CENTER FOR GLOBAL DEVELOPMENT

The JETPs of South Africa and Indonesia

A Blueprint for the Move Away from Coal?

ANNIKA SEILER · HANNAH BROWN · SAMUEL MATTHEWS

Abstract

The Just Energy Transition Partnerships (JETPs) are a novel approach to intensifying ongoing efforts toward carbon neutrality, combining country-led strategies to decarbonize the energy sector and addressing development priorities resulting from the ensuing structural transformation with focused, long-term, and plurilateral partnerships. The launches of the $8.5 billion JETP for South Africa in 2021 and the $20.0 billion JETP for Indonesia in 2022 provide momentum for this effort. However, the legacies of coal-based power and modest renewable energy deployment in both countries present key challenges in the areas of political economy, policy alignment, finance, and supply chain development.

This paper consolidates available information about these two JETPs and analyzes the approaches taken by South Africa and Indonesia, with the aim of providing a thought framework for these JETPs. It seeks to identify risks and gaps that could obstruct these JETPs' advancement and to assess whether these JETPs can serve as blueprints for other countries looking to accelerate their move away from coal. Further, this paper highlights complementary action that could enhance the effectiveness of these JETPs and guide the development of similar partnerships in the future. The paper finds that while the JETPs for South Africa and Indonesia appear to deliver a blueprint for moving away from coal in their respective contexts, barriers, risks, and gaps call into question whether the targets can be delivered at the planned pace and scale.

POLICY PAPER 302 • JULY 2023

The JETPs of South Africa and Indonesia: A Blueprint for the Move Away from Coal?

Annika Seiler,* Hannah Brown, and Samuel Matthews
Center for Global Development

**On secondment from the Asian Development Bank*

Annika Seiler, Hannah Brown, and Samuel Matthews. 2023. "The JETPs of South Africa and Indonesia: A Blueprint for the Move Away from Coal?" CGD Policy Paper 302. Washington, DC: Center for Global Development.
https://www.cgdev.org/publication/jetps-south-africa-and-indonesia-blueprint-move-away-coal

CENTER FOR GLOBAL DEVELOPMENT
2055 L Street, NW Fifth Floor
Washington, DC 20036

1 Abbey Gardens
Great College Street
London
SW1P 3SE

www.cgdev.org

Contents

List of Figures

List of Tables

Executive summary

The just energy transition partnerships are a novel approach to intensifying ongoing climate change actions toward carbon neutrality combining country-led strategies to decarbonizing the energy sector and addressing development priorities resulting from the ensuing structural transformation with focused, long-term, and plurilateral partnerships. The launches of the $8.5 billion Just Energy Transition Partnership (JETP) for South Africa in 2021 and the $20.0 billion JETP for Indonesia in 2022 provide momentum for this effort. However, the legacies of coal-based power and modest renewable energy deployment in both these countries to date, present key challenges in the areas of political economy, policy alignment, finance, and supply chain development.

This paper consolidates available information about these two JETPs and analyzes the approaches taken by South Africa and Indonesia, with an end view of providing a thought framework for these JETPs. It seeks to identify risks and gaps that could obstruct these JETPs' advancement and assess whether these JETPs can serve as blueprints for other countries looking to accelerate their move away from coal. Further, this paper highlights complementary action that could enhance the effectiveness of these JETPs and guide the development of similar partnerships in the future.

This paper finds that while the JETPs for South Africa and Indonesia appear to deliver a blueprint for moving away from coal in their respective contexts, barriers, risks, and gaps put into question whether the targets can be delivered at the planned pace and scale.

The effectiveness of JETPs depends on consistent and coherent policies across all sectors and levels of government and a long-term political commitment to the reform agenda. The early success of the JETPs hinges on readiness for the transition, for example, removing regulatory constraints, getting price signals right, and deploying new business models. A cost-effective transition from coal requires a comprehensive strategy for decarbonizing the energy sector and the whole of the economy.

The strength of JETPs is their integrated approach to power sector decarbonization. Maintaining reliability and quality of service throughout and beyond the transition requires complementary grid investments. For the transition to be cost-effective, it must be backed by a comprehensive strategy for shifting to a decentralized system based primarily on renewable energy, enhancing energy conservation and energy efficiency, electrifying the transport sector, decarbonizing hard-to-abate sectors, and abating emissions. While pursuing long-term decarbonization efforts, the JETPs also must support short- to medium-term, low-cost, high-impact mitigation investments.

Good governance also requires the disclosure of JETPs' full costs and benefits. With higher electricity rates resulting from the net zero transition, JETPs should follow best practices in power sector and subsidy reforms. Appropriate sequencing of transition plans is needed to cushion social impacts at the asset, regional, and national levels. Economic diversification measures should be coupled with infrastructure investments, business development services, and systematic upskilling and reskilling programs.

The success of the JETPs also hinges on the international partner groups' delivery of their financial commitments and the beneficiary countries' ability to mobilize capital. Multilateral development banks can play a key role in mobilizing stakeholders and facilitating funding for the JETPs. International partner groups' support must be complemented with technology transfer and coherent efforts to develop local value chains to ensure a long-term, sustainable just transition.

Given these barriers, risks, and gaps, it is imperative to closely track and measure the progress in both the development and the rollout of implementing plans for the JETPs and to put stakeholders to task for delivering on their respective commitments.

Abbreviations

ADB	Asian Development Bank
CCUS	carbon capture, utilization, and storage
CFPP	coal-fired power plant
CIF	Climate Investment Funds
CO_2 per kWh	carbon dioxide per kilowatt hour
COP26	2021 United Nations Climate Change Conference
DFI	development finance institution
ETM	energy transition mechanism
GFANZ	Glasgow Financial Alliance for Net Zero
GHG	greenhouse gas
GW	gigawatt
G20	Group of 20
IEA	International Energy Agency
IPG	international partners group
IPP	independent power producer
IRENA	International Renewable Energy Agency
JETP	Just Energy Transition Partnership
MDB	multilateral development bank
MEMR	Ministry of Energy and Mineral Resources
MSME	micro, small, and medium enterprise
$MtCO_2$	metric tons of carbon dioxide
$MtCO_2e$	metric tons of carbon dioxide equivalent
NDC	nationally determined contribution
PLN	Indonesian National Electricity Company
PV	photovoltaic

Introduction

The just energy transition is a novel approach to intensifying ongoing climate change actions toward carbon neutrality. By comprehensively addressing the issues and risks accompanying the accelerated decommissioning of coal-based power plants in a country, the transition helps create enabling conditions and practical solutions for moving away from coal in a dependent economy. Just transition was an underlying principle of the Paris Agreement, which is gaining wider recognition and acceptance as a crucial instrument to address the social and economic downsides of energy transition. The Glasgow Climate Pact recognized that a phasedown from unabated coal needs to ensure just transitions that promote sustainable development and eradication of poverty and the creation of decent work and quality jobs. The launch of the $8.5 billion Just Energy Transition Partnership (JETP) for South Africa in 2021 signified this fact. The further announcement of a $20 billion JETP for Indonesia in 2022 at the Group of 20 (G20) Leaders' Summit in Bali, Indonesia, provided much-needed momentum for just energy transition. Both partnerships were launched with support from the international partners group (IPG),[1] which committed to accelerate financial and technical resources through appropriate instruments in collaboration with multilateral development banks (MDBs) and other development finance or green finance institutions, the private sector, and other partners.

JETPs recognize that some low- and middle-income countries have extraordinary potential to leapfrog into a cost-competitive, renewable energy-driven, decarbonized growth path given their high carbon intensity and high demand growth and/or pent-up demand, while at the same time being at high risk of carbon lock-in and a potentially large future carbon footprint; however, achieving this requires a structural transformation necessitating long-term and whole-of-economy support to manage this process and the accompanying risks and challenges. While in the long run, the structural transformation is expected to drive the creation of decent jobs and green growth, workers and communities dependent on coal will be negatively impacted. The JETPs offer an alternative to a singular focus on project- or program-based, renewables-dominated, climate mitigation support. Instead, they offer a country-led, plurilateral and long-term partnership in support of the transition and duly factor in transition risks and other development priorities of developing countries, which have minimally contributed to climate change. The IPG support selected countries decarbonizing their coal-based power sectors with the aim to help them achieve their enhanced greenhouse gas (GHG) emissions reductions ambitions, set out in their updated Nationally Determined Contribution (NDC), while supporting a just transition with (1) the creation of alternative employment for workers across the coal value chain who are driven out of work and (2) economic opportunities that promote sustainable development and eradication of poverty for communities that are adversely affected

1 The countries collectively referred to as IPG include members of the Group of Seven (G7), the EU, and some signatories of the Government Declaration on Just Transition, but the composition differs for each JETP. In each partnership, one or two countries take the lead in negotiating on behalf of the IPG. In the case of South Africa, the United Kingdom is representing the IPG, and in the case of Indonesia, Japan and the United States are representing.

due to this transformation. Thus, JETPs aim to reduce risks and improve acceptance at the local and national levels for accelerating energy transition and carbon neutrality.

The JETPs for Indonesia and South Africa are in their initial stages of implementation. Nonetheless, a lot of preparatory work has been undertaken ahead of their launch, and as they move forward, they promise to offer rare insights into this complex and ambitious endeavor to entirely move away from coal in large economies. Coal is a bedrock of both economies, with Indonesia ranked globally as the first and South Africa as the fifth largest seaborne exporters of coal. Their power sectors are heavily reliant on domestic coal, with more than 60 percent and 90 percent of electricity generated from coal. With the support of the IPG, South Africa aims to decommission nearly 60 percent of its installed coal-fired power plants (CFPPs) by 2035 and replace them with the equivalent renewable energy capacity.[2] Indonesia aims to achieve a 34 percent share in renewable power generation by 2030, up from 19 percent in 2020, and completely phase out coal-based power by 2050—or potentially 2045 with additional support from international partners.

Given the legacy of coal-based power and the modest capacity of renewable energy deployment so far in both Indonesia and South Africa, there are key underlying challenges in areas of political economy, policy alignment, finance, and supply chain development. This paper provides a thought framework for assessing just energy transition. It shines a light on the approaches taken by South Africa and Indonesia in their respective JETPs' governance and leadership, investment strategy, just transition components, financing, and technology transfer. It captures identified risks and potential gaps at this early stage of development of the JETPs that could slow down or stall the partnerships' advancement toward their goals. The paper also discusses the role of MDBs and assesses whether the JETPs for both these countries can serve as blueprints for other countries that are looking to accelerate their move away from coal.

Further, this paper seeks to highlight complementary action required to improve the effectiveness of these JETPs and guide the development of similar just transition partnerships such as those being explored by the G7 countries with India, Senegal, Vietnam, and potentially others.

This paper is organized as follows. Following this Introduction, the second section will take stock of Indonesia's and South Africa's energy and economic contexts for their JETPs, the third section will discuss key elements and salient approaches of the JETPs, and the fourth section will provide recommendations and implications for future JETPs.

2 South Africa needs to add as much renewable capacity every year as it added during the past 10 years.

Unique country contexts of the JETP plans

The just energy transitions in Indonesia and South Africa comprise a whole-of-country transition and are implemented before two significantly diverging and unique contexts. Before discussing the various aspects of the JETPs, this section provides a brief background against which the transition in the two countries is being executed.

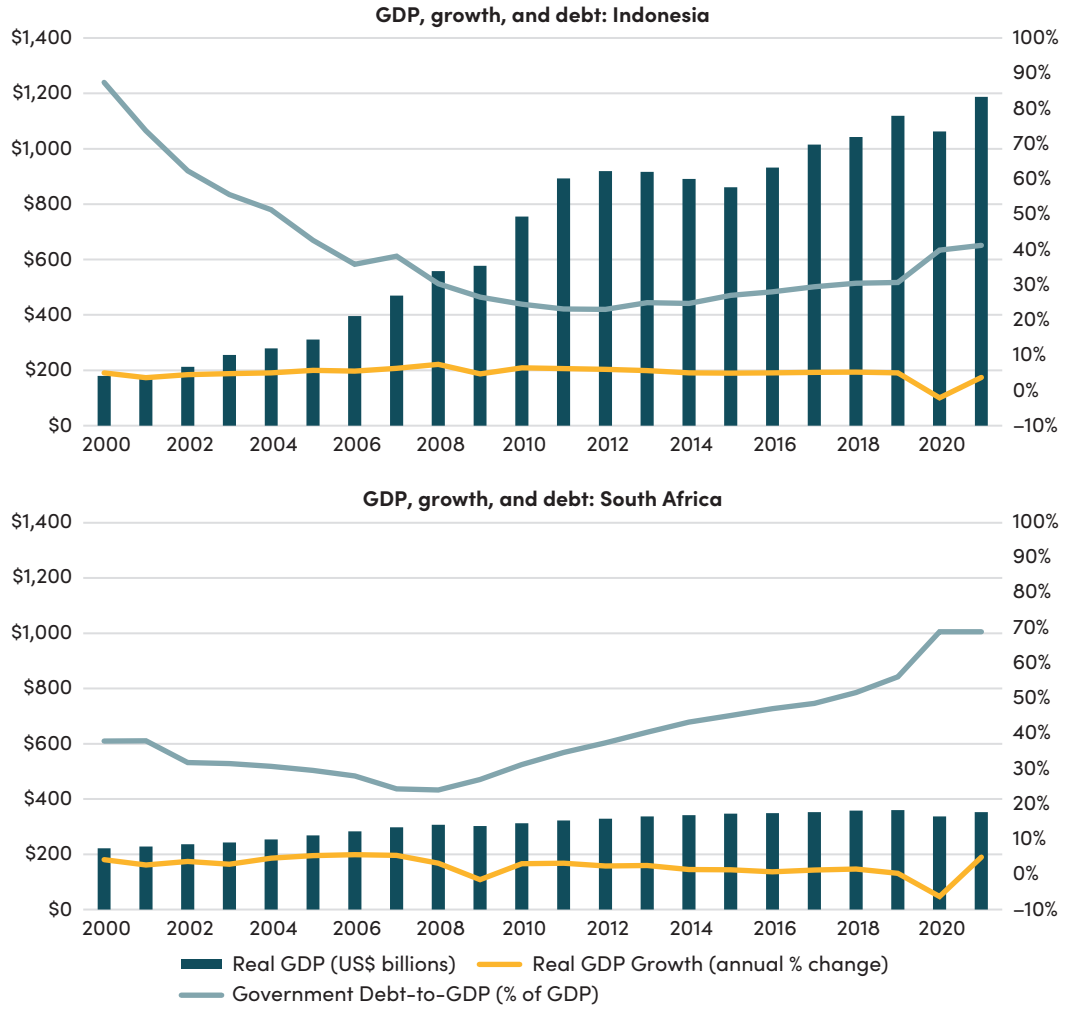
Macro-economic background

Indonesia, an archipelagic, lower-middle-income country with a population of 277.5 million, grew at an average of 5 percent during the past two decades. After a protracted recovery from the COVID-19 pandemic, the country is projected to return to its long-term average growth rate from 2022.

South Africa, an upper-middle-income country with a population of 60.4 million, has suffered from sluggish economic growth of a 2 percent average during the past two decades. According to the International Monetary Fund, the unprecedented and protracted energy crisis, climate shocks, and logistical bottlenecks severely affect the country's growth prospects.

Countercyclical policy measures to avert the worst impact of the pandemic left them with constrained fiscal space. After a decade of fiscal tightening in the 2000s, Indonesia's debt-to-GDP ratio increased by 10 percentage points. South Africa's public debt jumped to 70 percent after it had already been on a steady upward slope in the wake of the global financial crisis. South Africa's government budgeted to take on the state-owned utility Eskom's debt in a staggered manner between FYs 2023 and 2026 and forecast the debt-to-GDP ratio to rise to 74 percent by FYs 2025 and 2026 before it falls back to the current level by FYs 2027 and 2028. As a result, the fiscal space for further active government support for the climate adaptation, a just transition, and its unfinished Sustainable Development Goal agenda are constrained by public debt in both countries, but much more so in the case of South Africa.

FIGURE 1. Real GDP (US$ billions), real GDP growth (%), and government debt-to-GDP (% of GDP)



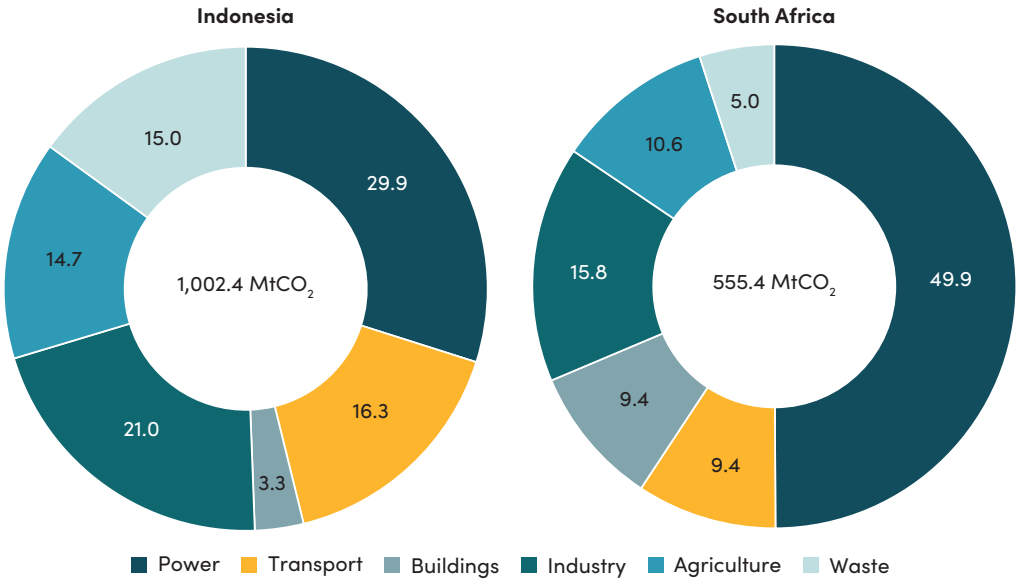
Source: International Monetary Fund.

High Vulnerability, Limited Readiness to Adapt to the Effects of Climate Change, and High Transition Risks as a Common Denominator. Indonesia and South Africa are highly vulnerable to the impacts of climate change. They are ranked 100th and 96th, respectively, out of 182 countries in the Notre Dame Global Adaptation Index, which measures the vulnerability of a country to the effects of climate change on the one hand and its readiness to adapt on the other hand. According to this assessment, Indonesia is progressing in its efforts to effectively prepare for adverse impacts from climate change, but the needs due to its high vulnerability are immense. In contrast, South Africa's vulnerability is considered manageable, but the country lags in terms of readiness.

Both countries are at the same time important carbon emitters. In 2021, Indonesia and South Africa were the world's 10th and 15th largest carbon dioxide (CO_2) emitters, respectively

(EDGAR, 2022).[3] In 2019, Indonesia's GHG emissions exceeded 1 billion metric tons of carbon dioxide equivalent (tCO_2e) for the first time. South Africa's GHG emissions reached 0.55 billion tCO_2e. The power sectors represent 29.9 percent and 49.9 percent of Indonesia's and South Africa's GHG emissions, respectively (Figure 2). Due to their heavy reliance on coal, both countries' power sectors are highly carbon intensive, with Indonesia in 2021 hitting an average carbon intensity of 785grams of CO_2 per kilowatt hour (g of CO_2 per kWh) and South Africa 867g of CO_2 per kWh; compared to 445g of CO_2 per kWh as the average carbon intensity of power sectors among G20 countries for the same year. South Africa's per capita emissions of 7.34 $MtCO_2e$ are higher than those of the EU. In contrast, Indonesia's emissions per capita of 2.19 $MtCO_2e$ are far below the world average of 4.81 $MtCO_2e$ per capita.

FIGURE 2. GHG emission profile, 2019



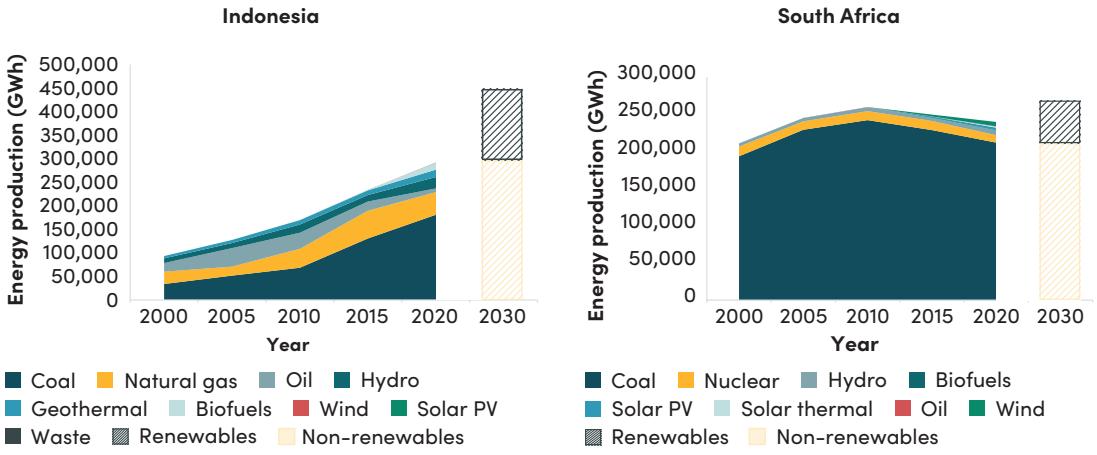
Note: $MtCO_2$ = million metric tons of carbon dioxide.
Sources: Climate Transparency; World Bank, World Development Indicators.

Driven by rapid economic growth, urbanization, industrialization, and a massive program to provide 100 million people with access to electricity, Indonesia's electricity demand has increased by more than 200 percent during the past two decades; much of this growth was fueled by coal, particularly after 2010. The country switched from imported oil to domestic coal to stop the drain of foreign currency, to electrify its rapidly growing economy. Because the expansion of generation capacity was faster than realized demand growth, the archipelago's main grid, the Jawa-Bali grid, is in a situation of overcapacity with a reserve margin of 50–60 percent. Indonesia's thirst for power is projected to increase by an additional 50 percent by 2030. In a business-as-usual scenario, this would continue to be fueled by coal.

3 In this ranking, international shipping and the EU are considered as one country.

Meanwhile South Africa's generation during the same period grew by only 13 percent. Its generation peaked in 2011 before it declined, due in large part to lack of sector governance, underinvestment, and infrastructure fragilities in the power system. Coal-based power assets were built in the 1970s and 1980s and have dominated the generation mix ever since (Figure 3). Given their high growth (Indonesia), and pent-up demand (South Africa), both countries are at an elevated risk of carbon lock-in.

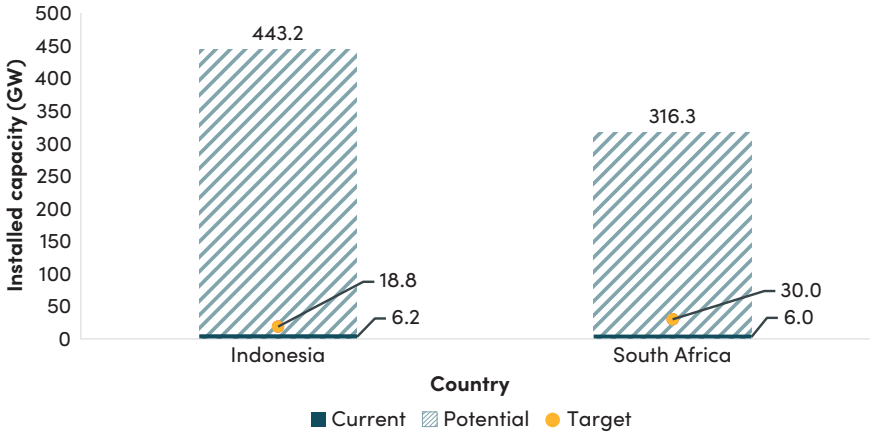
FIGURE 3. Power sector generation mix, 2000–2020, and targeted renewables share by 2030



Note: GWh = gigawatt-hours; PV = photovoltaic.

Sources: International Energy Agency, Climate Investment Funds; International Energy Agency, Eskom, Integrated Resource Plan.

FIGURE 4. Installed capacity, target, and potential renewable energy capacity (GW)



Note: The renewable energy potential of South Africa is a proportional estimate derived from IRENA's figure for the potential of the Southern Africa region; Indonesia's renewable energy target will increase once the Energy Supply Business Plan is updated to reflect the increased ambition enabled by the JETP.

Sources: Climate Investment Funds; Integrated Resource Plan; IRENA; Indonesian National Electricity Company.

Indonesia and South Africa have large untapped potential and are well placed to transition to clean energy. Less than 3 percent and 7 percent of the estimated renewable energy potential is developed to date.

The government of Indonesia in 2017 estimated a total potential of 443 GW, comprising 208 GW from solar and 61 GW from wind. A more recent assessment by the International Renewable Energy Agency (IRENA) estimates that the solar PV potential could be 15 times larger than the government estimate. IRENA also forecasts a large offshore wind potential for Indonesia, which is not included in the government estimate.

TABLE 1. Emissions levels and targets in first and enhanced NDC

	Old 2030 Targets ($MtCO_2e$)		New 2030 Targets ($MtCO_2e$)		
	Unconditional	Conditional	Unconditional	Conditional	Net Zero By
Indonesia	2,034	1,787	1,953	1,632	2060
South Africa	614	398	420	350	2050

Sources: World Bank, World Development Indicators; Climate Action Tracker; NDC.

Through the successful implementation of their enhanced NDCs, Indonesia and South Africa aim to achieve an earlier peaking and carbon neutrality by 2060 and 2050.

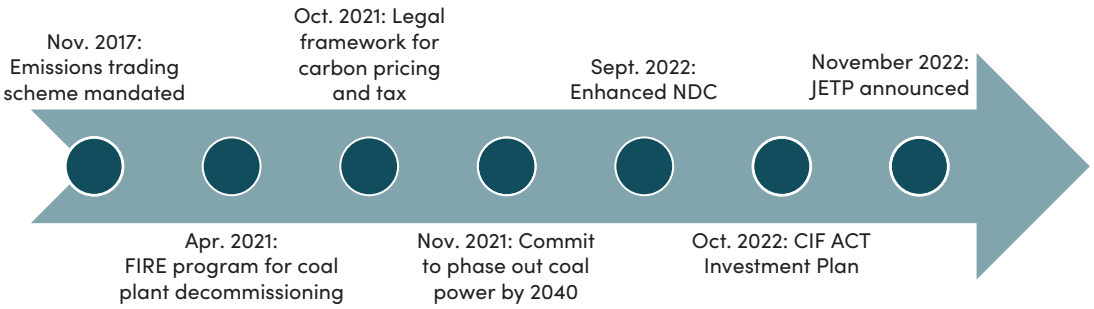
Assuming the successful implementation of its JETP, South Africa should achieve its most ambitious emission reduction level. Indonesia updated its NDC in September 2022, increasing its unconditional emission reduction target from 29 percent to 32 percent below its business-as-usual scenario and its conditional target from 41 percent to 43 percent below its business-as-usual scenario, including emissions from land use, land use change, and forestry. The JETP for Indonesia accelerates Indonesia's transition toward a cleaner energy future. In addition to increasing the share of renewables in the power mix, the partnership also includes a target for the first time—a 2030 peaking date for Indonesia's power sector emissions including emissions from on-grid, off-grid, and captive power systems—shifting the projected peak seven years earlier. The country committed to limiting power sector emissions to no more than 290 megatons by 2030 and to bringing forward its commitment to net zero in the power sector by 2050. Yet the GHG emission trajectory for Indonesia continues to be inconsistent with the 1.5 degrees Paris Climate Goal according to Climate Action Tracker. It rates South Africa's reduction targets as being nearly in line with the goal.

Recent climate and just energy policies

Indonesia. The energy and climate policy making landscape in Indonesia is made up of a range of diverse stakeholders, including ministerial departments, the Executive Office of the President of the Republic of Indonesia, the national parliament, several regulatory agencies, and non-governmental organizations. Key policymaking ministries are the Ministry of Energy and Mineral Resources which governs renewable energy support mechanisms; the Ministry of Finance which sets the size

of renewable energy subsidies, fiscal incentives, and other financial measures; the Coordinating Ministry of Maritime Affairs and Investments, which is in charge of coordinating investments; the Ministry of Industry and Ministry of Villages, Disadvantaged Regions, and Transmigration which has the power to establish local grants and renewable energy requirements; and the Ministry of Environment and Forestry is mandated to coordinate the overall implementation of Indonesia's (NDC) and carbon pricing mechanism.

FIGURE 5a. Recent energy and climate policy action—Indonesia



Notes: FIRE = Friends of Indonesia Renewable Energy; CIF ACT = Climate Investment Funds Accelerating Coal Transition.

In the lead-up to the 2021 United Nations Climate Change Conference (COP26), the government of Indonesia submitted its Long-Term Strategy for Low Carbon and Climate Resilience 2050 to the United Nations Framework Convention on Climate Change, which outlines its plans to peak emissions by 2030 and establishes a net zero GHG emissions goal of 2060 or sooner. Indonesia also submitted its Enhanced NDC, which increased sectoral targets and reconfirms a 41% GHG reduction target by 2030 'subject to availability of international support for finance' (Table 1), to achieve an electrification ratio of 99.7% by 2025, and to reduce energy intensity by 1% per year up to 2025.

Indonesia has numerous commitments and policies in transitioning out of coal, including the Friends of Indonesia Renewable Energy program, which announced plans to decommission 9.2 GW of coal capacity by 2030. Indonesia also signed the Global Coal to Clean Power Transition Statement at COP26, which would phase out coal power by 2040 with additional support from the international community.

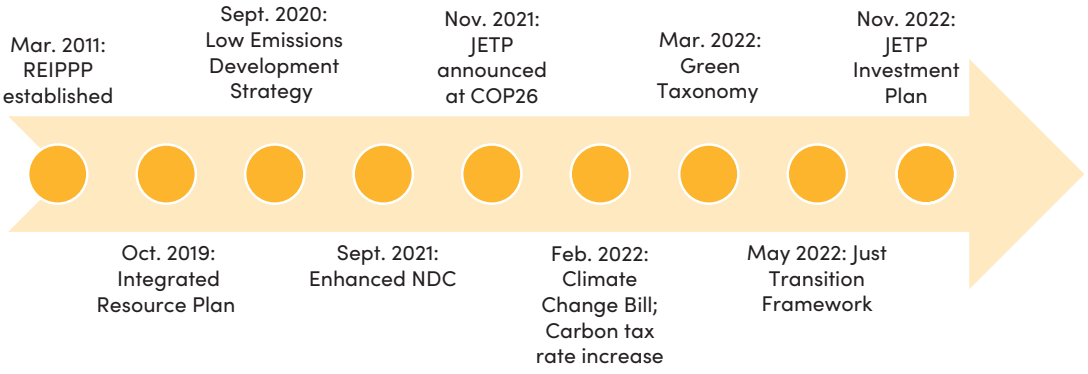
Recent changes in energy policies and regulations have aimed to accelerate deployment of renewables, increase energy justice, and to align them with a more ambitious future decarbonization trajectory. Notable laws and regulations include

- In October 2021, the state-owned, vertically integrated power utility Indonesian National Electricity Company (PLN) and the government of Indonesia released the Electricity Supply Business Plan (Rencana Usaha Penyediaan Tenaga Listrik) 2021–2030, which lays out a 10-year development plan for electricity generation, transmission, and distribution assets in Indonesia. For the first time set a renewable-energy target of 51.6 percent (or 21 GW) of total power capacity addition by 2030.

- Ministry of Villages, Disadvantaged Regions, and Transmigration Regulation No. 11 of 2019—creates regional financial support for off-grid renewable energy projects.
- Presidential Regulation No. 10 of 2021 on Investment Business Sector—creates a range of fiscal incentives for renewable energy generation, including corporate income tax reduction.
- Presidential Regulation 112/2022 on Acceleration of the Development of Renewable Energy for Electrical Generation, issued in September 2022 is central to the country's energy transition. It establishes an enhanced regulatory framework and pricing regime for renewable energy sources. It further sets a 2050 phaseout date for coal power, prohibits the development of new CFPPs, and mandates that PLN terminate early the operation of its CFPPs and/or power purchase agreements with CFPPs developed by independent power producers (IPPs). Early retirement of CFPPs is to be implemented with consideration of the reliability and affordability of the supply of electricity in Indonesia. The regulation, however, allows the development of new CFPPs in two exceptional circumstances. The first is if CFPPs have been included in the latest Electricity Supply Business Plan (Rencana Usaha Penyediaan Tenaga Listrik) 2021–2030. The second is if CFPPs (1) are integrated in industrial development plans to add value to natural resources or included as National Strategic Projects that drive job creation and/or economic growth, (2) are committed to reducing carbon emissions by at least 35 percent against the 2021 average in-country CFPP emissions within 10 years from the commercial operations date, and (3) will remain in operation only until 2050.

The government with Presidential Regulation No. 98 of 2021 on the Implementation of Economic Value of Carbon for Achieving NDC Targets and Control of GHG Emissions in National Development also created a legal framework for domestic carbon pricing, a groundwork for carbon tax, and an emissions trading scheme to be implemented by 2024. Both the emissions trading scheme and the carbon tax remain in development. The government released the National Action Plan on Climate Change Adaptation, which establishes Indonesia's strategic plan for adaptation, first in 2014 and (updated) in 2019.

FIGURE 5b. Recent energy and climate policy action—South Africa



Sources: JETP Investment Plan; Climate Action Tracker.

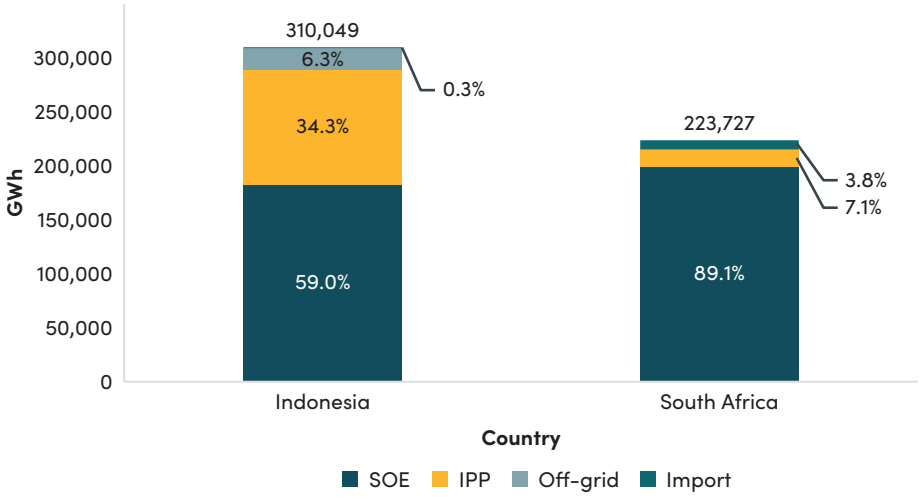
In June 2019, South Africa introduced a carbon tax with the goal of progressively increasing the in-country cost of carbon. South Africa has a Low Emission Development Strategy that was approved by the United Nations Framework Convention on Climate Change in September 2020. Its success hinges on the implementation of its Integrated Resource Plan 2019, which is being revised. In 2021, South Africa submitted an Enhanced NDC—approved by the country's cabinet, which provides additional credibility to its commitments—with more ambitious emission mitigation targets. These efforts laid the foundation for the announcement of the JETP between South Africa and the IPG at COP26. The country carried out several reforms while the JETP Investment Plan was being drafted. In February 2022, the Department of Forestry, Fisheries, and Environment introduced Climate Change Bill B9-2022 to parliament. It provides a legal framework for South Africa's climate action, establishes municipal intergovernmental forums to coordinate local responses, and mandates the formulation of a national GHG emission trajectory with sectoral targets. At the same time, the National Budget Speech indicated that the country's carbon tax would increase by $1 a year until reaching $20 per ton in 2026, with more rapid increases to follow. Current carbon tax levels are above the global average of $6 per ton but significantly below, for example, the European Union, where carbon is priced at $90 per ton. Two months later, the National Treasury released a Green Finance Taxonomy that created a voluntary framework for defining green investments. Later that year, in June 2022, the Presidential Climate Commission released a report called "A Framework for a Just Transition in South Africa." Based on a consultative process, it sets out a definition for the just transition of South Africa. A year after the announcement of South Africa's JETP, the country's JETP Investment Plan was released by the office of the president. It outlines the financing needs of the different sectors of the energy transition and identifies funding gaps.

Sector governance challenges to the renewable energy deployment

The rapid scale up of renewable power in both countries will have to come to a large part from private sector investments. Indonesia's RUPTL sets a target of 56 percent. But lack of competition and the dominance of the state-owned utilities—PLN in Indonesia and Eskom in South Africa—create high entry barriers and hamper the rapid deployment of renewables. The share of generation from IPPs, renewables, and fossil fuel-based, in South Africa is particularly low at 7.1 percent. While the share of IPPs is higher in Indonesia, with IPPs' representing 34.3 percent of total generation in 2021, these are predominantly fossil fuel-based plants; the share of renewables is negligible. Private power is dominated by internationally financed, coal-based IPPs.[4] In Indonesia, coal-based IPPs' take-or-pay clause provides the already financially struggling offtaker PLN little incentive to deprioritize the dispatch of CFPPs.

4 According to estimates of the Institute for Energy Economics and Financial Analysis, as of 2021, 12.9 GW was financed by Chinese investors, either fully or partially, while Japanese banks backed about 5.5 GW. As for the 13.8 GW in the pipeline at that time, at least 7.3 GW received financing from Japan or China and 2.0 GW from South Korea.

FIGURE 6. Energy production by type of producer, 2021



Note: GWh = gigawatt hour, SOE = state-owned enterprise.
Sources: Eskom (2022); Ministry of Energy and Mineral Resources (2021).

Indonesia's operating coal plants have an average age of 12 years. Coupled with a situation of overcapacity in its main Java-Bali grid around main load centers, this leaves little or no room for renewable IPPs in the immediate to short run.[5] The enhanced business ecosystem for renewables, with an improved pricing regime and must-run obligations for renewables through the promulgation of Presidential Regulation 112/2022 in September 2022 (see above), remains untested.

Moreover, in both countries, regulatory red tape and uncertainty in the project development process as well as delays in licensing and project approval constitute additional important impediments to a large-scale deployment of renewables.

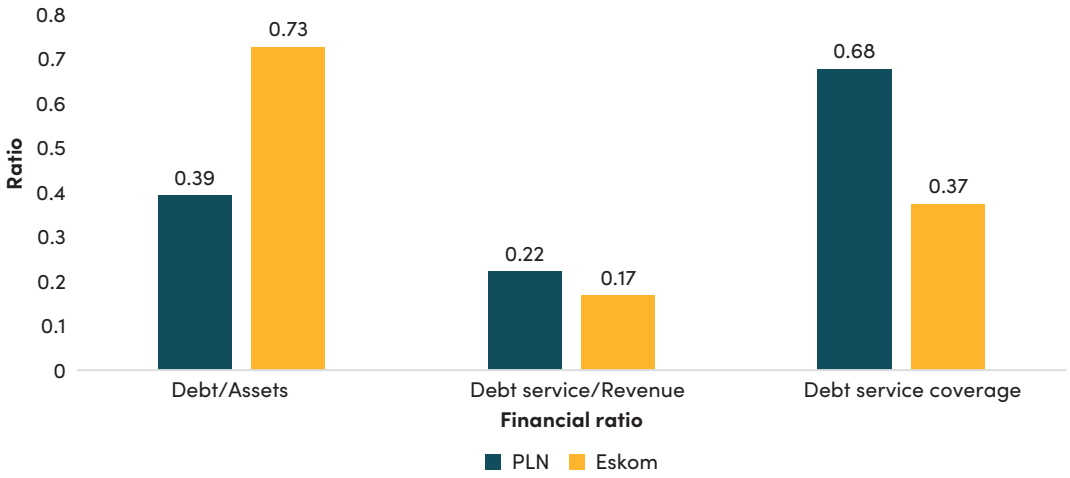
The government of South Africa in the JETP Investment Plan commits to introducing competition into the market by restructuring Eskom and moving toward a single-buyer model under which the transmission operator has been carved out to reduce regulatory red tape and policy uncertainty changes to unlock private investments in the sector. There is no progress on the unbundling to date.

A major impediment to the rapid scale-up of renewables and the transition away from coal is the ill financial health of the power sector and the state-owned utilities in both countries. In their capacity as state utility companies, Eskom and PLN have public service obligations across South Africa and Indonesia. For decades, a substantial part of the electricity sold to end consumers has been subsidized. As a result, the vertically integrated utilities are structurally in a loss-making position

5 There is inconsistency between sources regarding the installed and operating capacity of CFPPs in Indonesia. While the government of Indonesia's project information document to the Climate Investment Fund highlights a capacity of 34.5 GW of CFPP in operation, the Global Energy Monitor database documents a capacity of 45.3 GW in operation. The difference in capacities is assessed due to inclusion of captive power in the database.

and rely on government support for their operations. This places them in a difficult situation to support renewable development.

FIGURE 7. Debt ratios for PLN and Eskom, 2022



Note: Eskom figure is from 2022 while PLN figure is from 2021 due to data restrictions.
Sources: Eskom (2022); PLN (2021).

Decades of operational inefficiencies and below-cost, recovery-level tariffs led to a financially unsustainable profile of Eskom, underinvestment in new and maintenance of existing infrastructure, and progressively deteriorating service quality. In 2022, South Africa suffered from the greatest number of days with rolling load shedding. The transmission and distribution grids are in no state to absorb large-scale renewable power. Still, Eskom benefits from government support. The utility received more than 80 percent of all government support to financially distressed, state-owned companies during the past decade, and the government budget provides for explicit support to Eskom until the financial year ending March 2026 (FY 2026) through equity injections and until FY 2023 through the Guarantee Framework Agreement.

PLN is also reliant on state support to sustain its operations. State support in recent years has reportedly been timely, and compensation payments were made in full. The utility also benefits from a tariff system that recovers its recurring costs, finances expenditures, and in part covers investment costs.

With a lack of financial sustainability in the sectors, offtaker risks, including curtailment risks, partial, and/or delayed payments of IPPs remain high in both countries. Such risks have substantial negative impacts on creditworthiness and their realization reduce the effective rate of return of renewable IPPs. As a result, the risk premiums of borrowings and equity return expectations remain high. Due to this comparatively unfavorable investment framework to date, Indonesia has seen the highest tariffs for renewable IPPs in Southeast Asia (International Energy Agency [IEA] 2022).

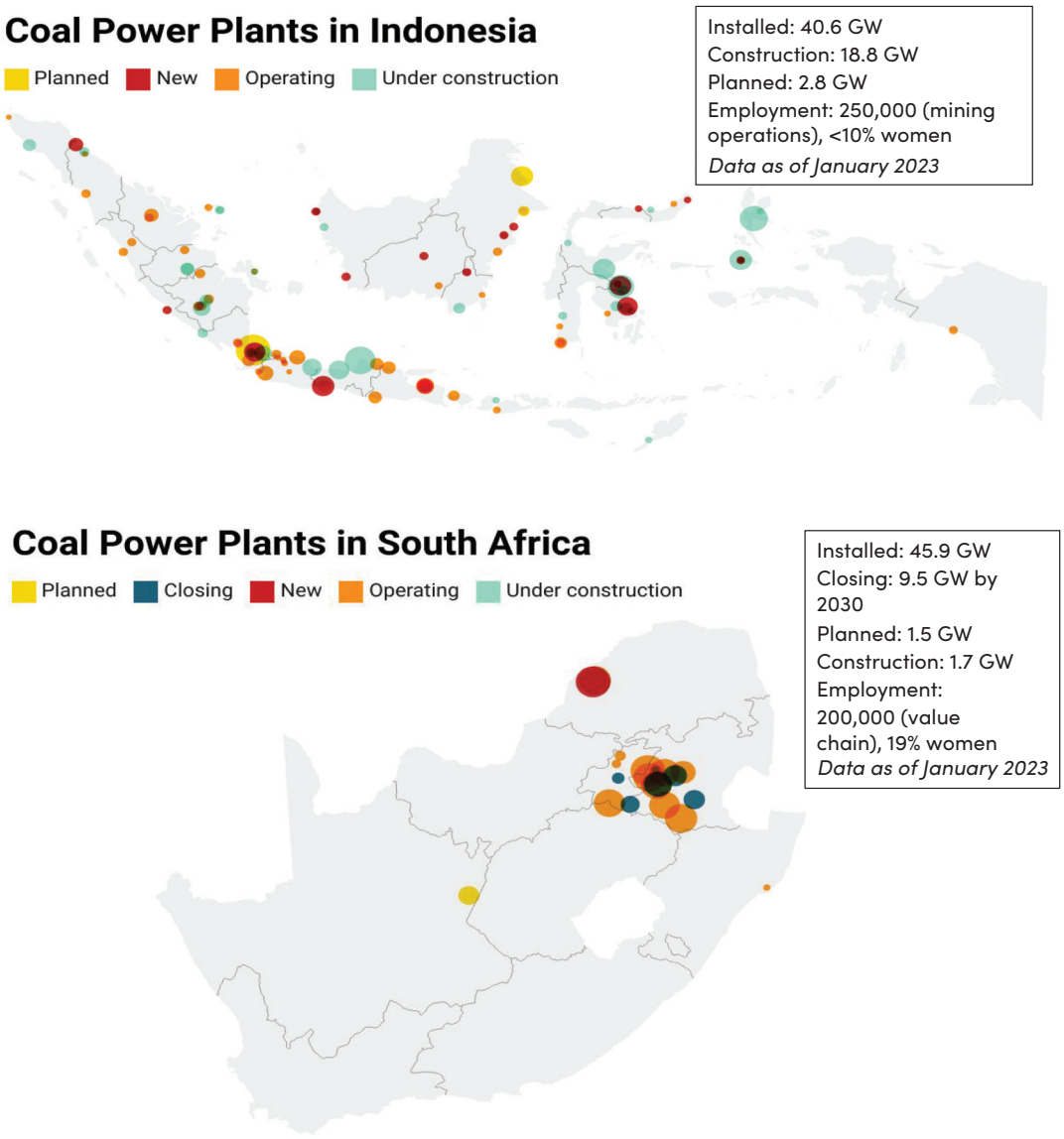
Just transition challenges

The coal industries in Indonesia and South Africa are important employers. While the countries' energy transitions are projected to have net positive job outcomes, the workers in the coal value chain stand to lose out. To ensure that their transition is just and gender equitable, each country needs to address unique challenges.

In Indonesia, CFPPs are widely distributed across the country, with some concentration in the interconnected network of Java and Bali. Thus, through careful selection and avoiding geographic concentration of coal plant retirement, the negative social impacts from decommissioning of plants potentially could be mitigated in the short term. While development of pipeline-captive and on-grid CFPPs will be restricted and frozen, respectively, an additional 19 GW of new CFPP capacity is currently under construction. A total of 250,000 are employed in mining operations, with the share of women employed in the sector being below 10 percent.

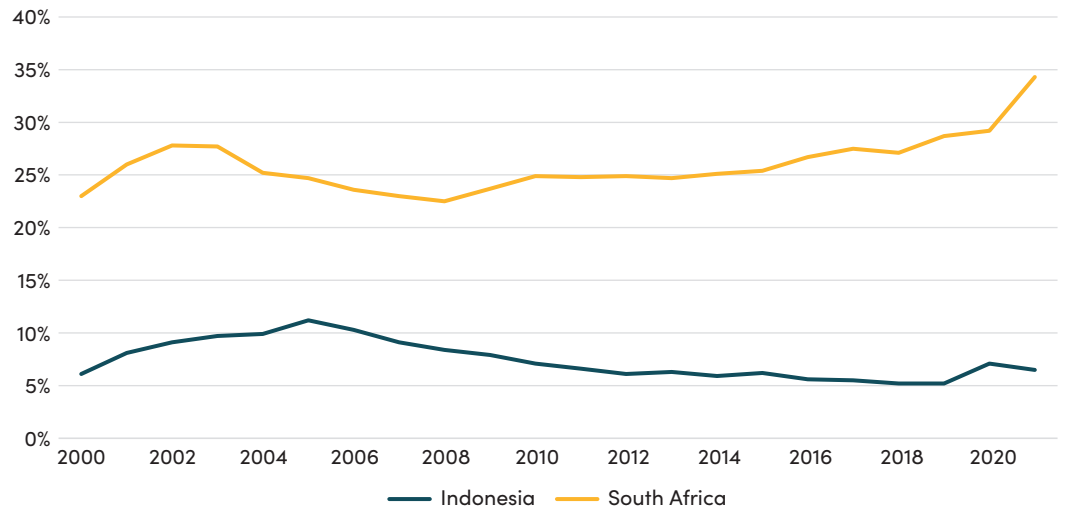
South Africa has an older coal fleet of 45.9 GW and an average of 42 years, with 74 percent of installed operating capacity located in Mpumalanga Province. An additional 1.7 GW of new capacity is under construction, and another 1.5 GW is in the planning phase. The coal value chain employs 200,000 workers, 19 percent of whom are women. The geographical concentration of coal plants and mines in one single region could result in negative multiplier impacts from the decommissioning of plants.

FIGURE 8. Geographical distribution of coal plants, 2022



Source: Global Energy Monitor, created with Datawrapper.

FIGURE 9. Unemployment rate, 2000–2020

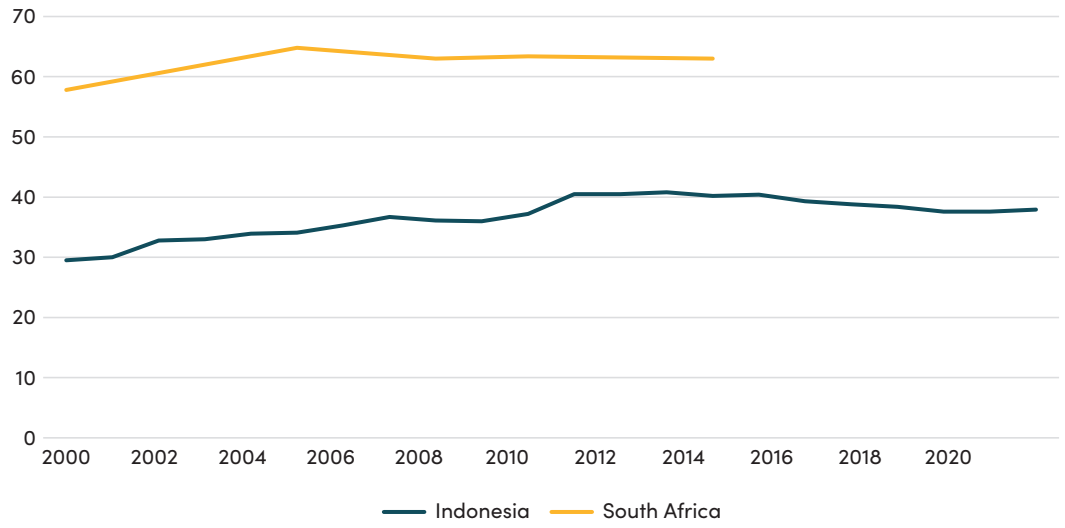


Source: International Monetary Fund.

Labor market recovery in the wake of the COVID-19 pandemic in the two countries has been asynchronous. In Indonesia in 2022, the unemployment rate dropped to its level before the pandemic of 5.5 percent. Meanwhile in South Africa, economic recovery has not been accompanied by a decrease in unemployment rate levels; the steady increase in the unemployment rate since 2010 accelerated in 2020 and reached 35.6 percent.

Moreover, the quality of these countries education systems is low to medium. The World Population Review ranks the quality of Indonesia's and South Africa's education systems 54 and 33, respectively, out of 72 countries.

FIGURE 10. Income inequality—Gini index, 2000–2020

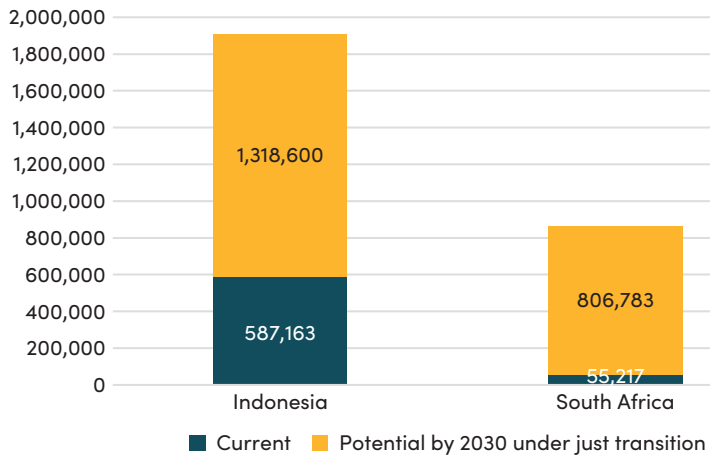


Source: World Bank.

South Africa is among the countries with the highest income inequality worldwide, and the income divide has become worse over the years. Ten percent of the country's population take home 65 percent of all income, and the remaining 90 percent of South African earners take home only 35 percent of all income. Incomes in South Africa remain racialized, gendered, and spatializedmeaning that white people are more likely to find work (and work that pays better) than their black counterparts, female workers earn about 30 percent less than male workers, and urban workers earn about double that of those in the countryside.

The absorption of many workers from the coal value chain will be more difficult in South Africa than in the Indonesian context.

FIGURE 11. Employment in renewables sector, 2022 versus 2030



Sources: International Labor Organization, IRENA, Price Waterhouse Coopers.

The renewable energy subsector is projected to become a motor for job creation in both Indonesia and South Africa under a just transition scenario. According to research by IRENA, Indonesia in 2021 had a renewable energy workforce of nearly 587,163 and could add more than twice as many employees by 2030 under a 1.5 degree scenario, which is driven largely by gains in the bioenergy and solar sectors. Under the planned energy scenario, gains are more modest, with 158,600 additional jobs in renewables by 2030.

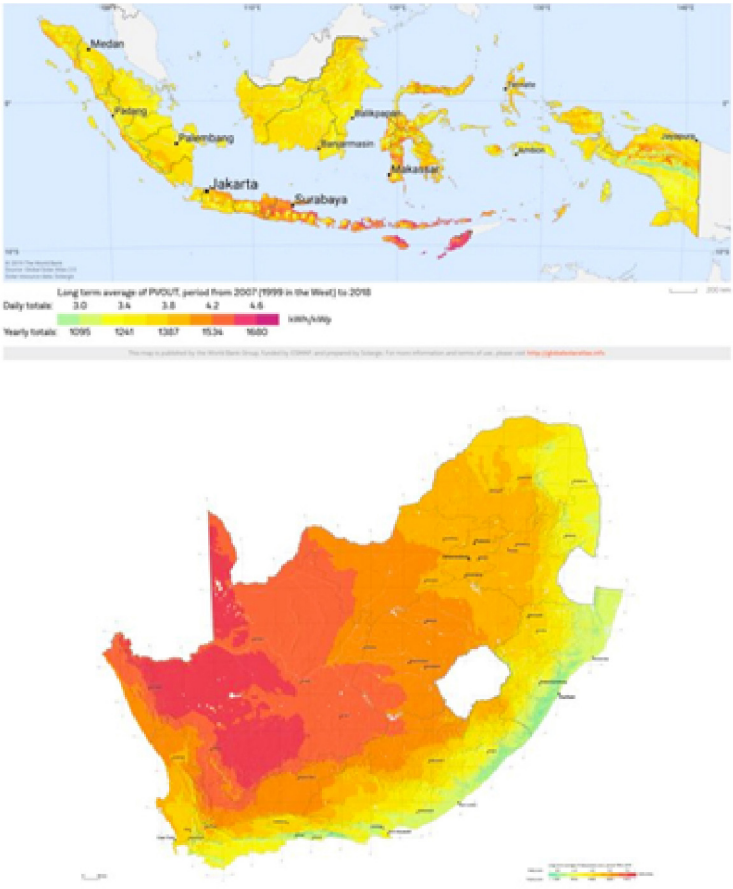
As of 2020, direct employment in South Africa's renewable energy subsector is at about 55,000, and it could add 265,000 direct employees in construction, operation, and maintenance and 596,000 in indirect and induced jobs: 20 times the current employment levels (Figure 11).

Unlocking the deployment of the countries' abundant resources necessitates large investments in expanding Indonesia's and South Africa's transmission infrastructures. First, as regions with the highest solar and wind resource potential in both Indonesia and South Africa are not located in the same regions as current coal value chain centers and are not close to the countries' main load

centers, the transmission network capacity needs to be expanded in those resource-rich regions. Second, the network does not have the necessary flexibility and complementary storage capacity to absorb large-scale variable renewable resources. Given the long lead time for grid infrastructure development, grid capacity rather than resource potential will drive deployment of renewables in the short to medium term.

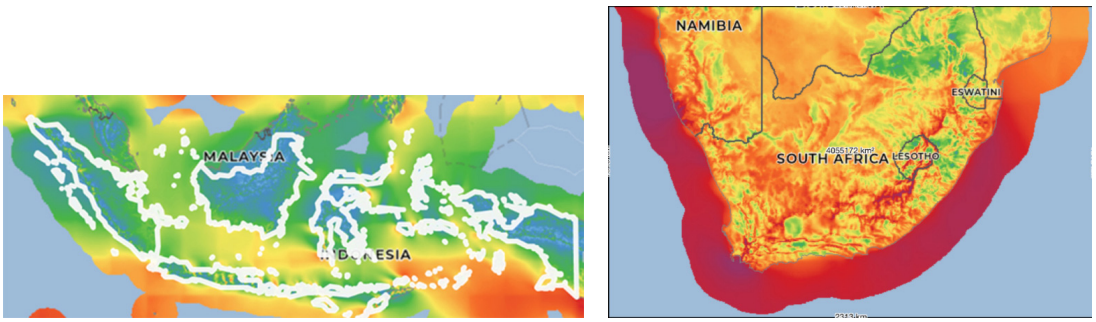
Regions where coal assets are to be phased out tend to have adequate grid capacity. Therefore, those regions that stand to be affected from the coal phaseout also possess an opportunity to reap full co-benefits in terms of creation of quality green jobs from the deployment of renewables for just transition. In the short to medium term, there is a tradeoff between deployment of most cost-effective renewables in regions with the highest potential, potential speed, and scale of deployment and co-benefits from job creation and absorption of lost jobs in the renewables value chain.

FIGURE 12. PV potential in Indonesia and South Africa, 2022



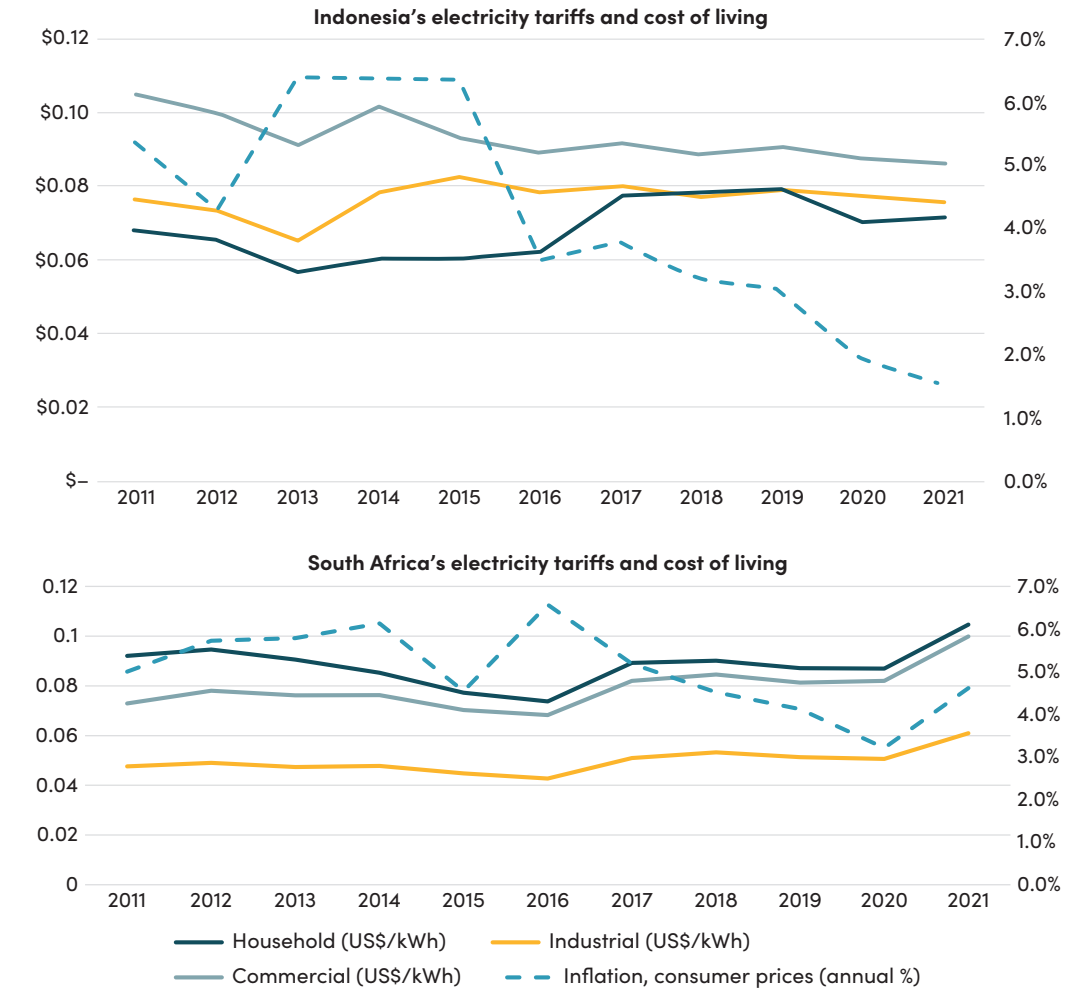
Sources: Solargis/Energy Sector Management Assistance Program; Solargis/Energy Sector Management Assistance Program.

FIGURES 13a and 13b. Wind power potential at mean wind speeds and at 100 meters in Indonesia and South Africa, 2022



Source: World Bank, Energy Sector Management Assistance Program, and Vortex.

FIGURES 14a and 14b. Electricity tariffs and cost of living development in Indonesia and South Africa, 2001–2021



Notes: Electricity prices were converted from South African rand into US dollars using average annual exchange rates. kWh = kilowatt hour.

Sources: Ministry of Energy and Mineral Resources, World Bank; Eskom, Exchange Rates, World Bank.

The JETPs are to be implemented before the background-heightened inflation and increasing food insecurity.

In Indonesia, after a period of declining consumer prices, headline inflation rose 5.4 percent year-on-year in 2022. Between 2011 and 2021, electricity tariffs in domestic currency for residential, commercial, and industrial households increased by average annual growth rates of 5.0 percent, 2.4 percent, and 4.1 percent, respectively, while the average annual depreciation rate of the rupiah against the US dollar was 6.0 percent.

In South Africa, the average annual tariff increases in rand for residential, commercial, and industrial households increased by average annual growth rates of 8.0 percent, 9.8 percent, and 9.2 percent, respectively, while the average annual depreciation rate of the rand against the US dollar was 6.3 percent. Inflation averaged 6.9 percent in 2022, up from 4.5 percent in the previous year, statistics office data show—the highest level since 2009, when rising electricity costs added to price pressures. Rising electricity tariffs happen against the background of deteriorating service quality. During the past decade, South Africans have suffered from rolling load shedding, which has become increasingly worse. In 2022, numerous protests and complaints were lodged about rising rates and heightened levels of power cuts. A survey of the prevalence of food insecurity in the country in 2021 found that 20.4 percent of South Africans were food insecure. The most vulnerable were females, people living in rural areas, those with low socioeconomic status, people without high school certificates, and adults older than 45.

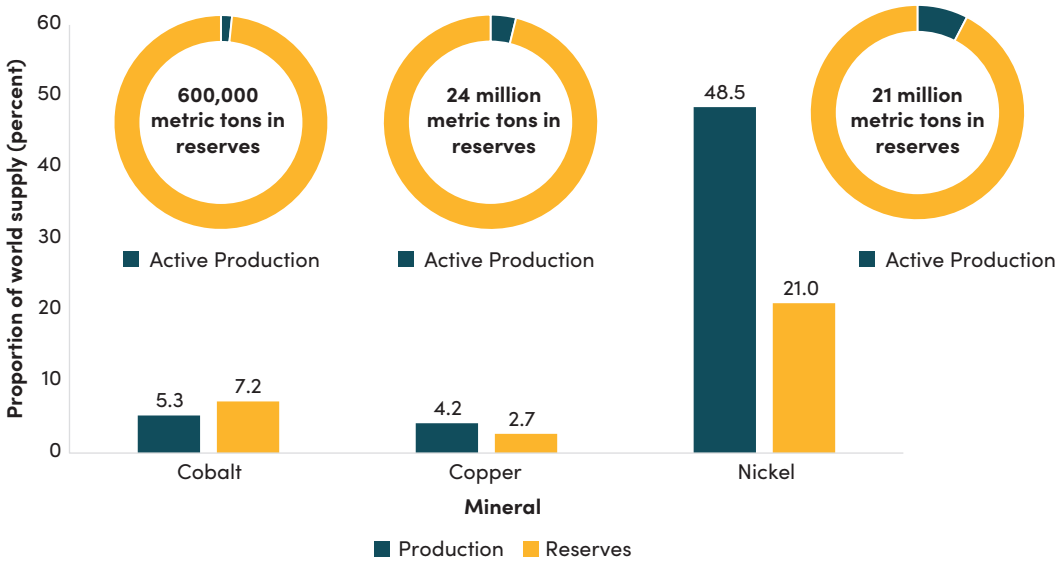
Opportunities for just energy transition through value addition and value chain development

Indonesia and South Africa have a particular aptitude for championing the clean-energy revolution and achieving a just transition. Beyond the aforementioned largely untapped potential for renewable energy deployment, the countries are richly endowed with reserves of minerals and precious metals such as nickel, cobalt, copper, and platinum that are essential for the manufacturing of clean energy technologies. This creates new opportunities for both countries to integrate themselves into global value chains and export-led growth.

Indonesia has a dominant position in nickel production globally and has substantial amounts of cobalt reserves, both essential for the manufacturing of batteries. According to IEA, global demand for these minerals would grow by about 20 times by 2040 if the world were to shift to a pathway consistent with a net zero emissions future by 2050.

Following its nickel strategy, Indonesia aims to produce downstream materials and products in the nickel and EV battery supply chain, replicating its success in onshoring foreign direct investments and becoming the second-largest producer of stainless steel in the world within less than a decade. The country is advanced in expanding its onshoring strategy to other metals essential for the energy transition, including bauxite and copper, which are essential for grid infrastructure.

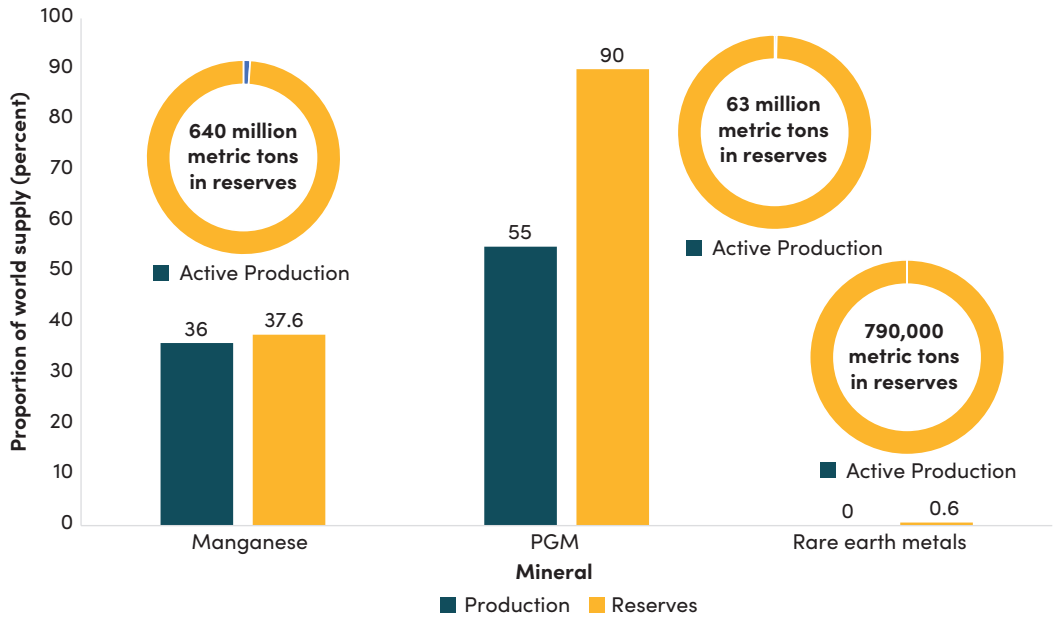
FIGURE 15. Production and reserves of minerals related to renewable energy technology for Indonesia, 2022



Source: United States Geological Survey.

South Africa has a dominant position in manganese and platinum production globally, which are essential for the manufacturing of batteries and electrolyzer membranes. According to the IEA, global demand for manganese for clean energy would grow by about 8 times by 2040 if the world were to shift to a pathway consistent with a net zero emissions future by 2050.

FIGURE 16. Production and reserves of minerals related to renewable energy technology for South Africa, 2022



Source: United States Geological Survey.

South Africa's rare earth elements reserves are not developed to date. In 2022, China held a dominant hold on the market—with 70 percent of global production, down from a dominance of close to 90 percent of production a decade ago.

South Africa's Steenkampskraal Mine has one of the highest grades of rare earth elements in the world. It contains 15 elements and 86,900 tons of rare earth oxides, with large deposits of neodymium and praseodymium. To date, there is one Angolan subsidiary of Pensana Rare Earths, a British firm that received exclusive mining rights to the Longonjo Mine, a rare earths operation, for a 35-year period.

Potential co-benefits from a phasedown of coal

While the phasedown of coal and efforts to peak early are projected to come at high costs, the co-benefits in terms of improvement of public health and outdoor air as well as soil and water body pollution reduction outweigh the costs. In South Africa, in addition, the repowering of the system bears the promise of overcoming the current power crisis and growth impasse. For 2023, South Africa's Reserve Bank projects the cost of load shedding in terms of foregone growth at 1 percent of GDP for the country. Due to load shedding, the cost of doing business is elevated as businesses are forced to operate expensive diesel generators and cut operating hours short.

According to the Climate Investment Fund (CIF), Indonesia is one of the world's largest coal exporters and exports most of its coal output, accounting for about 40 percent of global international coal—a value of around $40 billion in a typical year. Together, coal mining, domestic transshipment, and exports represent about $80 billion per year in economic activity—8 percent of GDP.

TABLE 2. Potential co-benefits of a phasedown of coal

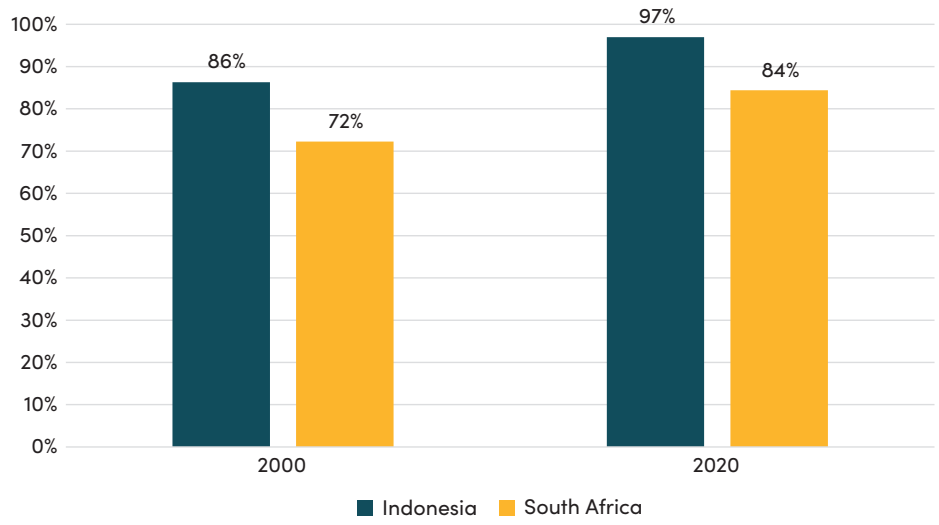
South Africa	
Annual avoided costs associated with air pollution and GHG emissions from fossil fuels	US$33 billion
Annual deaths from coal-fired plants	2,239
Total health costs of coal-fired plants	US$2.4 billion
Indonesia	
Annual avoided cost of air pollution and climate change externalities, 1.5 degree scenario	US$20–38 billion
Deaths related to outdooor air pollution (2019)	168,300

Progress toward universal access to reliable and affordable electricity

Both Indonesia and South Africa have seen electrification increase significantly in the past 20 years. Indonesia's access to electricity increased by 11 percentage points to 97 percent from 86 percent in 2020, while South Africa's increased by 12 percentage points to 84 percent from 72 percent. However, due to load shedding, electricity access is frequently disrupted in South Africa; in 2022, South Africans had more than 200 days of power cuts and the situation is projected to worsen

in 2023. Indonesia's rural electrification is slightly lower than urban, rising from 79.6 percent in 2000 to 93.5 percent in 2020 versus 95.5 percent to 99.6 percent. South Africa's rural population has seen considerable progress in the past 20 years, rising from 54.6 percent to 75.3 percent, while urban electrification saw a more modest increase from 85.7 percent to 88.8 percent. Indonesia and South Africa also have seen great progress in access to clean cooking, growing from 6.1 percent and 55.7 percent in 2000 to 82.4 percent and 86.3 percent in 2019, respectively.

FIGURE 17. Electrification ratio, 2000 and 2020



Source: World Bank DataBank.

Discussions and key takeaways of JETP features

This section discusses and draws takeaways from some key design features that will determine the effectiveness of the JETPs. The features discussed include Governance and Climate Action, the Investment Plan, the Just Transition Approach, and Financing Plan.[6]

Governance and climate action

Key Takeaways:

1. ***Partnerships established through the launch of the JETPs were conducive to generating top-level leadership and raised ambitions in climate action.***
2. ***The effectiveness of the JETPs and the implementation of the transition critically depends on the rapid completion of reforms in the power sector.***

6 The discussion mainly draws from information contained in the South Africa's JETP Investment Plan and for Indonesia's JETP on the Joint Statement of the Government of Indonesia and the IPG and the Draft Climate Investment Fund-Accelerating Coal Transition: Indonesia Country Investment Proposal.

3. ***Institutional set up of the JETPs will be vital to foster a whole-in-economy transformation and policy alignment across sectors and levels of government, influencing cost-effectiveness and speed of the transition.***
4. ***Overcoming powerful vested interest and maintaining long-term political commitment to the reform agenda, is crucial to reaching JETP targets.***

The partnerships established through the launch of the JETPs were conducive to generating top-level leadership and raised energy transition to become a top political priority in both South Africa and Indonesia. This effectively raised climate ambitions and fast-tracked the preparation of key plans and just transition strategies and their rapid adoption.

The effectiveness of the JETPs and the implementation of the transition critically depends on the rapid completion of reforms in the power sector. Both governments advanced the reform process of policies and regulations that address climate risk and accelerate the deployment of renewables; yet the readiness for the transition is limited. Fossil fuel subsidies had already been scaled back significantly in both countries; subsidies were reintroduced during the COVID-19 pandemic. Carbon pricing is still in its preliminary stages. Though the overall level remains low, South Africa's carbon tax regime is expected to progressively increase. In contrast, Indonesia's emissions trading scheme and carbon tax regime remain at trial stages. The recently improved investment framework for renewables remains untested und continues to be weak. Reforms in the electricity sector that lie at the heart of a successful transition are in the early stages. There is no progress on unbundling the vertically integrated utilities. Regulatory uncertainties and gaps in sector governance remain and impede an accelerated deployment of renewable and clean energy investments. Indonesia's improved pricing and procurement regime for renewable IPPs remains untested; the regulation to phaseout coal has important loopholes. Given the limited readiness, the JETPs need to emphasize completion of policy and regulatory reform in the power sector during the initial phase of the partnership.

Consistent and coherent policy alignment across sectors—not only environment and energy but also fiscal, transport, industry, infrastructure, financial sector, innovation, education and skills development, international trade and investment, urban development, and agriculture, among others is essential. By aligning policies across all sectors and generating synergies, not only can the transition be accelerated, but its cost can be significantly reduced.

In South Africa, two special task teams were set up in the presidential office. The teams reported to a broad-based interministerial committee chaired by the president. The Presidential Climate Change Committee prepared the Just Transition Framework for South Africa in a consultative process that included representatives of youth, affected workforces, businesses, local government, and civil society in the affected area. The Presidential Climate Finance Task Team prepared the Investment Plan in alignment with the Just Transition Framework. It is responsible for coordinating with relevant government departments; negotiating financing with counterparts from the IPG, development finance institutions (DFIs) and MDBs, and the private sector; and finally, overseeing

the development of relevant financing mechanisms and facilities to enable the flow of international climate finance to support South Africa's just energy transition.

In Indonesia, the Ministry of Finance was instrumental in driving the country's just energy transition. As the nodal ministry for delivering the just energy transition country platform, it convened an interministerial steering committee to oversee just transition efforts and is using its leadership role to hold discussions with key stakeholders. The secretariat, which will serve as the coordinator for internal and external stakeholders, is placed in the Ministry of Energy and Mineral Resources (MEMR) and supported by the Asian Development Bank (ADB) (US Treasury Department 2023). MEMR is the primary government institution in charge of policy-making and decision making to supervise Indonesia's energy sources and assets. It is responsible for national energy policies' design and implementation. MEMR also functions as a regulator for renewable energy, fossil fuel-based plants, and other power sources. In addition, under the ministry's supervision are the geological survey agency and the Human Resources Development Agency for Energy and Mineral Resources. The latter is responsible for formulating human resources development policies and programs in energy sectors.

The two institutional setups for policy design, coordination, and implementation of the JETPs have important implications for policy alignment. The Organisation for Economic Co-operation and Development's research on effective coordination mechanisms for a transition to a low-carbon economy implies that interministerial committees situated at the center of government that are supported by interministerial committee and specialized task teams, as in the case of South Africa, can be effective in driving coherent policy alignment for whole in-economy, low-carbon transformation processes. The interministerial committee that supervises the Presidential Climate Commission and implements the commission's policy recommendations comprises all relevant ministries for policy alignment as well as other key stakeholders from civil society and academia. Yet by not including representatives from local government authorities and Mpumalanga Province, where CFPPs and mining are concentrated, the coordination mechanism may not address local vested interests against the transition.

In Indonesia, on the other hand, where the line ministry responsible for coordinating JETP measures has been chosen, internal silos create a high likelihood that information sharing and coordination across other policy areas and at different levels of government will be challenging and even may inhibit effective policy alignment. Given the overcapacity in the power system, a big policy push toward electrification of transport and indirect electrification of industry and maritime shipping through green hydrogen and green ammonia could, for example, support an accelerated deployment of renewables. But misalignment of energy, transport, industrial policy, and trade priorities and difficulties in information sharing across ministries and sector regulators can hinder progress. Also, in terms of a just transition in a broader sense that is about ensuring social equity and inclusion as well as minimizing the negative impacts on communities and creating diversification strategies, there is a risk of insufficient coordination with other line ministries. On a positive note, MEMR, with

its broad policy and regulatory mandate in the energy sector, including renewables to fossil energy in the mineral sector, and including human resources policy and development for the energy sector, can be highly effective in driving the completion of reforms in the power sector, deployment of renewables, coal phasedown, and value chain development under the JETP program.

Overall, the institutional setup makes the South African JETP more conducive to cross-sectoral policy alignment, including economic diversification and industrial development. The institutional arrangement for Indonesia, in contrast, places more focus on the energy sector. Given the early stage of renewables deployment in Indonesia, the institutional structure of the JETP in Indonesia can be conducive to effectively driving reforms and establishing a supportive business ecosystem in this sector. Concerns remain for both countries that the institutional setup does not effectively support a just transition in a holistic way, with no involvement of local government in South Africa and a pure focus on human resources development in the energy sector in the case of Indonesia. Given the emphasis on just transition under this partnership, it will be important to know how this lost opportunity is overcome in its implementation.

Moreover, Indonesia and South Africa will need to overcome powerful vested interests to advance the coal phaseout. Coal in both countries is an important source of foreign currency and state and provincial revenues. Mines in Indonesia are approved by local authorities and are controlled by a few families who have significant political cloud and who have experienced windfall gains in their fortunes because of unprecedented price spikes in coal since 2021. In Indonesia, the industry is an important spender on political campaigns. Unless the JETPs effectively address the political economy of the process, it risks to derail progress.

Strong political leadership is crucial to overcome vested interests in both public and private sectors which benefit from the status quo and resist beneficial change. More recent research found that economic change often happens not when vested interests are defeated, but when different strategies are used to pursue those interests. There is evidence that changing the elites' ideas regarding new ways of advancing the economic interests of their countries is crucial. Strategies that encourage economic development while diversifying the countries' economic base or foster industrialization can affect change (Rodrik, 2013). Hence, economic diversification strategies and alternative investment opportunity, for example, through a big push toward a green hydrogen economy and clean energy value chain development, could be one effective way of gaining the elite's support. Some of the elite are already shifting toward renewables. This movement will need to be further accelerated.

Investment strategy

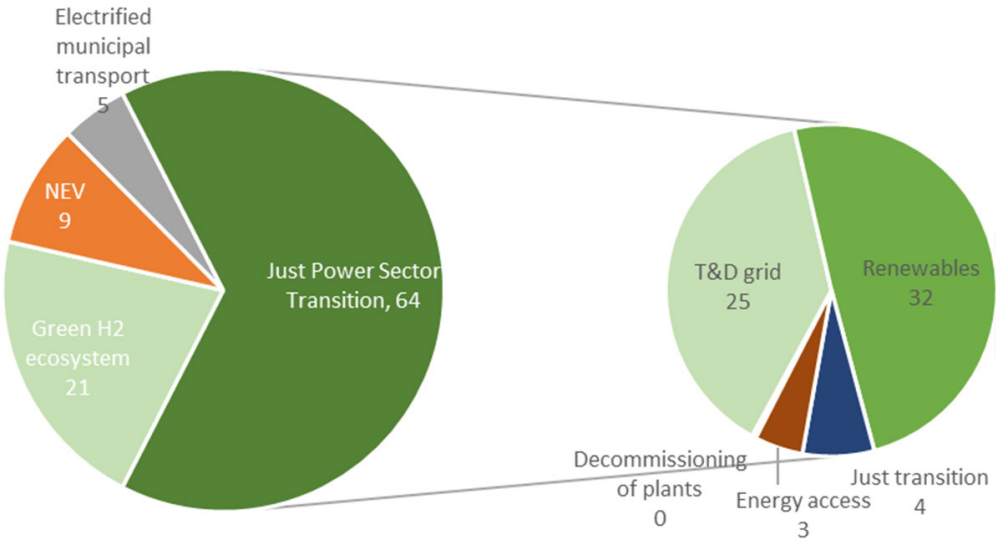
Key Takeaway: To achieve a cost-effective transition away from coal, the JETPs should broaden their focus and aim to realize synergies with parallel ongoing decarbonization processes in the economy. The narrow focus of the JETP initiative on phasing out CFPP in the first phase of the partnership needs

to be appropriately prioritized. Recipient countries with IPG's support need to ensure that the efforts under the partnership are seamlessly integrated into an economywide decarbonization strategy. The JETP has a greater chance for success if it adopts a broader spectrum.

South Africa's JETP Investment Plan, in line with the political declaration, emphasizes decarbonizing the power sector, averting the worst impacts on workers and affected communities of rapid transition, and laying the foundations for decarbonized economic diversification, including building a green hydrogen business ecosystem; laying foundations for decarbonized urban transport; transitioning the existing automotive industry to the manufacturing of new energy vehicles; and micro, small, and medium enterprises (MSMEs)—contributing to the goals of decent work for all, social inclusion, and the eradication of poverty. Once implemented, this plan can achieve the most ambitious target of South Africa's enhanced NDC, an emission level of 420 to 350 $MtCO_2e$ by 2030.

Transition costs for the power sector alone are estimated at $145 billion between 2023 and 2035. Identified needs for phase 1 (2023–2027) of the JETP Investment Plan are estimated at $99 billion, allocated as shown in Figure 18 below.

FIGURE 18. Structure of JETP investment for South Africa, 2023–2017 in $ billion



Note: NEV = New Energy Vehicles]; H2 =Hydrogen; T&D = transmission and distribution.
Source: South Africa's JETP Investment Plan.

The JETP Investment Plan underscores South Africa's unique opportunity to make significant short-term progress toward early peaking of emissions and long-term decarbonization of its economy. Prolonged underinvestment and insufficient maintenance in the power sector rendered much of the aging infrastructure unreliable, leading to chronic power deficits, rolling load shedding, and blackouts that cost the economy between 1 percent and 2 percent of GDP and led to slow, jobless recovery from the COVID-19 pandemic. Moreover, with the steep decline in the levelized cost of

electricity from renewable energy sources (in particular solar photovoltaic [PV] and onshore wind) during the past decade, coal-fired power is no longer the least-cost option to support the growth of the economy, creating an economic rationale beyond climate mitigation to shift from coal to renewable power.

According to the Plan, a quarter of the country's coal fleet's capacity (9.5 GW) shall be decommissioned by the end of 2030, and an additional third of the installed capacity (12.5 GW) before 2040. The government plans to repower the electricity system to overcome the country's power shortages using the country's abundant but underdeveloped renewable energy resources that to date generate less than 7 percent of annual electricity supplied. Accommodating the transition and to achieve an outcome in 2030 towards the lower end of the NDC, South Africa estimates that the country needs to add 50 GW of renewable electricity capacity by 2030. Compared to its past performance, this is a Herculean task; it requires that South Africa adds 6 to 7 GW of renewable electricity capacity per year—equivalent to the capacity the country installed over a period of a decade—between 2023 and 2030.

In addition, insufficient transmission capacity is further expected to hamper the ability of South Africa to rapidly tap into its abundant renewable energy resources. The country will not be able to shut down its coal plants and rapidly deploy its renewable potential unless the transmission and distribution grid is expanded and equipped with battery storage capacity, especially in regions with large solar and wind potential. To accommodate the transition from a system with point sources and facilitate a system integration of distributed, variable, renewable energy resources, which are located in distant parts of the country far away from load centers and current main generation assets. The JETP Investment Plan estimates investments equivalent to 80 percent of investments in renewables for upgrading the dilapidated transmission and municipal distribution systems as well as adding sufficient battery energy storage systems. Notwithstanding the economic and environmental rationale, the Plan is highly ambitious and requires a challenging and immediate ramp up in investments and project development scale and speed.

Noteworthy is that the JETP Investment Plan for South Africa, one of the world's most energy-intensive countries, does not include investments and does not include insights as to how this program interacts with essential demand-side energy efficiency measures. Energy efficiency is an indispensable tool for a cost-effective and just energy transition. In the context of a just energy transition, it is particularly important to underline that energy efficiency is job intensive. Government energy efficiency programs have proven effective in boosting economic activity in key labor-intensive sectors and delivering rapid positive outcomes in preserving existing jobs and creating new ones in addition to delivering longer-term benefits such as increased competitiveness, fossil fuel consumption savings, reduced emissions of GHG and air pollutants, improved energy affordability, and lower bills. For example, government programs to support the energy efficiency industry in the United States and Europe created millions of jobs that, on average, pay higher wages and tend to be more inclusive than the rest of the energy sector.

In addition, while highlighted in the G7 summary on joining forces to accelerate clean and just transition toward climate neutrality, it is not evident from the JETP Investment Plan for South Africa that the JETPs support complementary, low-cost decarbonization investments in the short to medium term, for example, in waste-to-energy, nature-based solutions and investments in a circular economy.[7]

In contrast, Indonesia's economic case for a rapid phaseout of coal and scaled deployment of renewables—without considering socioeconomic, environmental, and climate change benefits—is less compelling. Given the relatively young average age of the CFPPs and the overcapacity in the archipelago's main grid, the Jawa-Bali grid, with a reserve margin of 50–60 percent, the coal phase out will result in significant stranded assets.

To achieve the rapid increase in renewable power by 2030 and to hit the country's most ambitious target of reducing carbon emissions by 43.2 percent by 2030, PLN is to gradually retire its own young coal fleet and terminate power purchase agreements of CFPPs developed by IPPs with an average age of about 12 years before plants reach the end of useful economic life. With the intention to maintain reliability of service quality and affordability of the phaseout program. PLN announced a plan to decommission 1 GW early by 2030 and 9 GW by 2035 and then carry out a series of retirements to phase out CFPPs by 2055, starting with low-efficiency, high-emitting subcritical plants and retiring the most efficient plants last.

In the case of Indonesia, costs and benefits of an early retirement of coal plants should be weighed against those of a potential retrofitting of assets with carbon capture, utilization, and storage (CCUS) technology. While most coal assets in Indonesia are small, with capacities of less than 600 megawatts and of the least efficient subcritical technology for which a potential retrofit with CCUS may not be economical, some of the most recent units have supercritical and ultrasupercritical technology, in particular units that are still going ahead and are being constructed, could be fitted with CCUS. The IEA projects that a cost-effective decarbonization path for Indonesia would include the deployment of CCUS. The JETP should incorporate in its strategy to decarbonize the power sector the deployment of this low-emission technology and support the completion of a regulatory framework and investment framework for its deployment.

Moreover, given the overcapacity in the power sector of Indonesia, an effective strategy to accelerate the deployment of renewables, advancing the electrification of transport and decarbonization of its industry, could open space for the accelerated development of renewable

[7] For example, a recent study by Indonesia's Ministry of National Development Planning (Bappenas) in partnership with the United Nations Development Programme demonstrated that the implementation of the circular economy in Indonesia in five sectors, namely, the food and beverage, textiles, construction, wholesale and retail trade, and electronics sectors, has the potential to increase GDP by IDR 593–638 trillion by 2030, creating annual household savings of nearly 9 percent of the budget, equivalent to IDR 4.9 million or US$344 per year, and creates 4.4 million jobs, 75 percent of them for women. The implementation of a circular economy in Indonesia also can reduce CO_2 emissions by 126 million tons and water usage by 6.3 billion cubic meters in 2030.

energy. Indonesia has ambitious targets for the transformation of its transport sector, including the deployment of 2.2 million electric vehicles and 13 million electric two-wheelers by 2030. Yet it is lagging its Southeast Asian peers. As such, an important focus of the JETP, next to its emphasis on the coal phaseout of its CFPPs, should be to support Indonesia in realizing its ambitious targets to decarbonize its transport sector.

Just transition components

Key Takeaways:

1. ***Rapid structural transformation processes with significant scope and a low level of preparedness concentrated in one coal-dependent region, like in the case of South Africa, in all likelihood lead to a significant loss of embedded energy in the region and carry significant risks of opposition, which could stall progress in the transition.***
2. ***Transparent and appropriately sequenced transition plans complemented with targeted regional development and investment incentives, in particular for renewables can cushion large-scale job losses.***
3. ***Meaningful and sustained participation of all affected groups and stakeholders will be what is needed to hit just transition goals. Transparent and continuous awareness raising campaigns will be essential to garner long-term support from the public.***

In South Africa, poor macroeconomic performance with muted real GDP growth, very high levels of unemployment, and inequality renders a just transition difficult. The loss of a significant share of the 200,000 high-value direct and indirect jobs as forecast in the JETP Investment Plan along the value chain within a short 15-year time frame, concentrated in Mpumalanga province, is likely to induce negative multiplier impacts on the province's local economy. Given prevailing labor market constraints, migration of typically low-skilled workers out of the coal value chain will already be challenging. This is rendered even more difficult as coal workers tend to have better salaries with less education than the rest of the formal economy and as a low level of preparedness raises the risk of a disorderly transition. The risk of broad-based opposition, if no adequate livelihood alternatives are offered to workers, their families, and communities, could stall the energy transition.

The Just Transition Framework for South Africa's JETP was prepared through a multistakeholder, evidence-based process and followed guidelines for a just transition by the International Labor Organization. The Presidential Climate Commission held public consultation workshops on the draft Framework, focusing on geographic locations expected to be most impacted, including Mpumalanga province, where most of the country's coal production takes place. Observers of these consultation workshops noted that while participants in these seemed to value the opportunity to make their voices heard, civil society groups, however, flagged insufficient transparency regarding planned just transition investment (International Human Rights and Business 2022).

Planned investments in the JETP Investment Plan aim to achieve a just, equitable, and inclusive transition for workers in the coal value chain and affected communities so that all are protected against the risks and benefit from the opportunities presented by this transition and no one is left behind. Planned investments in Mpumalanga Province enhance the local infrastructure, support economic diversification and local economic development through targeted support to MSMEs, improve the employability of workers and youth through reskilling and upskilling programs, and repurpose decommissioned coal plant and mining land for renewable energy deployment. In addition, the JETP Investment Plan foresees the establishment of skills development zones across the country to foster green jobs development.

The measures included in the JETP Investment Plan for South Africa are in line with good practices and important elements for ushering in a just, inclusive, and equitable transition based on previous successful coal phaseout transition processes, e.g. in Germany's Ruhr Valley (WWF, 2019). Yet advanced measures to foster a rapid absorption of coal workers by developing renewable energy resources in Mpumalanga Province are not included in the plan. A recent study found that renewable energy development in the province could compensate for predicted job losses by 2030.

Experiences in regions that moved out of coal offer an important lesson for both South Africa and Indonesia in terms of sequencing. The cases of Poland and the Ruhr Valley in Germany show that regions that went through rapid structural transformation processes with significant scope and a low level of preparedness experienced a rapid reduction of direct and indirect jobs along the coal value chain and a significant loss of embedded energy in the coal-dependent regions that resulted in regions' backsliding from previously achieved development gains. With not many job alternatives, workers resorted to broad-based industrial actions that eventually stalled progress in the transition process. These cases also showed that having a transparent medium- to long-term plan for decommissioning carbon-intensive plants and complementing it with (1) a proactive industrial development approach with targeted investment incentives in special economic zones and (2) systematic and enhanced upskilling and reskilling programs proved effective in facilitating the absorption of workers into new jobs.

For South Africa the examples of Germany and Poland imply that beyond investments in local economic development, local infrastructure, and MSMEs, additional targeted investment incentives should be provided for Mpumalanga Province, including the creation of special economic zones, to attract private sector investments to the province. While the renewable energy potential in the region is inferior to that in other parts of the country, the province benefits from essential grid infrastructure such as high-voltage substations, which makes it an attractive region for renewable energy development in the shorter term, to 2030, until the grid in the rest of the country is rehabilitated.

In the case of the JETP for Indonesia, the government expressed commitment to the country's energy transition's being just, and its NDC laid down the creation of decent work and quality jobs as part of foundational efforts to achieve an effective and inclusive transition to a low-carbon future. In contrast to South Africa's, Indonesia's economy is forecast to grow rapidly after a protracted recovery

from the COVID-19 pandemic, and the unemployment rate is forecast to return to its long-term average of 5.5 percent.

In Indonesia, a steering committee appointed by the Ministry of Finance will oversee just transition efforts. The country platform manager will develop and implement the Just Transition Framework, and through 2022, the government worked with MDBs to conduct strategic social impact assessments and develop a comprehensive approach that considers direct, indirect, and induced impacts from coal asset retirements at different levels. The developed methodology also considers the need for local economic diversification and the need to compensate affected communities and regions. Indonesia can avoid cumulative and adverse multiplier impacts on the local economy by including, in addition to the technical selection criteria aiming to ensure system reliability and affordability of early retirement of CFPP, carefully selected criteria preventing the geographical concentration of the CFPP phaseout. Such criteria are, however, not part of the selection criteria for the plants to be retired.

The coal mining industry in Indonesia has benefited from a large commodity windfall and coal exports in 2021 and 2022 triggered by supply chain disruptions in the wake of the COVID-19 pandemic, an increase in demand from major importers of Indonesian coal, and the energy crisis in Europe. The windfall gains from coal offer an extraordinary opportunity for the government to make long-term provisions for its just energy transition.

The pace and scale of the decarbonization plans by both Indonesia and South Africa as envisaged under both JETPs are highly ambitious. This necessitates a comprehensive approach to better address the potential socioeconomic impacts of the transformation. The just transition approaches to substituting job losses in the coal value chain in the short term mainly focus on creating jobs in construction of renewable plants and laying foundations for developing clean-energy value chains. Indonesia and South Africa have a unique opportunity to boost economic growth and create jobs through the expansion of their production, processing, and value addition of critical minerals.[8]

Furthermore, the JETPs will require a long-term and sustained commitment to the partnership and the net zero goal by both the recipient and the IPG partners. The five-year commitments under the partnerships make them fragile to changes in political priorities that could potentially shift priorities away from the JETPs, affecting the development and execution of its long-term implementation. Substantial investments and early progress and successes can build confidence in the long-term commitment of partners.

Long-term commitment, however, can be granted only if the process will be supported by the population. Transparency and accountability are essential to achieving long-term commitment. Indonesia and South Africa as well as IPG governments will need to raise awareness and garner support from the public for the net zero transition.

8 The crucial metals and minerals include copper, nickel, manganese, cobalt, chromium, molybdenum, zinc, rare earth minerals, and silicon, among others.

In addition, power sector decarbonization processes will generally result in an increase in electricity tariffs, which might create opposition against the transition among the countries' populations, especially if it is not accompanied by an increase in quality of service.[9] Against the background of increasing inflation and heightened food insecurity, South Africa in recent months already experienced protests against power tariff increases while service quality deteriorated. The JETP IP for South Africa, however, does not include cash transfer programs that cushion the negative impacts of tariff increases, particularly targeting poor and low-income households, a good practice measure to garner support from the public for a power tariff or energy subsidy reform.

Financing components

Key Takeaways:

1. ***The ambitious investment and transition plans may fail to launch given the unfinished regulatory reforms, governance issues, and fragmented climate finance landscapes. The JETPs must go hand in hand with policy and regulatory reforms in the power and financial sectors to deliver the funding needed to support just energy transition.***
2. ***The IPG funding for South Africa's JETP with project-to-project cofinancing approaches is unlikely to deliver the leverage needed to deliver the scale of financing required. A scalable country platform to catalyze, aggregate, and blend financing from a large group of traditional and new funding partners as adopted by Indonesia is considered effective to crowd in additional commercial and concessional funding for financing the transition.***

The large-scale financing packages offered by the IPG for South Africa and Indonesia, with $8.5 billion and $20 billion, respectively, in return for political commitment and raised ambition are unprecedented. Yet they are dwarfed by the forecasted investment needs to achieve a just transition away from coal. To achieve early peaking of the power sector, South Africa will need to invest $145 billion between 2023 and 2035. The JETP Investment Plan for the first phase alone estimates a total cost of $98.7 billion. Overall, South Africa's just energy transition is estimated to cost $250 billion by 2050 with at least $10 billion allocated to "climate justice outcomes" to support workers and communities in the transition. While at the time of writing, n final JETP Investment Plan had been published, the State-Owned Enterprises Minister of Indonesia was cited that Indonesia will need to invest $600 billion to phase out 15 GW of coal generation, less than half of its current coal-fired capacity (Bloomberg, 2022).

Considering the need to balance their just transition to net zero emissions ambitions with the countries' need to grow and achieve their unfinished Sustainable Development Goals agenda without

9 While to date, renewables are cost competitive compared to coal-based plants in terms of their levelized cost of electricity, the transition will necessitate large-scale, complementary investments in the countries' transmission and distribution networks. The grids will need to be digitized and made fit for absorbing variable renewable resources. Moreover, in the case of Indonesia and other countries with relatively young fossil fuel-based plants, the early retirement of power plant assets will result in the creation of stranded assets. Thus, the just energy transition is projected to drive an increase in electricity prices until they tend to fall sometime after 2040 (IEA 2021).

endangering their debt sustainability, South Africa and Indonesia underscore the crucial importance of the transition to be not only just and inclusive but also—especially important—affordable. Funding of the JETPs should be largely concessional, additional, and deployed in catalytic investments.

It follows that the availability of grant and concessional resources will have a significant effect on the success of decarbonization efforts in both countries. Therefore, the IPG's delivery of their financial promise to both countries—and how much of this support will come in the form of concessional finance—is crucial to the success of the JETPs.

The available information offers insights into how the JETPs aim to support the financing of the just energy transitions of South Africa and Indonesia. While the same level of detail is not yet available for the JETP for Indonesia, significant differences in the financing designs of the two JETPs are already apparent. Noteworthy differences include the delivery mechanisms and disbursement channels, financing partner coordination, and crowding-in approaches.

In the case of South Africa, the funding partners deliver their funding through either their bilateral DFIs or an MDB using a combination of the DFIs' and MDBs' standard financial instruments, a combination of policy-based, results-based, and project loans combined with technical assistance, from either their public-sector and/or their private sector lending windows. Leveraging of private sector finance is not systematically targeted and likely to happen on a project-by-project cofinancing basis and by crowding-in private investments in renewables. Thus, actual financing approaches do not offer any innovations apart from the joint and coordinated large-scale commitment.

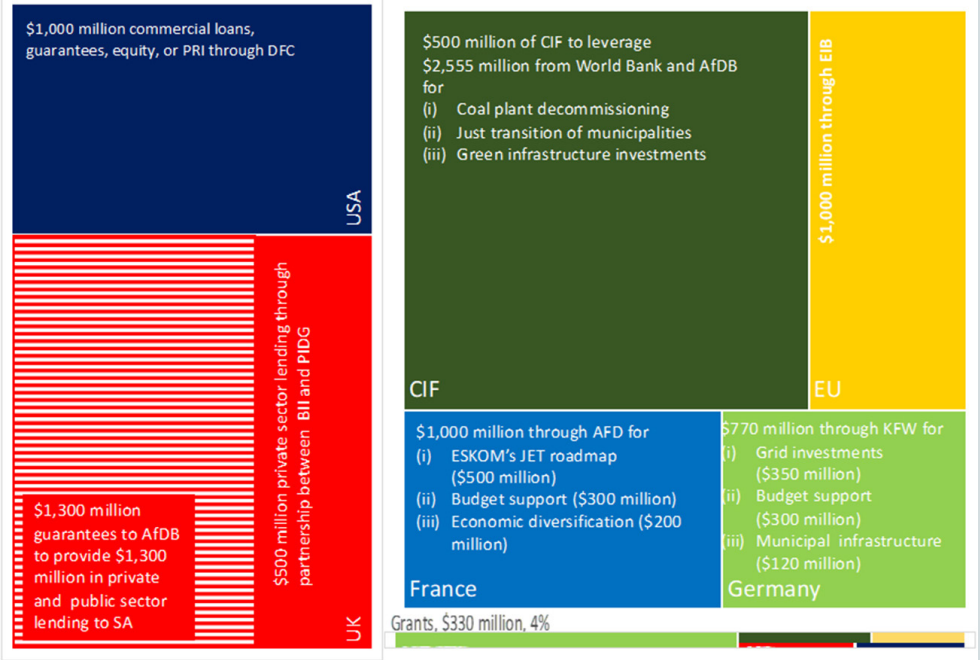
BOX 1. Indicative financing plan and IPG funding for South Africa's JETP investment plan

Based on the Financing Plan presented in South Africa's JETP Investment Plan document, this box highlights salient features of the Financing Plan as agreed with IPG partner.

- Four percent of the IPG funding provided in the form of grants will be allocated for just transition elements comprising skills development and social inclusion programs, essential analyses, feasibility studies, policy advisory services, technical assistance, and capacity-building efforts to support these measures, which will be supported by grants representing.
- Up to 85 percent of the $8.5 billion will be provided by IPG partners and CIF in concessional and loans from multilateral and bilateral development finance institutions.
    - Concessional loans from the Climate Investment Fund will be blended with parallel cofinance from MDBs, notably the World Bank and the African Development Bank. The funds will be deployed into noncommercial parts of the Investment Plan, including the decommissioning of coal plants, critical grid infrastructure, and just transition measures.

- Funding from France and Germany will be provided through the French Development Agency and the KfW Development Bank; that from the European Union through the European Investment Bank.
- The United Kingdom will provide its public and private sector finance in the form of guarantees to the African Development Bank with the leverage ratio of guarantees remains 1:1. The debt is provided in a combination of policy-based loans and project finance for critical infrastructure. According to the JETP Investment Plan, "any debt-related terms for the sovereign should be more attractive than South Africa's National Treasury could secure in the capital markets without unduly onerous reporting."
- Public finance from IPG partners will be allocated to fund catalytic investments, primarily in the power grid and, in part, in the improvement of the policy environment.

- Of IPG funds, up to 15 percent will be provided as private sector finance in the form of loans, guarantees, political risk, and/or equity investments.
  - The United States will provide its private sector funding through the Development Finance Corporation.
  - At least $300 million of funding from the UK is for private sector investments.
  - Private sector funding will be allocated for first mover infrastructure investments, mainly in renewables.



Notes: AFD = French Development Agency; AfDB = African Development Bank; BII = British Investment International; DFC = Development Finance Corporation; EIB = European Investment Bank; KFW = KfW Development Bank; PIDG = Private Infrastructure Development Group; PRI = political risk insurance; SA = South Africa.

Source: Authors based on South Africa's JETP Investment Plan, 2022.

The Financing Plan of the JETP Investment Plan estimates that in addition to the $8.5 billion from the IPG, $10 billion of funding from MDBs and DFIs can be mobilized for critical grid infrastructure investments and policy reforms by the government. These investments in grid infrastructure and policy environment are expected to crowd in $32 billion in private sector investments in solar and wind assets by 2027. The Financing Plan notes that the crowding-in effect of the private sector financing will be on a project-by-project basis.

The current solutions may not adequately balance risk and return for private sector investors in renewable power plants to achieve ambitious crowd-in targets. To substitute the power generated from decommissioned coal plants, satisfy additional demand driven by the electrification of transport, and effect indirect electrification of industry, South Africa would need to replicate its achievement during the past decade under its Renewable Independent Power Producers Procurement Program—the main route for private-sector-led renewable energy deployment in the country—within one year, every single year, for at least the next 10 years.

Despite the targeted acceleration in the medium term, no additional proactive financing solution is proposed to de-risk and enhance the viability of private sector investments that could overcome impediments stemming from identified weaknesses in the enabling environment for renewable deployment due to gaps in the regulatory framework and a fragmented climate finance landscape as well as from significant offtaker risks due to Eskom's ill financial health. Perceived and real risks including delays in project approvals and uncertainties regarding permitting, licensing, and curtailment risks stemming from gaps in the regulatory framework for renewable energy hinder the development of a pipeline of projects. Information, capacity, coordination, and policy barriers in the climate finance ecosystem further limit the provision of the scale of climate finance required.

A major concern about rapid renewable deployment through private sector investors remains the ill financial health of Eskom, representing significant offtaker risks for renewable IPPs. While the government of South Africa budgeted a debt-relief arrangement of 254 billion rand during the next three years, planned regulator-approved tariff increases, and announced plans to unbundle the state-owned utility, these deep sector reforms will take time, and there are high risks of delays.

With these concerns in mind, a complementary de-risking mechanism could be effective to support the accelerated scale-up. South Africa, with financial support, should complement available funding by setting up a facility to support pipeline development and enhance the bankability of renewable energy and low-carbon energy projects. A catalytic financing facility that combines technical assistance for project development support and crowds in partners by offering blended financing solutions would be necessary. Such a catalytic financing facility could be institutionally supported by one of the MDBs supporting the process. The Indonesian model described below could provide important lessons for South Africa. Another fitting example is the Association of Southeast Asian

Nations Catalytic Green Financing Facility, which was innovated and is administered by ADB and leverages ADB funding up to six times.

In addition, for nearly $47 billion of investments identified under the JETP Investment Plan, i.e. 47 percent of total investments, no funding has been identified at the time of the JETP Investment Plan's publication. In particular, 86 percent of investments aimed at diversifying the economy and creating employment by developing the new energy vehicle and green hydrogen value chains were unfunded at the time of publication of the Investment Plan. This not only manifests the focus of the JETP on the power sector but also adds to the fragility of the long-term partnership. Unfulfilled aspirations could turn rapidly to disillusionment.

In contrast, the JETP for Indonesia demonstrates a progressive and innovative solution for financing early retirement of coal power assets. First, the JETP offer innovates a combined offer of public and private funding. The innovation of the JETP for Indonesia to include as 50 percent of the $20 billion funding pledge a commitment by private sector financial institutions, which are all members of the Glasgow Financial Alliance for Net Zero (GFANZ) Asia chapter,[10] and are strongly committed to align their financing with a net zero future, brings a progressive dynamic into the partnership. By including partners from GFANZ in the package, financing institutions become more than just financing partners; they become knowledge partners and deliver their structuring expertise. Their inclusion partnership can be harnessed to engineer solutions to derisk investments. But still, this package needs to deliver a greater leverage than one-dollar private sector funding for one-dollar public funding to address the challenge.

Furthermore, in addition to working with MDBs as providers as policy-based loans and project loans to advance the just energy transition, like in the case for South Africa, the JETP for Indonesia leverages the central role of MDBs as mobilizers of other sources of funding. While to date it is not fully clear whether all or only a share of IPG funding will flow though the mechanism, the JETP funding can build on a leveraged mechanism established through the groundwork of Indonesia with its partner ADB. At COP26, Indonesia, the Philippines, and ADB launched a partnership to design and establish an energy transition mechanism (ETM) to accelerate the transition from coal to clean energy in Southeast Asia. For its JETP, Indonesia is using this mechanism to catalyze investments and crowd in both public- and private sector investments.

The ETM offers a scalable public-private financing mechanism to facilitate the early retirement of carbon-intensive assets. This funding platform creates a new quality of collaboration among stakeholders, including sovereigns, subsovereigns, philanthropies, international and domestic DFIs,

10 GFANZ is a global coalition of leading commercial financial institutions committed to accelerating the decarbonization of the economy. Achieving the objective of the Paris Agreement to limit global temperature increases to 1.5 degrees Celsius from preindustrial levels requires a whole-economy transition. Each company, bank, insurer, and investor will need to adjust its business model; develop credible plans for the transition to a low-carbon, climate-resilient future; and then implement those plans.

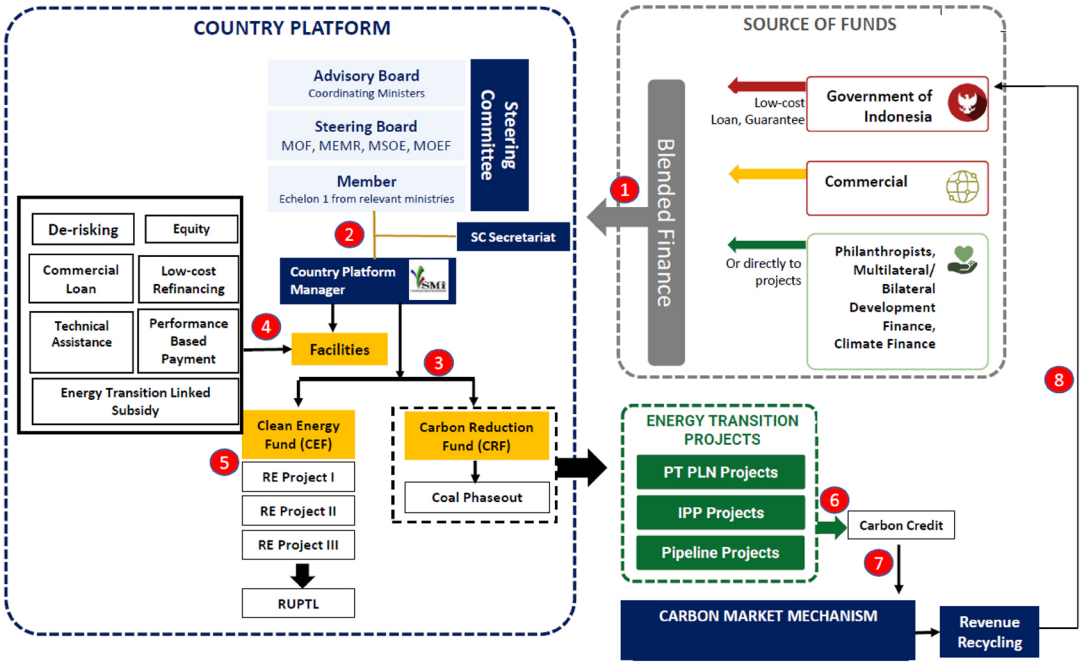
and commercial financial institutions, while also promising to deliver efficiency in the deployment of capital. In essence, the mechanism consists of two funds: one to invest in the deployment of renewables and clean-energy investments and the other to fund the early retirement of carbon assets. At each vehicle level, concessional finance from development banks and other green funds, commercial finance raised from institutional and commercial investors, and budgetary transfers from governments are blended to enhance commercial viability and de-risk investments. Direct co-investments from other bilateral DFIs or MDBs can be arranged if investors prefer not to invest through the fund.

Early retirement of coal plants under the ETM shall be achieved through either the acquisition of the CFPPs' equity or the refinancing of commercial debt held by CFPPs with a more concessional debt—in part or in full—against the commitment of plant owners to retire their plants earlier in proportion to the lowering of their costs of financing. The effectiveness of the JETP for Indonesia, even more than that for South Africa, will hinge on the availability of highly concessional resources. The amount of concessional resources determines the scale of the retirement program and the speed at which coal plants may be retired as the mechanism hinges on the cost competitiveness of the blended debt financing package compared to the original commercial financing structure. The challenge of engineering a competitive funding package for a large-scale retirement program is becoming even more daring before the background of a rising interest rate environment. Once implemented, the carbon tax will give owners of coal plants an additional incentive to engage and agree to a less concessional early retirement financing package. Partners also plan to mobilize additional funds for the transition by selling carbon credits and recycle revenues into the platform.

The Ministry of Finance of Indonesia assigned a state-owned nonbank financial institution under the Ministry of Finance as the country platform manager; the platform manager will have the responsibility to structure blended financing solutions with committed financial resources under the platform and mobilize financial resources from the government to achieve viability of proposed transactions.

The appointed manager also will be responsible for delivering a just transition solution for workers and communities of each early retirement transaction and for ensuring proper documentation, monitoring, and reporting during its implementation. The manager is supported with transparent and unified principles and guidelines prepared by ADB and the World Bank. A precondition for the effectiveness is that the dedicated fund manager be well resourced and equipped with trained staff in all areas of due diligence. Government representatives on the steering committee ensure due oversight (Ministry of Finance, Republic of Indonesia, 2022).

FIGURE 19. Indonesia energy transition mechanism (ETM) country platform



Notes: 1) Investment flows from blended finance through PT SMI; 2) Program priority direction from Steering Committee to Country Platform Manager; 3) Country platform conduct early retirement process according to roadmap; 4) Ministry of Finance supports Country Platform with different forms of financing as needed; 5) Clean Energy Fund mobilization according to RUPTL; 6) carbon credit from Energy Transition Mechanism; 7) trading carbon credit in carbon market; 8) recycling of revenues from carbon credit sale to the platform as Non-Tax State Revenue from the Government of Indonesia.

Abbreviations: CEF = Clean Energy Fund, ETM = Energy Transition Mechanism, IPP = Independent Power Plant, MEMR = Ministry of Energy and Mineral Resources, MOEF = Ministry of Environment and Forestry, MOF = Ministry of Finance, MSOE = Ministry of State-Owned Enterprises, PT PLN = national power utility, PT SMI = non-bank financial institution assigned as country platform manager, RE = renewable energy, RUPTL = Electricity Business Plan (Rencana Usaha Penyediaan Tenaga Listrik), SC = Steering Committee.

Source: Ministry of Finance Republic of Indonesia, 2022.

Notwithstanding the potential effectiveness of the platform, funding the early retirement of coal-based assets also involves high operational risks for financiers because the assets potentially continue to operate for several years after the conclusion of the refinancing transaction. Financiers involved in these transactions include members of the International Development Finance Club, MDBs, and members of the GFANZ which committed to stop financing unabated coal and align their investment portfolio with the 1.5 degrees Celsius Paris Goal. Unless the refinancing transaction will result in the early decommissioning of the coal assets as agreed, financiers face high reputational risks.

Moreover, to date, while there is an increasing proliferation of standards, there is no generally accepted standard for transition finance, that is, financing of high-emitting sectors, and existing sustainable finance solutions do not apply to the financing of carbon-intensive assets. Commercial financial institutions that are committed to aligning their financing with a net zero future are hesitant to fund, for example, the early retirement of coal plants for fear of being accused of greenwashing. For financial institutions to deploy their finance, fundamental tools including

standards, taxonomies, and disclosure frameworks are needed. Moreover, financial institutions and other financial market participants will need access to transparent transition pathways for the sector and the corporate, metrics and targets, and effective disclosure mechanisms to independently evaluate the transition strategies of clients and their assets to be financed.

As mentioned before, the speed and scope of the transition will depend on the availability of concessional funding. The ETM financing platform also is apt to develop and demonstrate novel forms of mobilizing concessional resources for funding the just energy transition, e.g., through sales of internationally transferred mitigation outcomes under Article 6 of the Paris Agreement. Two newly proposed approaches proposed by Harvard University appear to be suitable to be piloted by the JETP. Under these novel approaches, additionality is interpreted incrementally rather than in a binary way as it is currently defined under Article 6. Donor countries under the first approach provide concessional resources to invest in projects that are additional and not available in the domestic market. In return, donors receive a portion of the associated emissions reductions relative to the financial additionality of their investments, which could be a de-risking solution, for example. A second approach is allowing private investors to be compensated for their dues under a carbon tax regime by transferring their "earned" internationally transferred mitigation outcomes from an investment in a developing country to the state. MDBs, which already apply a harmonized framework for measuring financial additionality and ensuring minimal concessionality in their private sector transactions, could support the JETPs in establishing the suitable policy framework and appropriate monitoring and verification frameworks to demonstrate and deploy the new funding mechanisms.

IPGs rely on their partnerships with MDBs for support in the JETP initiative. MDBs are well placed to support the design and delivery of the just energy transition. MDBs have a long-standing track record in infrastructure finance, promotion of the energy sector, and tariff reforms, having worked as long-standing partners in South Africa and Indonesia. MDBs—through policy- and results-based lending—can support the establishment of the policy and regulatory reforms necessary to consolidate the processes initiated under the JETPs. Their broad mandate also gives them long-standing experiences in social-sector and financial-sector development.

Given their preferred creditor status and trusted partnership relationship with their developing member countries, MDBs can support demonstration and early-mover projects to create investment track records and establish good practices to ultimately create functioning markets so that private capital can follow. With their access to concessional and grant resources, they can structure blended finance solutions to catalyze private sector cofinancing and support the development of a pipeline of projects.

MDBs, with their solid social and environmental safeguard policies and approaches, can assist countries with strategic environmental and social impact assessment; support the establishment of environmental and social management standards for just transition, for example, coal decommissioning and social programs for affected workers; and support demonstration of first-of-their-kind decommissioning and retirement projects for coal plants and mines. MDBs are

coordinating to exchange and deliver just transition approaches and knowledge; as such, a cross-MDB working group on just transition can impart good practice approaches and facilitate knowledge sharing across the different JETPs.

The ETM country platform established by Indonesia with the support of ADB is an example of how MDBs can deliver value added in the just transition process. MDBs do this by combining their financial support, their convening power, and their trusted partner relationships in crowding in all forms of stakeholders to co-create new financing platforms and play a catalytic role to scale up and accelerate the implementation of the just energy transition, coordinate interventions, and develop innovative support approaches. With complementary programmatic and results-based lending, MDBs also can support the establishment of a conducive regulatory environment for the transition.

Technology cooperation and value chain development

Key Takeaway: IPGs' financial support should be complemented with technology transfer and coherent efforts to develop local value chains for innovative, future-oriented green technologies to ensure that the energy transition facilitates productivity growth and a long-term, sustainable just transition in partner countries.

There is a strong case for incorporating technology cooperation as an integral part of the JETPs as a long-term partnership for collectively achieving carbon neutrality. Climbing the technology transfer staircase can help partner countries accelerate productivity growth and achieve sustainable low-carbon growth. A cooperation that helps partner countries move beyond technology adoption and deployment and support the development of manufacturing supply chains can support partner countries' targeted economic diversification, innovation, job creation, and export-led growth for a just transition. It also will be important to support their energy security in a clean energy system.

The JETPs are founded on the rationale that to date renewables are cost competitive compared to coal. Countries like South Africa and Indonesia that rely on imports of technology components for their accelerated, large-scale deployment of renewable energy technologies to achieve their net zero transition are vulnerable to supply chain disruptions, price increases in technology components, and spikes in critical minerals and metals prices that to date represent 50–70 percent of clean-energy technology component costs. Because renewables are capital intensive, price increases in technology components affect the life cycle costs of a plant. For example, in South Africa in 2021–2022, increases in shipping costs, supply chain disruptions in the wake of the COVID-19 pandemic coupled with inflationary pressures, a weak rand, and a surge in mineral prices for renewable energy resulted in a price increase for solar PV projects of nearly 40 percent, rendering renewable energy IPPs that participated in South Africa's fifth round of bidding in 2020 commercially unviable. Therefore, supporting Indonesia and South Africa to develop in-country critical supply chains is an important part of an energy security strategy and can strengthen the resilience and long-term affordability of their energy transition.

South Africa's and Indonesia's rich endowment in critical minerals and metals for a clean-energy transition, including copper, nickel, and platinum; their large domestic markets; their ambitions to participate in the global value chain; and their desire to create decent jobs create additional strong pull factors for technology transfer and cooperation with partner countries. Because mining and extraction today are mainly capital intensive, the benefits of an expanded production and export of ores would be limited in terms of job creation. Investments in value addition and processing are essential to achieve their objectives. The countries are lacking the skill base, technology, standards, certification, and capital to achieve the desired economic diversification, to create jobs, and to drive a just energy transition.

Moreover, the countries may hold undiscovered deposits. According to the IEA, Africa's revenues from critical mineral production could more than double by 2030. However, investment in mineral exploration in Africa has been declining in recent years. Reversing this trend hinges on improved geological surveys, robust governance, improved transport infrastructure, and a particularly strong focus on minimizing the environmental and social impacts of mining operations.

Changes in the energy landscape following the COVID-19 pandemic and renewed emphasis on energy security because of the war in Ukraine create an additional strong push for IPG countries to incorporate technology transfer into the JETPs. The crunch for green hydrogen, particularly in Europe; IPG country efforts to diversify global supply chains for renewable energy technology components; and the global race to secure essential metals and minerals needed for the energy transition create important drivers to support capacity development and transfer of technology in JETPs for South Africa and Indonesia.

Complementary incentives by partners to remove barriers and encourage public-private technology transfer and cooperation could be particularly important considering the unfunded plans for developing a green hydrogen economy and for decarbonizing the transport sector.

Yet while measures to increase transfers of relevant low-carbon technologies to developing countries can reduce economic inequality, advance emissions reductions, and support the just transition, the information available in the JETPs for both South Africa and Indonesia does not provide a clear picture of how technology transfer will be supported in these partnerships and to what extent. For example, financing for investments in new energy vehicles and the green hydrogen value chains included in the JETP Investment Plan for South Africa remains largely unidentified. This leaves questions about whether partners will support incentives for private sector partnerships in manufacturing to deliver new scaled-up manufacturing value chains.

IPG countries individually have introduced incentives for private sector investments in green hydrogen abroad. For example, innovative financing mechanisms offered by the German government for additional green hydrogen produced from renewables in emerging economies could drive technology transfer in recipient countries. These mechanisms are intended to help reduce

the funding gap for large-scale green hydrogen projects. They will provide grants for investments along the entire value chain—from green hydrogen production to processing all the way to storage and hydrogen and Power-to-X product transport infrastructure. The Power-to-X products can be used locally in the partner countries or can be exported for purposes such as fertilizer production from green ammonia; replacement of natural gas for carbon-free steel and metal production; and e-kerosene for aviation, shipping, and heavy goods vehicles.

Given the identified barriers, risks, and gaps, it will be important to closely track and measure the progress in both the development and the rollout of implementing plans for the JETPs and to put stakeholders to task for delivering on their respective commitments.

Conclusions and recommendations

One must commend Indonesia and South Africa for their bold step to engage with the IPG in the first-of-their-kind JETPs. The discussion highlighted the relevance of the program in supporting the phasing out of coal as well as the complexity of the program.

While Indonesia and South Africa share similar characteristics and there are positive indications of their JETPs' potential to serve as a blueprint for developing countries and emerging economies to accelerate their move away from coal, the discussion underscored that both countries face several unique challenges to achieving their just energy transition objectives. JETPs' designs need to address unique transition risks, carefully consider readiness for the transition, and offer integrated knowledge and finance solutions based on the specific country context. The following conclusions and recommendations can be derived from the JETPs' key elements discussed in this paper.

First, the paper underlined that the JETPs set a new framework for policy design and implementation and that the effectiveness of JETPs depends on consistent and coherent policies in critical policy areas—not only environment and energy but also fiscal, transport, industry, infrastructure, financial sector, innovation, education and skills development, international trade and investment, and urban development, among others. It found that the institutional setup of South Africa's JETP appears to better facilitate coordination and alignment across relevant policy areas, diverse levels of government, and stakeholders. The setup in the case of Indonesia could make it difficult to reap full benefits from policy alignment and realization of synergies between the energy transition and ongoing transition in some sectors, including the transport, trade, and financial sectors. Indonesia and its IPG partners will therefore need to ensure the alignment of policies across all sectors and levels of government to accelerate the transition.

Second, the JETPs must be made resilient to political changes in both beneficiary and IPG countries to maintain long-term commitment to the partnership. Multistakeholder participation and transparency in the development and implementation of the JETP plans and accountability in the

delivery of pledges will be what makes the difference in this long-term transition. The Just Transition Framework for South Africa was prepared in a multistakeholder process. Mechanisms for regular consultation during the JETPs' implementation need to be strengthened in recipient and IPG countries.

Third, by combining actions to phase out coal with just transition measures aimed at mitigating negative impacts on coal workers and communities; providing support for creating quality green jobs; and developing innovative, low-carbon technology industries as well as the completion of the governments' expansion of energy access agendas, the JETPs can strengthen government ownership and address, in part, the political economy of the transition. The discussion in this paper also pointed to additional strong vested interests in the coal value chain in recipient countries. Both JETPs design will need to address these vested interests to avoid derailing the progress of a coal phaseout agenda.

Fourth, the focus of the JETP program on the power generation side is important, that is, the retirement and decommissioning of coal-based generation assets and large-scale deployment of renewables to substitute coal-based generation. But the design of the first phase of the long-term partnership will be determined by the readiness of the soft and hard infrastructure for the energy transition. To unlock private investment in the transition, the establishment of a conducive business environment—removing regulatory constraints, getting price signals right, and deploying new business models—needs to be prioritized. To achieve progress in the short to medium run, subsidiary government guarantee mechanisms will need to bridge regulatory gaps and uncertainty.

Fifth, transition from a coal-based power system to a renewable-based system will likely result in electricity tariff increases, given the need for complementary grid investments. To garner support for the transition, the JETPs should follow good practices and lessons learned from power sector and subsidy reforms and include as accompanying measures (1) systematic and sustained communication and awareness-raising campaigns and (2) establishment of cash-transfer programs for vulnerable, poor and low-income households to cushion negative impacts of price increases in the short term, particularly before the background of rising inflation and heightened food security.

Sixth, the imperative of a cost-effective and affordable transition away from coal and long-term decarbonization of the power sector cannot neglect to incorporate climate investments, such as in energy efficiency, energy conservation, and circular economy.

It has been well established that for an energy-sector decarbonization strategy to be cost-effective and affordable, it must be buttressed by a comprehensive strategy that is rooted in a country's unique energy economic realities and covers five strategic areas: (1) shifting from a fossil-fuel-based, centralized power sector to a decentralized system based on low-carbon energy sources, primarily renewable energy; (2) increasing energy conservation and enhanced energy efficiency of households, industries, and buildings driven by sustainable consumption and production patterns and technology and process innovations; (3) electrifying the transport sector;

(4) decarbonizing so-called "hard-to-abate" industrial processes, shipping, and aviation through indirect electrification and low-emission and zero-carbon fuels; and (5) abating emissions through carbon capture and storage. The JETP's plans to accelerate the shift away from coal-based power should seamlessly integrate with a comprehensive plan for a whole-of-economy decarbonization. Transparency would require that the JETP plans clarify how the coal phaseout fits into the picture.

In addition, good governance requires a comprehensive economic cost-benefit analysis of all of the JETPs' relevant costs and benefits, including their environmental co-benefits; reduced public health costs; job creation; and in the case of South Africa, ensuing reduction in load shedding. However, the current available documentation for South Africa is not laying this out. Transparency regarding the transition's comprehensive costs and benefits along with an in-depth assessment of risks is crucial in ensuring value for money from its proponents and implementors. More important, it would allow a more complete assessment of the debt sustainability of the initiative for the countries.

Seventh, structural measures—as included in South Africa's JETP Investment Plan comprising infrastructure investments, MSME business development services, upskilling and reskilling programs, and social support measures to mitigate the adverse impacts on workers and communities are important and in line with good practices. Yet, they might be insufficient to fully avoid a loss in embedded energy in the Mpumalanga region and opposition against the transition, given the very ambitious time frame and geographical concentration of the plan. The South Africa's JETP, and other JETPs to come, should combine measures that mitigate impacts in regions affected by the transition in the short run with targeted and pro-active investment incentives for the region.

The imperative of reliability and quality of service will require complementary grid investments to accommodate the transition from a centralized system with large-scale, baseload units to decentralized, variable, renewable energy sources. Given the long lead time of grid transformation, the deployment of renewables will be determined by constraints in the grid rather than resource potential. Hence, there is a trade-off between transition progress and establishing the most cost-efficient plants. However, there is also an upside to it. The decommissioning of CFPPs free up grid assets, which can be used for early development of renewables and support a just transition. Investment incentives, such as payment of contract for differences and other incentives, could attract investments in renewable IPPs in Mpumalanga region.

Ninth, the successful implementation of JETPs hinges largely on the IPGs' delivery of their financial commitments on one hand; on the other hand, the partners' ability to mobilize additional grant and concessional resources and with it leverage a multiple of their funding in private capital to fully fund these JETPs.

While the JETPs must be lauded for their innovative, plurilateral cooperation to financing a country-led strategy, individual partners of the IPG continue to apply their standard financing instruments in their toolbox in the case of South Africa's JETP. Financiers need to move away from traditional

development finance that leverages cofinancing on a project-by-project basis as does the JETP for South Africa. This cannot deliver the degree of leveraging of public funding that is required for the energy transition.

The innovation of the JETP for Indonesia to include as 50 percent of the funding pledge a commitment by private sector financial institutions, who are strongly committed to align their financing with a net zero future, brings a progressive dynamic into the partnership. But still, this package needs to deliver a greater leverage than one-dollar private sector funding for one-dollar public funding to address the challenge. By including partners from GFANZ in the package, financing institutions become more than just financing partners; they become knowledge solutions partners and deliver their structuring expertise, which could contribute to delivering the necessary leverage.

The JETP for Indonesia, in contrast to that for South Africa, also recognizes the central role of MDBs as mobilizers of other sources of funding and makes use of their comparative advantages. IPG partners contribute to the ETM that Indonesia established through its collaboration with the ADB, a catalytic financing platform to aggregate funding from various sources and package different funding instruments to deliver tailored de-risking and blended finance solutions. In a next step, partners supported by MDBs should aim to enhance the mobilization of concessional resources, for example, by connecting the ETM with climate finance mobilized under modified arrangements provided by Article 6 of the Paris Agreement.

Tenth, Indonesia's and South Africa's long-term commitment to the JETP will also depend on IPG's effective support to the implementation of their partner countries' economic diversification strategy and targeted establishment of local clean energy value chains that can compensate for lost revenues from coal value chains and contribute to the creation of high-value jobs and deliver impetus for green and sustainable growth. Proposed economic diversification measures must be backed with adequate funding, which to date is not the case for South Africa. Partners from the IPG should demonstrate earnest efforts to develop local value chains. JETP partners could work together in developing complementary policies that encourage innovation and technology partnerships.

In conclusion, while the JETPs for South Africa and Indonesia appear to deliver blueprints in their specific contexts, some barriers, risks, and gaps put into question whether the goals set out in these JETPs can be delivered at the pace and scale planned. Given uncertainties relating to numerous key issues in the JETPs for both South Africa and Indonesia, it becomes even more imperative to closely track and measure the progress of the development of these JETP plans and, perhaps more important, their implementation on the ground. These will form the basis for putting stakeholders to task for delivering on their respective commitments to lead the way to a just energy transition.

Appendix 1: Key features and salient points of the JETPs for Indonesia and South Africa

The following table outlines the key features and salient points of the JETPs for South Africa and Indonesia.

Governance and Climate Action	
South Africa	Launched in November 2021 at COP26, the JETP for South Africa is founded on support from CIF, the European Union, Germany, France, the United Kingdom, and the United States. This support was firmed up by an initial pledge of $8.5 billion that would finance the plan to phase out coal power plants and transition the country to green energy. South Africa established in the Presidential Office two special task teams reporting to an interministerial committee chaired by the president. Apart from the president, it includes an eminent person as deputy chair, ministers (10), representatives of civil society, representatives of climate organizations, private sector representatives, Eskom representatives, a Sasol representative, representatives of academia, representatives of organized labor, and a representative of former government. Policy alignment is supported by representation of the following ministries in the committee: – Ministry of Forestry and Fisheries and Environmental Affairs – Ministry of Finance – Ministry of Public Enterprises – Ministry of Mineral and Energy Resources – Ministry of Trade and Industry – Ministry of Higher Education, Science, and Technology – Ministry of Water and Sanitation – Ministry of Agriculture, Land Reform, and Rural Development The Presidential Climate Change Task Team prepared the Just Transition Framework while the Presidential Climate Finance Task Team prepared the Investment Plan. The Just Transition Framework was approved by South Africa's parliament, and the Investment Plan by the Cabinet of Ministers. See https://www.climatecommission.org.za/just-transition-framework.
Indonesia	In the case of Indonesia, the $20 billion JETP signed by the government and the IPG (co-led by Japan and the United States and including Canada, Denmark, the European Union, France, Germany, Italy, Norway, and the United Kingdom) in November 2022 received high-level political attention. The Ministry of Finance is taking the lead in accelerating energy transition and convened an interministerial steering committee to oversee the just transition efforts. Just energy transition was elevated to one of the top three priorities under Indonesia's G20 presidency in 2022. In February 2023, the government of Indonesia and the IPG announced that the secretariat for the JETP would be hosted in the MEMR and supported by the ADB and that it will serve as the coordinator for internal and external stakeholders on the JETP.

Investment Plan	
South Africa	The JETP Investment Plan for South Africa emphasizes decarbonizing the power sector, averting the worst impacts of rapid transition, and laying the foundations for decarbonized economic diversification—contributing to the goals of decent work for all, social inclusion, and the eradication of poverty. Once implemented, this plan can achieve an emission level of 420 to 350 MtCO2e by 2030 in support of updated NDCs. Transition costs for the power sector alone are estimated at $145 billion between 2023 and 2035. Identified needs for phase 1 (2023–2027) of the JETP Investment Plan are estimated at $99 billion. For allocation see Figure 18.
Indonesia	The JETP Investment Plan has yet to be prepared and disclosed. Yet the draft CIF Investment Plan and the Joint Statement of the government of Indonesia and the IPG provide insights into main components. The objective is to achieve peaking of power sector emissions and renewables constituting 34.0 percent of power generation by 2030 to achieve its net zero targets by 2060. PLN, which owns and operates about 60 percent of installed power assets, announced a plan to increase renewable energy generation from 12.7 percent of total generation in 2021 to 24.8 percent by 2030 and phase out CFPPs by 2055. This plan should facilitate accelerated integration of renewables and decarbonization of the system. In addition, governments pledge in the joint declaration that the partnership should support: • early retirement of coal plants; • widespread deployment of renewables and energy efficiency; • achievement of unfinished electrification; • development of a local industry in renewable energy; • delivering of a just transition by supporting all segments of the population most vulnerable to potential negative impacts of the transition; • acceleration of reforms, including standards; and • strengthening of technology capacity.
Just Transition Components	
South Africa	Ninety percent of investments allocated for just transition measures in the Investment Plan, or $4 billion, are planned to flow to Mpumalanga, which hosts 11 out of 13 coal plants operated by Eskom and will be disproportionately affected by the transition. Planned interventions aim to spur economic diversification to compensate the region for lost revenues and jobs, navigate competing stakeholder interests, and address lasting labor and social impacts. Planned measures include supply chain development in new energy technologies, promoting small and medium enterprise development, social protection and reskilling/upskilling programs for coal workers, and capacity development programs for local institutions. The Investment Plan introduces programs to develop skills for low-carbon jobs and to attract renewables and low-carbon investments in affected regions.

<table>
<tr><th colspan="2">Just Transition Components</th></tr>
<tr><td></td><td>Low-Carbon Jobs and Skills Development
<table><tr><th>Project</th><th>Financing (ZAR billion)</th></tr><tr><td>Skills hub/platform for “Just Energy Transition and the Future of Work”</td><td>0.05</td></tr><tr><td>Pilot Skills Development Zones in Mpumalanga, Eastern Cape, and Northern Cape</td><td></td></tr><tr><td>– Establishment of three SDZs</td><td>1.00</td></tr><tr><td>– Train the trainers and curriculum development</td><td>0.10</td></tr><tr><td>– Catalytic funding in the new just energy transition skills programs</td><td>0.50</td></tr><tr><td>Targeted to mobilize allocations to the just energy transition from the existing public and private post-school education and training funding per annum</td><td>1.00</td></tr><tr><td>Total</td><td>2.65</td></tr></table>
Low Carbon and Renewable Investments
<table><tr><th>Project</th><th>Financing (ZAR billion)</th></tr><tr><td>Investing in distribution grids to catalyze investment in renewable embedded generation</td><td>200.00</td></tr><tr><td>Electrification backlog</td><td>45.00</td></tr><tr><td>Total funding for catalytic investment requirements for South Africa’s municipal-scale electricity service delivery, 2023–2027</td><td>319.06</td></tr></table></td></tr>
<tr><td>Indonesia</td><td>The government—committed to pursuing energy transition in a just and affordable manner—appointed a country platform manager to develop and implement the Just Transition Framework. Through 2022, the government worked with MDBs to develop a comprehensive approach that considers direct, indirect, and induced impacts from coal asset retirements at various levels. This approach also considers the need for local economic diversification and the need to compensate affected communities and regions.

No details about the JETP Investment Plan are known, yet, but CIF introduces programs for skills development for low-carbon jobs and to attract renewables and low-carbon investments in affected regions.</td></tr>
</table>

Just Transition Components

Low-Carbon Jobs and Skills Development

Project	Relevant Components	Total Financing (US$ million)
PLN RBL	Increase in the number of women in the energy sector; transition and retraining of PLN workers affected by the retirement of CFPPs	950
Just Transition and CFPPs and Coal Mines Repurposing Investment	Transformation of workers, broader community impacts, and alternative livelihood needs	600
PLN/MEMR Energy Transition Program for Results	Governance and institutional reform including capacity building and training programs on various aspects of energy transition relevant for government counterparts	435
PRIME STeP	Creation of opportunities that can support a just transition by providing workers with the means to access sustainable and decent livelihoods	149

Low-Carbon and Renewable Investments

Project	Relevant Components	Total Financing (US$ million)
PLN RBL	Activities supporting and expenditures on increasing the share of electricity supply from renewable energy sources; expansion of the smart transmission grid infrastructure	950
PT SMI Indonesia ETM Country Platform—Facility 1	Support of the acceleration of Indonesia's clean-energy transition across the spectrum of activities identified in the CIF-ACT IP for Indonesia	201
PLN/MEMR Energy Transition Program for Results	Scale-up of renewable energy through replacement RE; storage capacity and grid enhancements to take the place of fossil fuel generation	435
Just Transition and CFPP and Coal Mines Repurposing Investment Projects	Mine and CFPP repurposing: development of renewable energy, storage, and ancillary services	600

Just Transition Components

Project	Relevant Components	Total Financing (US$ million)
PRIME STeP	Creation of opportunities, including for clean energy, by supporting R&D, innovation facilities, improving the innovation ecosystem, and strengthening the R&D and institutional capability of science and technology parks	149
Accelerating Storage Technology Deployment in Power and Transport	Support of the first generation of RE and storage projects, battery manufacturing plants, nickel smelters using RE and storage, and e-vehicles/charging infrastructure	500
Private Sector Dispatchable Renewables Program	Private sector financing of dispatchable RE capacity in the country; focus on both repurposing existing CFPP sites and supporting RE generation scale-up in other areas	560
PT SMI Indonesia ETM Country Platform—Facilities 2 and 3 (Standby Facility and RE Loan Facility)	Scale-up of RE financing through fiscal incentives—a credit enhancement facility will support energy transition while bolstering the local currency bond market	500

Financing

South Africa

- $8.5 billion funding pledge from IPG, comprising
  - 4 percent grants for studies, analyses, and capacity development through at least six delivery channels
  - 75 percent concessional sovereign debt through six delivery arrangements from the CIF, the European Investment Bank, the French Development Agency, and KfW Development Bank
  - 21 percent commercial debt, equity, and/or risk mitigation for private sector investments through at least three private sector oriented DFIs/MDBs, including the African Development Bank, the Development Finance Corporation, and British International Investment
- $34 billion in private sector investments
- $10 billion funding from MDBs and DFIs

These amounts combined place the outstanding funding gap for phase 1 at $46 billion. Unfunded investments for just transition in the power sector, green hydrogen economy, and new energy vehicle amount to $21 billion, $19 billion, and $7 billion, respectively.

Financing	
Indonesia	• $10 billion funding pledge from IPG • $10 billion funding from commercial banks, initially all members of GFANZ, which at the initial stage include Bank of America, Citi, Deutsche Bank, HSBC, Macquarie, MUFG, and Standard Chartered, catalyzed via the ETM funding platform that pools financing instruments (i.e., grants, concessional funding, and commercial tranches) for catalyzing investments in (1) decarbonizing assets and (2) renewables and clean-energy investments.
Technology Transfer	
South Africa	Unclear whether partners will support technology transfer and incentives for private sector partnerships in manufacturing to deliver new scaled-up manufacturing value chains.
Indonesia	

Notes: CFPP = coal-fired power plant; CIF = Climate Investment Fund; CIF-ACT IP = Climate Investment Fund-Accelerating Coal Transition; COP26 = 2021 United Nations Climate Change Conference; DFI = development finance institution; ETM = energy transition mechanism; GFANZ = Glasgow Financial Alliance for Net Zero; G20 = Group of 20; IPG = international partner group; JETP = Just Energy Transition Partnership; MDB = multilateral development bank; MEMR = Ministry of Energy and Mineral Resources; MtCO2e = metric tons of carbon dioxide equivalent; MUFG = Mitsubishi UFJ Financial Group, Inc; NDC = nationally determined contribution; PLN = Indonesian National Electricity Company; PLN RBL = Results-based loan to PLN; PT SMI = nonbank financial institution under Indonesia's Ministry of Finance assigned as Energy Transition Mechanism country platform manager; RE = renewable energy; SDZs = Special development zones.

References

Asian Development Bank (ADB). 2023. *Energy transition mechanism*. https://www.adb.org/what-we-do/energy-transition-mechanism-etm#:~:text=What%20is%20ETM%3F,fossil%20fuels%20to%20clean%20energy.

Baskaran, Grace. 2022. *Could Africa replace China as the world's source of rare earth elements?* Brookings Institution. https://www.brookings.edu/blog/africa-in-focus/2022/12/29/could-africa-replace-china-as-the-worlds-source-of-rare-earth-elements/.

Blended Finance Taskforce and Centre for Sustainability Transitions. 2022. *Making climate capital work: Unlocking $8.5bn for South Africa's just energy transition*. https://www.blendedfinance.earth/making-climate-capital-work.

Bloomberg.com. "Indonesia's $600 Billion Plan to Shut Coal Plants Struggles for Support." September 15, 2022. https://www.bloomberg.com/news/articles/2022-09-15/indonesia-s-600-billion-plan-to-curb-coal-struggles-for-support.

Casim, Adila, Jack-Vincent Radmore, Natasha Dinham, and Steve McCallum. 2021. *South African climate finance landscape 2020*. Climate Policy Initiative, Bertha Centre, and GreenCape. https://www.climatepolicyinitiative.org/wp-content/uploads/2021/01/South-African-Climate-Finance-Landscape-January-2021.pdf.

Climate Action Tracker. 2022a. *Indonesia*. https://climateactiontracker.org/countries/indonesia/.

———. 2022b. *South Africa*. https://climateactiontracker.org/countries/south-africa/.

Climate Transparency. 2022a. *Indonesia. Climate transparency report: Comparing G20 climate action*. https://www.climate-transparency.org/wp-content/uploads/2022/10/CT2022-Indonesia-Web.pdf.

———. 2022b. *South Africa. Climate transparency report: Comparing G20 climate action*. https://www.climate-transparency.org/wp-content/uploads/2022/10/CT2022-South-Africa-Web.pdf.

COBENEFITS. 2022. *From coal to renewables in Mpumalanga: Employment effects, opportunities for local value creation, skills requirements, and gender-inclusiveness*. https://www.cobenefits.info/resources/from-coal-to-renewables-in-mpumalanga/.

Cotterill, Joseph. 2023. "South African Reserve Bank cuts forecasts after blackouts hit economy." *Financial Times*. https://www.ft.com/content/dda4ab82-0af2-482e-80eb-a2980978e94c.

Dahlbeck, Elke, and Stefan Gärtner. 2019. *GERECHTER WANDEL FÜR REGIONEN UND GENERATIONEN Erfahrungen aus dem Strukturwandel im Ruhrgebiet*. WWF Deutschland. https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Klima/WWF-Studie-Gerechter-Wandel-fuer-Regionen-und-Generationen.pdf.

Department of Mineral Resources and Energy, Republic of South Africa. 2020. *Integrated resource plan 2019*. https://www.energy.gov.za/irp/2019/IRP-2019.pdf.

Enerdata. 2022. *World energy and climate statistics—Yearbook 2022*. https://yearbook.enerdata.net/total-energy/world-energy-intensity-gdp-data.html.

Energy Efficiency in the Construction Sector in the Mediterranean (MED-ENC). 2013. *Energy efficiency and employment: A win-win opportunity in the southern Mediterranean*. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwj4ibeKkt79AhVEGlkFHa3jA60QFnoECAgQAQ&url=https%3A%2F%2Feuropa.eu%2Fcapacity4dev%2Ffile%2F23910%2Fdownload%3Ftoken%3Dg0VqL9aL&usg=AOvVaw1n690q1lBfm3JrTHnsdqkz.

Eskom. 2022. *Annual financial statements 2022*. https://www.eskom.co.za/wp-content/uploads/2022/12/2022_annual_financial_statements.pdf.

———. 2023a. *Integrated report 2022*. https://www.eskom.co.za/wp-content/uploads/2022/12/2022_integrated_report.pdf.

———. 2023b. *Tariff history*. https://www.eskom.co.za/distribution/rates-in-excel-format/.

European Commission. Joint Research Centre. "CO_2 Emissions of All World Countries," 2022. https://data.europa.eu/doi/10.2760/730164.

Exchange Rates. 2023. *South African rand to US dollar spot exchange rates*. https://www.exchangerates.org.uk/ZAR-USD-spot-exchange-rates-history-2011.html.

E4 the Future, E2, and BW Research. 2021. *Energy efficiency jobs in America*. https://e4thefuture.org/wp-content/uploads/2021/10/Energy-Efficiency-Jobs-in-America_National-Summary-2021.pdf.

Federal Ministry for Economic Affairs and Climate Action. 2022. *Germany accelerates climate action through global scale-up of green hydrogen economy*. https://www.bmwk.de/Redaktion/EN/Pressemitteilungen/2022/11/20221115-germany-accelerates-climate-action-through-global-scale-up-of-green-hydrogen-economy.html.

Fiscal Policy Agency, Ministry of Finance, Republic of Indonesia. 2022. *CIF Accelerating Coal Transition (ACT): Indonesia Country Investment Plan (IP)*. https://fiskal.kemenkeu.go.id/docs/CIF-INDONESIA_ACT_IP-Proposal.pdf.

Forbes Asia Team. 2021. *Indonesia's coal barons reap windfall from rising demand*. https://www.forbes.com/sites/forbesasiateam/2021/12/14/indonesias-coal-barons-reap-windfall-from-rising-demand/?sh=26c6977333c1.

Glasgow Financial Alliance for Net Zero (GFANZ). 2023. *Glasgow Financial Alliance for Net Zero*. https://www.gfanzero.com/.

Global Energy Monitor. 2023. *Projects*. https://globalenergymonitor.org/.

Godongwana, Enoch. 2023. *Budget Speech*. National Treasury, Republic of South Africa. https://www.treasury.gov.za/documents/National%20Budget/2023/speech/speech.pdf.

G7. 2022. *G7 leaders' communiqué—Executive summary.* https://www.g7germany.de/resource/blob/974430/2057928/3b483140715059ebf8c4f7362044be1b/2022-06-28-leaders-communique-executive-summ-data.pdf?download=1.

Holland, Mike. 2017. *Health impacts of coal fired power plants in South Africa. Groundwork and health care without harm.* https://cer.org.za/wp-content/uploads/2017/04/Annexure-Health-impacts-of-coal-fired-generation-in-South-Africa-310317.pdf.

Institute For Advanced Sustainability Studies (IASS)/International Energy Transition (IET)/ Council for Scientific and Industrial Research. 2022. *From coal to renewables in Mpumalanga: Employment effects, opportunities for local value creation, skills requirements, and gender-inclusiveness. Assessing the co-benefits of decarbonising South Africa's power sector.* COBENEFITS executive report. https://www.cobenefits.info/wp-content/uploads/2022/01/COBENEFITS-Study_From-coal-to-renewables-in-Mpumalanga.pdf.

International Council for Clean Transportation. 2021. *Indonesia transport electrification strategy.* https://theicct.org/wp-content/uploads/2021/12/india-electrification-strategy-oct21.pdf.

International Energy Agency (IEA). 2020. *Energy efficiency and economic stimulus.* https://www.iea.org/articles/energy-efficiency-and-economic-stimulus.

———. 2021. *Financing clean energy transitions in emerging and developing economies.* https://www.iea.org/reports/financing-clean-energy-transitions-in-emerging-and-developing-economies.

———. 2022a. *Access to clean cooking.* https://www.iea.org/reports/sdg7-data-and-projections/access-to-clean-cooking.

———. 2022b. *Key findings—Africa energy outlook 2022.* https://www.iea.org/reports/africa-energy-outlook-2022/key-findings.

———. 2022c. *World energy outlook 2022.* https://iea.blob.core.windows.net/assets/830fe099-5530-48f2-a7c1-11f35d510983/WorldEnergyOutlook2022.pdf.

———. 2023a. *An energy sector roadmap to net zero emissions in Indonesia.* https://iea.blob.core.windows.net/assets/b496b141-8c3b-47fc-adb2-90740eb0b3b8/AnEnergySectorRoadmaptoNetZeroEmissionsinIndonesia.pdf.

———. 2023b. *Indonesia.* https://www.iea.org/countries/indonesia.

———. 2023c. *The role of critical minerals in clean energy transitions.* https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary.

———. 2023d. *South Africa.* https://www.iea.org/countries/south-africa.

International Human Rights and Business. 2022. *One Year On—5 Takeaways from South Africa's Just Energy Transition Partnership (JETP).* https://www.ihrb.org/focus-areas/just-transitions/one-year-on-5-takeaways-from-south-africas-just-energy-transition-partnership.

International Labor Organization (ILO). 2015. *Guidelines for a just transition towards environmentally sustainable economies and societies for all*. https://www.ilo.org/wcmsp5/groups/public/@ed_emp/@emp_ent/documents/publication/wcms_432859.pdf.

International Monetary Fund (IMF). 2022. *World economic outlook*. https://www.imf.org/en/Publications/WEO/Issues/2022/10/11/world-economic-outlook-october-2022.

International Partners Group (IPG). 2022. *Joint statement by the government of the Republic of Indonesia (GOI) and the governments of Japan, the United States of America, Canada, Denmark, the European Union, the Federal Republic of Germany, the French Republic, Norway, the Republic of Italy, and the United Kingdom of Great Britain and Northern Ireland (together the "International Partners Group" or IPG)*. https://www.whitehouse.gov/wp-content/uploads/2022/11/Joint-Statement.pdf.

International Renewable Energy Agency (IRENA). 2021. *Scaling up renewable energy investment in South Africa*. https://coalition.irena.org/-/media/Files/IRENA/Coalition-for-Action/Coalition-for-Action-BusinessInvestors-GroupScalingRenewableEnergyInvestmentSouth-AfricaDec2021.pdf.

———. 2022. *Indonesia energy transition outlook*. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Oct/IRENA_Indonesia_energy_transition_outlook_2022.pdf?rev=b122956e990f485994b9e9d7075f696c.

International Renewable Energy Agency (IRENA) and African Development Bank (AfDB). 2022. *Renewable energy market analysis: Africa and its regions*. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jan/IRENA_Market_Africa_2022.pdf?rev=bb73e285a0974bc996a1f942635ca556.

International Renewable Energy Agency (IRENA) and International Labor Organization (ILO). 2021. *Renewable energy and jobs—Annual review 2021*. https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_823807.pdf.

Kirchherr, Julian, and Frauke Urban. 2018. "Technology transfer and cooperation for low carbon energy technology: Analysing 30 years of scholarship and proposing a research agenda." *Energy Policy*. https://www.sciencedirect.com/science/article/pii/S0301421518302933.

Leshoro, Dimakatso. 2023. "South Africa will only see growth of 0.3% this year, says Sarb." *News24*. https://www.news24.com/citypress/business/south-africa-will-only-see-growth-of-03-this-year-says-sarb-20230126.

Listiyorini, Eko and Fathiya Dahrul. 2022a. "Coal billionaire Thohir to use profit boom to begin green shift." Bloomberg. https://www.bloomberg.com/news/articles/2022-04-20/coal-billionaire-thohir-wants-to-use-windfall-profit-to-go-green?sref=RGkt8hNg.

———. 2022b. "Indonesia's $600 billion plan to shut coal plants struggles for support." Bloomberg. https://www.bloomberg.com/news/articles/2022-09-15/indonesia-s-600-billion-plan-to-curb-coal-struggles-for-support?sref=RGkt8hNg.

Makgetla, Neva, and Muhammed Patel. 2021. "The coal value chain in South Africa." *Trade & Industrial Policy Strategies (TIPS)*. https://www.tips.org.za/research-archive/trade-and-industry/item/4161-the-coal-value-chain-in-south-africa.

Ministry of Energy and Mineral Resources (MEMR), Republic of Indonesia. 2022. *Handbook of energy & economic statistics of Indonesia 2021*. https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-and-economic-statistics-of-indonesia-2021.pdf.

Ministry of Finance (MOF), Republic of Indonesia. 2022. *Indonesian Energy Transition Mechanism (ETM)—Aligning Energy Transition with Economic Development*. Jakarta.

Mtintsilana, Asanda. 2023. "Hunger in South Africa: Study shows one in five are at risk." *The Conversation*. https://theconversation.com/hunger-in-south-africa-study-shows-one-in-five-are-at-risk-199133.

Mukherjee, Promit. 2022. "Pandemic, war and 'crazy' prices threaten South African pivot from coal." Reuters. https://www.reuters.com/business/energy/pandemic-war-crazy-prices-menace-south-african-pivot-coal-2022-07-21/.

National Treasury, Republic of South Africa. 2023. *Budget review: 2023*. https://www.treasury.gov.za/documents/National%20Budget/2023/review/FullBR.pdf.

Notre Dame Global Adaptation Initiative. 2022. *ND-GAIN country index*. https://gain.nd.edu/our-work/country-index/.

Organization for Economic Cooperation and Development (OECD). 2015. *Effective coordination from the center: Coordinating policies to promote the transition to a low-carbon economy*. https://www.oecd.org/gov/Coordination-policies-to-promote-a-low-carbon-economy.pdf.

———. 2021. *RUPTL 2021-30: PLN steps up ambitions to accelerate clean energy investments in Indonesia*. https://www.oecd.org/environment/cc/cefim/indonesia/RUPTL-2021-30-PLN-steps-up-ambitions-to-accelerate-clean-energy-investments-in-Indonesia.pdf.

Pierce, Warrick, and Monique Le Roux. 2022. *Statistics of utility-scale power generation in South Africa*. CSIR Energy Centre. https://www.scribd.com/document/607959472/Statistics-of-Utility-scale-Power-Generation-in-South-Africa-2022#.

The Presidency, Republic of South Africa. 2022. *South Africa's Just Energy Transition Investment Plan (JET IP) 2023–2027*. https://www.thepresidency.gov.za/content/south-africa%27s-just-energy-transition-investment-plan-jet-ip-2023-2027.

———. n.d. "Commissioners." Presidential Climate Commission Towards a Just Transition. https://www.climatecommission.org.za/commissioners.

President of the Republic of Indonesia. 2017. *Presidential Regulation 22/2017.* https://www.esdm.go.id/assets/media/content/content-rencana-umum-energi-nasional-ruen.pdf.

Preusahaan Listrik Negara (PLN). 2021. *Diseminasi RUPTL 2021–2030*. https://web.pln.co.id/statics/uploads/2021/10/materi-diseminasi-2021-2030-publik.pdf.

PwC. 2021. *What a "just transition" means for jobs in South Africa: Considering employment in a low-carbon economy*. strategy&. https://www.pwc.co.za/en/assets/pdf/what-a-just-transition-means-for-jobs-in-south-africa.pdf.

Republic of Indonesia (2021). Updated Nationally Determined Contribution. Republic of Indonesia. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Indonesia%20First/Updated%20NDC%20Indonesia%202021%20-%20corrected%20version.pdf.

Rodrik, Dani. "The Tyranny of Political Economy." Project Syndicate, February 8, 2013. https://www.project-syndicate.org/commentary/how-economists-killed-policy-analysis-by-dani-rodrik.

Sandler, Ely, and Daniel Schrag. 2022. *Financing the energy transition through cross-border investment*. Belfer Center for Science and International Affairs, Harvard Kennedy School. https://www.belfercenter.org/publication/financing-energy-transition-through-cross-border-investment.

Sembene, Daouda, Nancy Lee, and Mark Plant. 2022. *Country platforms and delivery of global public goods*. Center for Global Development. https://www.cgdev.org/publication/country-platforms-and-delivery-global-public-goods.

Solargis. 2020a. *Solar resource maps of Indonesia*. Solargis and the World Bank. Global Solar Atlas 2.0. https://solargis.com/maps-and-gis-data/download/indonesia.

———. 2020b. *Solar resource maps of South Africa*. Solargis and the World Bank. Global Solar Atlas 2.0. https://solargis.com/maps-and-gis-data/download/south-africa.

Trade and Industrial Policy Strategies. 2021. *The coal value chain in South Africa*. https://www.tips.org.za/research-archive/trade-and-industry/item/4161-the-coal-value-chain-in-south-africa.

UN Climate Change Conference UK. 2021. *Supporting the conditions for a just transition internationally.* https://ukcop26.org/supporting-the-conditions-for-a-just-transition-internationally/.

United Nations Environment Programme (UNEP). 2012. *Investing in a climate for change: UNEP's Energy Finance Programme: Scaling up clean technology investment.* https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjGqaadq979AhVTF1kFHTfLAuMQFnoECAkQAQ&url=https%3A%2F%2Fwedocs.unep.org%2Frest%2Fbitstreams%2F11481%2Fretrieve&usg=AOvVaw04sBbtVeGZ9KaC5Vyit7dR.

United Nations Framework Convention on Climate Change (UNFCCC). 2016. *The Paris Agreement.* https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf.

———. 2021. *Political declaration on the just energy transition in South Africa.* https://ukcop26.org/political-declaration-on-the-just-energy-transition-in-south-africa/.

———. 2022. *Glasgow climate pact*. https://unfccc.int/sites/default/files/resource/cma2021_10_add1_adv.pdf.

———. 2023a. *Cooperative implementation*. https://unfccc.int/process/the-paris-agreement/cooperative-implementation.

———. 2023b. *Nationally determined contributions registry*. https://unfccc.int/NDCREG.

US Department of the Interior. 2023. *Mineral commodity summaries 2023*. US Geological Survey. https://pubs.er.usgs.gov/publication/mcs2023.

US Treasury Department. 2023. *Press Release—Government of Indonesia and International Partners Launch Just Energy Transition Partnership Secretariat to Drive Indonesia's Energy Transformation*. https://home.treasury.gov/news/press-releases/jy1278.

Wibisono, Ardian. 2022. "Indonesian coal billionaire Low Tuck Kwong mines super-profits to become the country's second richest person." *Forbes*. https://www.forbes.com/sites/ardianwibisono/2022/12/07/indonesian-coal-billionaire-low-tuck-kwong-mines-super-profits-to-become-the-countrys-second-richest-person/?sh=45a2154d4f70.

World Bank. 2023. *World development indicators*. https://databank.worldbank.org/source/world-development-indicators.

World Bank Group and Vortex. 2023. *Global wind atlas*. https://globalwindatlas.info/en/.

World Resources Institute (WRI). 2021. *Wałbrzych, Poland: Delayed transition after coal mine closures*. https://www.wri.org/update/walbrzych-poland-delayed-transition-after-coal-mine-closures.

World Wildlife Fund. 2019. *Gerechter Wandel für Regionen und Generationen. Erfahrungen aus dem Ruhrgebiet*. https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Klima/WWF-Studie-Gerechter-Wandel-fuer-Regionen-und-Generationen.pdf.