2030 to about 8 GW compared to the pre-COP electricity plan which was planning to retire only 1 GW. However, detailed plans for increased coal-fired power plants retirement would need to be developed.

**The power sector transition faces technical and economic constraints and trade-offs.** The trade-offs are associated with the potential negative impacts of phasing out coal and other carbon-intensive energy sources on growth and jobs, including in coal-dependent regions. The constraints are related to the narrow space to integrate cleaner sources of energy in the short to medium term, and limited potential for electricity imports. The space to integrate renewable energy is limited by four main factors: (i) the current excess installed capacity in coal-fired power, (ii) regulatory and price distortions that impede private investments in renewable energy such as coal and fuel subsidies, caps on renewable energy prices that do not account for energy subsidies, and local content requirements on renewable energy equipment; (iii) scarce land for large photovoltaic solar energy in densely populated areas, and (iv) narrowing geothermal and hydroelectricity potential. Although Indonesia is connected to the Malaysia grid through West Kalimantan, electricity imports are limited by the country's low inter-islands grid interconnections.

**Two scenarios are compared to the current NDC baseline (the national electricity plan or RUPTL 2021-2030) to assess the impacts and trade-offs of the**

**low carbon transition in the power sector:** (i) a coal phase-down scenario in which coal plants are retired after 20 years instead of 40 years in the baseline; (ii) an alternative decarbonization scenario where carbon dioxide emissions are reduced by 70 percent relative to baseline by 2040. The scenarios also consider the effects of public versus private financing to meet the transition investment needs.

**Phasing down coal and scaling up renewable energy are central to reducing the carbon footprint of the power sector.** Under the coal phase-down scenario coal power generation is slashed from 27 to 5 percent of installed capacity in 2021-2040. This would cut emissions of carbon dioxide in the power sector by 40 percent relative to baseline. A least cost electricity system optimization model shows that under this scenario photovoltaic solar energy is deployed massively while gas replaces part of the coal. Achieving the more ambitious reductions in carbon emissions under the alternative scenario would involve the deployment of photovoltaic solar energy and gas as well as less cost-competitive technologies such as carbon capture and storage, and other forms of renewable energy (hydro, biomass).<sup>1</sup> Emissions will start to decline around 2026 under the two scenarios instead of 2036 in the baseline.

**A whole-of-economy approach is essential to ensure that the power sector transition translates into economy-wide emissions reductions.** Simulations from the World Bank Computable General Equilibrium (CGE) model show that while GHG emissions in the power sector decline as presented above, they only drop by 4 to 6 percent relative to baseline for the whole economy (Table ES.2). This is because coal-fired power declines in the electricity sector but increases in other parts of the economy such as in manufacturing. This illustrates the so-called “waterbed effect” where policy changes in one part of the economy translates into emissions leakages in other parts. Notwithstanding, lower GHG emissions reduce pollution, as measured by PM 2.5 particles in the air, by 6 to 8 percent relative to baseline by 2040. This could generate important local and global climate co-benefits in terms of health and labor productivity.

**The cost of power generation and investment needs would increase under the more ambitious transition paths.** Excluding the costs of early coal retirement (stranded asset costs) and economic and social impacts, the average cost of power generation under the coal

phase-down scenario is projected to be only 6 percent higher than in the baseline in 2040. Sector investment needs would only be 10 percent higher in 2040.<sup>2</sup> In contrast, under the alternative decarbonization scenario, the cost of power generation would be 27 percent higher in 2040 than in the baseline, while investment needs would be 54 percent higher.

**Overall, transition costs are expected to be limited but depend on the ability of the country to mobilize private financing.** CGE simulations indicate that GDP can decline in the 2030s by up to 0.1 percent or increase by up to 0.3 percent relative to the baseline. By 2040 growth improves in all scenarios and GDP is 0.1 to 0.3 percent above the baseline (Table ES.2). The effects on GDP depend on the extent to which the private sector is mobilized to meet the financing needs for the coal phase-down and investments in alternative sources of energy. More public financing relative to private financing lowers GDP because using public resources for the power sector transition crowds out other priority spending due to budget constraints.

**The economy sheds jobs in the early phases of the transition but can create more jobs in the longer term with private financing.** Job losses are estimated to reach up to 2 million cumulatively by 2040 in the worst scenario relative to the baseline (Table ES.1). They are driven by the coal and coal power sector and are mitigated by job creation in the gas and renewable sectors. These job losses represent 1 percent of the working-age-population in Indonesia but 18 percent in the four most coal-dependent provinces. Job losses are marginal with private financing because growth and job creation improve in 2030-2040.

**Poor and vulnerable households need to be protected during key transition phases.** Phasing down coal and introducing lower-cost renewable energy help contain electricity prices. This benefits all households, especially higher income energy-consuming ones. These benefits decline under the faster decarbonization path because higher-cost alternative energy sources are introduced, and the costs associated to phasing down coal and stranded assets are significantly higher. Although the poor benefit overall, their welfare can drop significantly during the closing of coal plants.

<sup>1</sup> Some technologies and choices were not considered in the simulations such as interconnection of all islands within Indonesia, or with Malaysia and Australia decentralized energy resources (DER) such as rooftop PV, demand response, battery storage via electric vehicle and virtual power plants floating PV less mature technologies such as marine technologies, and green/blue hydrogen.

<sup>2</sup> Bappenas estimates that overall investment needs under the government plans are expected to amount to (i) an average of US\$ 150-200 billion per year from 2021-2030; (ii) US\$700 billion to US\$ 1 trillion per year from 2031-2040.

equipment, and phasing out coal and fuel subsidies. The

**Table ES.2: Transition Costs and Benefits under Different Power Sector Transition Scenarios**  
(in percent relative to the NDC baseline in 2040)

Scenario	Greenhouse Gas Emissions	Gross Domestic Product	Employment (in millions, Cumulative)	Pollution (PM 2.5 particles)
Coal phase-down with private financing	-4.5	0.2	-0.5	-6.4
Coal phase-down with 50/50 public/private financing	-4.5	0.1	-1.8	-6.4
Alternative decarbonization scenario with private financing	-6.0	0.3	0.05	-7.6
Alternative decarbonization scenario with 50/50 public/private financing	-6.0	0.1	-2.1	-7.6

Source: World Bank staff simulations using a CGE model. The baseline is the current NDC baseline which is the national electricity plan RUPTL 2021-2030 extended until 2040 based on the government's recent commitments.

**A comprehensive package of reforms and investments is needed to meet Indonesia's climate ambitions.** This has four key pillars: (i) *strengthening public institutions*: by improving sector coordination, planning and regulation to translate low carbon commitments into effective actions; (ii) *enabling private investments in RE*: by improving the regulatory environment and preparing the grid infrastructure to integrate more RE; (iii) *ensuring the financial sustainability of the sector*: by improving the power utility (PLN)'s revenue adequacy and reducing energy subsidies; and (iv) *paving a just transition for all*: by developing strategies to address the potential negative socio-economic impacts of the energy transition.

**Strengthening public institutions.** Aligning the government and PLN's net-zero carbon strategies will provide clear signals to private investors on the planned transition pathway, reduce risks of stranded assets and ensure consistency with other whole-of-economy transition goals. A coordinating inter-ministerial commission such as the Special Task Force for Upstream Oil and Gas, in charge of approving PLN's investment plans could ensure alignment of sector, climate and financial targets. It could transition to a fully-fledged regulator as confidence builds regarding its missions and effectiveness. Separating PLN's system planning, generation procurement and operations would level the playing field between PLN and IPPs and enhance sector regulation and transparency. Indonesia has recently adopted an emissions trading system and a carbon price, but it is also important to assess alternative options to phase-down coal such as acquiring and retiring high-emitting coal plants. Complementary solutions to decarbonize the grid such as interconnections between islands and with neighboring countries, carbon capture and storage, nuclear or hydrogen could also be explored.

**Enabling private investments in RE.** Three regulatory changes can help Indonesia boost private investment in RE and benefit from low RE prices: reforming RE price controls, reducing local content requirements for RE

price at which PLN can purchase RE is also capped at 85 to 100 percent of the average generation cost which does not account for coal and fuel subsidies. Moreover, new investments in transmission, distribution and storage will be needed to make the grid reliable and secure as RE is integrated. Appropriate regulation and pricing for these services are critical for their viability. Local content requirements increase the cost of private investment and impede competition. The coal domestic market obligation, which caps coal exports at 75 percent of production and domestic prices at US\$ 70 per ton, subsidizes coal-fired power plants.

**Ensuring the financial sustainability of the sector.** Improving PLN's revenue adequacy is essential to finance its investment needs in a sustainable manner while reducing contingent liabilities on the State Budget. This will involve gradually reinstating electricity tariffs adjustment, to reflect changes in cost and the energy mix, while protecting the poor and vulnerable. PLN could also explore new financing schemes and sources such as expanding the use of green bonds and carbon credits.

**Paving a just transition for all.** A comprehensive economic plan needs to be developed to help people and communities to transition to a greener economy and new jobs. This includes reforms to unleash new sources of growth as well as social assistance and active labor market programs to help those most affected smooth their income and acquire new skills. This could be underpinned by continuous dialogue and consultations with affected stakeholders, including on the scope, scale, and timing of coal mine closures.

## A. Economic and Fiscal Update

### 1. A Diagnostic of the Recovery

*The economic rebound continued in 2021 but was moderated by the COVID-19 Delta wave. The vaccine rollout accelerated in cities and large economic centers but is likely to face more constraints in lagging areas.*

**The Indonesian economy was off to a strong start during the first half of 2021.** Growth rebounded to 7.1 percent in Q2 2021, compared to -5.3 percent a year ago, driven by low base effects, a pickup in domestic demand and net exports (Figure A.1). The rebound was strong compared to peers (Figure A.2) and was underpinned by a relatively well contained pandemic situation, more upbeat business and consumer sentiment, as well as strong external environment. Private consumption and investment recovered gradually to pre-pandemic levels (Figure A.3). On the supply side, high-contact services sectors including wholesale and retail, transport, and hospitality also rebounded to pre-pandemic levels, helped by the relaxation of mobility restrictions and improved consumer sentiment.

**The highly contagious Delta variant deteriorated the COVID-19 situation around the world and Indonesia was no exception.** According to official statistics, daily cases increased fourfold between June and July. The rapid increase in caseloads strained the healthcare system. The bed occupancy rates exceeded 90 percent in the largest cities by mid-July. In response, the government increased emergency treatment facilities and redirected the bulk of oxygen for industry to medical use,<sup>3</sup> and procured concentrated oxygen abroad. Notwithstanding, official COVID-19 deaths were relatively elevated during the peak of the wave (Figure A.4).

**The government accelerated the COVID-19 vaccine rollout and tightened mobility restrictions.** It expanded vaccine eligibility from healthcare workers and the elderly to all citizens above 12 years old in early July. Daily vaccine inoculations almost doubled within a month (Figure A.5). Progress in urban areas was even more rapid. By early August 90 percent of eligible beneficiaries (12 years and above) had received at least one dose in Jakarta and

<sup>3</sup> 75 percent of the oxygen produced in Indonesia is used for industry, and 25 percent is used for medical purposes. The government redirected 90 percent of oxygen for industry to medical use.

Bali. The government also eased vaccine supply and distributional bottlenecks, including to improve vaccination in lagging regions. It also launched communication and outreach efforts to address vaccine hesitancy. More stringent lockdown measures were introduced, and mobility dropped but from a relatively high base (Figure A.6).<sup>4</sup> Testing increased but remained low overall (Figure A.7).

**The health response allowed Indonesia to flatten COVID-19 cases earlier than regional peers.** Official COVID-19 cases declined earlier in Indonesia compared to the Philippines, Malaysia, and Thailand (Figure A.8). Province level analysis shows that vaccination played an important role in reducing viral transmission and severe cases in Indonesia. Provinces that had reached higher vaccination rates by mid-July experienced a faster decline in cases and deaths by mid-September (Figure A.9). This allowed a gradual reopening of the economy and improvement in mobility.

**Vaccine rollout to more remote parts of the country is likely to run into vaccine distribution, health capacity and vaccine hesitancy constraints.** The national vaccination rate - 39 percent of the target population as of December 5, 2021 - hides large spatial differences. About 71 percent of the target population are fully vaccinated among provinces in the top 25 percent by inoculation rate. This is compared to only 24 percent among the bottom 25 percent.<sup>5</sup> These differences are in part due to prioritization of densely populated urban areas and large economic centers where viral transmission is higher. If persistent, the uneven vaccine rollout can pose pandemic risks and equity challenges. Indonesia has received 326 million vaccine doses and needs 383 million to inoculate 70 percent of the target population. The government expects to receive an additional 68 million doses by the end of 2021, including to provide booster shots. Although vaccine stocks have remained adequate overall, smaller and more remote areas have had low vaccine stocks and currently stand at around 1 month of vaccination at current rates of inoculation.

**Although the Delta wave slowed the growth momentum, the economy showed signs of resilience.** Growth moderated to 3.5 percent in Q3 2021 compared to -2.1 percent a year ago due to weak private consumption while

<sup>4</sup> The mobility restrictions included work from home requirements for non-essential workers, ban on restaurant dine-in, and closure of malls etc.

<sup>5</sup> The top 25 percent of provinces by inoculation rate account for 15 percent of total population and 31 percent of GDP.

net exports and investment remained relatively more buoyant. Economies have become more resilient over time to successive COVID-19 waves thanks to improved targeting of mobility restrictions as vaccination progressed (World Bank EAP Update Oct 2021). In the case of Indonesia, leading indicators of private consumption such as retail sales remained subdued compared to previous waves as consumer sentiment remained depressed (Figure A.10). On the other hand, manufacturing activity and exports have been more resilient compared to 2020 amid supply chain disruptions, moderating global trade but still high export commodity prices (Box A.1).<sup>6</sup> Within manufacturing, growth was relatively stronger in transport equipment, basic metals, and chemicals. Export growth was driven largely by coal, crude palm oil, iron, and steel. Notwithstanding, the economy remains about 4 percent below potential (Figure A.11).

*The labor market was less affected than in 2020 but remained less buoyant than before the pandemic. Poverty risks can be mitigated by the strengthening of social assistance programs.*

**Poverty remained elevated during the first quarter of 2021.** The poor and vulnerable have been hit hard by the pandemic. The official national poverty rate increased from 9.0 percent to 10.2 percent in September 2019-2020. The poverty impact of COVID-19 was less than during the 1997-1998 Asian Financial crisis, where poverty increased by 13 percentage points. This is owing to the shallower recession and the substantial expansion of social safety nets.<sup>7</sup> Poverty remained relatively high in February 2021 at 10.1 percent<sup>8</sup> amid subdued growth and labor markets and relatively high COVID-19 cases. Poverty in urban areas continued to increase between February 2020-21 from 7.4 to 7.9 percent reflecting tighter mobility restrictions and weak growth in high-contact services sectors such as trade, transport, and hospitality.

**The labor market was less affected than before the pandemic, but labor incomes remained subdued.** The World Bank High Frequency Survey (HiFy) found that the share of household breadwinners who stopped working increased from 9 to 12 percent in March-October 2021, partly due to seasonal factors. But work stoppages remained well below their peak of 24 percent in May 2020. Similarly, the slight increase in the unemployment rate

from 6.3 to 6.5 percent in February-August 2021 while labor force participation was stable overall is also partly explained by seasonal factors. Moreover, unemployment did not increase as much as in 2020, when it rose from 5.3 to 7.1 percent in August 2019-2020. Notwithstanding, although they have declined since mid-2020, labor income losses remained prevalent, including among the bottom 40 percent of households. According to the World Bank High Frequency Survey (HiFy), the share of household primary breadwinners that are earning less than before COVID-19 declined from 63 to 45 percent between May 2020 and October 2021.

**The 2021 social assistance package has the potential to mitigate the poverty impact of the Delta wave.** In August 2021, the government partly reversed the envisaged scaling back of social assistance to provide additional relief during the Delta wave (Annex 1). The social assistance package increased by 0.2 percentage point to 1.5 percent of 2020 GDP, which is 0.1 percentage point lower than what was spent last year. For instance, the Family Cash Transfer (PKH) which targets the poorest 10 percent households received lower budget allocations per beneficiary this year, whilst the Village Fund BLT had both the coverage and benefit level reduced. World Bank simulations show that had the social assistance package not been increased this year, poverty could have risen to 11.4 percent, compared to 10.6 percent under the new package and revised growth assumptions (Figure A.12).<sup>9</sup> The simulations also show that a higher social assistance package could have further mitigated risks of rising poverty. For instance, maintaining the 2020 social assistance package in 2021 could have reduced poverty to 9.7 percent.

**Although the targets for social assistance coverage were met, program rollout faced targeting and delivery challenges.** Findings from HiFy surveys suggest that most social assistance programs reached their estimated program coverage by March 2021, although some households reported only receiving partial benefits (Sari et al., 2021). Program challenges also include exclusion error (some poor and vulnerable households not receiving any assistance), inclusion error (non-eligible households receiving assistance), and double-dipping (households receiving benefits from multiple programs when program rules do not allow it).<sup>10</sup>

<sup>6</sup> In line with these developments, the mining sectors surged by 7.8 percent while manufacturing grew moderately by 3.7 percent.

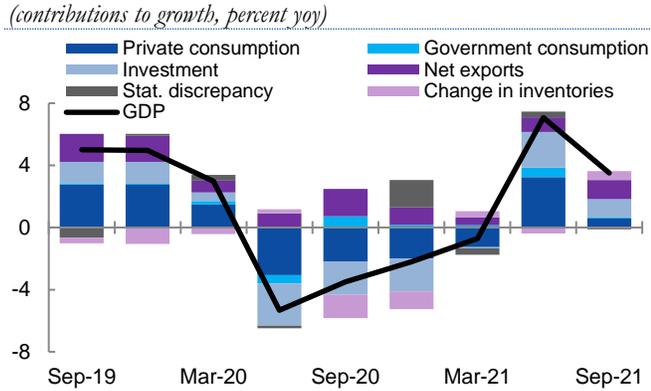
<sup>7</sup> Social assistance spending increased from IDR 112.5 trillion to IDR 310 trillion in 2019-2020.

<sup>8</sup> BPS Press Release on Poverty based on SUSENAS March 2021.

<sup>9</sup> These simulations assume that with the Delta wave, growth declines from 4.4 to 3.7 percent. The new sectoral growth projections are agriculture (3.6 percent), industry (5.2 percent) and services (1.8).

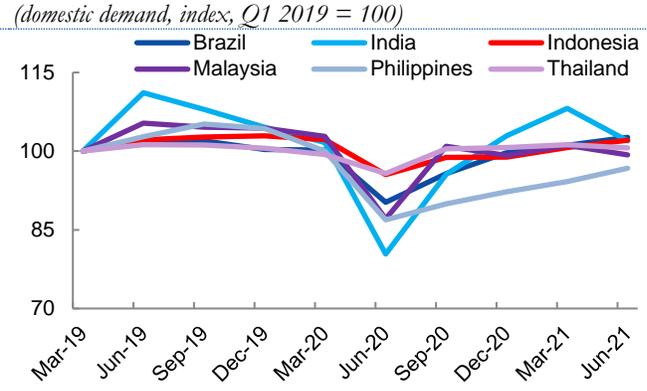
<sup>10</sup> SMERU 2021.

**Figure A.1: The COVID-19 Delta Wave Slowed the Growth Momentum**



Source: BPS, World Bank staff calculations

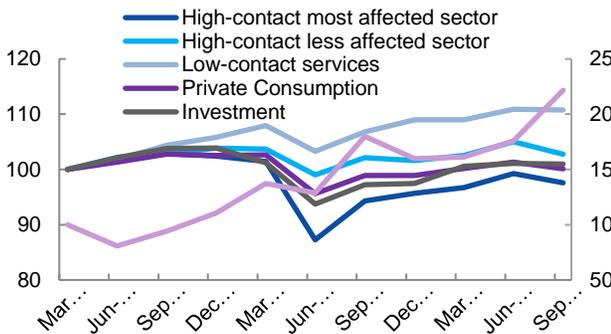
**Figure A.2: The Indonesian Economy Was Off to a Strong Start During the First Half of 2021**



Source: BPS through CEIC, World Bank staff calculations

**Figure A.3: The Rebound was Broad-based**

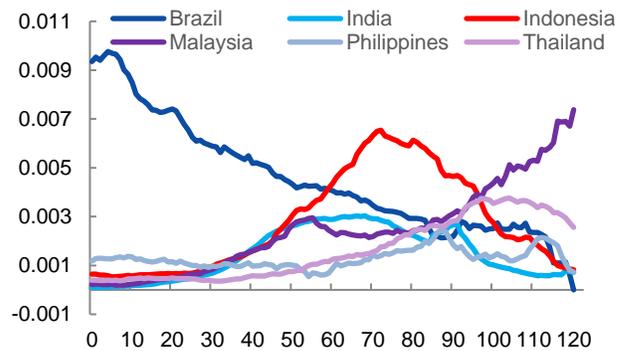
(index, Q1 2019 = 100)



Source: BPS through CEIC, World Bank staff calculations

**Figure A.4: COVID-19 Mortality Rose Sharply During the Delta Wave as the Health System Was Strained**

(daily deaths per thousand people, seven-day moving average, by number of days since beginning of the Delta wave)

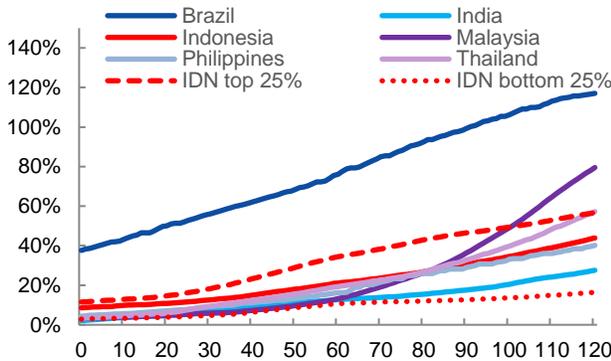


Source: WHO, CEIC, World Bank staff calculations

Note: The delta wave begins when cases increased by 25 percent compared to the previous week and when the share of delta variant reached double digits. The respective onset dates are Brazil (6/17/2021), India (3/16/2021), Indonesia (5/22/2021), Malaysia (4/15/2021), Philippines (5/31/2021), Thailand (5/18/2021).

**Figure A.5: The Vaccine Rollout Accelerated but Remained Uneven**

(vaccination rate, first dose, smoothed)

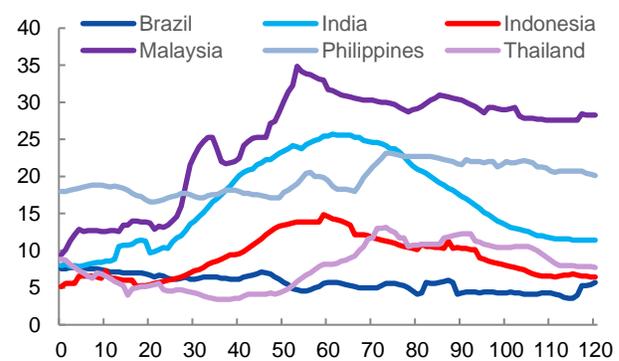


Source: Our World in Data, Ministry of Health, World Bank staff calculations

Note: For the dates and definition of the delta surge, refer to Figure A.4. IDN top 25% (resp. bottom 45%) refers to provinces in the top 25 (resp. bottom 25%) by inoculation rate as of mid-July 2021.

**Figure A.6: Stay-at-home Increased from a Relatively Low Base**

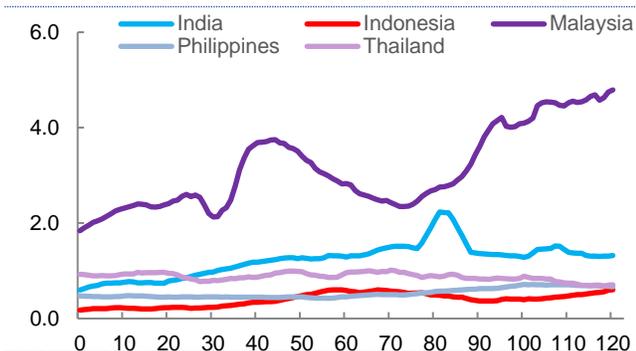
(change in the stay-at-home index, percentage points relative to pre-pandemic baseline)



Source: Google Mobility Index, World Bank staff calculations

Note: Stay-at-home refers to mobility in residential areas. For the dates and definition of the delta surge, refer to Figure A.4

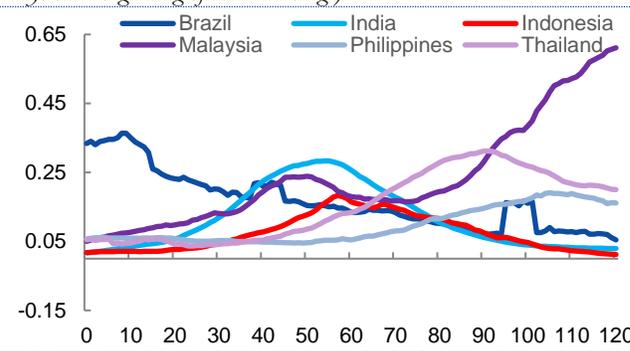
**Figure A.7: Testing Increased but Remained low Overall**  
(percent of population, seven-day moving average)



Source: Our World in Data, World Bank staff calculations  
Note: For the dates and definition of the delta surge, refer to Figure A.4; Brazil was dropped due to missing data.

**Figure A.8: Indonesia Flattened COVID-19 Cases Relatively Early Compared to Regional Peers during Delta surge**

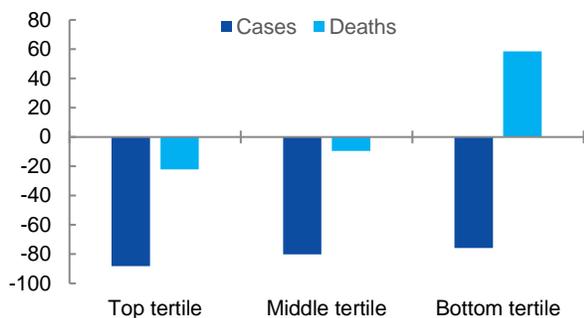
(daily cases per thousand people, seven-day moving average, by number of days since beginning of the delta surge)



Source: WHO, CEIC, World Bank staff calculations  
Note: For the dates and definition of the delta surge, refer to Figure A.4

**Figure A.9: Vaccination Helped Reduce Viral Transmission**

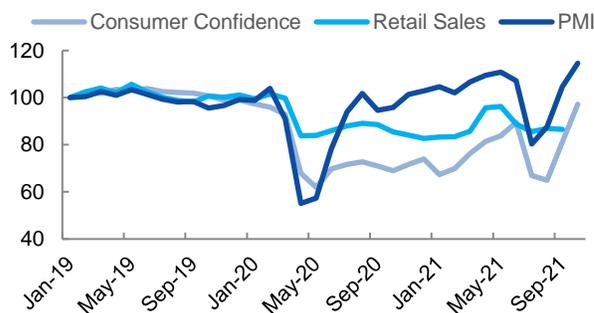
(percent change in daily cases and deaths between mid-July and mid-September by tertile of vaccination rate across provinces)



Source: Ministry of Health; CEIC; World Bank staff calculations  
Note: Provinces are ranked by quartile of vaccination rate as of mid-July. The graph shows average percent change in COVID-19 cases and deaths, for the period June 15 to September 15, by tertile of vaccine coverage (first dose) at the province level (34 provinces)

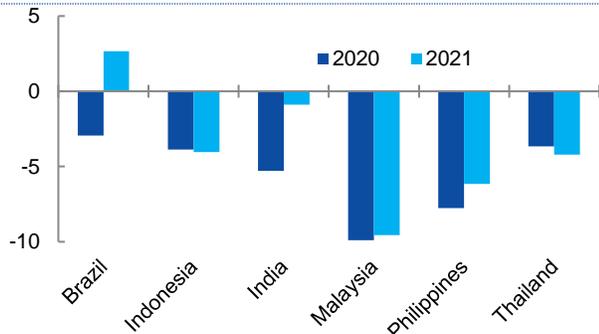
**Figure A.10: Manufacturing Has Been More Resilient Than Consumption During the Delta Wave**

(Index, Jan 2019=100)



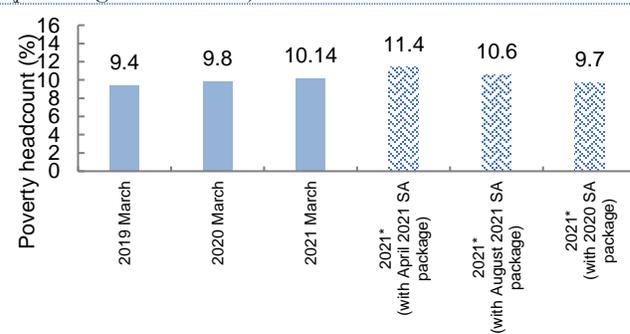
Source: Bank Indonesia through CEIC; World Bank staff calculations

**Figure A.11: The Economy Remains Below Potential**  
(Output gap, in percent of potential output)



Source: World Bank Macro Poverty Outlook Database October 2021; World Bank staff calculations  
Note: Output gap is calculated as the difference between real output and potential output

**Figure A.12: Actual and Simulated Poverty Rates in 2021 under Different Social Assistance Packages**  
(potential growth,  $t-1=100$ )



Source: SUSENAS and World Bank staff simulations.  
Note: \* refers to simulated figure based on World Bank Ex-Ante simulation with growth assumption and SA package in August 2021. Details methodology discussion is available in Tiwari, et al (2020) and the results are based on assumptions and simulations discussed in Sjahri et al (2021a).

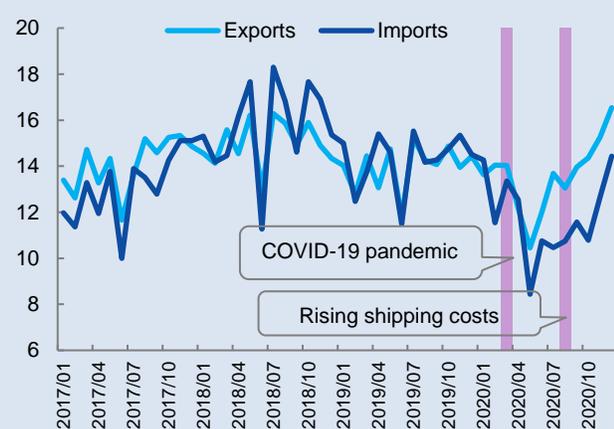
**Box A.1: The Impact of COVID-19 and Shipping Disruptions on Indonesia's Trade Flows**

**Goods exports are at all-time highs while imports have started to rebound to pre-pandemic levels.** Goods exports and imports rebounded steadily after contracting in March-May 2020 by 34 and 58 percent, respectively (Figure A.1.1). The trade surplus reached 1.7 percent of GDP in 2020 (1.6 percent of GDP in the first half of 2021) compared to a deficit of 0.4 percent of GDP in 2019. Strong exports were driven by buoyant global demand and increasing commodity prices. Import growth was subdued due to weak domestic demand amid depressed consumer sentiment and declining mobility. Exports have been more resilient to mobility restrictions than imports, as discussed below.

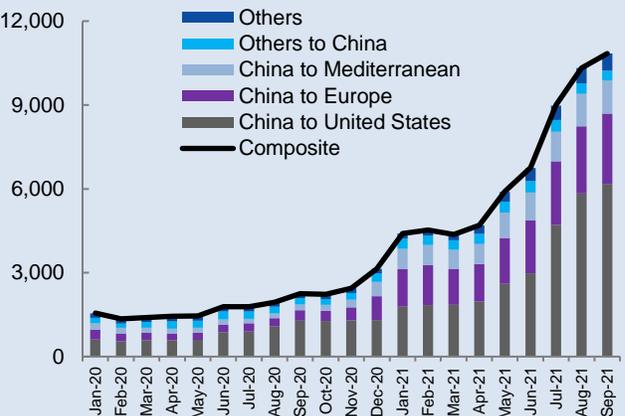
**There have been significant disruptions to global trade during COVID-19.** Mobility restrictions disrupted trade and led international shipping lines, airlines, and logistics service providers to reduce capacity. Demand for international transportation and landside logistics services skyrocketed with the relaxation of lockdowns and rebounding global economy and trade starting in the second half of 2020. This resulted in a sharp increase in shipping rates and major capacity shortages. Since September 2020, international maritime shipping rates have increased five-fold (Figure A.1.2) and shipping delays almost doubled due to port congestions (Figure A.1.3).

**Vessel and container shortages are reducing Indonesia's connectivity to its trading partners and increasing shipping bottlenecks.** Indonesia maritime connectivity has been adversely affected by congestions in Chinese and other transshipment ports (e.g., Singapore and Port Klang in Malaysia) and reduced vessel capacity along the country's main trading corridors. The latter dropped percent to zero along the important corridors between Indonesia and the US East Coast, the US West Coast, and the Mediterranean as international shipping lines prioritized the largest and profitable East-West trade routes (Figure A.1.4). More recently, international shipping disruptions have started to spill over to Indonesia's domestic shipping industry. Traders are facing challenges to find empty containers and space on domestic vessels.

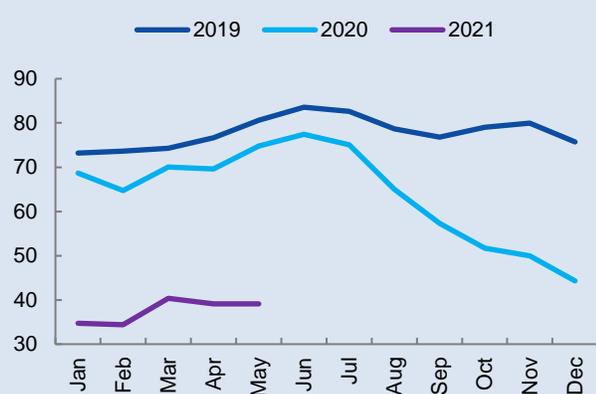
**Figure A.1.1: Indonesia trade flows**  
(US\$ billions)



**Figure A.1.2: Maritime shipping rates**  
(US\$)



**Figure A.1.3: Global shipping reliability**  
(percent of ships arriving within 8 hours of schedule)



**Figure A.1.4: Indonesia's loss of connectivity**  
(percent)



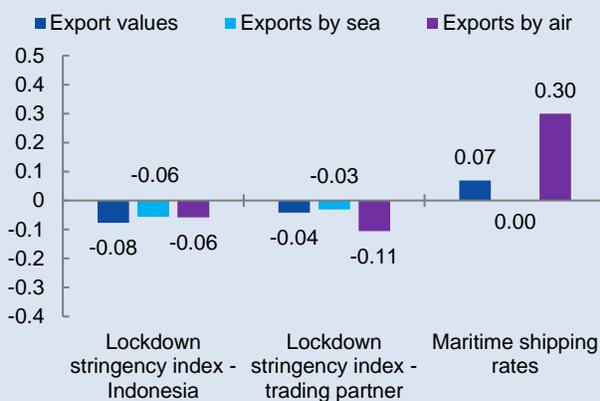
Source: Statistics Indonesia; Bloomberg; World Bank; Compilation from the World Bank's Global Trade and Regional Integration team based on data by MDS Transmodal  
Notes: Figure 1.2: Freightos Global Shipping Index; Figure 1.4: Quarterly deployed capacity, 2021 Q1 compared to 2019 Q3.

**Freight costs have increased sharply.** International maritime shipping rates have reportedly increased by 100-500 percent in Indonesia, depending on the destination.<sup>11</sup> For instance, ocean freight costs from Jakarta to the United States West coast have increased more than five-fold, reaching US\$18,000-20,000 for a 40-foot container.<sup>12</sup> Intra-Asia freight rates have also been significantly impacted, with shipping costs to Singapore increasing from USD 200 to USD 1,000 per container. Space shortages combined with other factors, have also resulted in increased domestic sea freight rates. Beyond rising costs, the unreliability of global shipping is increasing cost and uncertainty for importing and exporting firms.

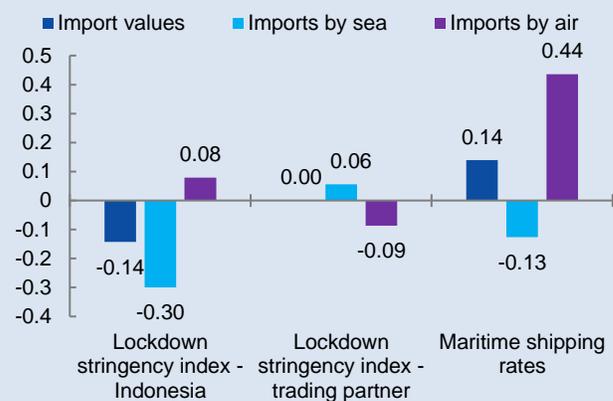
**Exporters and importers are coping with high shipping disruptions and maritime freight costs by shifting some freight to air transport, where feasible.** Staff calculations show that rising maritime shipping rates so far have not had significant effects on exports and imports. This is partly explained by increased use of air transport for some products. A 10 percent increase in trade cost is estimated to raise exports and imports by air by 3-4 percent, according to regression analysis (Figures A.1.5 and A.1.6). Trade data confirms this shift in mode of transport. The share of imports entering by air has increased from 10-12 percent during the pandemic, driven by chemicals, machinery and mechanical appliances, and vehicle and transport equipment.

**Goods exports have been more resilient to mobility restrictions than imports.** Estimates show that a 10 percent increase in the stringency of domestic mobility restrictions reduces exports by 0.8 percent and imports by 1.4 percent, confirming the finding above that consumption has been less resilient to domestic mobility restrictions than exports (Figures A.1.5 and A.1.6). Mobility restrictions in trading partner countries have lower and statistically insignificant impact on Indonesia’s trade flows.

**Figure A.1.5: Impact of lockdown measures and shipping disruptions on Indonesia’s exports**  
(percent change in exports assuming a 1 percent change in measure)



**Figure A.1.6: Impact of lockdown measures and shipping disruptions on Indonesia’s imports**  
(percent change in imports assuming a 1 percent change in measure)



Source: World Bank estimation.

**Trade and competitiveness reforms can help Indonesia respond to COVID-19 and shipping disruptions and better integrate into global value chains.** First, improving logistics performance and trade facilitation are key to reducing not only the time and costs associated with the cross-border movement of goods but also achieving the government’s ambitious objective to reduce logistics costs from 24 percent to 17 percent of GDP by 2024. Second, reforms that eliminate burdensome and costly non-tariff measures (NTMs) can improve firms access to inputs and boost their competitiveness (see Box A.5 in the policy recommendation section). Finally, increasing access to foreign markets by pursuing additional and deeper free trade agreements (FTAs) will not only provide Indonesian firms with new trading opportunities but will also catalyze Indonesia’s participation in global value chains.

<sup>11</sup> <https://newssetup.kontan.co.id/news/tarif-kargo-laut-naik-hingga-500-ini-penyebabnya>

<sup>12</sup> Media coverage and discussions with logistics companies

## 2. The Policy Response

*Budget flexibility, recovering tax revenues and accommodative financing conditions enabled a swift response to the Delta wave.*

**Budget flexibility allowed the authorities to quickly ramp up support during the Delta wave.** The government increased the 2021 COVID-19 fiscal package by 0.3 percentage points in July to 4.8 percent of 2020 GDP to respond to the Delta wave (Figure A.13). The package is 1 percentage point of GDP higher than what was spent in 2020 and remained focused on health (29 percent of package), relief to households (30 percent) and support to firms (31 percent). Spending on priority programs, including on structural challenges such as digitalization and food security, have increased but remain low given pandemic emergencies (10 percent). Reflecting these priorities and budget reallocations to meet deficit targets, the January-to-September spending decreased by 1 percentage point of GDP but remained above pre-pandemic levels (Figure A.14).

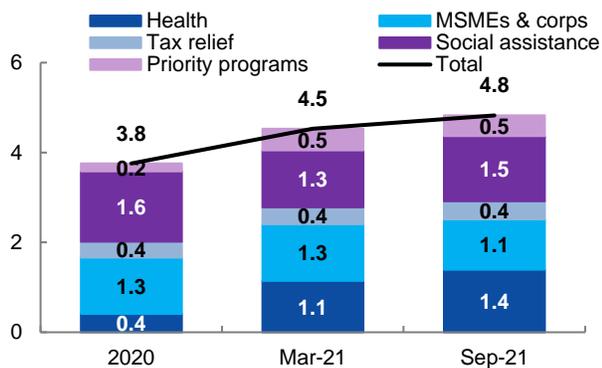
**Support to firms have also contributed to increased spending but targeting to large firms and MSMEs has varied by type of support.** COVID-19 support to firms took two main forms: (i) cash flow assistance such as wage subsidies, tax deductions, cash transfers and loan payment deferrals which aimed to help firms cope and protect employment during lockdowns and the economic downturn; and (ii) access to credit in the form of interest rate subsidies and credit guarantees. Overall firm support in Indonesia was comparable to peers but benefited large firms disproportionately (Figure A.15) mainly through wage subsidies and tax deductions (Figure A.16). This is partly because large firms are more likely to be formal, employ more workers and have high tax liabilities. On the other hand, cash transfers and loan payment deferrals were better targeted at MSMEs (Figure A.16).

**Revenues have started to recover in 2021, although buoyancy remained low.** Fiscal revenues rose in January-September from 7.5 to 8.2 percent of GDP in 2020-2021 (Figure A.17). This was driven by rebounding VAT, excises, and trade taxes as well as non-tax revenues. On the other hand, weak labor, and corporate incomes together with recent tax rate cuts, had offsetting effects. As of September, tax collections were 2.7 percent below pre-pandemic levels. The revenue rebound was moderate relative to peers (Figure A.18) due to longstanding constraints related to the narrow revenue base, tax administration and competitiveness gaps.

**The fiscal response to the Delta wave sustained pressures on budget financing.** The unprecedented scale of the fiscal response has required high central bank and commercial bank financing of the Budget as non-resident investors' holding of government paper declined. Financing needs remained elevated (Figure A.19). This pushed central government debt up from 30.2 to 41.8 percent of GDP in 2019-2020 (Figure A.20), which is nevertheless low relative to peers and the official debt ceiling (60 percent of GDP). But government debt holding shifted markedly with increased financing by Bank Indonesia, commercial banks, and other domestic investors. Bank Indonesia's holdings of local currency government bonds increased from 0.8 to 3.9 percent of 2020 GDP in January 2020-October 2021 (Figure A.21).<sup>13</sup> These holdings increased from 4.8 to 10 percent of 2020 GDP (resp. from 5.5. to 8.8 percent) for commercial banks (resp. other domestic investors) while they only declined slightly from 7 to 6.2 percent for non-resident investors. These shifts have also helped stabilize bond yields but from a relatively high base compared to peers (Figure A.22) due to Indonesia's shallow debt market (World Bank IEP June 2021). Authorities have remained committed to phasing out monetary financing after 2022. Budget financing by Bank Indonesia have eased in 2021 (Figure A.21).

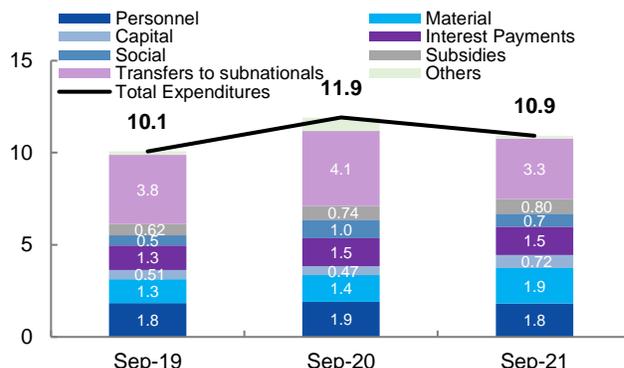
<sup>13</sup> The calculations are between end of January 2020 and end of October 2021.

**Figure A.13: The COVID-19 Fiscal Package Remained Largely Focused on the Health Response and Relief**  
(percent of 2020 GDP)



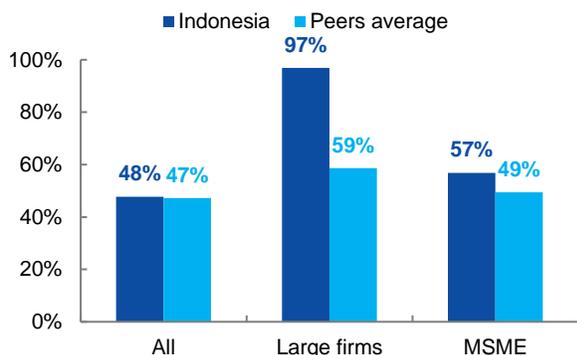
Source: World Bank staff calculations based on Ministry of Finance data. Note: 2020 is executed spending allocations, while 2021 is budgeted amounts

**Figure A.14: Spending Moderated but was still above Pre-Pandemic Levels**  
(January-to-September spending, in percent of GDP)



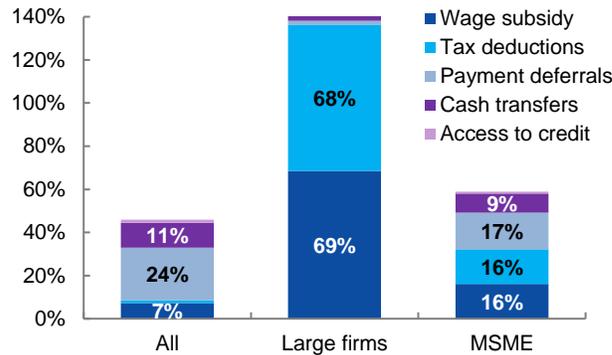
Source: World Bank staff calculations based on Ministry of Finance data

**Figure A.15: Large Firms are more Likely to Receive COVID-19 Support...**  
(share of firms that receive support, in percent)



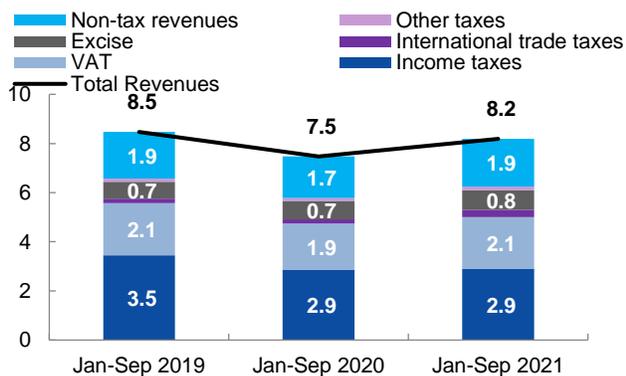
Source: World Bank Business Pulse Survey, second round. Note: The firm size classification is based on the number of workers: Large (>100), Medium (20-99), Small (5-19), Micro (<5). Country peers are Malaysia, Philippines, Poland, Turkey, Romania, Georgia, Bulgaria, and Brazil

**Figure A.16: Some Firm Support Programs are Better Targeted at MSMEs**  
(share of firms that receive support, in percent)



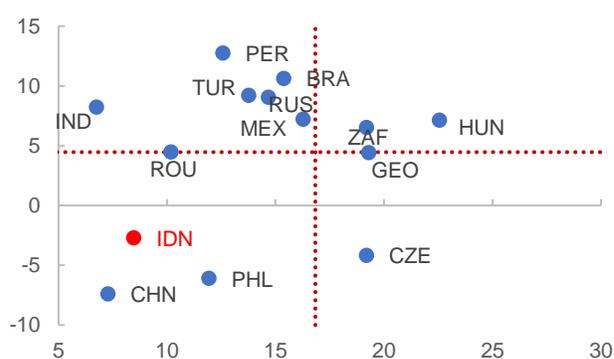
Source: World Bank Business Pulse Survey. Note: The firm size classification is based on the number of workers: Large (>100), Medium (20-99), Small (5-19), Micro (<5). Country peers are Malaysia, Philippines, Poland, Turkey, Romania, Georgia, Bulgaria, and Brazil

**Figure A.17: Revenues Have Started to Rebound but Income Taxes Remained Weak**  
(percent of GDP)



Source: Ministry of Finance and World Bank staff calculations

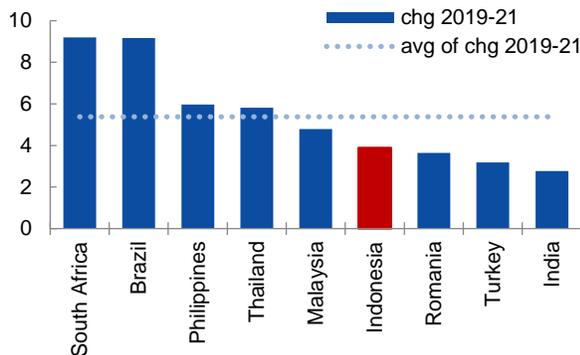
**Figure A.18: The Revenue Rebound is Moderate Relative to Peers**  
(x-axis: January-to-September revenue-to-GDP ratio in 2019; y-axis: percent change in the January-September revenue-to-GDP ratio in 2021-2019)



Source: Ministry of Finance through Haver Analytics, and World Bank staff calculations

**Figure A.19: Gross Financing Needs Have Increased During the Pandemic**

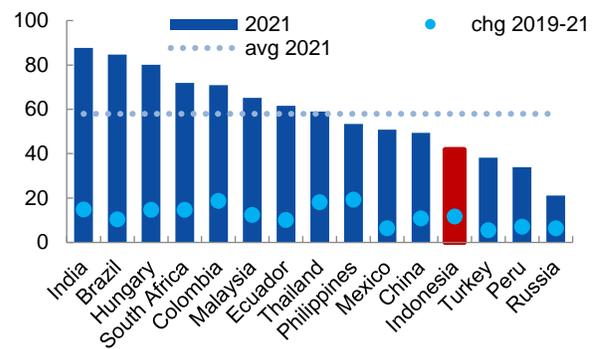
(increases in gross financing needs between 2019-2021 and 2019-2020, percentage point of GDP)



Source: IMF Fiscal Monitor April-October 2021

**Figure A.20: Government Debt has Increased but is Relatively low Compared to Peers and the Official Debt Limit**

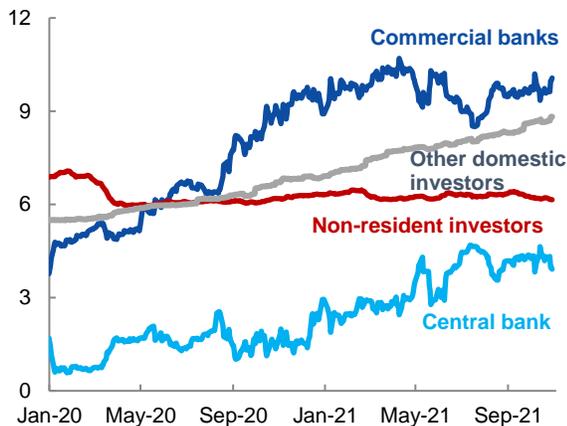
(general government debt-to-GDP ratio, and changes between 2019-2021 in percentage points of GDP)



Source: World Bank Macro-Poverty Outlook October 2021

**Figure A.21: Holdings of Local Currency Government Debt Have Shifted from Non-Residents Towards the Central Bank, Commercial Banks and Other Domestic Investors...**

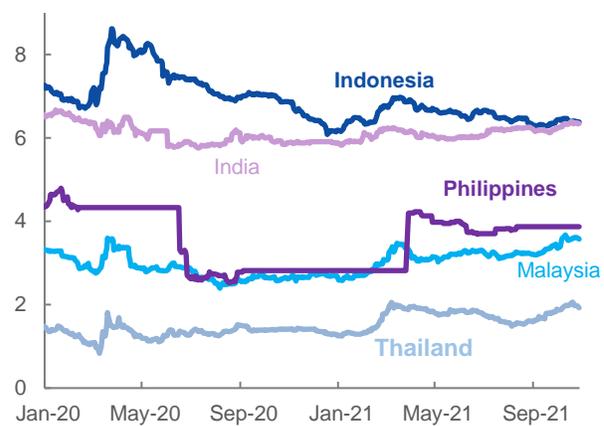
(share of government bond ownership, in percent of 2020 GDP)



Source: Ministry of Finance

**Figure A.22: ...Which Helped Stabilize Sovereign Bond Yields but from a Relatively High Pre-Pandemic Base**

(10-year local currency government bond yield, in percent)



Source: Bloomberg

*Monetary policy remained accommodative amid weak domestic demand and stable external conditions.*

The authorities maintained a historically low nominal policy rate amid weak domestic demand and stable external conditions. BI kept its benchmark nominal policy rate unchanged at 3.5 percent since January 2021 after cutting it by a cumulative 150 basis points during the pandemic. This is consistent with the large negative output gap (Figure A.11 in section 1), low inflation (Figure A.24), stable portfolio flows (Figure A.23), and accommodative global financial conditions. However, when correcting for inflation, the real policy rate has remained positive throughout the crisis in contrast to peers where it was reduced substantially (Figure A.25). The authorities have had to balance the need to stimulate the real sector with

attracting foreign financing by maintaining positive real returns on domestic financial assets (World Bank IEP June 2021). Although BI has injected liquidity into the economy, its balance sheet did not expand markedly (Figure A.35 and A.36).

**Vulnerabilities to tightening external financing conditions remain moderate.** Three factors contribute to this and are discussed in more detail below:

- (i) Vulnerability to capital flow sudden stops or reversals has moderated with the decline in external financing needs and the fall in stock of domestic assets held by non-residents.
- (ii) Monetary policy space is relatively strong given the stable rupiah, high foreign reserves, and real policy rate differential with the US.

- (iii) Inflation has remained muted and there has been limited pass-through from cost-push inflationary pressures.

**External financing needs and non-resident holdings of Rupiah denominated assets have declined during the pandemic.** External financing needs have declined with the narrowing of the current account deficit (Figure A.26).<sup>14</sup> The current account deficit dropped from 2.7 to 0.4 percent of GDP in 2019-2020 (0.3 percent of GDP in H1 2021) driven by strong external demand and commodity prices, and lower import demand. External financing needs dropped from 14.0 to 10.9 percent of GDP in 2019-2020, compared to 11.5 percent of GDP in 2012 before the 2013 Taper tantrum. Moreover, the stock of domestic assets held by non-residents has declined as a share of official reserves and is substantially lower than before the onset of the 2013 Taper tantrum (Figure A.27).

**Notwithstanding, adverse global or domestic developments could lead to sudden shifts in investor sentiment and inflation.** Market perceptions of sovereign risk as measured by the spread on government bonds have been low and stable since April-May 2020 (Figure A.28). Improved communication of global monetary policy compared to the 2013 Taper tantrum provides more predictability to policymakers and investors. Nevertheless, investors and markets are highly sensitive to adverse pandemic and economic developments and news in Indonesia and other countries. Lastly, although inflation has been muted so far, higher global food and energy prices and persistent supply chain disruptions could increase inflationary pressures and expectations.

**Monetary policy space to manage external financing pressures while supporting the recovery is relatively strong.** Maintaining a flexible exchange rate and avoiding premature monetary tightening can help support the recovery (World Bank IEP June 2021). Monetary policy space to sustain this policy in the near term is relatively ample. First, the real effective exchange rate (REER) has been stable since May 2020 and has appreciated by 2.4 percent since January 2020 (Figure A.29). Second, foreign reserves have been adequate and stable in 2021 at around 9-

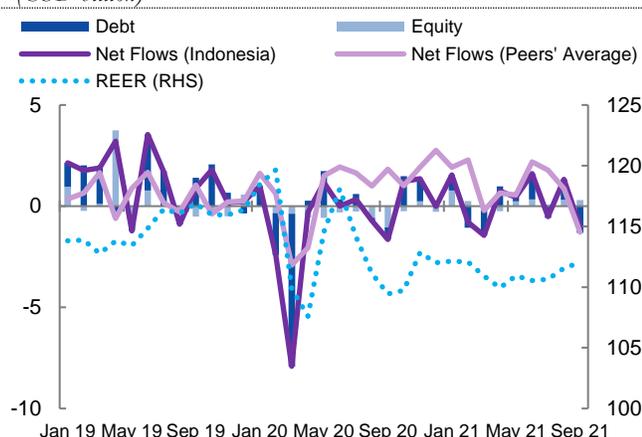
10 months of imports (Figure A.30). Lastly, the high real policy rate differential with the US relative to peers has widened in past months driven by the rise in the inflation differential (Figure A.31).

**Inflation has remained muted and there has been limited pass-through from higher producer prices.** Headline and core consumer price inflation were stable at 1.4-1.5 percent yoy in January-September (Figure A.32) while several emerging markets experienced increased price pressures amid rising commodity prices and supply chain disruptions. The muted consumer prices were due to a combination of weak demand and limited pass-through of higher producer prices and global energy prices. Producer price inflation picked up gradually in early 2021 - increasing from 1.1 to 3.0 percent yoy between December 2020 and March 2021 - and accelerated during the summer to 6.2 percent yoy (Figure A.33). Analysis of past episodes of acceleration in producer price inflation suggests that consumer price core inflation could increase by up 0.2 percentage point at current level of core inflation (Figure A.34). Hence, although cost-push inflation pass-through could increase in coming months, the resulting higher consumer price inflation is likely to remain largely within official targets. Notwithstanding, higher global food and energy prices and persistent supply chain disruptions could further increase inflationary pressures and expectations.

**Money supply has not accelerated despite the overall accommodative monetary policy stance.** BI injected liquidity in the financial system through open market operations, cuts to reserves requirements, and government bond purchases in the primary and secondary market. But money supply (M2) did not expand markedly in 2020 compared to peers as private credit remained weak (Figure A.35). Moreover, money growth moderated since the beginning of 2021. It slowed from 10.3 to 7.9 percent between the second and third quarter of 2021 amid an increase in capital outflows, moderating lending to government and a slight uptick in credit to the private sector (Figure A.36).

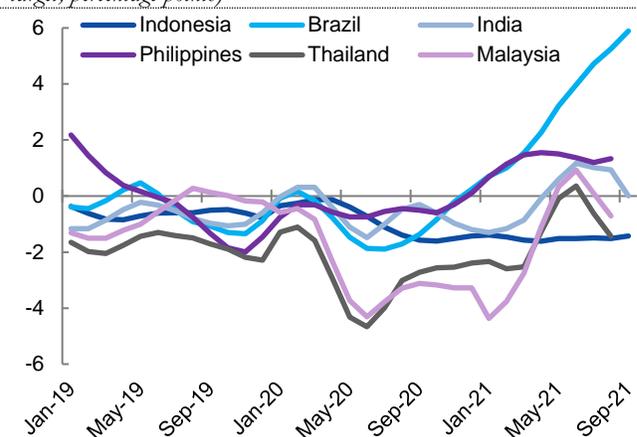
<sup>14</sup> In Indonesia, the narrowing of the current account deficit accounted for about two-thirds of the decline in external financing needs in 2020.

**Figure A.23: Capital Flows Have Been Stable Since April-May 2020**  
(USD billion)



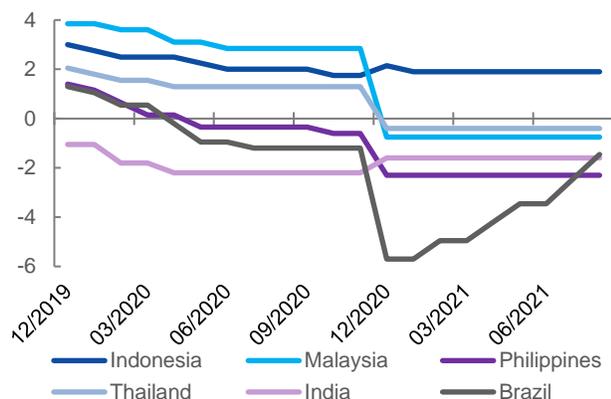
Source: IIF, World Bank staff calculations.

**Figure A.24: Consumer Price Pressures Remained Muted**  
(headline consumer price inflation deviation from the official mid-range target, percentage points)



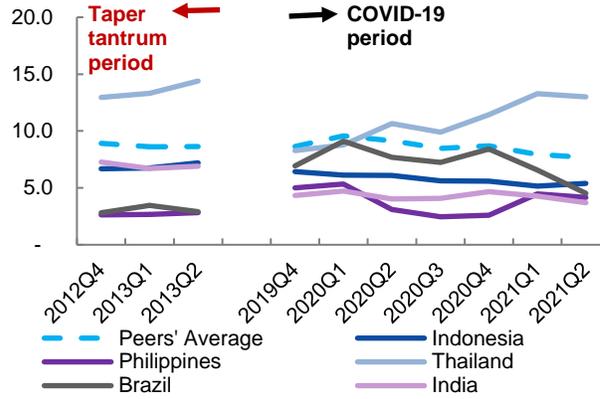
Source: CEIC, World Bank staff calculations.

**Figure A.25: The Real Policy Rate Remains Elevated Relative to Domestic Economic Conditions**  
(nominal policy rate minus annual inflation forecast, percentage points)



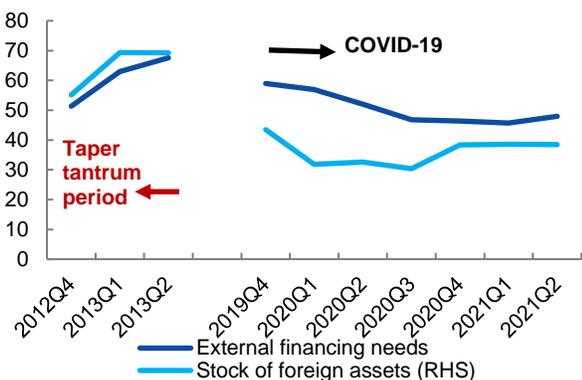
Source: CEIC, IMF WEO October, World Bank staff calculations. Note: The real policy rate is the difference between the nominal rate and the IMF WEO October inflation forecast for 2021.

**Figure A.26: External Financing Needs Have Declined during the Pandemic**  
(share of GDP)



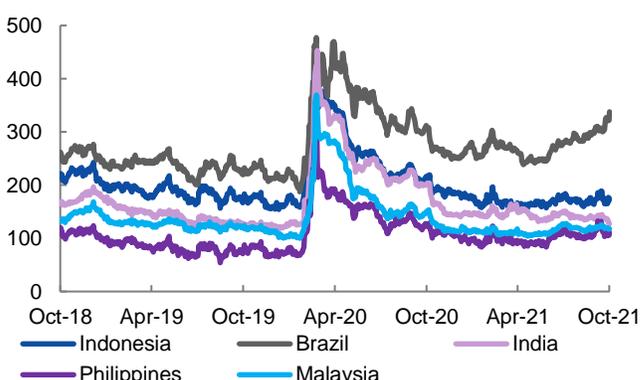
Source: CEIC, IMF WEO October 2021, World Bank QEDS, World Bank IDS, World Bank staff calculations. Note: External financing needs are defined as the sum of the current account balance, debt service on external debt, and short-term gross external debt stock.

**Figure A.27: Exposure to Risks of Capital Flow Sudden Stops and Reversals Has Lessened**  
(external financing needs as a share of FX reserves, LHS; stock of assets held by non-residents as a share of FX reserves, RHS)



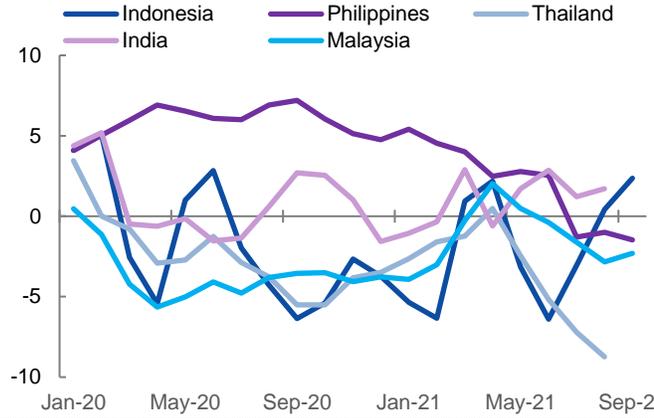
Source: CEIC, IMF WEO October 2021, World Bank QEDS, World Bank IDS, World Bank staff calculations.

**Figure A.28: Market Sovereign Risk Perceptions is Relatively Low**  
(strip spread, basis points)



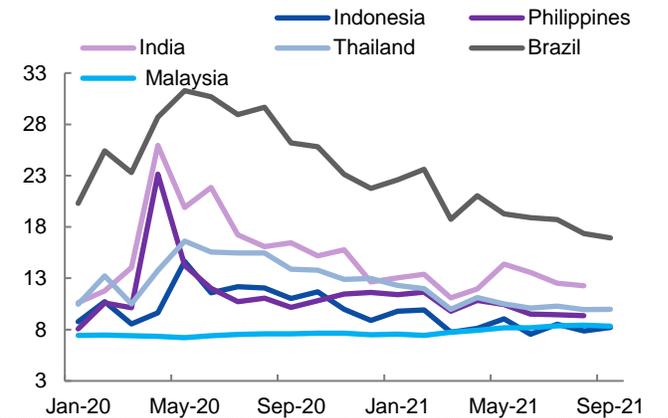
Source: JP Morgan, World Bank staff calculations. Note: Thailand EMBI Global data is not available.

**Figure A.29: The Real Effective Exchange Rate Appreciated with the Rising Inflation Differential**  
(REER cumulative yoy change, in percent)



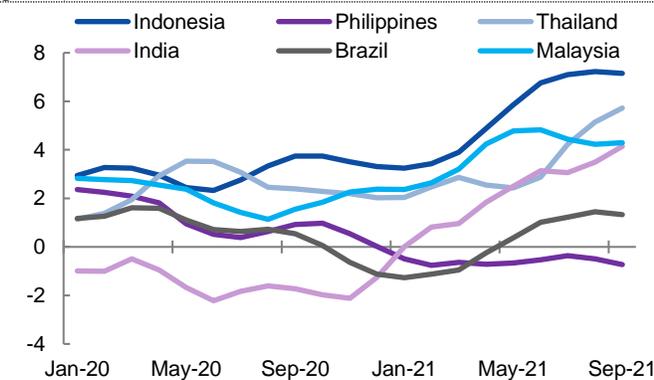
Source: CEIC, World Bank staff calculations. Note: Brazil not shown due to large fluctuations, between -25 and -28 percent in May-Sept 2020.

**Figure A.30: Foreign Exchange Reserves are Adequate**  
(FX reserves, in months of imports)



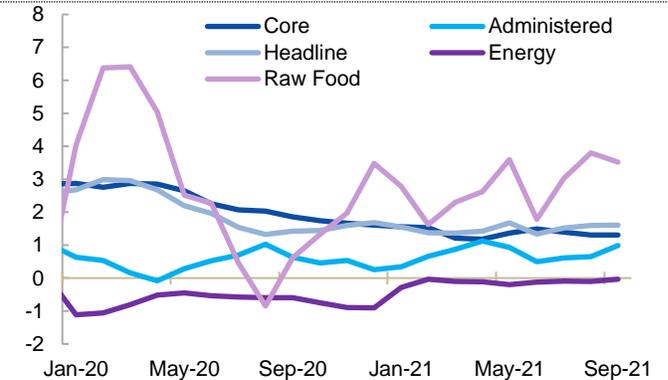
Source: CEIC, World Bank staff calculations.

**Figure A.31: The Real Interest Rate Differential with the US is Relatively Large**  
(real interest rate differential with the US, 3-month moving average, in percent)



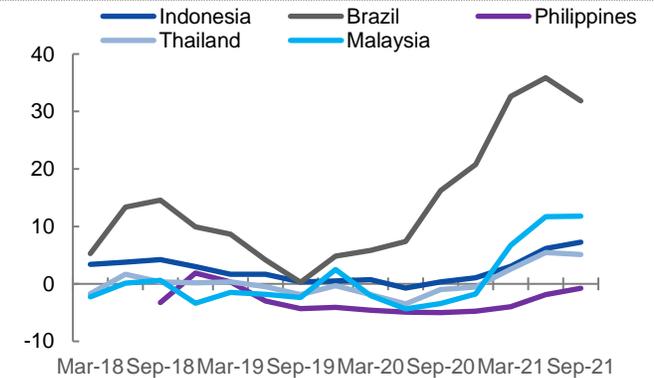
Source: CEIC, IMF WEO October 2021, World Bank staff calculations.

**Figure A.32: Headline and Core Inflation Have Been Stable and Below the Official Target**  
(consumer price inflation, annualized percent change)



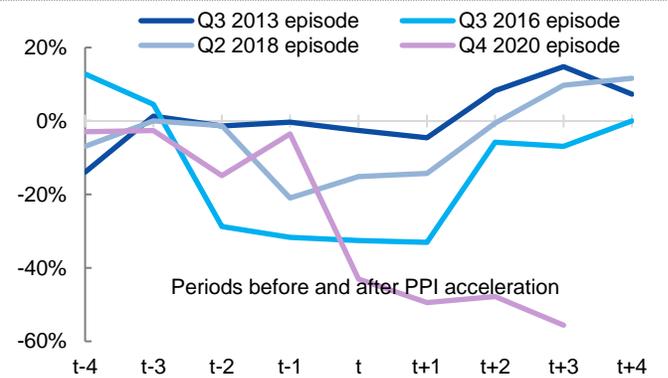
Source: CEIC, World Bank staff calculations. Note: Bank Indonesia's official inflation target is 2-4 percent.

**Figure A.33: Cost-push Inflation Picked up this Year amid Global Commodity Price Increases and Trade Disruptions...**  
(producer price inflation, annualized percent change)



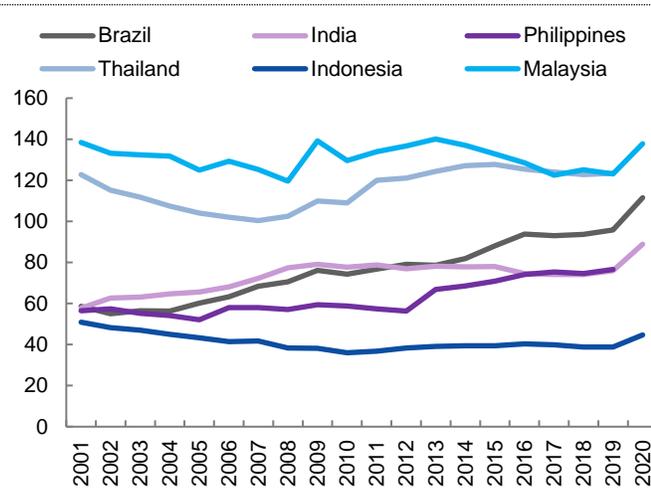
Source: CEIC, World Bank staff calculations.

**Figure A.34: ...but Pass-through to Consumer Prices Could be Limited**  
(consumer price inflation, annualized percent change)



Source: CEIC, World Bank staff calculations. Note: An episode of producer price inflation (PPI) acceleration corresponds to a quarter when PPI rises at least above one standard deviation above the average in the previous two quarters. The date t refers to the start of the episode.

**Figure A.35: Money Supply did not Expand as Credit to the Private Sector Remained Weak**  
(M2, in percent of GDP)



Source: CEIC, World Bank staff calculations.

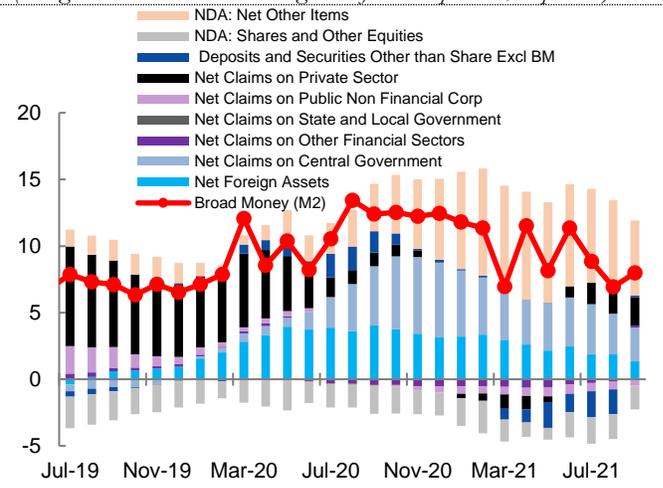
*Credit to the private sector picked up in recent months but remained weak despite healthy bank balance sheets and moderate corporate vulnerability.*

**Credit to the private sector remained weak during the pandemic.** Commercial bank lending growth turned negative in October 2020 and registered a lackluster -3.7 percent as of March 2021 (yoy), its lowest pace in over a decade, following a sharp and continuous decline since the beginning of the pandemic (Figure A.37). The pace of private credit growth has picked up recently, reaching 2.2 percent yoy in September 2021. This slowdown involves bank lending to finance working capital as well as to support investment and consumption and can be especially worrisome in the middle of a fragile and uncertain recovery. Possible causes of continued lackluster credit growth include demand side factors (economic conditions and policy support) and the supply factors (concerns of borrower risks, bank asset quality and profitability). Survey data, however, does point to stable household demand for credit (Financial Services Authority, OJK).

**Corporate funding conditions have been broadly accommodative with bond issuance on the rise, yield moderating, and survey-based measures of access to finance improving. MSMEs still lack access to lending.** Corporate funding conditions appear broadly accommodative, with the two main equity indexes gaining some ground YTD. Corporate bond issuance is on the rise per

**Figure A.36: Money Growth Decelerated during the Third Quarter amid Capital Outflows, Moderating Lending to Government and Slight Uptick in Credit to the Private Sector**

(M2 growth and contribution to growth from components, in percent)



Source: CEIC, World Bank staff calculations.

September 2021 data (IDR 76.1 trillion YTD, higher than the 68.8 trillion during the same period in 2020) and corporate bond yield is moderating (10-year AA National at 8.6 percent as of September 2021). Data from listed firms points to a stabilization of the fraction of firms facing debt service difficulties as of mid-2021<sup>15</sup>. With respect to MSMEs, results from the March 2021 World Bank COVID-19 business pulse survey shows that fewer Indonesian firms experienced difficulties in repaying loans, paying wages, rents, or utilities compared to October 2020. In March 2021, 54.4% of firms claimed no problem in accessing finance: an 8% increase from October 2020; only 20% of firms needed loan adjustment: a 6% reduction from situation in October 2020. Market uncertainty remained the major constraint for accessing finance; also, access to finance and loan adjustment were more problematic for firms with female managers. Firms which transitioned to digital channels were more resilient and recovered more rapidly from revenue shocks than their analog counterparts. However, as of August 2021, MSMEs still account for only 18.6 percent of all bank lending, with micro and small firms receiving only 3.6 percent and 6.9 percent of total bank lending, respectively, even though 99 percent of all firms in Indonesia are MSMEs.

**Banks have increased their holding of government debt.** System-wide market liquidity of the banking sector remains broadly adequate with the liquidity coverage ratio (LCR) at 259 percent as of June 2021, well above the Basel

<sup>15</sup>According to the EFI Macro-Financial Review, debt at risk according to the interest coverage ratio stood at 24.2 percent, unchanged from the previous quarter.

III regulatory minimum of 100%. Notably, bank holdings of government bonds have more than doubled from IDR 763 trillion in March 2020 to IDR 1573 in March 2021 in lockstep with the central bank's asset purchase programs, decreased holding by foreign investors and elevated funding needs in response to the pandemic. This trend shows little sign of moderation with IDR1554 trillion (16% of total banking system asset and 35% of total outstanding government securities) in late October 2021, raising concerns of tightening sovereign-bank nexus and possible adverse feedback loops and amplifying linkages in times of stress. The growth differential between bank credit to the central government versus bank credit to the private sector reflects banks' incentive to lend to the public sector in this phase due to rising yields on government paper and safer prospect relative to riskier credit to the private sector with uncertain returns due to fragile economic outlook. (Figure A.38)

**Available data suggest that bank asset quality is generally high, bank capital and provisioning level adequate.** System-wide non-performing loan (NPL) ratio has barely increased since mid-2020 and stands at 3.2 percent as of September 2021. The capital adequacy ratio has edged up slightly to 25.2 percent as of September 2021 and remains well above the regulatory minimum of 10 percent. Provisioning levels relative to NPLs increased markedly to 183 percent in August 2021 from 157 percent in August 2020. Indonesia's NPL level has been on par with EAP peers such as China and other ASEAN-5 countries, but provisioning level is higher, so its NPL net of provision to capital remains on the lower end of the EAP distribution (Figure A.39).<sup>16</sup>

**The elevated level of loan-at-risk (LAR) warrants close monitoring.** During the pandemic, the system-wide loan-at-risk (LAR) ratio<sup>17</sup>, defined as the sum of NPLs, restructured loans and special mention loans, showed a sharp increase from 11.6 percent in March 2020 to 22.6 percent in June 2021, but LAR levels for top ten banks have stabilized since March. This development warrants continued close monitoring of bank balance-sheet vulnerabilities, especially as loan forbearance measures have been extended until March 2023 and may temporarily mask the true extent of these vulnerabilities. If persistent, the credit slowdown could delay and weaken the nascent economic recovery, causing further deterioration of bank asset quality through linkages with corporate and household sectors. Also, as of June 2021, 59 percent of financial

sector debt is denominated in foreign currency (4.9 percent of GDP), higher than most peer developing economies, indicating that currency mismatch could be a potential concern.<sup>18</sup>

**Banking sector profitability has stabilized after a decline from pre-pandemic levels.** Profitability ratios experienced a marked decline from pre-pandemic levels.<sup>19</sup>, with return on assets (ROA), return on equity (ROE) and interest margin to gross income at 1.90 percent, 10.84 percent, and 4.63 percent in August 2021 respectively, compared to 2.70 percent, 14.65 percent, and 4.96 percent prior to the pandemic. Profitability has traditionally been higher than EAP regional peers, due to market structure, level of competition, dominance of public banks and the increase in provisioning levels.

**Funding liquidity of the banking sector is adequate but overall low compared to regional peers.** Funding liquidity concerns the banking sector's ability to repay deposits and other short-term liabilities and is inherent in the function of maturity transformation performed by banks. System-wide level of liquid assets stood at 26.3 percent of deposits and short-term funding as of August 2021, up from its level of around 24.2 percent half a year ago but lower than EAP average and most regional peers such as China (58 percent) and other ASEAN-5 countries (i.e. 145 percent for Malaysia, 51 percent for the Philippines and 34 percent for Thailand). At 79.4 percent in August 2021, loan-to-deposit ratio is significantly lower than the 93.4 percent registered in early 2020 as private credit growth turned negative. Finally, the system-wide net stable funding ratio (NSFR) stands at 141 percent in June 2021, above the Basel III regulatory minimum of 100%.

**The Indonesian government has deployed a series of measures to support the economy through the financial sector, and trade-offs between supporting the recovery and management of financial stability risks will have to be balanced.** As of September 2021, 49 financial sector policy measures have been deployed, with banking sector (45 percent of total) and liquidity/funding (27 percent) measures accounting for the lion's share but financial markets/NBFI (18 percent) and payment system measures (10 percent) also in place. These measures include some unprecedented regulatory forbearance which could contradict the minimum prudential requirements set by global standards. Credit restructuring policies have a

<sup>16</sup> Non-Performing Loans in East Asia and the Pacific: Practices and Lessons in Times of COVID-19, World Bank, April 2021.

<sup>17</sup> Included restructured loans in collectability 1 (performing loans), restructured & non restructured special mention loans, and NPL in the

LAR calculation as of December 2020 based on Bank Indonesia definition.

<sup>18</sup> Global debt monitor, Institute of International Finance.

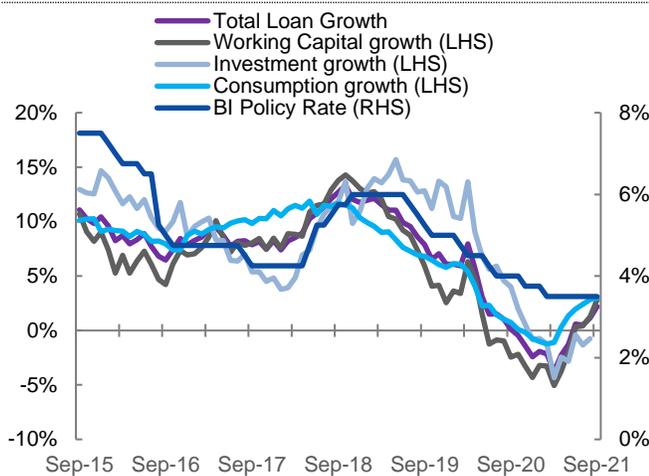
<sup>19</sup> Albertazzi and Gambarcorta (2009) finds empirical evidence that bank profitability is procyclical, i.e. decreases during a downturn.

broad scope of coverage<sup>20</sup> and have seen high uptake across all categories of banks and financing companies. As of August 2021, banks restructured 14 percent of total loans (IDR 778 trillion), benefiting 9.4 percent of total bank borrowers, and financing companies restructured nearly 60 percent of outstanding financing (IDR 211 trillion). These measures are expected to be in place until March 31, 2023. In addition, the government has also provided interest rate subsidies (0.26 percent of GDP benefiting 4.9 million firms) and credit guarantees (0.04 percent of GDP) for MSMEs. While credit guarantees can catalyze counter-cyclical lending to distressed but viable firms

and have been widely pursued globally as a pandemic recovery tool, interest rate subsidies are relatively unique to Indonesia and may have limited impact in spurring broad firm recovery due to their focus on the pricing rather than the additionality of lending. In general, while these measures have been necessary to sustain the post-pandemic recovery, they could also sow the seeds for the buildup of financial stability risks and pose medium-run challenges for policymakers and hence require carefully balancing of trade-offs.

**Figure A.37: Credit to Private Sector Remained Weak**

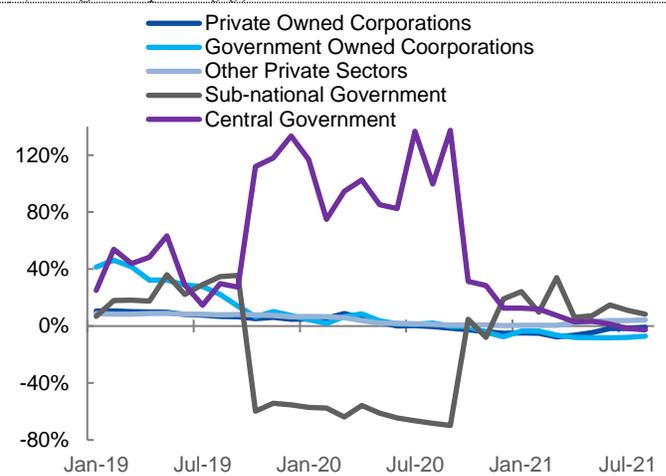
(loan growth, percent yoy, LHS; BI rate, percent, RHS)



Source: Financial Service Authority (OJK), BI, World Bank staff calculations

**Figure A.38: Credit to the Government Increased Significantly**

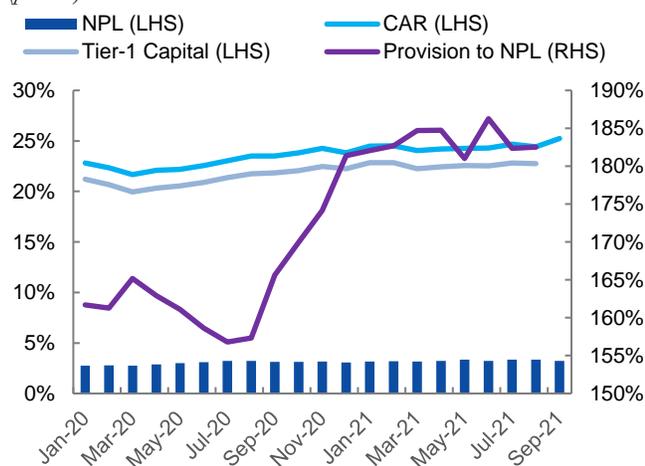
(loans growth, percent yoy)



Source: BI, World Bank staff calculations

**Figure A.39: Bank Asset Quality is overall Healthy**

(percent)



Source: OJK, World Bank staff calculations

### 3. The Outlook

*The Indonesian economy is expected to continue to rebound in 2022 assuming the country does not experience a new severe COVID-19 wave. Downside risks remain high.*

The Indonesian economy is projected to rebound by 3.7 percent in 2021 and grow by 5.2 percent in 2022 assuming there is no new severe COVID-19 wave (Table A.1). The 2021 estimate is 0.7 percentage point lower than the June forecast reflecting the impact of the Delta wave. The 2022 projection is 0.1 percentage point higher than in June based on assumptions around the vaccine rollout and pandemic control, the extent of domestic and global policy support and potential scarring effects of the crisis (Box A.2). It is assumed that the vaccine rollout will progress more evenly with most provinces reaching 70

<sup>20</sup> Including reduction of interest rates; extension of the loan term; reduction of principal arrears; reduction of interest arrears; addition of

credit/financing facilities; conversion of credit/financing into equity participation.

percent vaccine coverage in 2022. This is expected to improve consumer sentiment, release some pent-up demand, and help private consumption and contact-intensive services sectors rebound more strongly. Per capita GDP growth is projected to slow from 3.8 per annum in 2015-2019 to 3.4 percent per annum in 2021-2022.

**Continued effective COVID-19 response and structural reforms are paramount to boost medium-term growth.** Growth is projected to improve to 5.1 percent per annum on average in 2023-2024 which is close to the average growth rate in 2017-2019. However, output would remain below pre-COVID-19 levels highlighting the importance of lifting medium-term growth potential through continued effective COVID-19 response and structural reforms. Per capita GDP growth is projected to improve to 4.0 percent per annum in 2023-2024.

**External financing conditions are expected to tighten but Indonesia has policy space to keep supporting the recovery.** The outlook assumes that global financing conditions will start to gradually tighten in 2022 consistent with policy signals by the US Federal Reserve. Although debt selloffs could increase, stronger commodity prices and structural reforms are expected to support FDI. External financing needs are expected to increase but remain contained as the current account deficit widens gradually from a lower base than before the pandemic. Although inflation is expected to pick up, it is projected to remain within the official target. Overall stable Rupiah, adequate official reserves, high interest rate differential with the US, and low inflation provide Indonesia with policy space to manage tighter global financial conditions while supporting the economic recovery.

**The fiscal deficit is expected to narrow to 3 percent of GDP starting in 2023 in line with the government's commitments.** The fiscal deficit is projected to drop

from 5.0 to 3.9 percent of GDP in 2021-2022 as spending moderates and revenues continue to rebound. The baseline assumes that over half of the fiscal adjustment needed to achieve the 3 percent of GDP in 2023 will be through expenditure cuts.<sup>21</sup> The remainder will be achieved through rebounding revenues driven by stronger growth and progress in implementing the Tax Harmonization Law (Box A.4). Expenditure reductions will come mainly from the unwinding of some exceptional COVID-19 measures and lower capital spending, while higher social assistance spending is maintained to protect the poor. The implementation of Tax Harmonization Law is estimated to boost tax revenues by 0.7 percentage point of GDP in 2022, which then restores the tax-to-GDP ratio in 2023 to its pre-pandemic level at 9.8 percent of GDP. Gross financing needs would decline from 7.4 to 6.9 percent of GDP between 2020 and 2023 but would remain above pre-crisis levels (5.9 percent of GDP in 2019). This is as the debt-to-GDP ratio rises from 30.2 to 44.3 percent of GDP in 2019-2023, although it remains well below the legal ceiling (60 percent of GDP).

**The materialization of some downside risks would slow the recovery in the short term and tighten policy space.** The forecasts are subject to considerable uncertainty on the pandemic, global financial conditions, banking and financial sector performance and stress and scarring effects of the crisis (Box A.5). A slower-than-expected vaccine rollout or spread of new variants such as Omicron, combined with weaker global growth could lower Indonesia's growth to 3.3 percent in 2022. In the near term COVID-19 could become endemic which would raise new challenges such as maintaining adequate vaccination and other prevention and response measures for a protracted period. This would erode policy space and undermine longer-term growth.

#### Box A.2: Outlook Assumptions and Downside Risks

The baseline forecasts are built on the following assumptions on the vaccine rollout, the extent of global and domestic policy support, and potential scarring effects of the crisis.

- **Pandemic control and vaccine rollout:** it is assumed that Indonesia will not experience a new severe COVID-19 wave. It is also assumed that the vaccine rollout will progress more evenly and that most provinces will reach 70 percent vaccine coverage in 2022. This would help contain the pandemic and improve consumer confidence. This would release some pent-up demand and help private consumption and more contact-intensive sectors recover.
- **Global and domestic support and spillovers:** On the global front, fiscal and monetary support is expected to be gradually unwound. The baseline assumes that the US Federal Reserve will start scaling back its exceptional asset purchase program in 2022 with potential rate hikes in the near term. Notwithstanding global trade and commodity prices are expected to moderate, although they remain overall strong. Oil prices are projected to rise moderately by 6 percent in 2022 before sliding by 12 percent in 2023. Coal prices are expected to remain at high levels through the start of 2022, increasing by 14 percent before falling by 25 percent in 2023 as supply constraints ease and production increases. Metal and agriculture prices are expected to decline 5 and 1 percent, respectively, in 2022 and each decrease 1 percent further

<sup>21</sup> These adjustments refer to differences relative to a no-reform baseline.

in 2023 (Commodity Market Outlook, October 2021). Despite temporary disruptions, trade volumes are expected to grow nearly by 10 percent in 2021, moderate to about 7 percent in 2022 and 3.5 percent over the medium-term (World Economic Outlook, October 2021). On the domestic front, it is assumed that monetary and fiscal policy would remain broadly accommodative in 2022 with gradual unwinding in subsequent years.

- **Scarring:** the crisis could damage Indonesia's growth potential through lower investment, weak productivity growth, and slower human capital accumulation. Potential growth is projected to drop by at least 1.2 percentage points below pre-COVID-19 levels (average 2010-2019) to 4.0 percent on average in 2021-2023, driven largely by depressed investment. Potential growth could drop further in the medium term if the crisis were to deepen or to spill over to the banking and financial sector. Under the baseline, growth would return to its pre-COVID-19 potential by 2024 assuming continued adequate COVID-19 response and the implementation of structural reforms.

**Risks to the outlook are severely skewed to the downside.** The forecasts are subject to considerable uncertainty on the future path of the pandemic, global financial conditions, banking and financial sector performance and stress and scarring effects of the crisis:

- **The vaccine rollout and new variants:** On the downside, the pandemic could last more than expected due the emergence of more transmissible variants. This could increase the incidence and frequency of flare-ups. Vaccine rollout could also be slower-than-expected due to vaccine supply shortages and distribution bottlenecks. Lastly, COVID-19 could become endemic which would raise new challenges such as maintaining adequate vaccination and other prevention and response measures for a protracted period, as well as erosion in policy space.
- **Global financial conditions:** Global financial conditions could tighten faster and more strongly than anticipated. Although Indonesia is well prepared, large capital outflows and rupiah depreciation could make financing of the twin deficit and corporations more difficult and fuel inflation.
- **Banking and financial sector performance and stress:** The ongoing weak credit impulse could slow down the recovery. At the same time, a wave of corporate default could trigger a crisis or weaken the banking system and its ability to provide credit during the crisis.
- **Scarring from the crisis:** Potential and actual output could take longer to recover due to deeper scars on firms' balance sheets and potentially higher bankruptcies, human capital loss of the unemployed and discouraged workers, weaker human capital accumulation of children and youth, etc.

Table A.1: Key Macroeconomic Indicators, 2019-2022

	2019	2020	2021	2022	2023	2024
	Actual		Projection			
Real GDP Growth and inflation, percent change						
Real GDP	5.0	-2.1	3.7	5.2	5.1	5.1
Private Consumption	5.2	-2.7	3.7	5.2	5.1	5.2
Government Consumption	3.3	1.9	3.1	2.9	2.8	3.0
Gross Fixed Investment	4.5	-4.9	4.0	5.5	5.4	5.5
Exports	-0.9	-7.7	9.1	7.9	7.3	7.3
Imports	-7.4	-14.7	9.0	8.0	7.6	7.9
CPI (year-average)	2.8	2.0	1.6	2.2	2.5	3.4
Fiscal accounts of Central Government, percent of GDP						
Revenues	12.4	10.7	11.7	11.8	11.8	12.1
of which tax revenue	9.8	8.3	9.0	9.7	9.8	10.1
Expenditures	14.6	16.8	16.7	15.7	14.9	15.2
of which interest expenditure	1.7	2.0	2.2	2.2	2.4	2.5
Fiscal Balance	-2.2	-6.1	-5.0	-3.9	-3.0	-3.0
Central Government Debt	30.2	39.4	41.8	43.7	44.3	44.4
Balance of Payments, percent of GDP unless indicated otherwise						
Balance of Payments	0.4	0.2	1.9	0.6	0.4	0.7
Current account balance	-2.7	-0.4	0.2	-1.2	-1.6	-1.9
Financial account, of which	3.3	0.7	1.8	1.9	2.0	2.6
Net FDI inflows	1.8	1.3	1.4	1.5	1.7	1.8
Foreign exchange reserves (months of imports of goods and services)	9.7	8.8	9.0	8.7	8.1	7.9
Terms of trade (2019 = 100)	100	111.5	136.0	129.1	127.3	125.5

Source: Ministry of Finance, Bank Indonesia and World Bank staff projections

*The lengthening pandemic and recurrent COVID-19 waves risk leaving lasting scars if not prevented and treated well.*

**Beyond its short-term negative effects, COVID-19 could also reduce longer-term growth through various channels.** Severe recessions have been associated with persistent losses in growth (World Bank GEP June 2020 and EAP Update April 2021). The channels include depressed investment due to weak growth expectations, human capital losses due to protracted unemployment, and their adverse effects on productivity. The exceptional nature of the COVID-19 pandemic could accentuate these effects through additional channels, including (i) protracted low aggregate demand and supply due to weak sentiment and high precautionary saving; (ii) persistent changes in consumption patterns as consumers maintain infection avoidance behaviors; (iii) and slower human capital accumulation due to school closures.

**Potential growth declined slightly during the pandemic but could recover in the medium-term with effective COVID-19 response and structural reforms.** COVID-19 is accentuating the longer-term decline in potential growth. Potential growth dropped by 20 percent or 1.3 percentage points in 2010-2019 driven by lower investment and productivity (Figure A.40). Potential growth declined by 3 percent in 2020 or 0.1 percentage points, although the impact has been lower compared to peers because Indonesia experienced a shallower recession. The impact of COVID-19 has also been lower than the Asian Financial Crisis, consistent with the global evidence that financial crises are associated with deeper and longer-lasting scars (World Bank GEP June 2020). World Bank projections suggest that potential growth could recover within 5 years (Figure A.41). This assumes effective COVID-19 response and mitigation, actions to remedy learning losses (Box A.3) and other human capital and asset losses, as well as successful implementation of structural reforms.

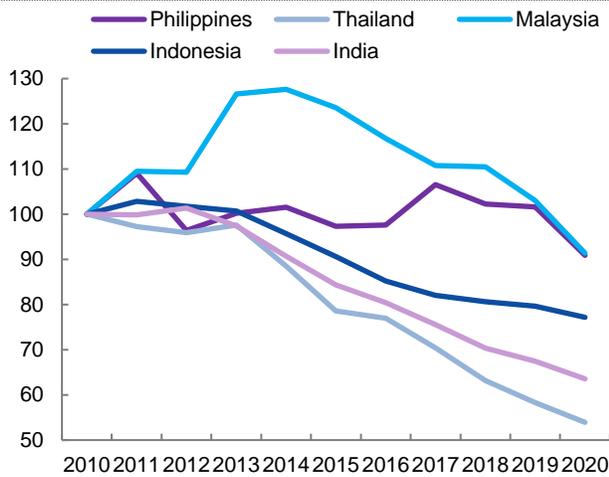
**Potential labor market scarring is analyzed in a case study focused on youth and young graduates.** These groups, together with older workers and women, are particularly vulnerable to lasting effects of downturns. This is through three main channels: (i) hysteresis in the initial lower probability of employment during recessions; (ii) adoption of coping mechanisms such as informal work which, however, can erode skills, productivity, and future earnings; (iii) inability to adopt other coping mechanisms such as extending schooling due to school disruptions during COVID-19 which increase risks of persistent inactivity and skills losses. The case study below discusses each of these channels during COVID-19 with comparison with the Asian Financial Crisis.

**Unemployment and informal work among youth increased during COVID-19 and could persist after the pandemic.** Globally and in Indonesia, youth (15-24 years old) are more likely to be unemployed than adults. This gap tends to increase during crises and COVID-19 has been no exception. The youth unemployment rate increased by 1.5 percentage points (pp) in February-August 2021 while it decreased by 0.1 pp among workers 25-59 years old (BPS August 2021), Figure A.15. The reduced employment opportunities for youth could persist for several years. It took 10 years for new graduates during the AFC to catch up to their peers who graduated just before or after the crisis (Figure A.42). More youth are also working in precarious and informal forms of employment. The informality rate among youth and young graduates increased, respectively, by 6.0 and 13.1 pp in February 2020-2021, compared to 2 pp among adults.

**Many youths exited the labor market and were not in employment, education, and training (NEET).** The youth employment rate decreased by 2.5 pp while their unemployed rate increased by 0.5 pp in February 2020-2021, indicating that many youths have become discouraged workers (Figure A.43). A similar trend was observed among young graduates. Coping by extending schooling declined during COVID-19 compared to the AFC, potentially due to learning disruptions. While the share of youth in education decreased slightly by 0.1 pp during the AFC, it dropped by 2.5 and 4.5 pp in February 2020-2021 for youth and young graduates, respectively. More generally, the share of youth not in employment, education, and training (NEET) increased from 8 pp to 16.4 percent in February 2020-2021. These findings highlight the potentially substantial learning and skills losses during COVID-19.

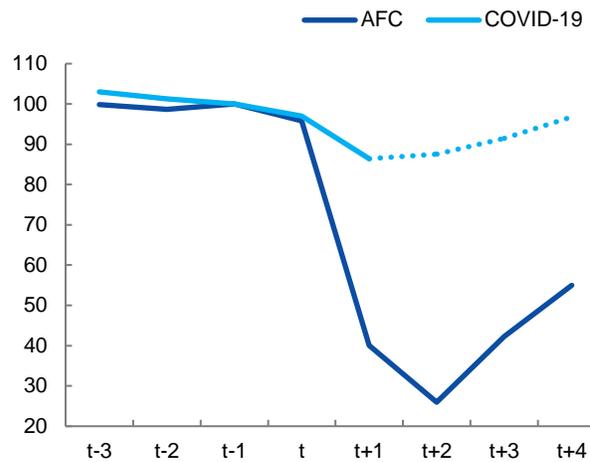
**The young graduates who found a job during COVID-19 are earning less.** An extensive academic literature finds that youth graduating during crises suffer from long-term skills and earning losses due to unemployment and lower quality jobs that do not match their skills (Cunningham and Maloney, 2000; Kahn, 2005; Cunningham and Salvagno, 2011; O'Higgins, 2011; Choudhry, Marrelli and Signorelli, 2012; Oreopoulos et al, 2012, and Naidoo et al. 2015.). In fact, there is evidence of lower earnings among the 5.7 million graduates who entered the labor market between 2020 and early 2021. They were earning on average 19 percent less than their peers who graduated just a year before. Evidence from the Asian Financial Crisis shows that wages drop by 3-4 percent for every year a youth spent in informal self-employment.

**Figure A.40: COVID-19 is Accentuating the Longer-term Decline in Potential Growth**  
(Potential growth, 2010=100)



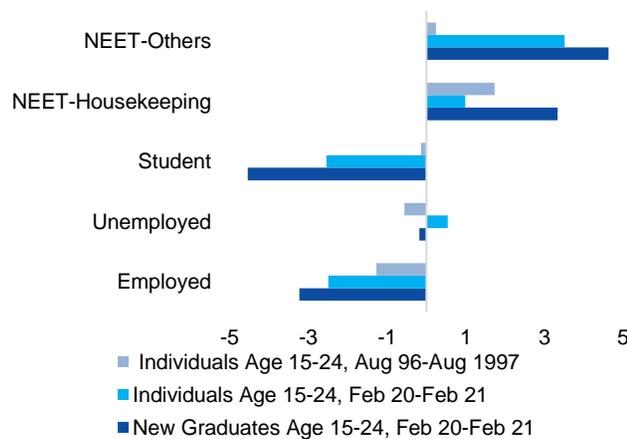
Source: World Bank Macro Poverty Outlook Database October 2021; World Bank staff calculations

**Figure A.41: Potential Growth Could Recover in the Medium-term with Effective COVID-19 Response and Structural Reforms.**  
(potential growth, t-1=100)



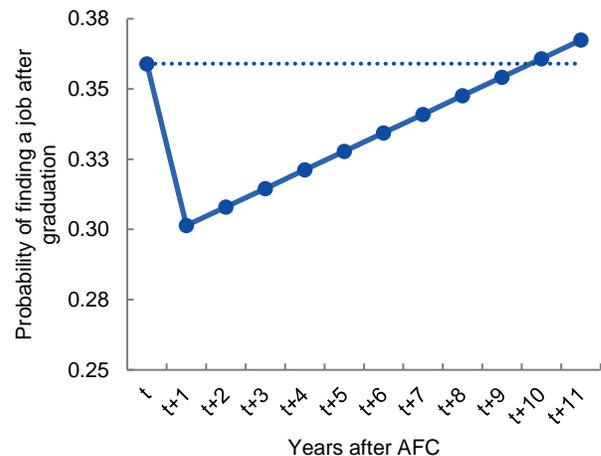
Source: BPS through CEIC; World Bank staff calculations  
Note: t denotes the year where the shocks occur: 1998 for the Asian Financial Crisis (AFC), and 2020 for the COVID-19 Pandemic. Dotted line indicates projection

**Figure A.42: Youth Occupation during COVID-19 and the AFC**  
(change in youth occupation during the AFC 1997-1998 and COVID-19 2020-2021, in percentage point)



Source: Microdata from Sakernas 1996, 1997, 1998, 2020, 2021. Note: Results are for youth (15-24 years old) during COVID-19 and the Asian Financial Crisis (AFC). NEET (not in employment, education or training).

**Figure A.43: Probability of Finding a Job among Young Graduates during the AFC**  
(potential growth, t-1=100)



Source: own calculation based on IFLS 2, 3, 4 and 5. Note: Results are for youth (15-24 years old) who graduated during the Asian Financial Crisis (AFC) compared to youth who graduated just before or after. Graduation refers to graduation from lower secondary and higher levels of education.

**Box A.3: Recovering Losses during COVID-19 and Raising Learning for All**

**The Indonesian education system was facing a learning crisis before the pandemic.** Only 30 percent of Indonesian children achieved minimum scores in reading on the 2018 Programme for International Student Assessment (PISA). The proportion of children who are unable to read and understand a short age-appropriate text by age ten was estimated at only 53 percent using pre-COVID-19 data (Human Capital Index 2020).

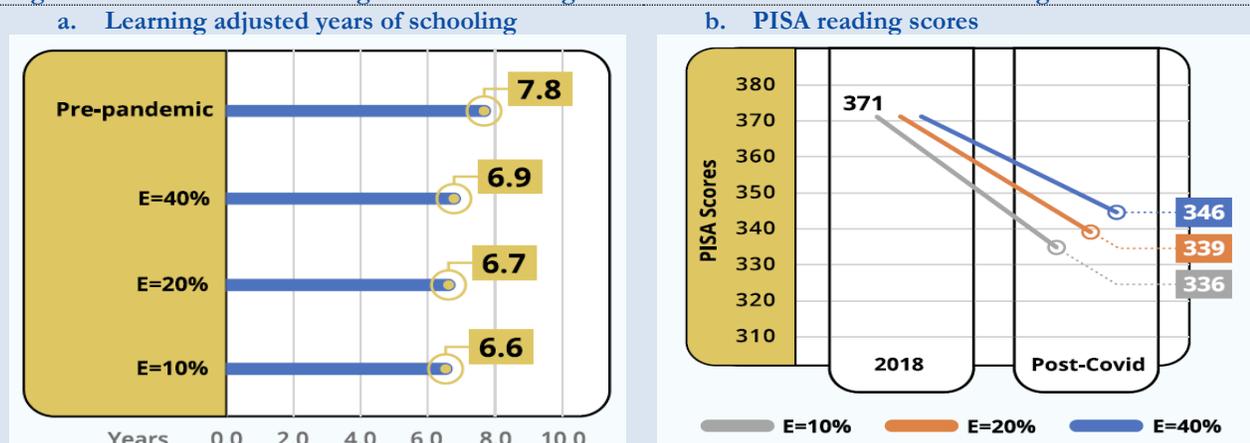
**Schools closed and shifted to less effective and shorter distance learning during COVID-19.** Most schools were closed until June 2021, with a gradual re-opening through November 2021. The government moved quickly to establish distance learning mechanisms including through online platforms such as *Belajar Dari Rumah* (Learning from Home), educational television (*TV Edukasi*), and provided free internet quotas to students, teachers, and lecturers. Although take-up was high, virtual schooling hours

varied widely. The HiFy survey found that although 93 percent of students were engaging in distance learning activities from home, the average number of hours spent daily on distance learning activities varied from nearly 3.5 hours per day in DKI Jakarta to 2.2 hours outside Java. Students in rural areas and those in the bottom 40 percent spent on average 0.4 hours less on distance learning than their peers in urban areas and those in the top 20 percent, respectively. Beyond class hours, the effectiveness of distance learning varies depending on teachers’ ability to interact with students and effectively instruct, the quality of learning materials, and the students’ ability and parental support, among other factors. Based on the evidence currently available, students learn best face-to-face with their teachers.

**Afkar and Yarrow (2021) estimate that school closures lowered schooling by 0.9 to 1.2 learning adjusted years of schooling and PISA reading scores by 25 to 35 points.** According to the Human Capital Index 2020, an Indonesian child is expected to complete 12.4 years of schooling but only 7.8 years of learning which is known as learning adjusted years of schooling (LAYS). Afkar and Yarrow estimate that school closures through end of June 2021 lowered LAYS to 6.9 years, assuming the effectiveness of distance learning is 40 percent<sup>22</sup>. The LAYS could be further lowered to 6.7 and 6.6 assuming the effectiveness of distance learning is 20 and 10 percent, respectively. The PISA reading scores, which measure 15-year-olds’ learning levels for reading, are estimated to decrease from 371 to 346 unless actions are taken to recover and accelerate learning. Indonesia is not alone; the pandemic has challenged students, parents, and education systems around the world, with effects varying by income and student age groups and other factors. [Patrinos and Donnelly \(2021\)](#) find that students in early grades are more vulnerable to learning losses than secondary students because of their inability to independently seek learning due to the differences in developmental and cognitive abilities.

**The learning losses would translate into annual earning losses equivalent to 7-10 percent per annum per student.** Our estimates show that the average student will face a reduction of annual earnings of US\$408 to \$575 depending on the effectiveness of distance learning. The present value loss in lifetime earnings for all students of about US\$253 billion under the optimistic scenario, equivalent to 24 percent of GDP.

**Figure A.3.1: Estimated learning and PISA reading score losses due to school closures during COVID-19**



Source: Afkar and Yarrow (2021). Note: E refers to the assumed effectiveness of distance learning.

**School dropout increased during the pandemic with lack of financial resources for tuition playing a major role among female dropouts.** About two percent of children aged 5- 18 years who had been enrolled in school up to March 2020 were no longer enrolled in November 2020 according to the HiFy survey, with male students more likely to drop out (2.5 percent) than females (1.3 percent). Male students who dropped out reported as main reasons “delay further schooling temporarily” (34 percent) and “did not want to continue” (31 percent). Most female dropouts (74 percent) reported ‘lack of financial resources to pay tuition fees’ as the main reason, compared to only ten percent among male students.

**To accelerate learning recovery, the government, schools, teachers, parents, and all stakeholders need to act now.** Afkar and Yarrow propose five strategic priorities to remedy learning losses and improve learning for all. First, schools and teachers will need to assess and identify what the students have and have not learned during school closures. A personalized approach for each child is needed to accelerate their learning recovery. It is important that local governments identify areas and schools where support is needed the most. Second, ensuring teachers have the right knowledge support and tools to deliver remote learning is also crucial. Third, parental engagement needs to be supported to ensure children are still learning even from home. Fourth, as schools gradually

<sup>22</sup> In our model, the effectiveness of alternative modalities (E) ranges from zero if the distance learning solutions are expected to have no effect on student learning, to one if those solutions are expected to be fully effective (meaning they are equivalent to face-to-face instruction).

reopen schools, it is important to improve water, sanitation and hygiene facilities for all. Finally, a key long-term recommendation is to increase the resilience of education service delivery to pandemics, climate change and other threats.

## 4. Policy Priorities

### *Macroeconomic Policy Trade-offs are Becoming more Acute*

**Looking ahead, policymakers will face three key challenges:** (i) *containing the pandemic*: the pandemic is not over. Omicron and other variants could spread, and COVID-19 could become endemic; (ii) *maintaining adequate monetary and financial policies*: the economy is still below potential while global financial conditions are likely to start tightening before Indonesia and other emerging markets have fully recovered; (iii) *enhancing fiscal space*: fiscal policy has the dual objective of meeting immediate pandemic needs while containing financing needs and public debt; (iv) *advancing structural reforms to boost inclusive and green growth*: igniting structural drivers of growth is important at a time when macroeconomic policy space is narrowing, the pandemic is weakening longer-term drivers of inclusive growth such as human capital and productivity, and addressing climate change becomes more urgent.

### *Containing the Pandemic*

**It is important to accelerate the vaccine rollout more evenly and ensure adequate testing-tracing-treatment and other health measures.** The government's prioritization of vulnerable health groups and geographic locations with high transmission rate such as cities helped it achieve high vaccination rates among these populations. Achieving higher vaccination in more remote areas will require not only maintaining adequate vaccine supplies but also addressing distributional bottlenecks and vaccine hesitancy. Improving testing and tracing remains crucial to target health measures and contain the pandemic. As evident during the Delta wave, sufficient hospital beds, critical care equipment such as ventilators and oxygen, and skilled human resources are essential to improve patient treatment and reduce morbidity.

**Recent government initiatives to promote regional cooperation on the production of vaccines and therapeutics are important to manage COVID-19 over the medium term.** Managing a longer pandemic and endemicity will require large supplies of vaccines and therapeutics. Although global vaccine production is expected to increase, global vaccine cooperation has been more difficult and uncertain. Regional cooperation could be an alternative path to ensure adequate and reliable access to vaccines

and therapeutics. The government's recent partnership agreements to establish vaccine and antiviral manufacturing plants in Indonesia are important steps in this direction.

### *Maintaining Accommodative Monetary and Financial Sector Policies while Preparing to Adjust*

**Given domestic economic conditions and the available policy space, authorities can maintain an accommodative monetary policy stance while preparing to manage tightening of global financial conditions.** Indonesia's external financing needs and exposure have moderated with the narrowing of the current account deficit and declining stock of domestic asset held by non-residents. Moreover, Indonesia has monetary policy space given the real policy rate differential with the US, adequate foreign exchange reserves, stable rupiah, and low inflation expectations. These conditions call for maintaining low nominal interest rates and exchange rate flexibility in the near term given the negative output gap and still uncertain recovery. However, it is also important that authorities continue to monitor external and domestic pressures and adjust their strategy to evolving circumstances. A well communicated and credible central bank strategy is also crucial for the effectiveness of monetary policy.

**Exit from macroprudential easing, particularly loan forbearance measures, involves trade-offs, and will need to be carefully designed and managed.** While these measures helped prevent the initial liquidity crunch from quickly morphing into widespread insolvency problems, uncertainties remain as to whether policy support has postponed or averted insolvency for corporates. Zombification risks (i.e. loss-making firms kept alive by policy support) could be high if bank lending keeps unviable firms alive to avoid loan losses. On the other hand, bankruptcies and loan defaults will increase unless firms in the most affected sectors continue to receive support. Hence, the policy trade-off appears difficult between zombification (if exiting too late) and bankruptcies (if exiting too early). Several considerations are important to the design of exit strategies, including close coordination between all financial sector authorities, tightening, or withdrawing from overly generous measures first, avoiding undue financial stability risks and setting-up contingency plans for banks that may become distressed during the exit phase.

**Strengthening the corporate insolvency system to enable firms to tide over a difficult economic period and**

**manage systemic risks.** A potential wave of corporate bankruptcies could push the corporate insolvency system beyond its limits and trigger fire-sales and a collapse in asset prices.<sup>23</sup> This risk is particularly acute in Indonesia, which features an insolvency system with very limited uptake by firms and a severe lack of access by smaller firms. These features are partially explained by the high complexity and exorbitant costs of the Bankruptcy Law, which was designed with large corporates in mind but lacks a special approach that may accommodate SMEs. Indeed, while Indonesia features around 30 million firms<sup>24</sup>, insolvency filings amount to only 500 cases a year, approximately. As a result, the limited capacity of the insolvency system may be a serious obstacle when dealing with an abrupt increase in the number of filings, should it materialize. This risk is particularly relevant in the current context, where distressed but viable firms (most of them SMEs) will need to restructure their debt and adjust to the challenges posed by the pandemic, especially when the extraordinary measures expire in March 2023. As currently designed, Indonesia's insolvency system may be a key obstacle to complete such adjustment, which may lead to the liquidation of viable firms and exacerbate the negative impact of the crisis, including a sharp deterioration of bank asset quality and increase in non-performing loans.

### *Enhancing Fiscal Space*

**On the fiscal front, the priority is to improve fiscal space to support the recovery as the pandemic lengthens while ensuring medium-term fiscal sustainability.** The short-term priority for fiscal policy is to remain focused on containing the pandemic and providing relief to households and viable firms. As discussed further below, fiscal space could be enhanced through better targeting and reprioritization of spending as well as implementation of tax reforms. A credible and flexible medium-term fiscal strategy to return to the legal deficit ceiling (3 percent of GDP) at a time of high financing needs, monetary financing of the deficit and tightening global financial conditions can help improve investor sentiment (World Bank IEP June 2021).

**Better targeting and reprioritization of fiscal support can help create fiscal space for immediate needs.** For example, fiscal support to viable firms could be better targeted to MSMEs while financing for large firms should come from commercial bank lending. This will help reduce short-term fiscal needs, improve the effectiveness of the fiscal response, strengthen the fiscal-monetary policy mix, and stimulate private credit. Social assistance could be improved through better program targeting and deliv-

ery by updating and expanding the DTKS database consisting of the poorest 40 percent, improving the identification of households in needs through universal digital identification, and regular program monitoring.

**The adoption of the Tax Harmonization Law (THL) on October 8, 2021, is an important step to help redress Indonesia's low tax collections.** The tax-to-GDP ratio was just 9.8 percent and fell to 8.3 percent of GDP in 2020 due to the COVID-19 crisis and previous tax cuts. Indonesia's tax gap – the difference between how much tax is collected and the country's tax potential – is estimated to have widened over time and currently stands at around 6 percent of GDP (Box A.4).

**The THL aims to increase tax revenues - by expanding the tax base and increasing tax rates - as well as to improve the overall fairness of the tax system.** Overall, it is estimated that the Tax Harmonization Law can increase tax revenues by 0.7 to 1.2 percent of GDP per annum in 2022-2025.<sup>3</sup> It expands the tax base through the introduction of a carbon tax, a final VAT on small firms, VAT collection on domestic ecommerce platforms, simplification of the approval process for excise reforms, and an asset declaration program ("tax amnesty"). The VAT rate is set to be increased by 1 percentage point in 2022 and an additional 1 percentage point could be added by 2025. A new PIT tax bracket with a 35 percent tax rate is imposed on taxable income over IDR 500 million. The previously legislated CIT rate cut from 22 to 20 percent in 2022 is abandoned. The expansion of the lowest PIT bracket, the introduction of a new tax-free threshold for the income of small firms, and stricter fringe benefits rules are contributing to making the tax system fairer. Implementation will span 2022-2025, though most measures are front-loaded to 2022-2023.

**It is important that implementation proceeds for the THL to be fully effective and impactful.** Several implementing regulations are needed for the carbon tax, the tax amnesty, the new final VAT on small firms, and the new VAT on domestic ecommerce platforms. Moreover, the enacted powers for government to cooperate with other jurisdictions on international tax collection cases will only be effective if the government actively requests overseas data on relevant taxpayers. The simplified processes for excise reforms could now be followed with proposals for the introduction of new excises (e.g. sugar-sweetened beverages) or the improvement of existing mechanisms (e.g. tobacco). It is important to complement the tax amnesty with measures to strengthen tax admin-

<sup>23</sup> <https://www.nber.org/papers/w15817.pdf>

<sup>24</sup> According to the Central Statistics Agency (BPS)

istration so that participating taxpayers and their associated assets and income remain within the tax net in the future.

**Complementary reforms will be needed to close Indonesia's tax gap.** A medium-term revenue strategy would form an overarching framework for efforts – both existing and new – toward an equitable, simple and efficient tax system that adequately finances the government's

priorities for development and poverty reduction. Candidates for the next generation of high-priority reforms include: (i) lowering the compulsory registration thresholds for the standard VAT and CIT regimes from IDR 4.8 billion to IDR 600 million; (ii) removing the final tax treatment of the construction and real estate sectors; (iii) replacing all remaining VAT exemptions with targeted social assistance; and (iv) converting the PIT regime's tax-free threshold, to a system of tax credits.

#### Box A.4: Closing Indonesia's Tax Gap Through Complementary Tax and Competitiveness Reforms

**A country's tax gap is the difference between what is collected and what could be collected given economic and other conditions.** The ratio of actual taxes over tax potential is a measure of the efficiency of tax collections. Detailed tax gap or efficiency analyses can be done by individual tax instrument depending on data availability. This can help determine the drivers of tax shortfalls e.g., lack of compliance or policy driven tax leakages.

**The IEP provides a first approximation of Indonesia's tax gap using a cross country approach.** This is done with stochastic frontier analysis (SFA).<sup>25</sup> which links a set of inputs (country characteristics) to a specific output (tax to GDP). The analysis uses a more limited sample of countries<sup>26</sup> compared to earlier studies.<sup>27</sup> The country characteristics are also limited to macro-structural determinants and do not include policy or institutional factors.<sup>28</sup> The results of the SFA are in line with expectations: GDP per capita, non-agriculture share of the economy, urbanization, and trade openness all expand the tax frontier; while age dependency and informality (as proxied by share of self-employed) reduce the tax frontier.

**The SFA shows that in Indonesia tax efficiency is below that of peers and the tax gap is rising.** High Income Countries in general tend to be clustered closer to the efficiency frontier (Figure A.4.1). Middle Income Countries are more dispersed. Indonesia's efficiency score (averaged since 2015) is among the lowest in the sample of countries and therefore furthest from the efficiency frontier. Tax efficiency has also declined over time (Figure A.4.2). This has translated into a growing tax gap estimated at around 6 percentage points of GDP for 2018 (Figure A.4.3).

**The Tax Harmonization Law enacted in November could help to reduce Indonesia's tax gap.** Preliminary estimates suggest that the Tax Harmonization Law could raise revenues by 0.7 percent – 1.2 percent of GDP in the medium-term, all other things constant. This would bridge the tax gap by 12 percent – 20 percent approximately. This is quite significant. Though there will still be a significant tax gap of around 5 percent of GDP, which will require additional tax reforms.

**Tax reforms should be complemented by improvements in the competitiveness of the business environment.** Lack of competitiveness raises the costs of doing business and induces informality and thereby tax leakage. For example, access to finance is a dimension of competitiveness that has an important impact on tax declarations. Several studies have illustrated the link between financial sector depth and tax collections. This includes firm level evidence showing that financially constrained firms tend to engage more in tax evasion and avoidance.<sup>29</sup> Recent investment liberalization reforms and upcoming financial sector reforms could have multiplicative effects on tax collections when complemented with tax reforms (Figure A.4.4).

<sup>25</sup> The SFA is based on a production function approach, whereby a set of country characteristics (inputs) determine how much an individual country could be collecting (i.e., tax potential). The SFA assumes that collections are below potential and computes an efficiency score between 0 and 1, where a higher number proxies for higher efficiency/tax effort.

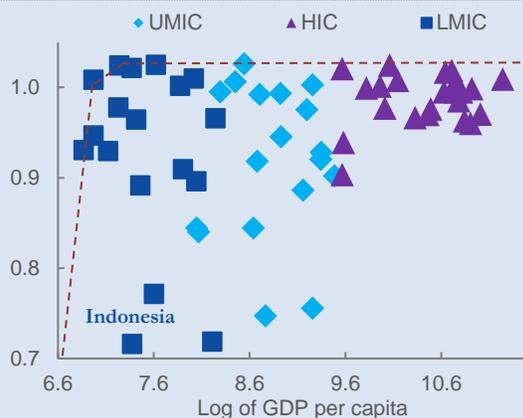
<sup>26</sup> The sample covers only high and middle-income countries, with a population of at least 20 million (with exception of a few HICs for which population may be lower), and natural resource rents below 20 percent of GDP. Low-income countries, small countries with low populations, and countries that have a high share of natural resource income are structurally very different from high income, large, economically diverse countries.

<sup>27</sup> See for example: Mawejje, J. and Sebudde, R.K. (2019), "Tax revenue potential and effort: Worldwide estimates using a new dataset," and Langford, B. and Ohlenburg, T. (2015), "Tax revenue potential and effort: An empirical investigation," International Growth Centre  
<sup>28</sup> Macro-structural characteristics include: GDP per capita, the non-agricultural share of the economy, urban share of population, age dependency ratio, trade openness, and share of self-employed (as proxy for informality). An extension of this analysis will look at how policy variables are associated with tax efficiency.

<sup>29</sup> See for example: Alm, J., Liu, Y., and Zhang, K. (2018), "Financial constraints and firm tax evasion," International Tax and Public Finance

**Figure A.4.1: Indonesia has a low tax efficiency score...**  
(log of GDP per capita vs. tax efficiency score)

(log of GDP per capita vs. tax efficiency score)



Sources: ICTD, WDI, ILO, WB Staff estimates

**Figure A.4.2: ...which has fallen over time**  
(tax efficiency score)

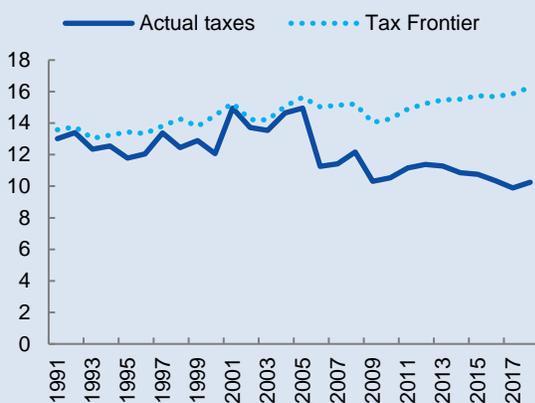
(tax efficiency score)



Sources: ICTD, WDI, ILO, WB Staff estimates

**Figure A.4.3: Indonesia has experienced a widening tax gap since 2005**  
(Actual tax collection/ GDP vs. Tax potential/ GDP)

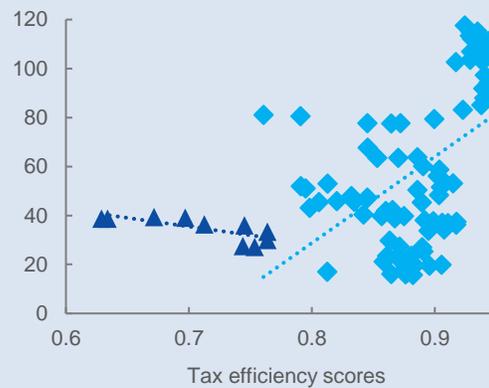
(Actual tax collection/ GDP vs. Tax potential/ GDP)



Sources: ICTD, WDI, ILO, WB Staff estimates

**Figure A.4.4: Tax reforms must complement wider competitiveness reforms**  
(Tax efficiency score vs. private credit to GDP)

(Tax efficiency score vs. private credit to GDP)



Sources: ICTD, WDI, ILO, WB Staff estimates

**Advancing structural reforms to boost high, inclusive, and green growth**

**Indonesia has embarked on important structural reforms during the pandemic that stand out in the East Asia and Pacific region and among emerging market economies.** The reforms in the Omnibus Law for Job Creation (OL) and the Tax Harmonization Law (THL) aim to improve Indonesia’s attractiveness to foreign investment, the functioning of the labor market and fiscal space. Competitiveness gap analysis indicates that they are addressing priority reform areas.<sup>30</sup> Indeed, pre-pandemic factor-driven competitiveness indicators were weaker in infrastructure, including ICT, and health (Figure A.44).

Efficiency-driven competitiveness indicators were also low for the labor market (Figure A.45). The OL reforms are also important for Indonesia to catch up to large middle-income peers that have liberalized Foreign Direct Investment (FDI) and labor markets faster in the 1990s and 2000s.

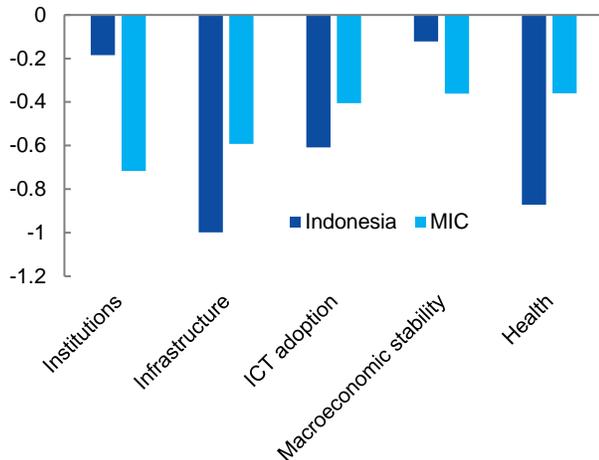
**Further reforms are needed to reduce gaps with peers.** Although the liberalization of the financial system is at par with peers (Figure A.46), the financial system is shallow compared to large middle-income peers (Figure A.45). Indonesia lagged behind its peers in reforming its product markets in the 1990s and 2000s (Figure A.46). Today, the quality of product market regulation for instance

<sup>30</sup> Competitiveness indicators can be classified in three groups according to the Global Competitiveness Index: (i) factor-driven competitiveness related to infrastructure, human capital, and institutions; (ii) efficiency-driven competitiveness associated with the functioning of factor and product markets; (iii) innovation-driven competitiveness related with innovative and entrepreneurial capacity.

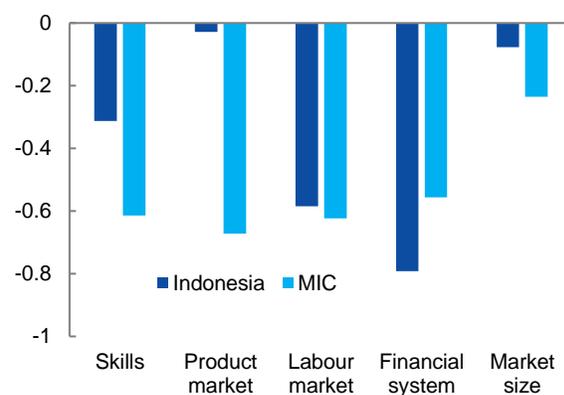
is relatively low (Figure A.47) due to a combination of high market involvement and interventions by the State – such

as SOE presence, price controls, heavy regulatory burden – as well as barriers to firm entry, investment, and trade.

**Figure A.44: Gaps on Factor-based Competitiveness Indicators are Larger for Infrastructure and Health**  
(Competitiveness z-score, factor accumulation-based competitiveness indicators)

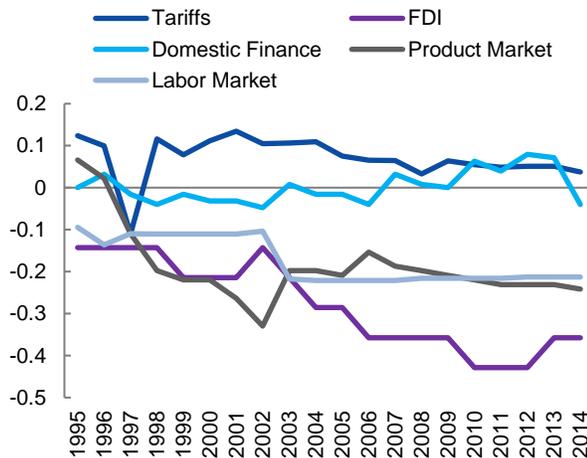


**Figure A.45: Gaps on Efficiency-based Competitiveness Indicators are Larger for Financial and Labor Markets**  
(Competitiveness z-score, efficiency-based competitiveness indicators)



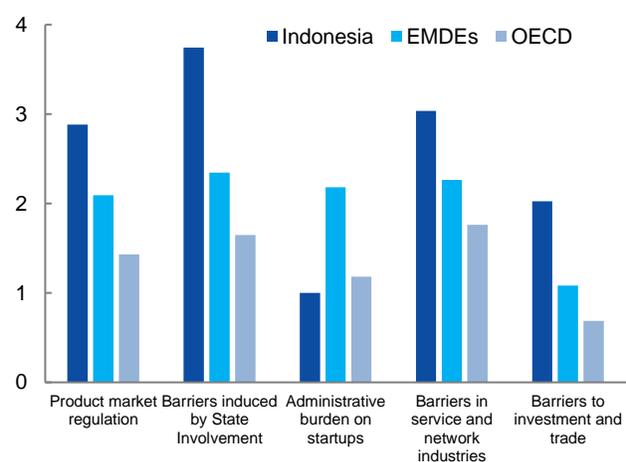
Source: Global Competitiveness Indicators, 2019. Note: Figures show z-scores (competitiveness scores minus sample mean divided by standard deviation). The sample is composed of 9 large middle-income countries MIC (Brazil, China, Colombia, India, Indonesia, Poland, Russia, South Africa, Turkey) and the 5 largest high-income countries (the United States, Japan, Germany, the United Kingdom and France).

**Figure A.46: Ongoing Reforms are Important to Reduce Reform Gaps with Peer Middle-income Countries**  
(Reform index, difference between Indonesia and large middle-income peers. Negative values = regulations in Indonesia are more restrictive)



Source: IMF Structural Reform Database developed by Papageorgiou et al. (2019). Note: The reform index takes values between 0 and 2 with higher values indicating more liberalized markets. The figures show the difference between Indonesia and 8 large middle-income peers (Brazil, China, Colombia, India, Indonesia, Poland, Russia, South Africa, Turkey).

**Figure A.47: The Quality of Product Market Regulation is Relatively Low**  
(Product market regulation and subcomponents, lowest=less distortive)



Source: OECD Product Market Regulations. Note: Data are for the most recent years. EMDEs are Brazil, Bulgaria, Croatia, Romania, Russia, and South Africa.

**Complementary reforms are critical to respond to the COVID-19 crisis and build a more competitive, resilient, inclusive, and greener economy.** Structural reforms to address remaining reform gaps are important to generate growth with less fiscal and monetary support. They are also critical to continue to remedy scars from the

crisis and put the economy on a more inclusive and sustainable growth path. Analysis of Indonesia’s development challenges and the implications of COVID-19 highlight several policy priorities:

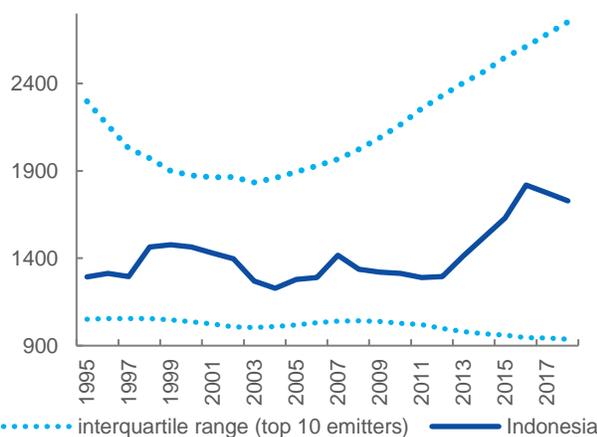
- (i) *Business environment:* The reform actions in the Omnibus Law for Job Creation to attract foreign investment can be complemented with

- equally important trade reforms such as reducing non-tariff barriers (Box A.5). This is critical to improve market access and level the playing field.
- (ii) *Financial sector:* The Financial Sector Omnibus Law (FSOL) is a window of opportunity to improve financial sector depth and stability. The law can help promote legal certainty, clarity, and confidence, especially in legal frameworks on financial innovation, macro prudential mandates, organizational structure for effective supervision and legal protection of officials of financial sector authorities. Moreover, completing the revision of the Bankruptcy Law and developing industry-funded resolution mechanisms are important to strengthen the insolvency framework and the crisis preparedness and resolution framework.
  - (iii) *Digitalization:* Improving access to the internet for all by enhancing regulation and competition in the digital infrastructure sector, digital skills and services, and e-government can help close the digital divide and boost the development of the digital economy (World Bank “Beyond Unicorns”, 2021).
  - (iv) *Human capital:* As discussed in Box A.3, reversing learning losses and building a more resilient education system will involve

providing more remedial classes, better preparedness for effective distance learning, investment in school water and sanitation infrastructure. Beyond education policies, risks to higher longer-term poverty and inequality could be addressed by improving the coverage and adaptability of social assistance, such as cash transfers and active labor market programs, and social insurance such as unemployment insurance for self-employed, informal workers and gig-workers. As highlighted by the pandemic, strengthening the health sector is critical to improve human capital as well as economic and social resiliency.

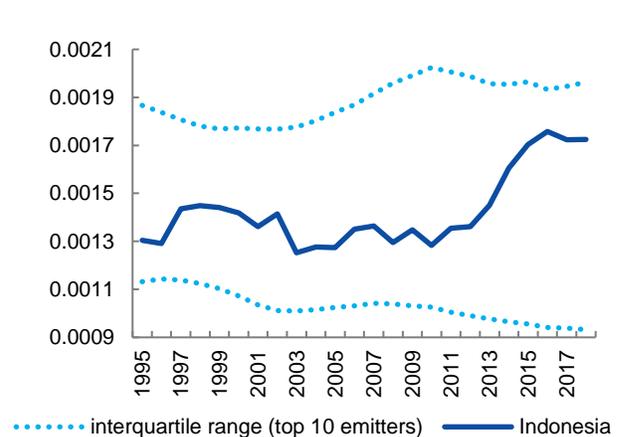
- (v) *Lower carbon transition:* Indonesia is among the top ten greenhouse gas emitters in the world due mainly to land and energy use (Figure A.47). Growth has also been increasingly carbon-intensive (Figure A.48). The government has made important commitments to mitigate climate change (Box A.6). As discussed in the second part of this report, decarbonizing the energy sector by accelerating the government’s commitments will require reforming electricity subsidies and pricing and promoting private investment in cleaner sources of power such as renewable energy, among other reforms.

**Figure A.48: Indonesia is a Large Emitter of CO2**  
(Metric ton of CO2 equivalent)



Source: World Resource Institute CAIT database. Note: The top 10 emitters are Brazil, Canada, China, Germany, Indonesia, India, Iran, Japan, Russia, United States

**Figure A.49: Growth Has Been Increasingly Carbon Intensive**  
(Metric ton of CO2 equivalent per real GDP in millions of US\$)



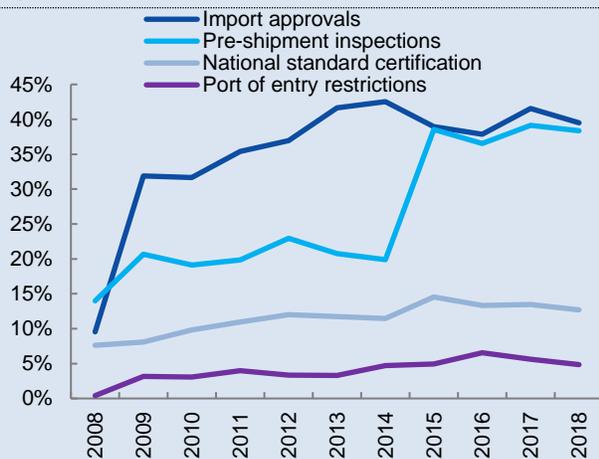
Source: World Resource Institute CAIT database. Note: The top 10 emitters are Brazil, Canada, China, Germany, Indonesia, India, Iran, Japan, Russia, United States

**Box A.5: Non-tariff Measures in Indonesia: Reforms for Competitiveness, Export Growth and Resilience**

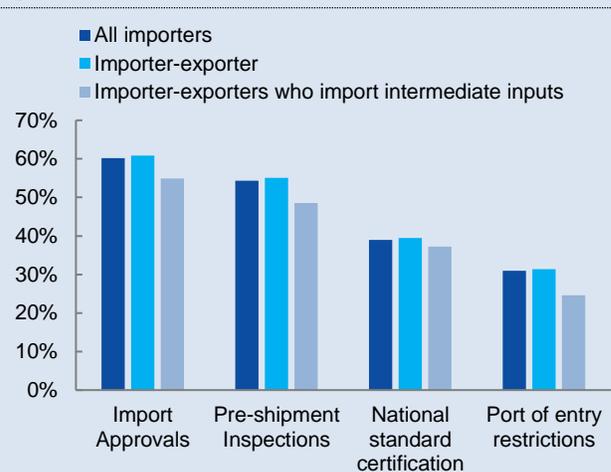
In today’s global value chains, Indonesian firms need to be able to import easily to export competitively. Imports are essential inputs into production, particularly for exports, as companies cannot successfully compete in international markets by sourcing all their inputs from domestic markets only. In Indonesia, for instance, two-thirds of exports are generated by firms that both export and import, demonstrating that imported inputs play a key role in generating export revenues. In turn, performance in international markets is positively related to the degree of competition in the domestic market (Porter, 1990) as lower import competition reduces exports by stifling productivity-enhancing investments.

Non-tariff measures (NTMs) are increasingly used as a trade policy tool in Indonesia (Figure A.5.1). While certain NTMs are used to achieve legitimate non-trade objectives such as protection of consumer health and safety, there are many that unnecessarily distort trade. The four NTMs that have been found to be among the most burdensome and costly for Indonesian firms are: pre-shipment inspections, restrictions on port of entry, import approvals and certification of compliance with Indonesian national standards (SNI). Import approvals and pre-shipment inspections affect more than one-third of Indonesian imports and close to two-thirds of firms, while SNI and port of entry restrictions affect about 5-10 percent of imports and a third of firms (Figure A.5.1 and A.5.2).

**Figure A.5.1: Share of imports affected by NTMs**



**Figure A.5.2: Share of firms affected by NTMs**



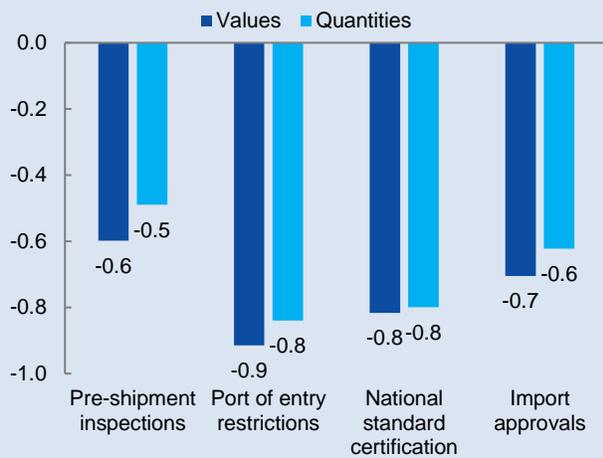
Source: World Bank.

World Bank analysis shows that an increase in firms’ exposure to these four NTMs leads to a significant decrease in export growth and diversity. On the one hand, results show that increased exposure to the four NTMs reduces firm-level export values and quantities. For instance, a 1 percent increase in exposure to port of entry restrictions and national standard certifications leads to a 0.8-0.9 percent decline in exports values and quantities (Figure A.5.3). Furthermore, higher NTM exposure is also associated with a lower number of products exported and a decrease in the number of export market destinations at the firm level. A 1 percent increase in exposure to port of entry restrictions and national standard certifications results in a 0.1-0.2 percent decline in the number of exported products and new destinations (Figure A.5.4).

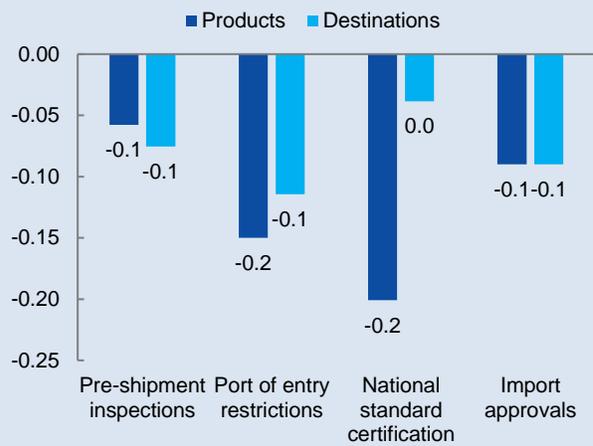
The authors also find that NTMs reduce firms’ survival rates and their ability to respond to economic shocks. When faced with economic shocks, firms - especially producers and smaller firms - see a much larger drop in their export values when they are exposed to NTMs. With an adverse exchange rate shock for instance, the drop of firms’ exports is magnified by 8-10 percent in the presence of NTMs (Figure A.5.5). Finally, higher exposure to NTMs is also negatively associated with firm survival rates (Figure A.5.6).

Targeted reforms that eliminate these burdensome, costly, and unpredictable NTMs will not only boost firms’ competitiveness but will also complement reforms undertaken in the Omnibus Law and boost investment in Indonesia. World Bank policy recommendations are the following: 1) phase out pre-shipment inspections; b) turn import approvals into automatic licenses except for goods subject to quotas; 3) turn Indonesian National Standard third-party verification into self-certification for non-high-risk products; and 4) phase out restrictions on port of entry of imports. In addition to improving trade, these will also improve trade logistics and enable firms to adjust to disruptions in trade while allowing access to inputs to upgrade to higher values added manufacturing and services.

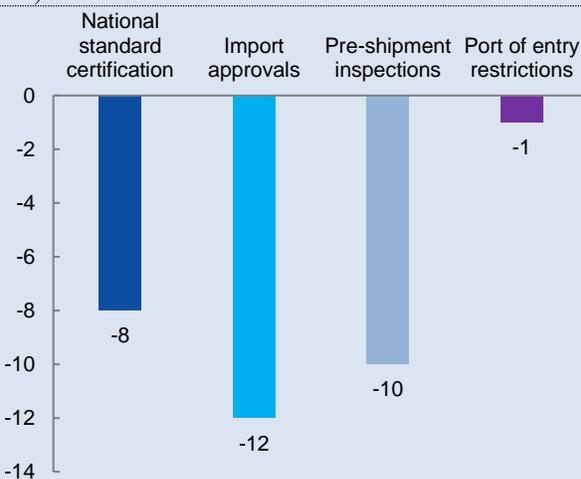
**Figure A.5.3: NTMs' impact on exports of existing products and destinations**  
(percent change)



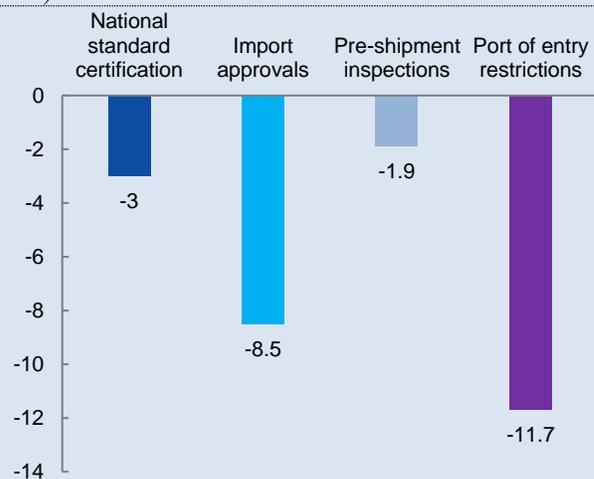
**Figure A.5.4: NTMs' impact on exports of new products and to new destinations**  
(percent change)



**Figure A.5.5: Response of exports to exchange rate shocks**  
(percent)



**Figure A.5.6: Firm survival time for a 1 percent increase in NTM exposure**  
(percent)



Source: Cali, M. and A.F. Montfaucon (2021). Note: Figure A.1.3 and A.1.4: percent change after a 1 percent increase in exposure; Figure A.1.5 and A.1.5 percent difference in elasticity of exports to exchange rates for firms with mean level of NTM exposure versus firms without any exposure.

**Box A.6: The Government of Indonesia's Commitments and Initiatives to Mitigate Climate Change**

As a signatory to the Paris Agreement, Indonesia's climate commitments are reflected in its **Nationally Determined Contribution (NDC)** and its **long-term strategy (LTS)**. Commitments are reflected in: (i) ratification of the Paris Agreement with the highest level of regulatory instrument, (ii) an updated NDC with detailed roadmaps for implementation and, (iii) a long-term strategy on low carbon and climate resilience (LTS-LCCR 2050).<sup>31</sup> Indonesia has set an unconditional emissions reduction target of 29 percent and a conditional reduction target (i.e., with international support) of up to 41 percent by 2030 relative business-as-usual (BAU).<sup>32</sup> These allow for a slight increase from 2019 emissions under the conditional target, and a slight decrease under the unconditional target (Figure A.6.1). The LTS-LCCR 2050 provides a long-term national policy direction and presents the nation's vision for sustainability beyond the Paris targets. It outlines Indonesia's goal to reach net zero emissions or carbon neutrality by 2060.<sup>1</sup> As outlined in the updated NDC, to achieve these objectives Indonesia will need to reduce emissions

<sup>31</sup> Indonesia LTS-LCCR (2021). Indonesia Long-Term Strategy for Low Carbon and Climate Resilience 2050. ([link](#)).

<sup>32</sup> UNFCCC (2021). Updated NDC Republic of Indonesia. ([link](#)).

from energy by 15.5 percent below BAU under the conditional target and emissions from forest and other land use (FOLU) by 24 percent.<sup>2</sup>

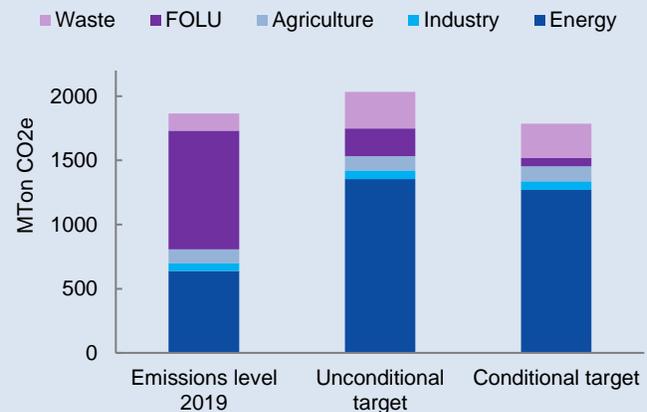
**Commitments for emissions reductions from FOLU include plans to restore 2 million ha of peatlands and 12 million ha of other degraded forest lands by 2030.<sup>2</sup>**

As outlined in the country’s LTS 2050, achieving net zero emissions in FOLU will require substantial decreases in peat-related emissions (peat decomposition and fires) from deforestation, as well as an increase in carbon sequestration, afforestation and reforestation.<sup>1</sup> Indonesia has initiated policies and measures (PaMs) towards these goals including a Reducing Emissions from Deforestation and Forest Degradation (REDD+) result-based payment initiative.<sup>1</sup> Other key PaMs include: (i) a moratorium of new license issuance for clearing of primary forests and peatland, (ii) mandatory certification for sustainable forest management and sustainable palm oil, (iii) a presidential instruction on ‘countermeasures’ for forest fires.<sup>33</sup> (2020), (iii) the establishment of the Indonesia Environmental Fund, and (iv) regulation on strategic environmental assessments (SEAs) through a landscape approach.<sup>1</sup> At the Conference of the Parties (COP) 26, Indonesia signed the “Glasgow Declaration” in which 141 countries agreed to “halt and reverse forest loss and land degradation by 2030 while delivering sustainable development and promoting an inclusive rural transformation.”

**Commitments for emissions reductions in the energy sector include accelerating the coal phase-down and introducing cleaner sources of energy.<sup>34</sup>** The National Energy Policy includes a target for renewable energy of at least 23 percent in 2025.<sup>35,2</sup> At COP 26, Indonesia signed the "Global Coal to Clean Power Transition" declaration, whose vision is to accelerate a transition away from unabated coal power generation.<sup>36</sup> The Government’s Energy Transition Mechanism (ETM).<sup>37</sup> will use a market-based approach to accelerate the closure of existing coal-fired power plants and replace them with clean power capacity. Other important regulations include the Presidential Regulation for ‘Economic Value of Carbon’, signed just before COP 26, which provides a legal basis for carbon trading and offsets, results-based financing, carbon taxes, and carbon trading.<sup>38</sup> In July 2021, the government launched a voluntary emissions trading scheme (ETS) — a pilot program covering the power sector that aims to familiarize stakeholders with ETS compliance and offset mechanisms, as well as to inform the development of an envisioned national ETS.<sup>39</sup> Carbon tax mechanism was also introduced in the recently adopted Tax Harmonization Law and will complement the planned national ETS.

**Figure A.6.1: Indonesia's Nationally Determined Contribution Commitments**

Updated (2021) NDC targets and 2019 emissions levels by sector



Source: UNFCCC (2021).

Notes 1: Targets from Indonesia’s updated NDC.

<sup>33</sup> These include law enforcement against forest and land fire crimes as well as payment of compensation in accordance with the level of damage or consequence needed for rehabilitation costs, restoration of forest and land conditions, and imposition of administrative sanctions.

<sup>34</sup> ADB (2021). Indonesia Raises Its Net Zero Ambitions ([link](#)).

<sup>35</sup> Other ambitions include that oil should be less than 25% in 2025 and less than 20% of the energy mix in 2050, and gas should be a minimum of 22% in 2025 and 24% in 2050.

<sup>36</sup> UKCOP26 (2021). Global Coal to Clean Power Transition Statement. ([link](#)).

<sup>37</sup> ADB (2021). Energy Transition Mechanism Explainer. ([link](#)).

<sup>38</sup> Reuters (2021). Indonesia introduces carbon trading policy to reduce emissions. ([link](#)).

<sup>39</sup> ICAP (2021). Indonesia launches voluntary ETS trial for power sector. ([link](#)).

## B. Low Carbon Transition in the Power Sector

### 1. Introduction

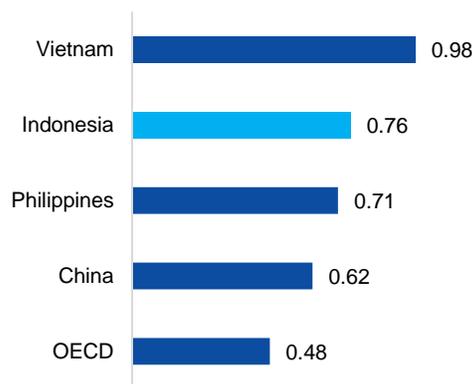
The effects of climate change on the Indonesian economy are likely to be significant unless measures are taken in Indonesia and around the world. High population density in hazard prone areas, coupled with strong dependence on natural resources such as land, forest and coal, make the country vulnerable to climate change. More than 70 percent of the Indonesian population live in coastal and flood-prone areas. Critical infrastructure such as roads, transmission lines, and power plants are also at risk. These vulnerabilities are exacerbated by poverty, significant infrastructure gaps even without accounting for climate change, and high dependence on natural resources in certain regions.

The Indonesian Government is committed to accelerating its mitigation efforts but is also wary of the cost that it will entail. Indonesia is among the top ten emitters of greenhouse gases (GHG) in the world. In its Nationally Determined Contribution (NDC), updated in 2021, the government committed to an unconditional reduction of GHG emissions by 26 percent relative to business-as-usual scenario (BAU) by 2030<sup>40</sup> and to a conditional reduction of 41 percent by 2030 if adequate international support is provided. In 2021, the government also committed to reaching net-zero emissions by 2060 or earlier. According to the government<sup>41</sup>, the net-zero investment needs would represent about 10 percent of the country's total investment needs over the period 2021–2030, and 20 percent of total investment thereafter through 2060.<sup>42</sup> However, the government is also concerned that mitigation efforts could undermine growth and jobs and slow down its development.

The energy sector is expected to be an important contributor to Indonesia's climate targets. In 2010, as per the NDC, 57 percent of Indonesia's GHG emissions were the results of land-use change and peat and forest fires, and 33 percent were due to the energy sector. By 2026, emissions from the energy sector are expected to become the highest contributor to GHG emissions in Indonesia (World Resource Institute, 2017).<sup>43</sup> and Indonesia has one

of the highest power grid emission factors in the region (see Figure B.1). The country's National Generation Plan for Electricity (RUKN) and the National General Plan for Energy/National Energy Policy (RUEN/KEN) set out major objectives and targets for the sector. The share of renewable technologies (RE) is expected to increase from 12 to 28 percent in the electricity mix and reach in 2020-2025 and reach 23 percent of the primary energy supply. In addition, under the net-zero scenario, the RE targets would need to be raised to 60 percent of power generation by 2030 and 82 percent by 2053 (BAPPENAS, 2021).

Figure B.1: Power Grid Emission Factor  
(tCO<sub>2</sub>eq per MWh generated)



Source: World Bank

The power utility has also made important climate commitments. In 2021, the power utility, PT Perusahaan Listrik Negara (Persero) (PLN), made two commitments on coal moratorium: no new coal-fired power plants will be committed after 2022 and all coal-fired power plants will be phased out by 2056. The first commitment translates into an expected 13.8 GW of coal power capacity to be built by 2030 which are projects that have already been contracted for the most part and will come as an addition to the 31GW already operating. It is important to note that the commissioned coal capacity was twice as large in the previous electricity generation plan, the RUPTL 2019-2028. The second commitment indicates that PLN currently expects to operate all coal-fired power plants until

<sup>40</sup> The government has committed to an unconditional reduction of GHG emissions by 26 percent relative to BAU set in 2020 or a reduction by 29 percent relative to BAU set in 2010 as per its first NDC submission.

<sup>41</sup> BAPPENAS, 2021, A Green Economy For A Net-Zero Future: How Indonesia can build back better after COVID-19 with the Low Carbon Development Initiative (LCDI)

<sup>42</sup> Based on BAPPENAS's analysis: overall investment needs are expected to amount to (i) an average of US\$ 150-200 billion per year from 2021-2030; (ii) US\$700 billion to US\$ 1 trillion per year from 2031-2040, (ii) US\$ 1.3-1.6 trillion per year in 2041 to 2050, and (iv) US\$ 2.1-2.2 trillion per year in the two decades after.

<sup>43</sup> World Resources Institute, 2017, How can Indonesia achieve its climate change mitigation goal?

the expiration of the power purchase agreements (PPAs). However, discussions are ongoing for an accelerated retirement of some coal plants. As stated by authorities during the COP26 in Glasgow, Indonesia would still consider bringing the coal phase-down forward to the 2040s, conditional on international financial and technical assistance. In the short term, as per the government’s announcements, this would mean a retirement of a minimum of 8 GW of coal projects by 2030 compared to 1 GW in the current plan. However, detailed plans for increased coal fired power plants retirement are yet to be developed.

The first part of this paper explores the sector context as well as the challenges and options to decarbonize the power sector in Indonesia. It also assesses the economy-wide transition costs and benefits. The second part presents policy recommendations to advance the energy transition.

## 2. Low Carbon Transition Options and Risks

### 2.1. Power Sector Context

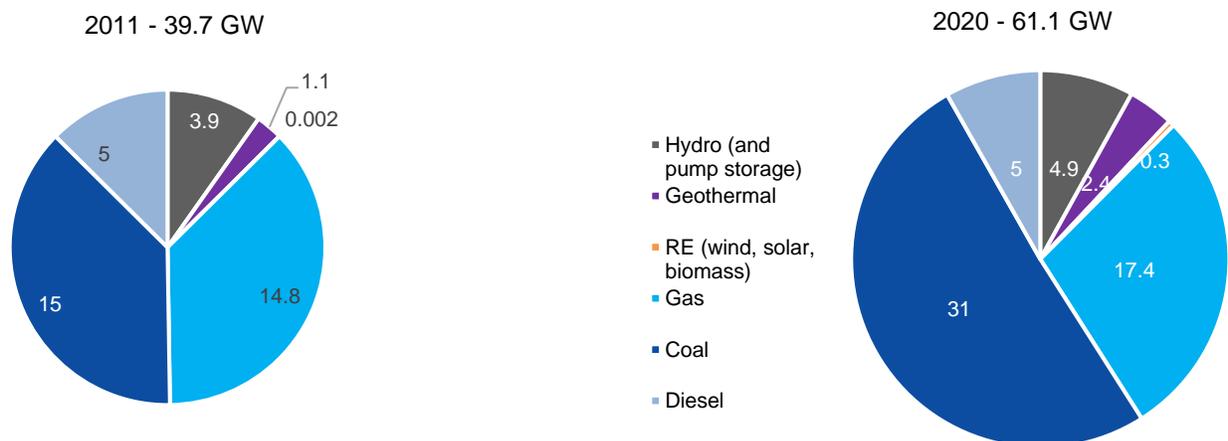
**Indonesia has made important progress in reaching universal access to electricity primarily through fossil-fuel deployment.** The power utility PLN manages Indonesia’s grid which covers over 600 islands. These grids are very diverse, from very large ones such as the Java-Bali grid which has over 40 GW of installed capacity, to very small grids that have installed capacity below 1 MW. Despite these challenges, Indonesia has reached near universal access. The access rate increased from 40 to about 99 percent in 20 years<sup>43F44</sup>. In the last 10 years, PLN has

connected over 34 million customers to the grid. Installed generation capacity increased from 40 GW in 2011 to 61 GW in 2020 but the pace of RE deployment was relatively slow. Out of the 20 GW of installed generation capacity that was added in 2011-2020, around 16 GW came from coal compared to 2.5 GW from geothermal and hydropower (Figure B.2). In addition, except for a few small grids that are hydropower or solar-based, most isolated mini-grids and small islands’ grids are 100 percent diesel based.

**Large investments will be needed to meet rising demand for electricity, to improve the quality of supply and meet the objectives of sector decarbonization.**

Electricity demand is expected to grow by about 5 percent per year on average over the next 10 years. As per the new generation plan, RUPTL 2021-2030, the installed capacity is expected to reach 100 GW by 2030 (see Table B.1). This would be a near doubling of the installed capacity within 10 years and would require US\$ 90 billion in new investments. PLN would need to expand drastically its grid while improving the quality of supply. Indonesia’s quality of supply, as measured by the System Average Interruption Duration Index (SAIDI), is low despite some progress in past years (Figure B.3). The quality of supply also varies greatly among regions (Figure B.4). In 2019, the SAIDI for Sumatera Utara was 44.4 hours compared to 4.6 hours in Jawa Timur. This poor reliability creates inconveniences for households, impedes economic development, and forces companies to invest in expensive back-up power generators.

Figure B.2: Installed Capacity in 2011 and 2020 (GW)



Source: RUPTL 2021, adapted by authors

<sup>44</sup> According to MEMR’s electricity definition which encompasses villages electrified with connection to the grid and households electrified under the pre-electrification SHS program – it represents

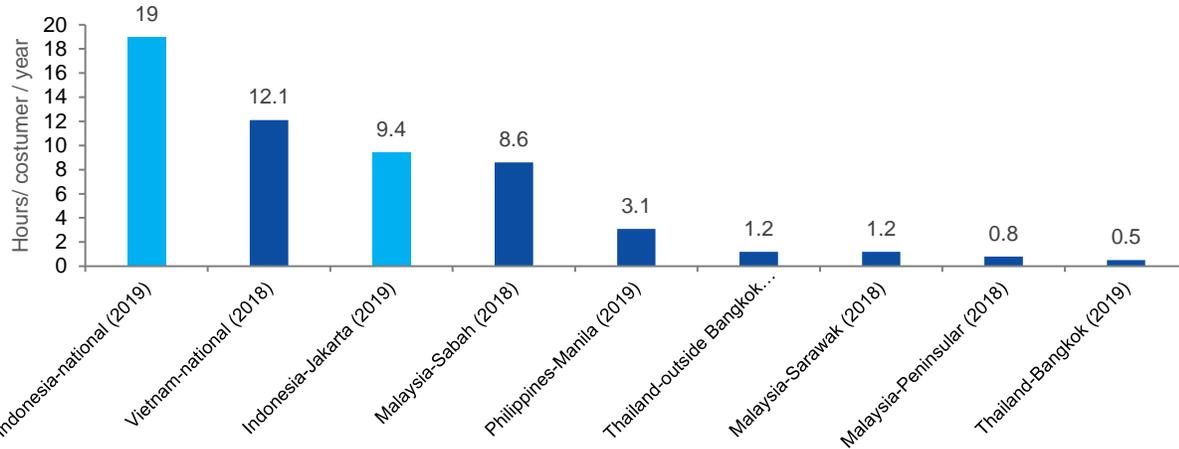
around 6 million people not connected to the grid yet. This number could be closer to 15-20 million if we were to be more restrictive on the definition of electrification.

**Table B.1: Expected Installed Capacity in 2028 and 2030 as per RUPTL 2019 and RUPTL 2021, respectively (GW)<sup>45</sup>**

Technology	RUPTL 2019 – 2028 targets	RUPTL 2021 – 2030 targets	difference
Hydro (and pump storage)	14.5	15.4	6%
Geothermal	5.2	5.8	12%
RE (solar, wind, biomass)	2.6	6.5	145%
Gas	28.8	23.2	-20%
Coal	56	44.8	-20%
Diesel	5	5	-
<b>Total</b>	<b>112.1</b>	<b>100.7</b>	<b>-10%</b>

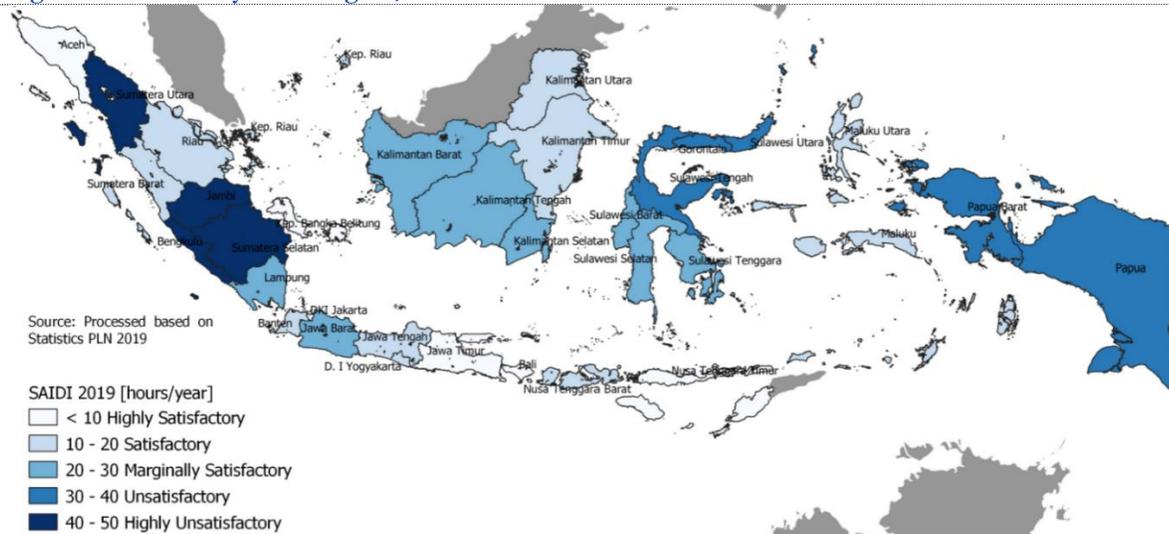
Source: RUPTL 2019 and RUPTL 2021, adapted by authors

**Figure B.3: PLN SAIDI compared to regional peers**



Sources: PLN Statistics 2019; EVN Annual Report 2018; Malaysia Energy Statistics Handbook 2019; Meralco Sustainability Report 2019; PEA Performance Report 2019

**Figure B.4: SAIDI by PLN Region, 2019**



Source: PLN Statistics 2019

PLN is also aiming to reduce carbon emissions by phasing down coal and scaling up renewable energy. Indonesia has large clean energy resources. It has the world’s largest geothermal potential and rich hydro, solar

and wind resources. But it is also the fourth largest producer of coal and the twelfth largest producer of gas in the world. In 2018, 88 percent of the installed capacity in Indonesia was coal, gas and diesel-based whereas only 12

<sup>45</sup> The comparison is between RUPTL 2019’s 2028 target, and the RUPTL 2021’s 2030 as these are both the “end dates” of the two plans.

percent was from renewable sources – including large hydropower generation. PLN's new plan is to increase the target for solar and wind by 145 percent (see Table B.1). The RUPTL 2021-2030 aims to reduce emissions by 49 million tons of CO<sub>2</sub> by 2028.

**The grid is currently not reliable and secure enough to accelerate the integration of VRE.** The main challenges related to the integration of VRE include the limited power transfer capacity of the grid from production to consumption locations, as well as ability of the grid operator to balance the variable nature of VRE supply with enhanced flexibility. PLN associates the deployment of VRE with further instability on the grid and therefore is limiting its deployment with that constraint in mind.

**Coal and fuel subsidies as well as renewable energy pricing distortions constrain the mobilization of private investments in RE.** To implement the new RE targets, private investments will need to be mobilized. However, so far, no fully competitive transparent tenders have been organized by PLN and there is limited appetite for such tendering process to be launched rapidly. In addition, the following regulations are constraining the deployment of RE:

- (i) Ministry of Industry (MOI) Regulation No. 54/2012 (updated through MOI Regulation No. 5/2017, and further detailed in MOI Regulation No. 4/2017) which sets a minimum threshold for local content both for materials and services used in solar power generation. These local content requirements raise costs for solar IPP developers. For solar panels, local solar panel manufacturers have been unable to produce at scale, resulting in solar PV panels which are more expensive and often of a lesser quality than what the developers could procure on the international market.
- (ii) Indonesia's policies on the Domestic Market Obligation (DMO) for coal, whereby coal producers must sell a certain amount of coal to PLN at lower-than-market rates, creates market distortions on the price of coal in the country, artificially reducing the cost of electricity.
- (iii) Ministry of Energy and Mineral Resources (MEMR) Regulation No. 50/2017 caps the price PLN can pay for RE at 85 percent of the average cost of generation for the local grid (or 100 percent of the average cost of the grid if below the country's average). This regulation is particularly

problematic for mini-hydro and geothermal projects in the islands where the generation cost is low because the system relies mostly on (subsidized) coal. For PV, it is less of an issue as solar generation could potentially be below the average cost of generation if deployed under a transparent, competitive and bankable framework, in particular in the smaller grids.

**PLN's financial sustainability is critical to improve the grid and mobilize private sector financing.** PLN's financial sustainability challenges are mainly driven by an inadequate tariff and revenue structure. Since 2017, PLN has been running losses from power sales because of restrictions on tariff adjustments for non-subsidized customers. The decision to freeze fuel cost pass-through into tariffs for commercial, business, and industrial customers has resulted in sustained low cost-recovery.<sup>46</sup> In addition, PLN's current revenue model, set as a cost-plus 7 percent margin, is not incentivizing efficiency and not sufficient to fund needed investments. Finally, the government-mandated 35 GW program has contributed to a mismatch between investment in supply and growth in demand. Consequently, the power system has started to face an excess capacity that creates a financial burden on PLN.

**PLN also relies on State Budget transfers that compensate for its Public Service Obligation (PSO) and non-tariff adjustments.** Affordability of electricity has been a priority for many years in Indonesia with PLN supplying poorer residential customers under a PSO tariff set well below cost-recovery. Although efforts have been underway since 2017 to reassign consumers to non- or less-subsidized tariff classes through means testing, many relatively better off households still receive the benefit of the PSO. Approximately 45 percent of PSO is used to subsidize households that do not fall within the database for poor and vulnerable households (representing approximately 23 million households). In total, PLN relies on budget subsidies (PSO and compensation payments) for 21 percent of its operating revenues (in 2019), representing 5 percent of central government spending. This dependence on subsidies has had various undesirable effects. It has heavily politicized the process of setting tariffs and led to an emphasis on short-term cost minimization at the expense of investing now to reduce costs and risks in the longer term.

**The fragmented institutional architecture of the sector poses challenges to coordination, regulation, and**

<sup>46</sup> Compensation of IDR 23 trillion in 2018 and IDR 25 trillion for 2019 has only been paid in the second part of 2020. The compensation for 2020 has been calculated to about IDR 17.9 trillion.

**performance.** Sector targets are set by MEMR based on national policies and objectives defined by the President of the Republic and approved by the Parliament. Power sector planning has become the de facto responsibility of PLN. The Ministry of State-Owned Enterprises (MSOE) is responsible for the oversight and commercial performance management of PLN. The Ministry of Finance (MOF) is responsible for sector subsidies, borrowing limits, and guarantees. This fragmentation has undermined effective planning and progress on the energy transition in recent years. PLN has been unwilling to commit to new investments without certainty that it will be able to recover the costs and with sometimes different objectives and targets from MEMR, MOF and MSOE. Moreover, PLN is the system planner, the single buyer, a power producer, the system operator, and the transmission owner.<sup>47</sup> This creates potential internal conflicts of interest, where PLN's decisions on planning, procurement and operations may be influenced by concerns over the impacts on its own generation and transmission businesses.

**The coal phase-down could have measurable economic and social impacts, including in coal-dependent regions.** Indonesia is the world's largest coal exporter (about 550mn tons/year). Coal exports represent 2 percent of GDP which is 13 percent of total goods exports. State Budget revenues from coal hovered around 0.5 to 2 percent of total revenues in 2015-2019. Coal mining employment stood at 240,000 jobs in 2018 or only 0.2 percent of Indonesia's 120 million formal sector workers. Notwithstanding, coal production is concentrated in four provinces (East, South and North Kalimantan, and South Sumatra), with the East and South Kalimantan local economies being relatively more dependent.

## 2.2. Low Carbon Transition Options

**Power sector decarbonization in Indonesia is facing several technical and economic constraints:**

- (i) **Limited space to integrate RE** in particular on the Java-Bali grid. While the solar resource is good in the region, the high population density of the islands means that land scarcity constrains the development of large utility scale PV plants. Although Indonesia is gifted with geothermal energy, half of the potential in Java-Bali is already

harnessed. Two thirds of the large hydro potential is already in production.

- (ii) **Complex island grid situation limiting potential for imports:** Although Indonesia is connected to the Malaysian grid through West Kalimantan, low inter-island grid connections limit the potential for electricity imports.
- (iii) **Excess power and potential carbon lock-in:** Most notably, over-estimation of demand growth and the government's commitment to the 35 GW program have left PLN with a large excess of coal capacity. This reduces the space for adding RE. The relative inflexibility of these assets also makes integration of variable RE (VRE) far more challenging.

**A scenario-based analysis was carried out to assess decarbonization options for the next two decades.**

The analysis focused on the Java-Bali grid which accounts for 70 percent of the installed capacity and hosts 60 percent of the population.<sup>48</sup> Three scenarios are considered: (i) a NDC (or RUPTL 2021) Scenario following the current RUPTL 2021-2030.<sup>49</sup> The simulations expand the plan until 2040 on a least cost basis without considering coal power, in line with the government's commitments; (ii) a Coal Phase-down Scenario under which coal plants are retired after 20 years, while the default is 40 years under NDC RUPTL 2021 Scenario; and (iii) a Decarbonization Scenario where carbon emissions reductions relative to NDC RUPTL 2021 scenario are capped at 70 percent in 2040.

**Although the modelling considers key technologies, some were not included and will need to be explored further.**

The modelling exercise includes the following technologies: coal, oil, gas and carbon capture and storage, PV solar energy, other forms of renewable energy (hydro, biomass) and storage. Other technologies and options were not included in the simulations such as (i) interconnections of Indonesian islands, or with Malaysia and Australia<sup>50</sup>, (ii) the deployment of decentralized energy resources (DER) such as rooftop PV, demand response, battery storage via electric vehicle and virtual power plants, (iii) floating PV (on reservoirs or offshore); and (iv) less mature technologies such as marine technologies, and

<sup>47</sup> PLN is a vertically integrated state-owned utility company who acts as the primary off taker of electricity generated by IPPs and as the sole buyer, transmitter, and distributor of power in Indonesia. PLN owns around 70 percent of the power generation assets in Indonesia, while the rest is owned by IPPs.

<sup>48</sup> The focus on the Java-Bali grid was decided as the island grid represents 70 percent of the installed capacity and host 60 percent of the population

<sup>49</sup> As the analysis was conducted before the RUPTL 2021 was published the NDC RUPTL 2021 scenario is based on the draft RUPTL of December 2020. For the Java Bali system, the main difference between the draft and the final version is Indramayu #4, a 1GW coal plant that was supposed to be commissioned in 2029 and was removed in the final version of the RUPTL.

<sup>50</sup> <https://renewablesnow.com/news/indonesia-okays-route-for-usd-218bn-australia-asia-solar-power-link-754924/>

green/blue hydrogen. Another option considered by the government is the deployment of nuclear power, but it was not considered in the modelling as its deployment, if decided, would only happen in the 2040's. It is also important to note that for certain technologies such as on-shore wind, improvements in technology increases the financial viability of lower wind sites that have not been

considered until now. In addition, this analysis does not consider the potential for coal plant repurposing which could lower the cost of the transition and facilitate VRE penetration in the Java-Bali grid (Box B.1).

### Box B.1: Coal Plant Repurposing

**Repurposing can lower the financial and environmental costs of decommissioning coal plants.** Decommissioning power plants entails significant costs, including dismantling, environmental remediation and restoration, and making it suitable for alternative usage (e.g. as an industrial facility). On the other hand, repurposing an old coal plant allows maintaining some of the equipment and functions for power generation, storage, and ancillary services.

**Coal plants can be repurposed to generate and store RE.** Older, smaller, and inefficient coal plants can be used to install large scale battery storage units. Their generators can also be converted into synchronous condensers for renewable and flexibility (RE+FLEX) centers. This can be a cost-effective way to support the integration of large amounts of variable solar and wind energy elsewhere in the system. The volume, range and quality of ancillary services can far exceed the services traditionally provided by the old coal plants. These centers can be planned in the Java-Bali system as well as individual islands in strategic locations to support the renewable projects utilizing (or upgrading if necessary) the existing substations and transmission lines. The process can immediately start with part of the 3+ GW fleet of relatively small units that are more than 25 years old and expand as more coal units are retired over the coming decade. Although Indonesia has a relatively young coal fleet, there is already more than 6 GW capacity that is 20 years or older that the government plans to replace with renewable energy.<sup>51</sup>

**Repurposing coal-fired offers many advantages.** First, it reduces decommissioning costs because it can partially avoid some of the environmental remediation requirements, retain part of the workforce and allow re-use of part of the existing assets such as generators and substations. Second, it reduces the cost of commissioning greenfield RE capacity at the same site. Third, for coal plants located in urban and semi-urban areas, repurposing manifests in a multiple end uses, leading to economic diversification benefiting local economies. Fourth, it could provide a lucrative exit strategy for stranded and stressed coal plants.

**Another solution could be to finance country-specific funds to retire coal power assets on an earlier schedule** than if they remained with their current owners as per the Energy Transition Mechanism (ETM) promoted by the Asian Development Bank (ADB).

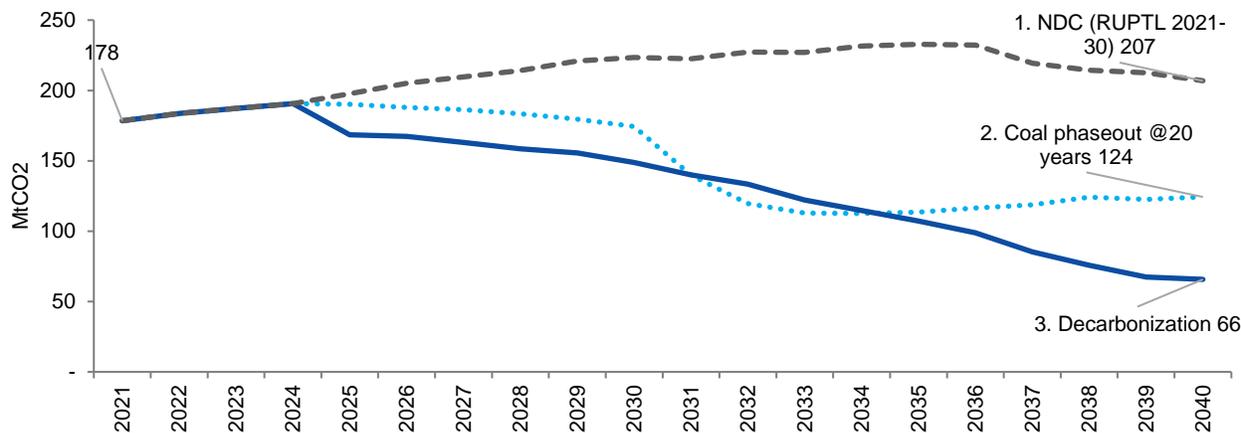
**The Coal Phase-down and Decarbonization Scenario achieves significant and early reduction in carbon emissions compared to the NDC RUPTL 2021.** Carbon emissions in the Coal Phase-down Scenario decrease by 40 percent in 2040 relative to the NDC RUPTL 2021 Scenario (Figure B.5). In the NDC RUPTL 2021 Scenario, emissions peak in 2036 and start decreasing driven by

rapid deployment of PV and the retirement of some old coal plants. In the Coal Phase-down Scenario and in the Decarbonization Scenario emissions peak in 2024. This is because there is no space for new RE generation in the Java-Bali system until 2025 due to excess installed capacity.

<sup>51</sup> As announced by Energy and Mineral Resources Minister Arifin Tasrif in January 2020:

<https://www.reuters.com/article/us-indonesia-power-coal/indonesia-plans-to-replace-old-coal-power-plants-with-renewable-plants-minister-idUSKBN1ZT17N>

Figure B.5: CO<sub>2</sub> Emissions in 2021-2040 under the Different Transition Scenarios

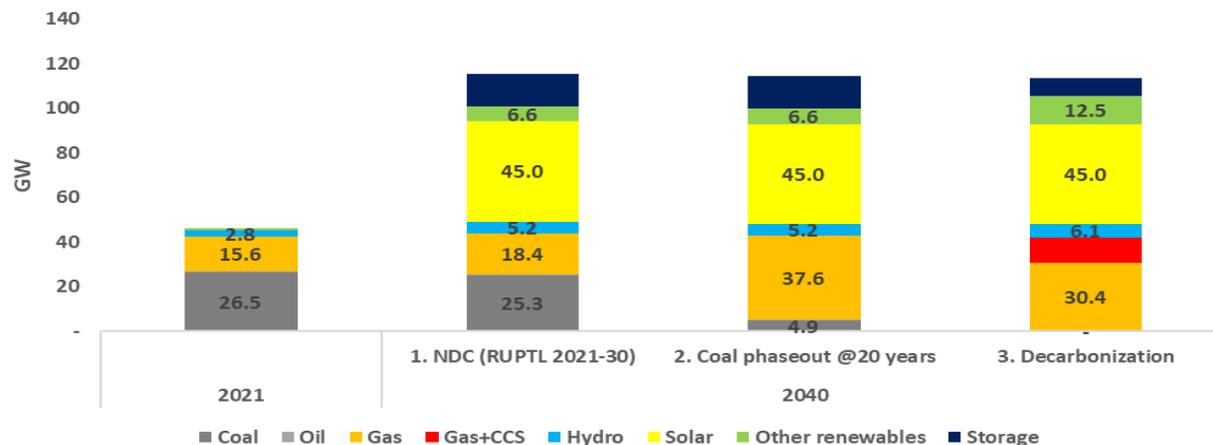


Source: World Bank Staff simulations.

PV is massively deployed in all scenarios while coal is displaced by gas and Carbon Capture and Storage (Box B.2) in the Coal Phase-down and Decarbonization Scenarios (Figure B.6). Good solar irradiation and declining costs of equipment make solar energy one of the least cost sources of power production in Indonesia. However, it is assumed that the solar photovoltaic (PV) potential in Java-Bali is capped at 45 GW due to land constraints.

Gas power is dispatchable and low cost. Therefore, once solar potential is fully met, there is a switch to combine cycle gas turbines (CCGT). The 20 GW of coal generation are being displaced by 20 GW of CCGT in the Coal Phase-down Scenario. In the Decarbonization Scenario, other more expensive RE sources (biomass and large hydropower plants) are deployed to displace 100 percent of the coal generation and some of the gas generation.

Figure B.6: Installed Electricity Generation Capacity in 2021 and 2040 under Different Transition Scenarios



Source: World Bank Staff simulations.

**Box B.2: Carbon Capture and Geological Storage in the Power Sector in Indonesia**

CCS is a technology for trapping carbon dioxide emitted from large point sources such as power plants, compressing it, and transporting it to a suitable storage site where it is injected into the ground. This technology has significant potential to help mitigate climate change, particularly in countries with large reserves of fossil fuels and a fast-increasing energy demand. Identified early as a cornerstone of decarbonization, CCS deployment has been lagging.

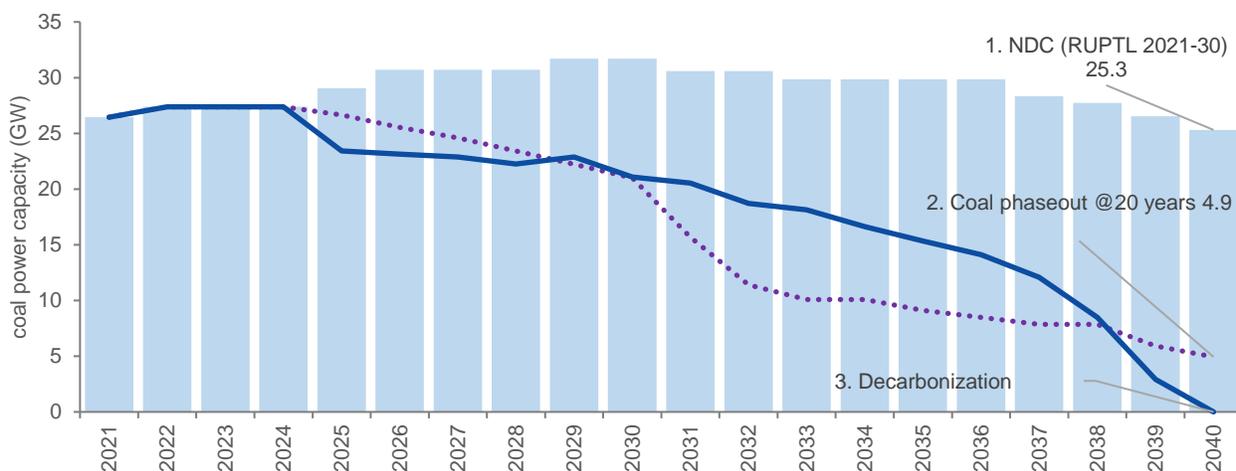
In Indonesia, the interest in CCS has increased recently. The IEA estimates that 85 percent of power plant and factories emissions in Indonesia are located within 150 km of potential storage site. While there are several ongoing CCS projects in Indonesia, most linked to Enhanced Oil and Gas Recovery (EGR/EOR), to date, no CCS project has been applied to the power sector. Yet, most coal power plants are quite recent and often part of larger industrial clusters, which makes them good candidate for a hub approach.

**Unlocking Indonesian CCS potential will require technical and financial resources as well as strong policy support.** First, as confidence in the availability of safe and secure CO<sub>2</sub> storage is a prerequisite for investment in CCS facilities, significant technical assessments will be necessary to convert theoretical capacity into bankable projects. Second, while a legal and regulatory framework has been developed to cover CO<sub>2</sub> EOR/EGR projects, it will need to be extended to include all CCS aspects. Third, as CCS projects are often of high risk and low returns, in particular in the power sector, a strong policy support will be needed and could take the form of subsidies, grants, carbon pricing and standard. Finally, to meet the temperature objectives of the Paris Agreement, investment in CCS in Indonesia will need to grow fast.

**Achieving significant emission reduction by 2040 is possible with an accelerated coal phase-down program (Figure B.7).** In both Coal Phase-down Scenario and Decarbonization Scenario, no new coal plants are committed after 2022 when the last plant currently under construction is commissioned and the additional 4.3 GW of coal plants still in the pipeline are removed. Under the

RUPTL 2021 scenario, 6.4 GW of coal plants will retire by 2040 because they will have reached their technical lifetime (40 years). In the Coal Phase-down scenario, an additional 16 GW are decommissioned early while in the Decarbonization Scenario, all plants are decommissioned by 2040, 21 GW before they reach their technical lifetime.

**Figure B.7: Coal Capacity under the Three Transition Scenarios**



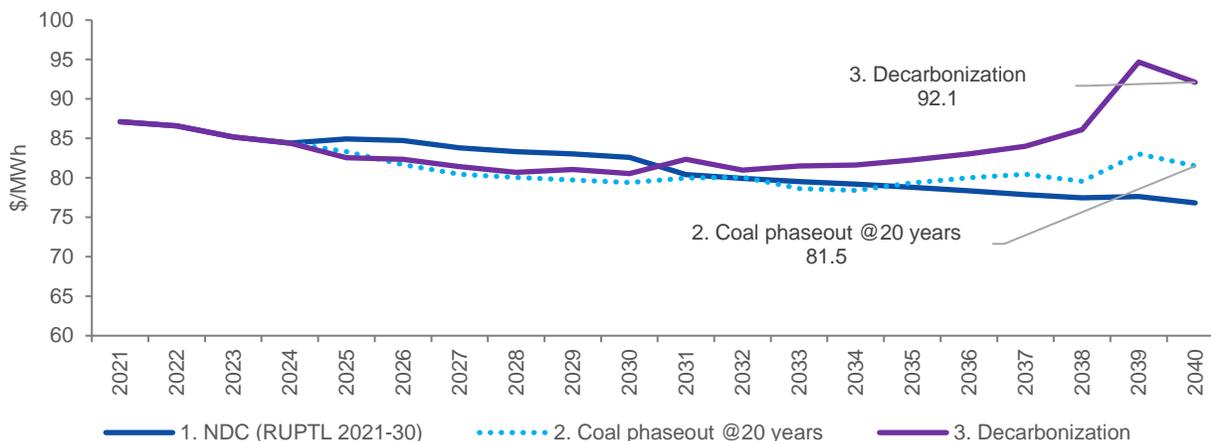
Source: World Bank Staff simulations

**The cost of electricity generation would increase under the more ambitious transition paths.** Excluding the costs of early coal retirement (stranded asset costs) and economic and social impacts, in coal-dependent regions, the cost of generation in the Coal Phase-down Scenario is estimated to be only 6 percent higher than in the NDC RUPTL Scenario in 2040. But it would be 27 percent higher under the Decarbonization Scenario. The significant reduction in emissions under the Coal Phase-down Scenario comes at an estimated increase in generation costs to customers lower than US\$ 5/MWh by 2040. The average abatement cost<sup>52</sup> in the power sector is US\$ 8.5/tCO<sub>2</sub>, above the recently approved carbon tax of US\$ 2/tCO<sub>2</sub>. The increase in generation costs in the Decarbonization Scenario is driven by the higher fuel costs of gas

replacing coal generation as well as by the costs of CCS, increased biomass generation as well as by the higher investment needs. Cumulative investment needs would increase by 10 percent (respectively 54 percent) in the Coal Phase-down Scenario (respectively Decarbonization Scenario). It is important to also note that (i) in the event where more solar generation could be added to the grid – above the 45 GW limit – the Decarbonization Scenario’s cost could be lower as CCS technologies are currently costly; and (ii) these scenarios are not including the cost of VRE integration which would impact – reasonably – the cost of transmission, or the cost for early coal closure which could be elevated<sup>53</sup>.

<sup>52</sup> Average abatement costs are the costs associated with reducing CO<sub>2</sub> emissions compared to the baseline.

<sup>53</sup> In the coal phase-down Scenario, retiring early 16GW could cost between US\$ 9 and 25 billion using as an upper bound the value mentioned in *Regional: Opportunities to Accelerate Coal to Clean Power Transition in Selected Southeast Asian Developing Member Countries*

**Figure B.8: Average Cost of Electricity Generation under the Three Transition Scenarios**

Source: World Bank Staff calculations. Note: the cost of generation includes system losses and grid costs. The peak in costs in 2039 under the decarbonization scenario (S4) is due to the retirement of 5.5 GW of coal power capacity in this year, with accompanying termination payments

### 2.3. Economy-Wide Effects of a Low Carbon Transition

**A Computable General Equilibrium (CGE) model is used to assess the economy-wide effects of the low carbon transition in the power sector.** The general equilibrium impacts of the NDC RUPTL, Coal Phase-down, and Decarbonization Scenarios are simulated by integrating the simulated electricity mix presented above into the CGE model (Box B.3). This provides the economy-wide impacts on GHG emissions, GDP, employment, and household welfare for the Coal Phase-down and Decarbonization Scenarios relative to the NDC RUPTL Scenario.

**A whole-of-economy approach is essential to ensure that the power sector transition translates into economy-wide emissions reductions.** Economy-wide GHG emissions are projected to decline by only 4 to 6 percent by 2040 relative to the NDC RUPTL (Figure B.9). This is while power sector CO<sub>2</sub> emissions decline by 40 to 70 percent relative to the NDC RUPTL as discussed previously. This is because coal-fired power declines in the electricity sector but increases in other parts of the economy such as in manufacturing. This illustrates the so-called “waterbed effect” where policy changes in only one sector translates into emissions leakages in other sectors.

**The impacts of the transition on GDP are expected to be limited overall although the effects depend on the ability of the country to mobilize private financing.** GDP is estimated to decline by up to 0.1 percent or increase by up to 0.4 percent in 2030 depending on the sources of financing for the investment needs discussed previously (Figure B.10). Under private financing, household and enterprise savings increase to match the investment requirements while under government financing

other public spending adjusts to keep the same fiscal balance across all scenarios. For this reason, private investment has a higher growth multiplier than public investment in the CGE model. The simulations also assume that private investments to close coal plants do raise the capital stock through repurposing, for instance as discussed previously. By 2040 growth improves in the two scenarios relative to baseline.

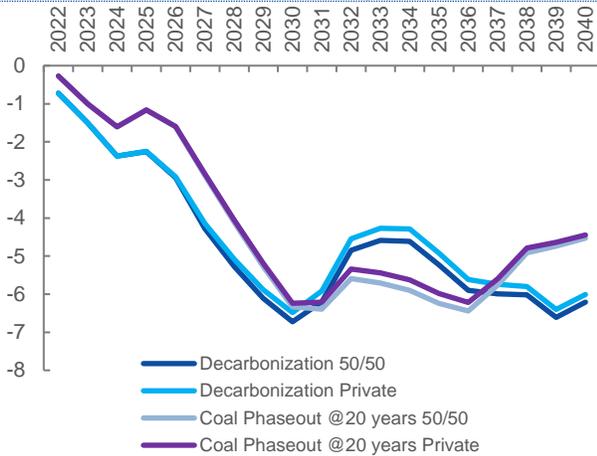
**The economy sheds jobs in the early phases of the transition but can create more jobs in the longer term with more private financing.** Job losses are estimated to reach up to 2 million cumulatively by 2040 in the worst scenario relative to the baseline. This represents 1 percent of the working-age-population in Indonesia but 18 percent in the four most coal-dependent provinces. Most employment losses occur in the power sector. This is driven by job losses in the coal and coal power sector which are mitigated by job creation in the gas and renewable sectors (Figure B.11). Job losses are significantly lower under private financing because the economy starts to create more jobs after 2035 as growth improves.

**Welfare gains increase during the transition, but poor and vulnerable households need to be protected during key transition periods.** Phasing down coal and introducing lower-cost renewable energy helps contain electricity prices which benefits all households (Figure B.12). Welfare gains are larger for higher income households who consume more energy. These benefits decline under the faster decarbonization path because higher-cost alternative energy sources are introduced. Although they benefit overall, the welfare of the poor can drop significantly during the closing of coal plants (Figure B.13).

The transition could also produce important climate co-benefits. Lower GHG emissions reduce pollution, as reflected in the amount of PM 2.5 particles in the air, by 6 to 8 percent by 2040 (Figure B.14). This could generate

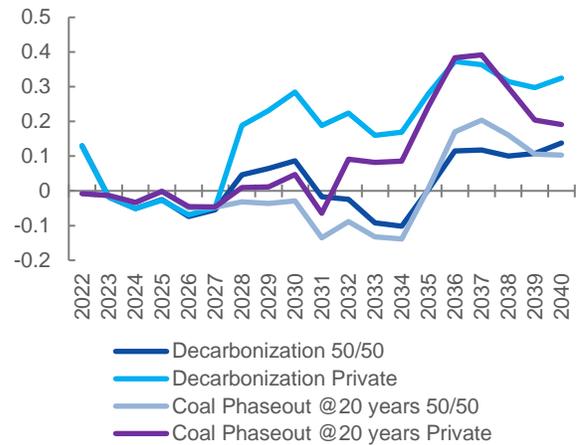
important local and global climate co-benefits in terms of health and labor productivity.

**Figure B.9: Impact of the Power Sector Transition on Economy-Wide GHG Emissions**  
(percent relative to NDC RUPTL Scenario)



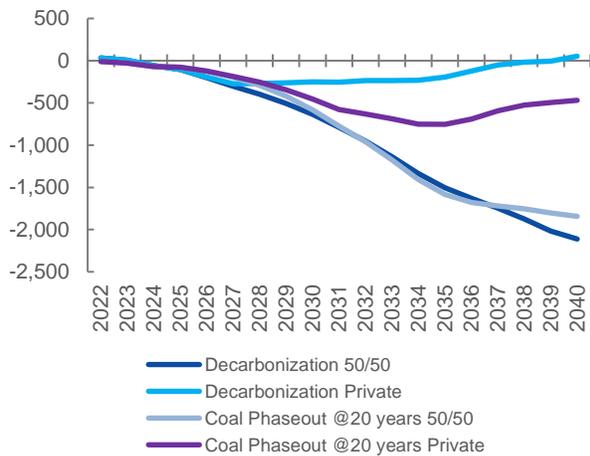
Source: World Bank staff simulations

**Figure B.10: Impact of the Power Sector Transition on GDP**  
(percent relative to NDC RUPTL Scenario)



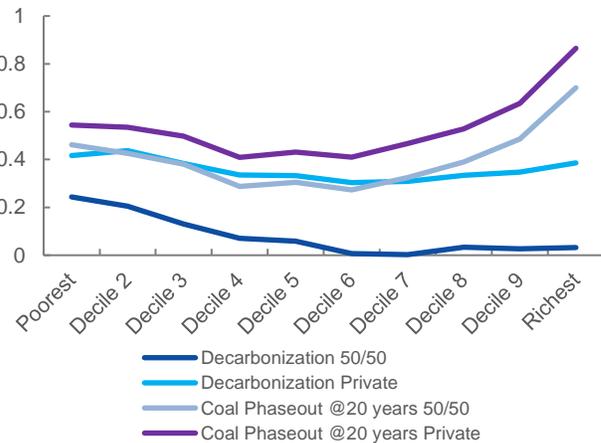
Source: World Bank staff simulations

**Figure B.11: Impact of the Power Sector Transition on Employment**  
(Cumulative net job creation in thousands, relative to NDC RUPTL Scenario)



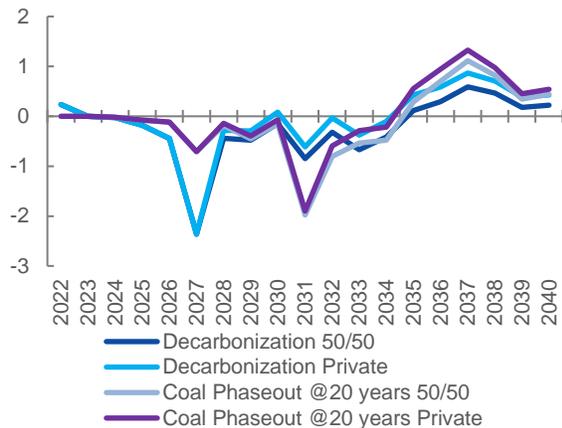
Source: World Bank staff simulations

**Figure B.12: Welfare Impact of the Power Sector Transition by Income Decile**  
(percent relative to NDC RUPTL Scenario)



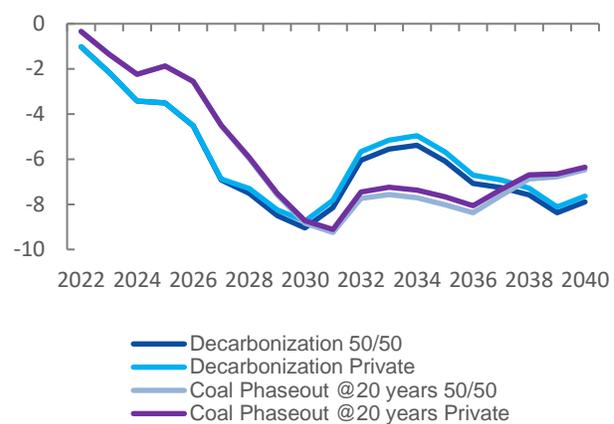
Source: World Bank staff simulations

**Figure B.13: Welfare Impact in the Bottom Decile during the Power Sector Transition**  
(percent relative to NDC RUPTL Scenario)



Source: World Bank staff simulations

**Figure B.14: Impact of the Power Sector Transition on Air Pollution**  
(PM 2.5 particles in the air)



Source: World Bank staff simulations

### Box B.3: CGE Model for Climate Mitigation

The CGE used in this paper is the **World Bank Mitigation Adaptation and New Technologies Applied General Equilibrium (MANAGE)**. It covers the whole economy with a focus on climate mitigation and adaptation policies. The model assumes that capital and energy are complements in the short-run and substitutes in the long run. The emissions are produced as a result of fossil fuel use by economic agents (e.g., firms, households), factor use (e.g. livestock in agriculture), industrial processes and product use (e.g. CO<sub>2</sub> emissions from cement production). Model covers all GHG emissions (CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>) for Indonesia. The emissions are calibrated to WRI (2021)<sup>54</sup> and GTAP data documented at Aguilar et al. (2019)<sup>55</sup>. A detailed documentation of the model is available from van der Mensbrugge (2019).

The model uses the **2018 Social Accounting Matrix (SAM)** to calibrate the model. The SAM is based on inputs output tables available from ADB<sup>56</sup> (2021) and Statistics Indonesia<sup>57</sup> (2019), macroeconomic indicators for 2018, household survey data for 2014 (Sakernas 2014 and IFLS5-2014), Gender Disaggregated Labor Data (GDLD) by World Bank<sup>58</sup> (2019). The macro-SAM that is built using the macroeconomic aggregates are disaggregated into 195 sectors, 10 household types by income decile and 4 labor types by gender and skill groups. The SAM used in the model is aggregated to 45 sectors and commodities to be able to solve the model.

## 3. Policy Recommendations

The government’s plan for energy transition needs to be implemented while ensuring financial sustainability of the sector and affordability of services. It is critical for the success of the energy transition that it does not impede socio-economic development. At a time where all countries are entering into a difficult economic recovery following the COVID-19 pandemic, the energy transition pathway will need to strike a balance between (i) ensuring reliable and affordable electricity services to households

and businesses - which will be key for a strong economic and social recovery, (ii) the longer-term objective of reducing the carbon footprint of the energy sector, including moving away from coal and relying more on clean energy, and (iii) ensuring the sector’s financial sustainability while limiting the fiscal burden of the energy transition.

**A conducive policy, market and social environment is needed for the energy transition to proceed in an effective and just manner.** These include the assumptions that (i) the costs of technologies underpinning the energy

<sup>54</sup> World Research Institute (WRI), 2021, Historical GHG Emissions, [https://www.climatewatchdata.org/ghg-emissions?end\\_year=2018&start\\_year=1990](https://www.climatewatchdata.org/ghg-emissions?end_year=2018&start_year=1990) accessed on 11/22/2021

<sup>55</sup> Aguilar, A., Chepeliev, M., Corong, E., McDougall, R., & van der Mensbrugge, D. (2019). The GTAP Data Base: Version 10. Journal of Global Economic Analysis, 4(1), 1-27. Retrieved from <https://www.igea.org/ojs/index.php/igea/article/view/77>

<sup>56</sup> Asian Development Bank, 2021, Indonesia: Input-Output Economic Indicators, <https://data.adb.org/dataset/indonesia-input-output-economic-indicators>

<sup>57</sup> Statistics Indonesia, 2019, Input Output Tables with 185 Products 2010, <https://www.bps.go.id/statistictable/2019/07/08/2057/tabel-input-output-185-produk-2010.html>

<sup>58</sup> World Bank, 2019, Gender Disaggregated Labor Database, <https://datatopics.worldbank.org/gdld/>

transition – solar, wind, battery energy storage systems – will continue to become more favorable; (ii) sector participants will be willing and able to make the necessary behavioral changes and transition to new technologies and business models; (iii) policy conditions will be created both domestically and internationally to ensure that environmental externalities of fossil fuel generation are increasingly reflected in their prices; (iv) sufficient resources (including concessional resources) are available to make network investments to support the energy transition; and (v) economic and social disruption resulting from the transition will be managed effectively.

The following paragraphs present the key recommendations for a successful transition. They form a package of policy changes and actions to be implemented over the next 2-5 years.

### 3.1. Effective Institutions for Decarbonization: Coordination, Planning, and Regulation

*Planning for decarbonization: Aligning targets and policies, assessing options, and exploring alternative futures*

**Aligning strategies and targets across the government is critical to minimize the costs and risks of stranded assets in the future.** Both government – at the Presidential and Ministerial level – and PLN have set out strategies to achieve carbon neutrality in the power sector. However, these long-term strategies vary greatly, offering little guidance to planners and to investors as to what technologies to pursue in the medium-term. This lack of clarity in planning stems from the absence of a framework for coordinating policies, strategies, and planning. As a result, there are also no government targets for RE between the 2025 target (23 percent by 2025) and the 2060 carbon neutrality target. PLN is left, to a large extent, to plan in a policy vacuum—and is focused on achieving a 23 percent share in energy for new and renewables technologies by 2025. Therefore, its planning understandably reflects its own priorities and balancing between competing objectives such as containing the cost of generation, electrification of last mile and previous commitments based on higher demand forecast. In addition, the lack of clear and consistent long-term policy and strategic guidance leaves PLN with significant financial risks. For instance, investments made now based on minimizing current costs can become stranded if and when policies change.

**To that end, appropriate pathways to phasing-down coal with innovative financing mechanisms will need to be carefully assessed.** These options may include: (i) market-based mechanisms which could take the form of

carbon pricing and Emissions Trading Schemes (ETS), (ii) mechanisms to buy and retire high-emitting coal plants and (iii) coal plant repurposing for alternative uses such as renewable power generation, battery storage, reactive power and inertia sources. Their practical applicability in Indonesia will need significant analysis, stakeholder consultation, and piloting. Many options need to be considered not as stand-alone measures but as complementary solutions forming part of an inclusive and affordable coal transition strategy.

**Solutions to decarbonize the grid such as interconnections, CCS or hydrogen need to be explored further.** Planning for decarbonization is a long-term exercise which calls for appraising the potential of new technologies. These include for example: (i) interconnection of all islands within Indonesia (Mega Grid Project connecting Java with Sumatra, Kalimantan, Sulawesi and Nusa Tenggara), or with Malaysia, Singapore and/or Australia, (ii) the deployment of DER such as rooftop PV, demand response, battery storage via electric vehicle and virtual power plants, and (iii) the adoption of less mature technologies such as marine and tidal technologies or hydrogen.

#### *Improving Sector Coordination*

**A new inter-ministerial commission could be created to align environmental, financial and fiscal targets.** This inter-ministerial commission could bring together MEMR, MSOE and MOF. It would jointly define planning objectives consistent with the availability of finance from tariffs and subsidies and approve PLN's investment plans. This new commission could provide the necessary coordinating mechanism between policies and financing that is currently missing and would make PLN accountable for delivering on plans which are aligned with both sector policies and financial targets. This coordinating inter-ministerial commission could be modelled on the Special Task Force for Upstream Oil and Gas (Satuan Kerja Khusus Pelaksana Kegiatan Usaha Hulu Minyak dan Gas Bumi, SKK Migas). Over time, it may grow into more of a fully-fledged regulator as confidence builds in its missions and effectiveness.

#### *Enhancing Sector Efficiency*

**Separating system planning, generation procurement and system operations from PLN's other activities could increase transparency and reduce conflicts of interest.** Without reforms, the accelerated energy transition will place even greater pressures on the current structure of the sector. Cognizant of this fact, the government is currently examining structural reforms to improve ac-

countability and enhance efficiency in the electricity sector. The priority is to address the current monolithic structure of PLN, who acts as the primary off taker of electricity generated by IPPs and as the sole buyer, transmitter, and distributor of power in Indonesia. This impedes effective regulation of the power supply value chain and creates conflicts of interest among PLN's many roles. In particular, the current organization of PLN may lead the utility to prioritize the dispatch of its own power plant at the expense of new renewable capacity and more largely to prioritize its own generating activities in planning, procurement, and operating decisions.

### 3.2 Clean Energy Deployment

#### *Improving the enabling environment for mobilizing private investment in VRE*

**Clear medium-term VRE deployment targets with associated tender timelines would help PLN benefit from low PV and wind power prices.** Competitive selection of private investors has led to lower prices and reduced the cost of energy transition across the globe. PLN is the natural lead for such competitive selection. PLN would need to communicate a clear timeline for VRE tenders, with associated MWs and locations. A pilot tender could be launched in 2022/23 for 500MW to 1GW in specific island grids for an expected commercial operation date (COD) in 2025/26.

**Three regulatory changes can help Indonesia boost private investment in RE: reducing or eliminating local content requirements, phasing out coal and fuel**

**subsidies and lifting RE price controls.** Local content requirements increase the cost of private investment and impede competition. The coal domestic market obligation, which caps coal exports at 75 percent of production and domestic prices at US\$ 70 per ton, subsidizes coal-fired power plants. The cap on PLN's RE purchase price does not account for coal and fuel subsidies.

**New investments in grid flexibility are needed to integrate RE. Appropriate pricing mechanisms and regulation is critical for their viability.** These investments in grid flexibility will need to be identified for each island grid, added to the RUPTL and financed to ensure grid reliability and security while the VRE deployment is being implemented. In addition, updating the pricing mechanism and associated regulations for energy storage systems and ancillary services is required to support VRE integration. Indeed, to address the variability and uncertainty of increasing VRE penetration in the grid, ancillary services need to be adapted to increase system flexibility, incentivize fast response and ramping ability, and remunerate each of the services. In the current system, ancillary services are not financially valued, and the potential contribution of storage (battery or pumped) is not fully regulated. Moreover, the value of load shifting is also not legally framed. To enable storage, it is important that the government (i) identify the investments in the RUPTL; (ii) financially value ancillary services to enable a financial assessment of the new investments; and (iii) update the grid code to incorporate relevant standards related to storage design, implementation, and operation.

#### Box B.4: Reliability and Resilience of Grid Infrastructure

**Revising technical standards and grid codes to adapt to climate risks and improve grid reliability and resilience will also be critical.** While decarbonizing the sector, energy planning also needs to reduce exposure and vulnerability to climate change. First, the expected increased frequency and intensity of heat waves will increase peak demand. This will be met by higher peak generation which should be included in the energy generation plans. Second, floods or heat-induced wildfires could greatly impact power plants, transmission and distribution lines and generation plants. For instance, coal power plants which require cooling systems can be vulnerable to heat waves. Third, droughts will reduce hydropower production and increase fuel imports unless the energy mix is re-focused on domestically produced solar and wind power. A systematic review and effecting maintenance of existing power generation plants, especially hydropower plants, is important to improve their reliability.

### 3.3 Financial sustainability

#### *Ensuring financial sustainability of the sector while maintaining affordability and limiting fiscal liabilities*

**Setting the appropriate revenue requirements is critical for the financial viability of PLN.** PLN's revenue, whether it comes in the form of tariffs or explicit subsi-

dies, must cover both PLN's operating costs and its financing needs. Hence, it is necessary to set up a forward-looking process for determining PLN's allowed revenue. The overall revenue determined through such a process must be consistent with PLN's investment needs and provide confidence that adequate revenue will be available to enable PLN to meet all its obligations on time. At present, the Government provides a wide range of debt guarantees, business viability guarantees and other forms of financing

support to enable PLN to keep on borrowing despite facing high-risk financial ratios. Transition to a sustainable revenue model should allow Indonesia to minimize these additional supports.

**Increasing the share of revenue received from tariffs through a subsidy reform will improve PLN's financial health.** It is important that PLN gradually receives most of its revenue from tariffs and much less from Budget transfers. Beyond changes in the revenue model, this could be achieved by: (i) improving the automatic adjustment formula to better include the future role of RE in the mix and progressively reinstate the automatic adjustment of tariffs; (ii) revising the tariff structure to make it more transparent and provide appropriate pricing signals to customers; and (iii) implementing the planned reform of the PSO subsidies (direct cash transfer) using the Unified National Database to protect the poor and vulnerable.

**PLN could explore new financing schemes and sources.** This is important to reduce PLN's reliance on State guarantees and other financing support while improving its financial sustainability. Alternative financing options include (i) further developing the use of asset-based securities, (ii) expanding the use of green bonds and green financing through full implementation of the sustainable financing framework, (iii) introducing independent transmission providers, and (iv) exploring the possibility of raising financing against carbon credits (Carbon Energy Transition Scheme) recently introduced in the Carbon Pricing Presidential Regulation.

### 3.5. Coal Phase-Down: A critical just transition for all

**Phasing down the use of coal would require a just transition for the people, communities, and businesses which rely on Indonesia's coal industry.** To implement a sustainable energy transition, it

is critical to recognize the contribution of coal to the national development, as a source of jobs, foreign currency export receipts and fiscal revenues. Geographic isolation of most coal mines means that the loss of the main regional employer can dramatically reduce overall employment potential, as for example in Kalimantan. Narrow economic base of a coal dependent region could expose the fragility of the economy, in terms of job creation potential. Disparity of wages between coal mining and alternative professions can be a stumbling block to re-employing former coal miners. Indirect job losses from subsidiary businesses accentuate the labor challenge and may be more at risk if not considered as beneficiaries of temporary income support or labor programs. Decarbonizing the energy sector would also require better management of impacts on workers and communities and to ensure good environmental stewardship of lands and infrastructure assets. Indonesia's *Just Transition for All* should be underpinned by: (i) continuous dialogue and consultation with a wide variety of affected stakeholders to determine scope, scale, and timing of closure; (ii) adequate planning at the outset which is sustained through dialogue and participatory monitoring during the various stages of closure and transition; (iii) provision of temporary income support to workers and their families that is complementary to other existing social protection programs; and (iv) deployment of active labor market policies that offer services, programs, and incentives to encourage and enable re-employment among laid-off workers..

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Annexes

Annex 1. Main Social Assistance Programs in 2021

Year	Program	Benefit type, beneficiary selection and coverage	2021 coverage	2021 benefit level & duration	2021 program duration	Simulated
<i>Continued programs (2020-21)</i>	<b>PKH (Family Conditional Cash Transfer)</b>	Existing family conditional cash transfer, targeting the poorest 15 percent in the DTKS	10 million households (maintained in 2021)	Lower budget allocation and lower benefit level in 2021: Pregnant woman: IDR 3 million/year Children under 5 YO: IDR million/year Primary student: IDR 900 K / Year Disability: IDR 2.4 million/ year Elderly: IDR 2.4 million/ year Senior secondary student: IDR 2 million/ year Junior secondary student: IDR 1.5 million/ year	Same duration, monthly disbursement for 12 months.	Yes
	<b>Sembako/BPNT (Food Assistance)</b>	Existing food assistance program, targeting the poorest 25 percent included in the DTKS	18.8 million households (reduced by 1.2 million households)	Same benefit level: Rp200,000/month	Same duration, monthly disbursement for 12 months; added benefit for 2 months in July and August 2021	Yes
	<b>UCT (previously: Non-Jabodetabek, includes Jabodetabek in 2021)</b>	Newly launched in 2020, unconditional cash transfer, targeting households in DTKS and outside Jabodetabek area, who are not currently covered in any of existing programs (Sembako, PKH, and Pra-Kerja).	10 million households (increased by 1 million in 2021)	Same benefit level: Rp300,000/month	Same duration, for 6 months	Yes
	<b>BLT Dana Desa (Village Fund)</b>	Newly launched in 2020, unconditional cash transfer using 31 percent of Indonesia's Village Fund (Dana Desa) program will be re-allocated targeting rural households, uncovered by Sembako, PKH, and Prakerja program and affected by Covid-19	8 million rural households, prioritizing those who lost main source of income (reduced by 3 million)	Lower benefit level: April-June: IDR 600,000/month Jul-Dec: IDR 300,000/month who are not beneficiary of PKH recipients, basic food cards, Non-cash Food Assistance, food assistance, cash assistance, and pre-employment cards	Increased duration: 12 months	Yes
	<b>Pre-Employment Program (Kartu Pra Kerja)</b>	Pre-employment card targeting jobseekers, age 18 or above who are not in formal education and not receiving PKH or Sembako	5.6 million individuals (maintained in 2021)	No changes in benefit level: Training: IDR 1 million (one time), benefits of IDR 600,000/month (4 months), IDR 50,000/months (3 months)	No changes in implementation, launched in April, rolling out progressively	Yes

	<b>Electricity Subsidy</b>	Newly launched in 2020, electricity fee waiver and partial discounts for households	32.6 million households	Lower benefit level: 450 VA : Jan-March = 100 percent discount for the first 720 hours of 324 kW; April – December = 50 percent for the first 720 hours 900 VA: Jan – March = 50 percent waiver for the first 720 hours or 648 kWh April – December = 25 percent discount for the first 720 hours.	Extended duration, for 12 months in 2021	Yes
	<b>Banpres Produktif (Cash Assistance for Micro Enterprise)</b>	Newly launched in 2020, grant for micro/ultra-micro enterprises affected by Covid-19 and not receiving credit program	12.8 million microenterprises (increased in 2021)	Lower benefit level: Rp 1.2 Million/business	One-off implementation	Yes
	<b>Internet Subsidy</b>	Newly launched in 2020, aim to subsidized internet data quota for teachers and students during PPKM	38.1 million teacher and students (reduced in 2021)		10 months from January-May and August-December 2021	Yes
	<b>Sembako PPKM (previously Sembako Jabodetabek)</b>	Food transfer launched in 2020, covering COVID-19 affected families. Beneficiaries are based on recommendation from the local government that are currently not covered in the initial Kartu Sembako program, PKH, and UCT	Increased coverage to 5.9 million households	Food package equivalent to IDR 200,000/month	Shorter duration, 6 months (July-December 2021)	Yes
	<b>Wage subsidy</b>	Unconditional cash transfer for workers with salary < IDR 3,500,000 and registered BPJS TK, and located in 167 cities and municipalities affected by PPKM level 3 and 4	8.78 million workers	IDR 500,000/worker	2 months, but disbursed in bulk	Yes
<b>Discontinued programs in 2021</b>	<b>UCT for Sembako Beneficiaries</b>	One-time unconditional cash transfer, targeting Sembako beneficiaries who are not receiving PKH	9 million households	IDR 500,000 (one time)	August, 2020	No

Source: World Bank staff compilation based on discussion with relevant ministries.



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