

Indonesia Sustainable Finance Outlook 2023

Financing the Energy Transition: Tracking Indonesia
Sustainable Finance Flows Towards Meeting 2030 NDC Target



Imprint

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Financing the Energy Transition: Tracking Indonesia Sustainable Finance Flows Towards Meeting 2030 NDC Target

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Foreword

This year has become a watershed one for sustainable financing in Indonesia as the topic of the energy transition has entered public policy discussions and the government has committed to more ambitious climate action. Last year, Indonesia made more concrete promises to reduce its long-term GHG emissions, including the early retirement of coal-fired power facilities and the rapid expansion of renewable energy infrastructure, all with the goal of reach NZE by 2060 or sooner. This pledge was quickly followed by inquiries into the scope of funding necessary to achieve such aims and strategies for efficiently mobilizing such resources to facilitate a just and affordable transition.

Setting the conditions for a steady flow of financing to back decarbonization is crucial. Key financing instruments and schemes, such as a carbon cap and tax on coal plants, the Energy Transition Mechanism (ETM) Country Platform, and the country's first green taxonomy, have all seen progress this year. Still, given the relative novelty of these tools and programs in the country, there is room for improvement even with the current trends. Further, some persistent problems have yet to be fixed.

There is no question that the mobilization and effective use of sustainable financing in the energy sector is hampered by persistent concerns including the lack of bankability of renewable energy projects, dependency on PLN to procure renewables, and continuous reliance on and high subsidies for fossil fuels. The current funding deficit that is slowing down the energy transition reflects this and other problems.

Since 2018, RE investments have fallen short of their annual objective, leaving Indonesia with a sizable funding deficit before it can meet its 23% renewables share by 2025. To avoid future “transition hazards”, Indonesia must immediately begin the early transition by gradually shifting away from fossil fuels and toward renewable energy sources. Coal-fired power facilities are becoming stranded assets, which can have far-reaching implications on the economy and fiscal health of the utility.

The Indonesia Sustainable Finance Outlook (ISFO) 2023 is the Institute for Essential Services Reform's (IESR) newest flagship research. It provides a comprehensive and in-depth analysis of sustainable financing in Indonesia, with a focus on the energy sector. This research goes beyond simple summaries of the country's existing financial difficulties and requirements. In contrast, this research examined a wide range of sustainable financing schemes and instruments, including blended financing, carbon tax, green bonds, green sukuk, and financing sources like international finance and banking sector financing, with a focus on timely delivery based on developments as of Q3 2022. To keep up with the momentum of Indonesia's G20 leadership, ISFO also updates the discussion of sustainable finance concerns at the G20 level.

Finally, IESR is excited to announce the first ISFO 2023. We believe this report can raise public understanding of sustainable financing while also serving as a resource for policymakers and related stakeholders, such as those in the energy and financial sectors.

October 17th 2022

Fabby Tumiwa

Executive Director

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List of Abbreviations

ACT	: Accelerating Coal Transition	DMO	: Domestic Market Obligation
ABO	: Asian Bonds Online	DPP	: Carbon Tax Imposition Basis
ADB	: Asian Development Bank	ETM	: Energy Transition Mechanism
APPLE-Gatrik	: Electricity Emission Calculation and Reporting Application	ETS	: Emissions Trading System
AuM	: Asset Under Management	EU	: European Union
BCA	: Bank Central Asia	FCY	: Foreign Currency
BI	: Bank Indonesia	G20	: Group of Twenty
BIRU	: <i>Biogas Rumah</i>	GCEL	: Global Coal Exit List
BNI	: Bank Negara Indonesia	GCF	: Green Climate Fund
BRI	: Bank Rakyat Indonesia	GFDRR	: Global Facility for Disaster Reduction and Recovery
BPP	: <i>Biaya Pokok Produksi</i>	GGG	: Global Green Sukuk
btu	: British Thermal Unit	GHG	: Greenhouse Gas
BUR	: Biennial Update Report	GJ	: gigajoule
CAPEX	: Capital Expenditure	Gol	: Government of Indonesia
CBI	: Climate Bonds Initiative	GREM	: Geothermal Resource Risk Mitigation
CEF	: Clean Energy Fund	GSS	: Green, Social, and Sustainability Bonds
CFPPs	: Coal-Fired Power Plants	GW	: gigawatt
CIF	: Climate Investment Funds	ICP	: Indonesia Crude Price
CO ₂	: Carbon dioxide	IDR	: Indonesian Rupiah
CO ₂ e	: Carbon dioxide equivalent	IEEFA	: Institute for Energy Economics and Financial Analysis
CRF	: Carbon Reduction Fund	IGEF	: Geothermal Electricity Finance Programme
DCF	: Discounted Cash Flow	IMF	: International Monetary Fund
Ditjen EBTKE	: <i>Direktorat Jenderal Energi Baru Terbarukan dan Konservasi Energi</i>	INA	: Indonesia Investment Authority
DJP	: <i>Direktorat Jenderal Pajak</i>	IPCC	: Intergovernmental Panel on Climate Change
DJPPR	: <i>Direktorat Jenderal Pengelolaan Pembiayaan dan Risiko</i>	IPPs	: Independent Power Producers
DMCs	: Developing Member Countries	KBLI	: Indonesian Standard Industrial Classification

List of Abbreviations

Kemenko Marves	: Coordinating Ministry for Maritime & Investment Affairs	REP	: Renewable Energy Programme
kWh	: kilowatt-hour	RUPTL	: National Electricity Supply Business Plan
kVA	: kilovolt ampere	SDGs	: Sustainable Development Goals
L&D	: Loss and Damage	SFWG	: Sustainable Finance Working Group
LCOE	: Levelised-Cost of Electricity	SIO	: SDG Indonesia One
LCY	: Local Currency	SJK	: <i>Sektor Jasa Keuangan</i> (Financial Services Sector)
MEMR	: Ministry of Energy and Mineral Resources	SPE-GRK	: Emission Reduction Certificate
MoEF	: Ministry of Environment and Forestry	SPV	: Special Purpose Vehicle
MoF	: Ministry of Finance	tCO ₂	: tonne carbon dioxide
MW	: megawatt	tCO ₂ e	: tonne carbon dioxide equivalent
MWh	: megawatt-hour	UNFCCC	: United Nations Framework Convention on Climate Change
NDC	: Nationally Determined Contributions	USD	: United States Dollar
NEK	: <i>Nilai Ekonomi Karbon</i>		
NZE	: Net-Zero Emission		
OECD	: Organisation for Economic Co-operation and Development		
OJK	: <i>Otoritas Jasa Keuangan</i>		
PLN	: <i>Perusahaan Listrik Negara</i>		
POJK	: <i>Peraturan Otoritas Jasa Keuangan</i>		
PTE	: Emission Technical Agreement		
PTE+	: PTE Surplus		
PT. IIF	: PT. Indonesia Infrastructure Finance		
PT. SMI	: PT. Sarana Multi Infrastruktur		
PT. PJB	: PT. Pembangkitan Jawa-Bali		
PPA	: Power purchase agreement		
PV	: Photovoltaics		
RE	: Renewable Energy		

Executive Summary



As a result of a lack of an enabling environment, renewable energy investments in Indonesia have stagnated, leaving the country's renewable energy goals unmet

- 1.** To reach a 23% share of renewable energy in the national energy mix by 2025, the Ministry of Energy and Mineral Resources (MEMR) estimates that Indonesia will need to invest at least USD 8 billion every year, totaling USD 36.95 billion. In the scenario where the country's energy system relies on renewable energy, IESR has anticipated annual investment needs of 20 to 25 billion USD from 2021 to 2030 to meet decarbonization in 2050. MEMR forecasts that the investment required for Indonesia to attain net-zero emissions by 2060 will reach USD 1 trillion, or USD 29 billion annually, in 2060.
- 2.** Comparatively, the average annual investment in renewable energy over the past five years has been \$1.62 billion, which represents only 20.2% of the yearly expenditure required for Indonesia to reach its 2025 goal. Indonesia has set a RE investment target of USD 3.91 billion for 2022, which is USD 2.3 billion below the yearly investment requirement of USD 8 billion.
- 3.** In Indonesia, renewable energy financing still faces a number of obstacles. Several examples include unattractive RE tariffs, competition with subsidized fossil fuels, high CAPEX requirements, a lack of clarity and traceability of financial flows and allocation of public financing for RE projects, and an absence of transparency and predictability in the procurement process for new RE power plants. These obstacles continue to erode investor confidence in investments in renewable energy.
- 4.** The amount of public funding allocated to renewable energy is negligible in comparison to the amount required for Indonesia to meet its goals by 2025, indicating the need for non-public financing sources to fill the funding gap. In 2021, the public budget apportioned to renewable energy yields a total added RE capacity of 16.42 MW. The majority of this budget is allocated to waste-to-energy power plants, biomass co-firing in CFPPs, geothermal exploration, and solar PV installations, which total only 171.75 kWp. In addition, the GoI budgeted for the distribution of solar light bulbs and the installation of solar street lighting.

Indonesia is getting ready to implement a Carbon “cap, tax, and trade” and an Energy Transition Mechanism to accelerate the energy transition

5. To accelerate the transition from fossil fuels to renewable energy, Indonesia has prepared the implementation of a carbon cap, tax, and trade, as well as the blended finance in the form of Energy Transition Mechanism Country Platform to mobilize financing for the coal retirement and the deployment of renewable energy.
6. Indonesia has postponed the implementation of its “carbon cap, tax, and trade” mechanism from April 2022 to the end of 2022 as a result of the current economic situation and delays in enactment of carbon pricing regulations. The government continues to develop seven supporting technical regulations. In 2022, the “carbon cap, tax, and trade” mechanism will only apply to CFPPs owned and operated by PLN and IPPs with 100-400 MW capacity, while in 2023, the Government of Indonesia plans to implement a carbon tax on CFPPs with a capacity of less than 100 MW. In addition, renewable energy power plants that are required to obtain emission reduction certificates may participate in the carbon trading mechanism. Planned for after 2025 is the scheme’s expansion into other industries, such as waste and transportation.
7. The ETM Country Platform announced in July 2022. PT SMI is being task to prepare the facility and will serve as fund manager. The overall objective of the ETM country platform is to: (1) achieve the optimal energy mix in accordance with the National Energy Policy; (2) reduce greenhouse gas emissions to achieve NDC and NZE in Indonesia’s electricity sector; (3) shorten the economic performance of coal-fired power plants; and (4) accelerate investments in renewable energy power plants. Additionally, carbon tax revenues will be recycled to finance the ETM country platform. As of September 2022, the Gol is still defining the platform’s mechanism and financial instruments in preparation for the MoF Regulation, which will be finalized in November. In addition, based on studies conducted by PLN, MEMR, and the ADB, the Gol is currently assessing the platform’s financing requirements, engaging potential financiers, and identifying which CFPPs will be retired. In addition to that ETM Country Platform is also expected to be aligned with financing mechanisms agreed by the Just Energy Transition Partnership (JETP).

The financing gap must be closed through the use of novel financing instruments, international financing, and enhancing the commitment of financial institution to sustainable finance

8. Significant bilateral support for RE persists. Between the fourth quarter of 2021 and the first quarter of 2022, eight nations have committed USD 13.1 billion in investments, technical assistance, grants, projects, and technical cooperation. With these commitments, bilateral support in 2025 will account for 35.4% of the projected total financing requirements for 23% RE through 2025.
9. From the total market value of Green, Social, and sustainability bonds (GSS) (USD 7.7 billion) as of November 2021, Green Bonds (USD 6.3 billion) have the highest amount of issuance. Government-issued non-Sukuk green bonds are the most prevalent, and as of Q4 2022, only two private companies have issued green bonds with proceeds designated for RE.
10. Regarding Green Sukuk, the proportion of proceeds from Green Retail Sukuk and Global Green Sukuk (GGS) allocated to RE remains low. Green Retail Sukuk used 22.8% of its proceeds for RE in 2021, 21% in 2020, and no use of proceeds for RE in 2019. GGS's allocation of proceeds to RE in 2021 represents only 21.9% (USD 164.7 million) of its total allocation of proceeds (USD 750.8 million).
11. In the context of financial institutions' progress on sustainable financing, 179 financial institutions globally, including 74 banks have announced their divestment from coal mining and/or coal power plants. Despite this global trend, throughout 2019 to 2021, lending towards coal mining and/or coal power plants by four Indonesian banks that were the highest lenders for the sector reached a total value of IDR 93.6 trillion. Conversely, the total financing for renewables by these four banks in 2019-2021 is only IDR 48.7 trillion.
12. The absence of stringent regulations mandating financial institutions to divest from coal and establishing a clear pathway for RE financing has led to continued financing for coal and a low proportion of financing for RE from the banking sector. Lack of project bankability and low awareness or confidence among domestic investors to invest in RE are also the most significant obstacles preventing the financial sector from supporting RE.
13. The launch of Indonesia's Green Taxonomy version 1.0 is one of the country's most significant achievements in terms of sustainable financing. Several enhancements are still necessary for the taxonomy to achieve its strategic objectives. The taxonomy requires a clear implementation framework for the financial sector and a more precise description of its 'yellow tier' category based on climate impact measurements. Also required are enhancements to rating methodologies to facilitate financing for specific projects. To ensure the interoperability and cohesion of the taxonomy between domestic and international market participants, the taxonomy must comply with internationally recognized standards.
14. As Indonesia's G20 presidency nears its conclusion, the G20 Sustainable Financing Working Group (SFWG) has addressed global challenges in sustainable financing through three priority issues. The primary focus is on the framework for transition financing, the commitments of financial institutions, and affordable and accessible sustainable financing instruments. These top concerns are also essential for addressing Indonesia's challenges. For instance, by supporting the commitments of financial institutions such as the Central Bank of Indonesia in the context of transition finance and by removing barriers to the financing of green projects through affordable and accessible financing instruments.

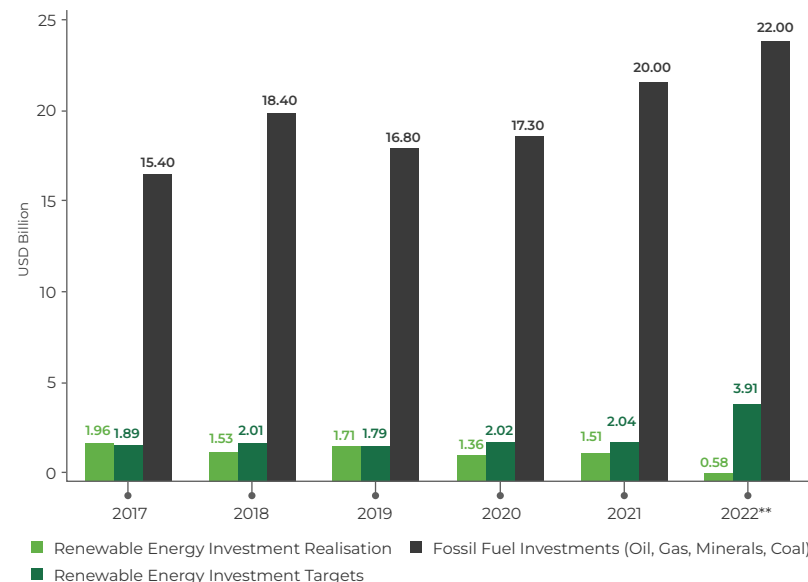


Current Status and Key Challenges on Energy Transition Financing

Indonesia's energy transition targets won't be met with only USD 1.62 billion in annual renewable energy investments from 2017-2021

- In accordance with its Nationally Determined Contribution (NDC), Indonesia must reach emission targets of 1,356 MT CO_{2e} to achieve its 29% unconditional target and 1,273 MT CO_{2e} to achieve its 41% conditional target, according to its Third Biennial Update Report to the UNFCCC (2021). According to the 2014 National Energy Policy (KEN), Indonesia has previously set a target of 23% renewable energy mix in order to reach the 29% unconditional target. To reach a RE share of 23% by 2025, the MEMR estimates an annual required investment of at least USD 8 billion, totaling USD 36.95 billion by 2025.
- The investment realized in the renewable energy (RE) sector has only reached \$1.51 billion in 2021, and the average investment over the past five years has been only \$1.62 billion, with no discernible decreasing or increasing trend. Indonesia has set an ambitious goal of \$3.91 billion in investments in renewable energy for 2022. However, as of Q2 2022, RE investment realization had only reached 0.58 billion dollars, or 14.5% of its intended goal.
- 2017 was the only year in which RE investments surpassed their target, reaching \$1.96 billion compared to the target of \$1.89 billion. During 2018-2021, the investment fell short of the designated amount. In 2020, the gap between investment realization and its target was at its greatest (USD 0.66 billion). Renewable energy investment returns were also at their lowest in 2020 (USD 1.4 billion). This modest investment realization was facilitated by the impact of the COVID-19 pandemic, which has impacted pipeline projects and an increase in RE component prices as a result of high import logistics costs.
- The MEMR estimates an annual investment requirement of \$8 billion to reach the 23% RE share by 2025. The average annual investment over the past five years has been \$1.62 billion, which represents only 20.2% of the annual investment necessary for Indonesia to reach its target of 23%. In the scenario in which the country's energy system relies on renewable energy, the IESR study on the Deep Decarbonisation of Indonesia's Energy System estimates that between 2021 and 2030, USD 20 to 25 billion per year will be required for investments. Similarly, the MEMR has projected that the investments required for Indonesia to achieve net-zero emissions by 2060 will total USD 1 trillion in 2060, or USD 29 billion annually. Considering that annual investment realization in renewables over the past five years has averaged only USD 1.62 billion, there is still a shortfall of USD 18-23 billion in annual investments.

Investment Realisation and Targets for Renewable Energy and Fossil Fuels (2017-2022)



Note:

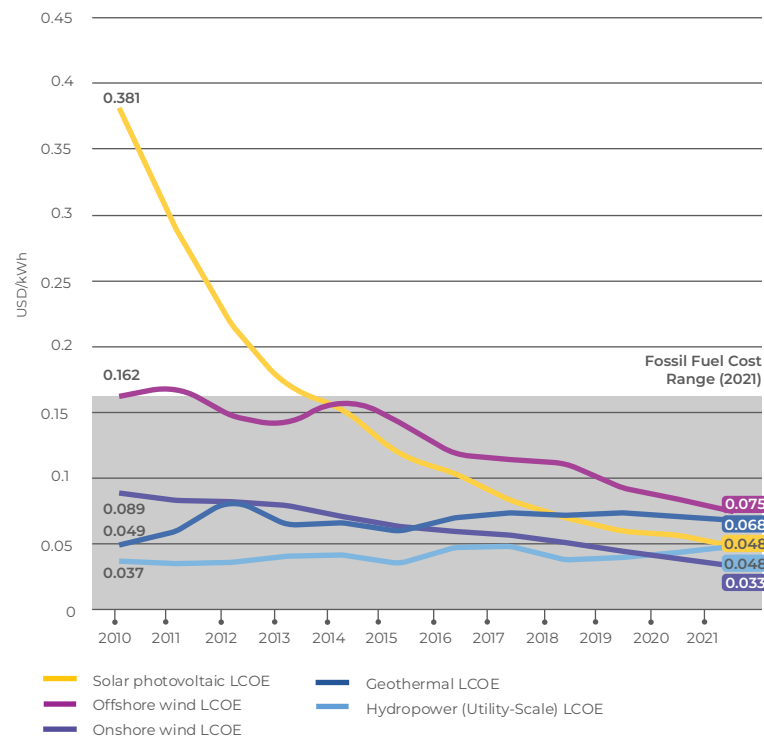
** USD 0.58 billion of Investment realization in 2022 is an accumulation as per June 2022, and value of fossil fossil fuel investments in 2022 only accounts for targets set for 2022.

Compiled Sources: MEMR, 2022; MEMR, 2021; MEMR, 2017; International Institute for Sustainable Development, 2021; IESR, 2019.

Due to exorbitant costs, uncertainty in regulations, investors lack faith in renewable energy projects

- In 2019, IESR reported the average LCOE of several RE technologies in Indonesia, such as onshore wind (0.117 USD/kWh), utility-scale solar PV (0.081 USD/kWh), biomass (0.080 USD/kWh), and geothermal (0.066 USD/kWh). In comparison, the global weighted-average LCOE in 2019 for these technologies is 0.045 USD/kWh for onshore wind, 0.060 USD/kWh for solar PV, 0.066 USD/kWh for biomass, and 0.074 USD/kWh for geothermal. Through these comparisons, the average LCOE for geothermal in Indonesia is the only value on par with the global LCOE.
- The lack of local industry for RE components and high local content requirements influenced the high LCOE of renewables in Indonesia. High capital expenditure (CAPEX), one of the significant cost drivers for power plants, also caused the high LCOE value. The GoI has implemented incentives such as tax allowance, tax holidays, and import facilities. However, developers still face difficulties in accessing these incentives.
- In addition to the high CAPEX, the significant risk of renewable energy investment due to unattractive RE tariffs also results in low private investors' confidence in RE investments. Based on MEMR Regulation No.50/2017, the local basic cost of electricity supply (BPP) is the basis of the tariff for RE power plants. Although the BPP in Indonesia's eastern regions, e.g., Sulawesi, Maluku, and Papua (2000-2500 IDR/kWh) are higher than in Sumatera, Java, and Bali (1000-1500 IDR/kWh), electricity demand in the latter regions is lower than that in its western counterparts, and is thus less attractive for investors. Furthermore, MEMR regulation No.50/2017 also authorises opportunities for pricing negotiations between PT. PLN and IPPs, creating pricing uncertainties.
- Likewise, the lack of clarity and traceability of financial flows and allocation of public financing for RE projects and the lack of transparency and predictability in the procurement process of new power plants signal the need for improvements in the investment environment and bankability for renewable energy projects to boost private investor's confidence and trust from international funders.

Annual Global Weighted-Average LCOE for Solar PV, Utility-Scale Hydropower, Offshore Wind, and Onshore Wind (2010-2021)



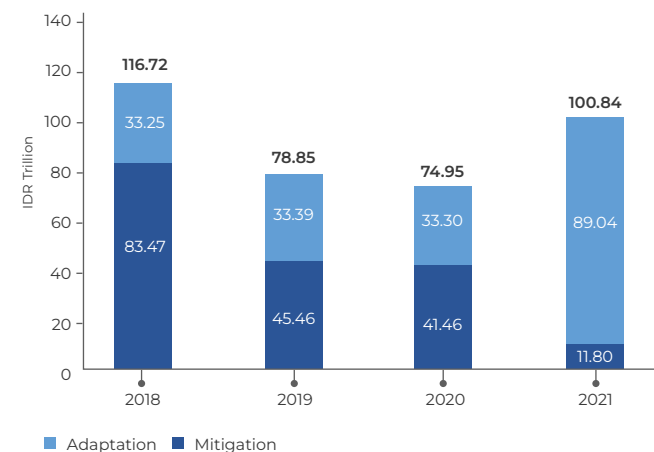
Note: (1) Value of LCOE for 2010-2020 are in 2020 USD/kWh; (2) Value of LCOE for 2021 is in 2021 USD/kWh; (3) LCOE of utility-scale Fossil fuel power is between 0.054 - 0.167 USD/kWh (in 2021 USD/kWh).

Source: IRENA Database on Global Cost of Renewable Energy (Accessed September 2022); IRENA (2021); IRENA (2022).

Indonesia's public budget is insufficient to reach 23% renewables by 2025, requiring non-public funding

- National budget allocation for climate action accounted for IDR 77.82 trillion in 2020, consisting of IDR 33.30 trillion allocated for adaptation and IDR 41.65 trillion for mitigation. Preliminary reports from the MoF stipulated that the budget for mitigation and adaptation in 2021 is IDR 11.80 trillion and IDR 89.04 trillion, respectively.
- Throughout 2018-2020, the average public budget allocated towards climate mitigation from all sectors accounts for IDR 56.8 trillion (USD 3.8 billion). In comparison, the total budget for climate mitigation from the MEMR Directorate General of Renewable Energy and Energy Conservation (Ditjen EBTKE) only accounts for USD 67 million per-year. If this trend of public budget persists until 2025, the annual government budget will only account for 0.83% of its USD 8 billion required annually to reach 23% RE share in 2025, in line with the 29% unconditional NDC target; thus, signalling the need for non-public financing sources to fill the financing gap.
- In 2021, the MEMR Directorate of Renewable Energy and Energy Conservation budget was IDR 539.4 billion, and more than 75% of the directorate's budget was for infrastructure spending. However, this public budget was mainly allocated to fund three waste-to-energy power plants with a total added capacity of 16.42 MW, support biomass co-firing projects in 27 CFPPs, geothermal exploration, solar power plants in 25 locations (totalling 171.75 kWp), distribution of solar light bulbs (1.095 units, 21.9 kWp), and solar street lighting installations for a total of 17,573 units. The GoI should utilise its budget to attract renewable energy investments. For example, through accessible fiscal incentives that effectively benefit project developers, subsidies for loan interests, and capital injections towards quasi-development financial institutions such as PT. SMI, which can channel financial instruments to meet the needs of RE projects.
- At the regional level, our study analysed three provinces with the highest fiscal budgets except DKI Jakarta, and Central Java ranked first in public budget spending for renewable energy development (IDR 11.7 billion), followed by Aceh (IDR 7.9 billion), and East Java (IDR 2.4 billion). However, the share of regional public budget spending for RE in 2021 is still insignificant (less than 0.1%) compared to the total government budget of these provinces within the same year (IDR 33 trillion for East Java, IDR 27.3 trillion for Central Java, and IDR 16.7 trillion for Aceh).

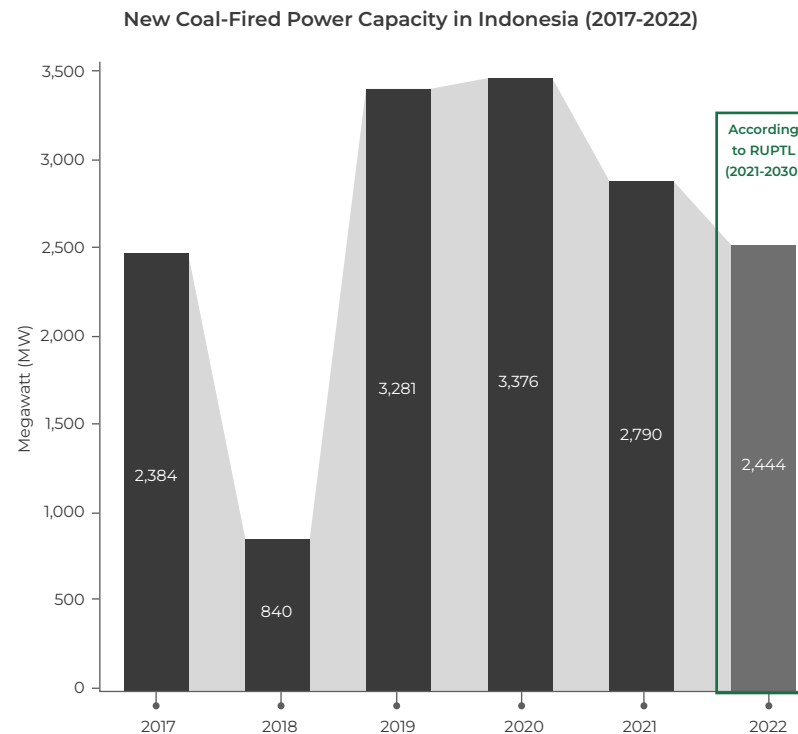
National Budget for Climate Mitigation and Adaptation (2018-2021)



Source: MoF, 2022; MoF, 2021.

Indonesia's reliance on fossil fuels requires the country to spend 20.8% of its national budget for energy subsidies in 2022

- As of 2021, Indonesia's national energy mix is still dominated by fossil fuels, with oil and gas at 50.5%, coal at 38%, and RE at 11.5%. Within the same year, the total existing Coal-fired power plants (CFPPs) in Indonesia accounted for a total of 31.4 GW, and an additional 13.8 GW of CFPPs will start operating by 2023. About 66% (22.8 GW) of Indonesia's coal-fired power plants are currently less than ten years old. CFPPs in Indonesia can operate for as long as 50-60 years, and around 40% of Indonesia's CFPPs are IPP projects bound by power procurement contracts with PLN that are in effect for between 25-30 years. Approximately, 10.5 GW of CFPPs require retirement before 2030 to fulfill the targets of the Paris Agreement. Considering the current operating age of most CFPPs and IPPs with PLN, early retirement of CFPPs is key for Indonesia to decarbonise its energy systems.
- Fossil fuels still benefit from government subsidies. Throughout January-December 2021, the GoI allocated IDR 140.4 trillion for fuel, gas, and electricity subsidy, equal to 5% of the total national budget expenditure in 2021 (IDR 2,786.6 trillion). In January-July 2022, the GoI has channelled subsidies totalling IDR 89.62 trillion, which consists of IDR 62.7 trillion for fuel and gas, and IDR 26.92 trillion for electricity subsidy. In addition, the GoI has also channelled an additional IDR 104.78 trillion for fuel and electricity compensations towards PT. Pertamina and PT. PLN throughout January-July 2022 to ensure public energy affordability. Electricity subsidy, in particular, is considered as a support for fossil fuels considering that more than 90% of electricity consumption comes from fossil fuels.



Source: Global Coal Plant Tracker (Updated January, 2022)

- In July 2022, the GoI announced that Indonesia will allocate an additional IDR 349.9 trillion for energy subsidies from its initial target of IDR 152.5 trillion for 2022. With this addition, Indonesia has allocated IDR 502.4 trillion in total for energy subsidies as of July 2022 to maintain domestic energy prices for the wider public. Specifically, the additional IDR 349.4 consists of fuel and gas subsidy (IDR 71.8 trillion), electricity subsidy (IDR 3.1 trillion), as well as compensation for fuel (IDR 234 trillion) and electricity (IDR 41 trillion). Furthermore, in September 2022, the MoF projected that Indonesia requires further increase of energy subsidies up to IDR 649 trillion for 2022 if the annual average Indonesia Crude Price (ICP) for the same year reaches USD 104.9 per barrel. If this projection materialises, energy subsidies for 2022 will account for 20.8% of the 2022 national budget (IDR 3,106.4 trillion).
- Indonesia's power system's reliance on fossil fuels also puts RE at a competitive disadvantage in terms of pricing. In line with the MEMR Regulation No.50/2017, PLN can only pay for RE capped at 85% of the average cost of generation for the local grid (or 100% of the average cost of the grid if below the country's average). Since electricity grids already rely on CFPPs heavily and the generation cost of CFPPs has been made cheaper due to policies such as Domestic Market Obligation (DMO), RE such as mini-hydro and geothermal become less lucrative for private investors since the prices of power generated from RE often become lower than those of coal generators.

Energy Subsidy (2019-2022)

	2019	2020	2021	Jan-Jul 2022	Updated projections (Jul 2022)*	Updated projections (Sep 2022)*
Fuel and Gas Subsidy	84.2	47.7	83.79	62.7	149.3	
Electricity Subsidy	52.7	61.1	56.61	26.92	59.6	
Fuel and Electricity Compensation*	0	92.77	50.1	104.78	293.5	
Total	62.7	201.57	190.5	194.4	502.4	649

Note: Value is in IDR Trillion - MoF updated projection in July 2022 on the required subsidies refers to the yearly average Indonesia Crude Price (ICP) that can reach USD 105 per barrel (IDR 14,700 exchange rate) until the end of 2022. The total projection was further updated to IDR 649 trillion on September 2022 based on ICP that can reach USD 104.9 per barrel. Specifics of the IDR 649 trillion projection is not yet available for the wider public

Source: Ministry of Finance



Supporting the Energy Transition through the Carbon Cap, Trade, and Tax Scheme in Indonesia

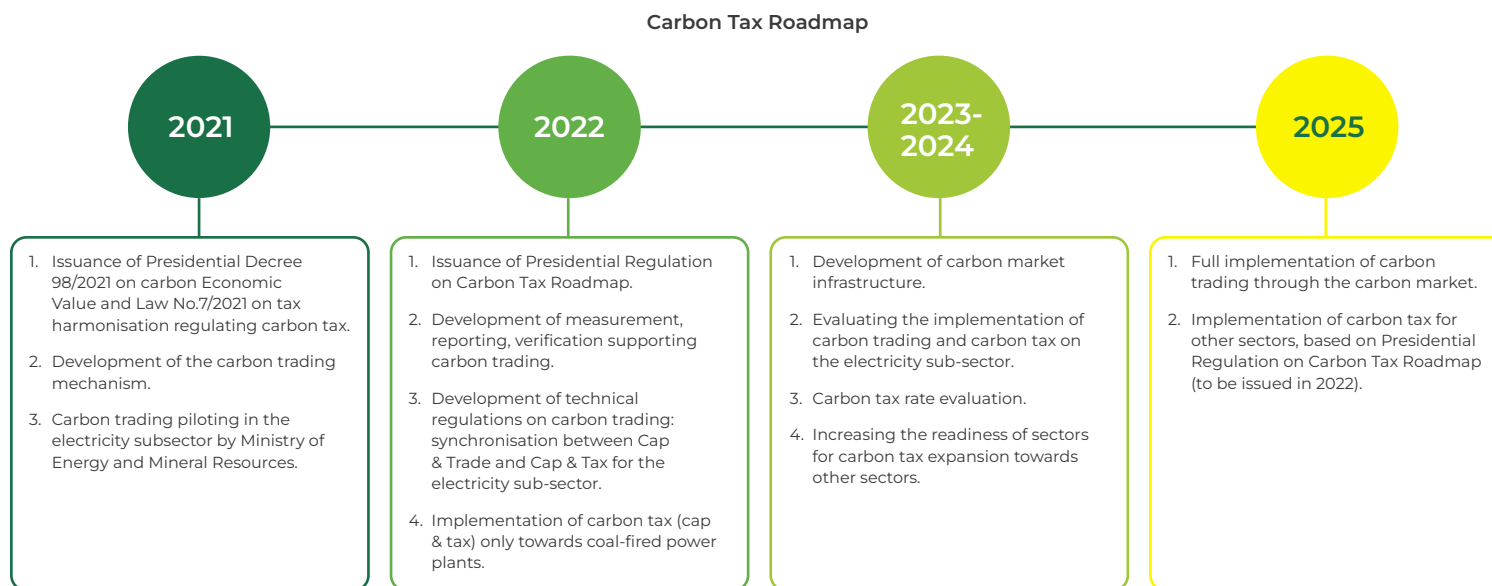
Indonesia's carbon tax implementation has been delayed yet again due to economic and regulatory concerns

- The carbon tax mechanism, which was originally planned to be launched in April 2022, has been delayed by the GoI until after July 2022. Although the renewed starting date remains uncertain, the GoI ensured that the carbon tax will still be implemented in 2022 as mandated by the latest Tax Harmonisation Law.
- According to the Ministry of Finance (2022), there are two reasons for delaying the implementation of the carbon tax:
 - The current state of the economy and geopolitical issues (e.g., the war between Russia and Ukraine, as well as the global energy and commodity crisis) may lead to a risk of increased financial burden for the wider public. Hence, public acceptance of a new tax imposition that will influence electricity costs would be low.
 - Seven technical regulations supporting the carbon tax are still in development and to be issued by the Ministry of Finance (MoF), Ministry of Environment and Forestry (MoEF), the Ministry of Energy and Mineral Resources (MEMR), and the Coordinating Ministry for Maritime and Investment Affairs as listed in the table below.

List of Upcoming Regulations Supporting Carbon Tax Scheme in Indonesia

Ministry of Environment and Forestry (MOEF)	Ministry of Energy and Mineral Resources (MEMR)	Coordinating Ministry for Maritime and Investment Affairs	Ministry of Finance
<ol style="list-style-type: none">1. Regulation on NDC Implementation2. Regulation on Carbon Pricing	<p>Regulation on Carbon Pricing in Electricity Generation</p>	<p>Regulation on Structure and Work of Carbon Pricing Steering and Implementation Committee</p>	<ol style="list-style-type: none">1. Regulation on the procedures and mechanism of carbon tax imposition2. Regulation on the carbon tax roadmap3. Regulation on the tariff and carbon tax imposition basis (DPP)

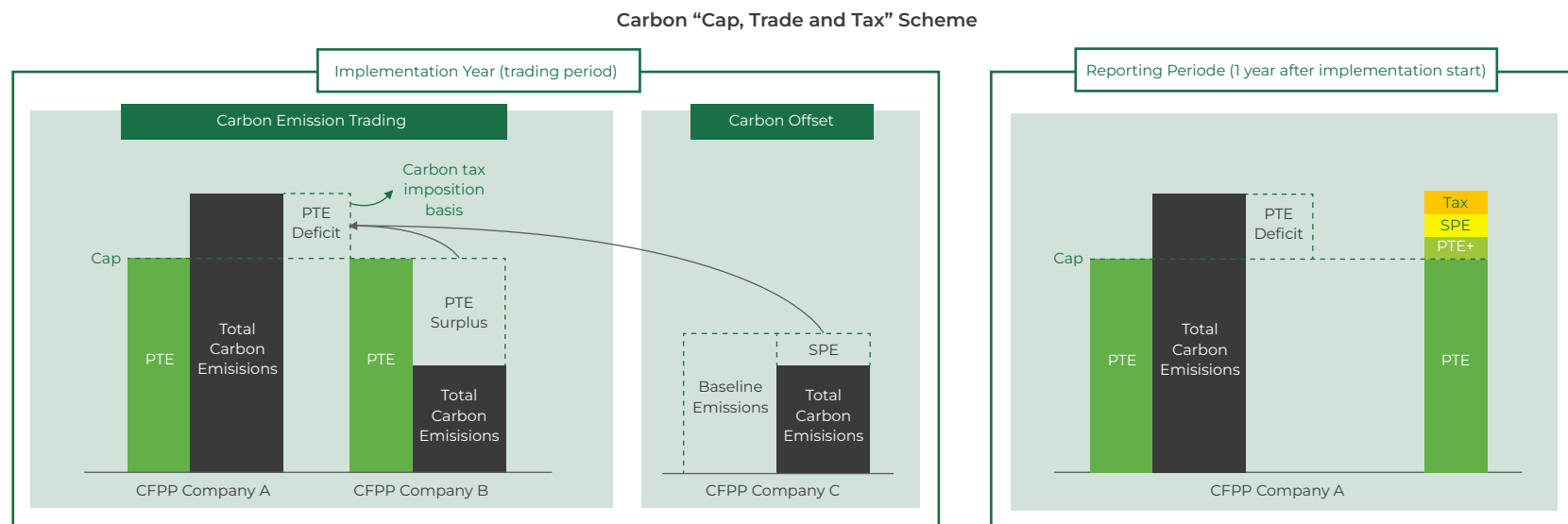
Source: Ministry of Finance



Highlights of the current carbon tax roadmap:

1. The carbon cap, tax, and trade mechanism will first be imposed on the electricity sub-sector in 2022, specifically on CFPPs owned or operated by PLN and IPPs. All RE power plants that have acquired emission reduction certificates (SPE-GRK) from the MoEF can participate in the carbon trading mechanism as carbon emission offset providers.
2. The planned carbon tax consists of an unseparated “cap, tax, and trade” scheme. However, the current roadmap stipulates that carbon trading will only start to be implemented in 2023-2025, considering that the carbon market infrastructure is still in preparation.
3. The current government plans stipulated that carbon tax will also apply to other sectors. Detailed plans to implement the carbon tax for other sectors will be in the upcoming Carbon Tax Roadmap Regulation, expected to be issued by the MoF in 2022. The Gol is currently still assessing how the carbon tax applies to other sectors, such as waste and transportation, with plans to implement it beyond 2025.

Domestic carbon “Cap, Tax, and Trade” is centred on carbon trading between CFPPs, and carbon tax paid by CFPPs can also be offset



Note: (1) PTE: Emission Technical Agreement; (2) PTE Surplus: Actual emission below cap/PTE; (3) PTE Deficit: Actual emission above cap/PTE; (4) PTE+: PTE Surplus purchases from other CFPPs; (5) SPE/SPE-GRK: Emission reduction certificate

Source: Adapted from Ministry of Finance (2022)

A step-by-step description of the carbon “Cap, Tax, and Trade” Scheme is as follows:

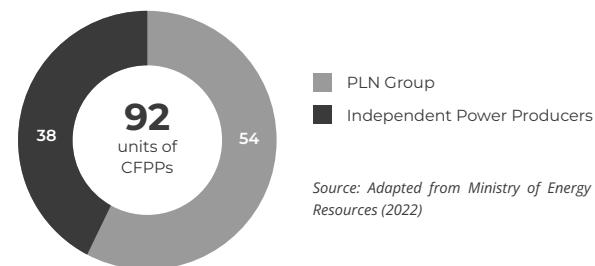
- Throughout the implementation year, CFPP companies will be required to follow an emission cap based on the emission technical agreement (PTE) and allowed to trade emission surplus with other CFPP companies. For example, if the emissions of CFPP company A exceeds the agreed emission cap, it will be considered a “PTE deficit”, and this deficit will be the basis of carbon tax imposition (DPP). CFPP companies’ are obliged to have an emission monitoring plan, and report their emissions after one year of trading for evaluation and validation by the Gol.
- In the reporting period, the company’s DPP can also be reduced by purchases of emission offsets (emission reduction certificate - SPE-GRK) and/or other CFPP companies’ PTE surplus (PTE+). PTE surplus can also be traded in the following years (up to two years) as an incentive for CFPPs to keep their emissions below the cap by acquiring profit from their PTE surplus.

3. Companies failing to report their emissions cannot participate in carbon trading, and will be charged with taxes equal to the emissions exceeding the emission cap. The GoI will also give letters of warning for companies failing to participate in the carbon trading. CFPPs owned by PLN Group and IPPs are mandated to report their emissions through the Electricity Emission Calculation and Reporting Application (APPLE-Gatrik) during the reporting period. Indonesia's carbon taxation scheme is similar to the carbon tax in South Africa, where the tax is levied based on the GHG emissions produced. Distinctively, carbon tax within the European Union (EU) Emissions Trading System (ETS) charges polluters that exceed the emission cap with an additional fine of EUR 100/tCO₂.
4. Tax will be paid to the MoF Directorate General of Taxes (DJP) as governed by the upcoming Ministry of Finance Regulation on the procedures and mechanism of carbon tax imposition. The state budget mechanism will determine how the carbon tax revenue can support climate mitigation and adaptation. It is important to note that the carbon tax revenue will not be earmarked. Therefore, the GoI can allocate the carbon tax revenue for other sectors, such as to support development funds outside of the energy sector and support low-income populations through social assistance.
5. The current design of Indonesia's carbon trading mechanism in 2022 only applies to the electricity sub-sector. In comparison, the European Union ETS applies to sectors including electricity and heat generation, 14 energy-intensive industries including steel, metal, aluminium, cement, pulp, and paper, industries producing nitrous oxide and perfluorocarbons, as well as commercial aviation within the European Economic Area. For further comparisons, countries such as South Africa applies carbon tax to any sectors that yield emissions. The tax is reportedly most impactful towards the energy sector (excluding its state-owned power utility company, ESKOM), the construction industry, the mining sector, various mineral industries such as cement, glass, and lime production, the chemical industry, and the metal industry.

In 2022, the GoI will put in place the Carbon Cap, Tax, and Trade mechanism for 92 units of CFPPs. The carbon tax rate and the emission cap will be adjusted over time

- A total of 92 units of CFPPs owned by PLN Group and Independent Power Producers (IPPs) have been registered and will be required to follow the carbon tax and trade mechanism in 2022. These CFPPs consist of 14 mine-mouth CFPPs more or equal to 100 MW, 21 mine-mouth CFPPs above 400 MW, and 57 units of non-mine-mouth CFPPs ranging from 100 MW to 400 MW. In addition, carbon tax implementation for CFPPs between 25-100 MW is planned for 2023.
- The GoI previously planned to set a carbon tax rate of IDR 75,000/tCO_{2e} before finalising the rate to IDR 30,000/tCO_{2e} due to considerations that a higher carbon tax rate would affect energy affordability. The carbon tax rate of IDR 30,000/t CO_{2e} (USD 2.1/t CO_{2e}) is still much lower than the carbon tax rate suggested by the World Bank and IMF, which is between USD 35-100/tCO_{2e}. With the USD 2.1/tCO_{2e} carbon tax rate, Indonesia is among the three countries with the lowest carbon tax rate among a total of 27 countries that have already implemented carbon tax. However, the GoI has planned to increase the carbon tax rate by 1.2 times the average carbon price in the carbon trading market starting from the second year of the carbon tax implementation in 2023.
- According to PLN and the MEMR, the current tax rate would not result in a significant increase in energy prices. Electricity cost provision (BPP) will only increase by IDR 0.58/KWh from the current BPP for households with 3,500 VA - 5,500 VA, and IDR 1.699,53 for households with >6,600 VA. Furthermore, the MoF has projected that the market-based carbon tax rate increase in 2023 will only increase BPP by IDR 1-2/KWh. Responding to this potential increase in electricity prices, the MEMR has planned to conduct a study to holistically assess the impact of carbon tax on BPP and the necessary steps required to overcome it.

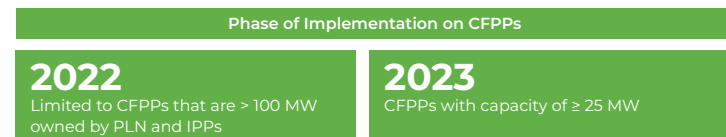
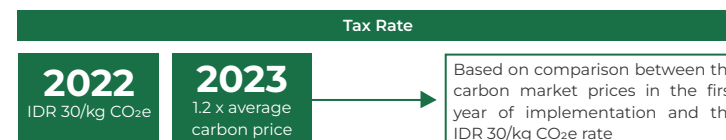
CFPPs Registered to Follow Carbon Tax and Trade in 2022



Source: Adapted from Ministry of Energy and Mineral Resources (2022)

Features of the Carbon Tax

Coal Fired Power Plants (CFPPs) by Capacity		
>400 MW Mine-Mouth CFPPs	21 Units	Total capacity of 14,954 MW
≥100 MW Mine-Mouth CFPPs	14 Units	Total capacity of 1,790 MW
100-400 MW Non-Mine Mouth CFPPs	57 Units	Total capacity of 12,610 MW



Source: Adapted from Ministry of Energy and Mineral Resources (2022)

- The MEMR is currently still in the process of determining the emission cap for the carbon tax scheme. In September 2022, the MEMR presented that the draft version of the Emission Cap Technical Agreement for 2022-2024 is 0.911 tCO₂e/MWh for non-mine-mouth CFPPs above 400 MW, 1.011 tCO₂e/MWh for non-mine-mouth CFPPs between 100 MW-400 MW, and 1.089 tCO₂e/MWh for mine-mouth CFPPs above 100 MW. The determination of the emission cap is based on the baseline emissions of the electricity sub-sector, the specific NDC target for the electricity sub-sector, the results of GHG emissions inventorisation, and the period required for the electricity sector to achieve the NDC target. Furthermore, the MEMR has also stated that the given emission cap or allowance will be made stringent over time to support the achievement of the NDC target in 2030. For example, the current plan of emission cap for 2024 is 1.297 tCO₂e/MWh for mine-mouth and non-mine-mouth CFPPs between 25 MW-100 MW.
- The carbon tax mechanism may initially yield low revenue due to a lack of tax objects & subjects, considering that the carbon tax initial implementation is only for CFPPs. However, the MEMR has assessed that the number of CFPP units that will experience PTE deficit is larger than those that will experience PTE surplus, in which CFPPs that experience PTE deficit will be required to acquire emission reduction certificates by implementing mitigation efforts through operational efficiency measures, and/or pay the carbon tax. Nevertheless, the GoI must ensure to allocate carbon revenues towards social safety nets supporting the transition or allocate further financial support for RE projects, as recommended by international practices on carbon tax revenue utilisation (United Nations, 2021; ADB, 2021; World Bank, 2021).

Paiton CFPP emissions of 6.5 million tCO₂ would require carbon trade or IDR 39.4 billion in carbon tax

- In the following simulation, our study calculated the implementation of the carbon cap, tax, and trade scheme for Paiton CFPP, owned and operated by the state-owned enterprise PT. Pembangkitan Jawa-Bali (PT. PJB), subsidiary company of the State Electricity Company (PLN). Emissions calculation for the CFPP is derived from data available in 2021. In addition, due to limitations in projecting market behaviours of CFPP in the carbon market, the analysis only utilises assumed scenarios based on options available for the CFPP owners in the carbon trading scheme, as informed by the MEMR and the MoF in 2022.
- Our study calculated the amount of emission produced by Paiton CFPP in 2021 through the operating margin (OM) emission factor formula published by the UNFCCC in 2018. In addition, data on the emission factor of the fuel type used, which in this case is Indonesian Coal, was based on the data published by the MEMR's Research and Development Centre, valued at 99,718 kg CO₂/TJ.
- Calculation results for Paiton CFPP (5,670,000 MWh in 2021) yields annual emissions of 6,520,500 tCO₂/MWh. In comparison, the 0.918 tCO₂/MWh emission cap utilised in the carbon tax pilot program in 2021 (MEMR, 2022) yields an emission quota or cap of 5,205,060 tCO₂ for Paiton CFPP. As a result, in this simulation Paiton CFPP in 2021 yields emissions above the emission cap (PTE deficit), with a margin value of -1,315,440 tCO₂.
- Utilising the USD 2/tCO₂e (IDR 30/tCO₂e) carbon tax rate and referring to the calculations available in Box 1, Paiton CFPP would need to conduct carbon trading valued at IDR 39,463,200,000 (USD 2,659,065.93) within one year of the trading period through purchasing of carbon surplus (PTE+) and/or carbon offset by acquiring emission reduction certificates (SPE-GRK) from other CFPP companies.
- Two possible scenarios exist: (1) If PT. PJB fails to conduct carbon trading equal to IDR 39,463,200,000, it would need to pay taxes equal to the deviation between the total carbon cost (IDR 39.4 billion) and the total transaction value of PTE+ and SPE-GRK purchases; (2) If PT. PJB succeeds in conducting carbon trading equal to the total carbon cost, it would lead to IDR 0 tax revenue paid to the Gol. In addition, our study found that the annual income of PT. PJB, which owns six units of CFPPs in 2021, accounts for IDR 5.8 trillion. Thus, the carbon tax cost is only 0.6% of its annual income.

Box 1. Carbon Surplus/Deficit Calculation for Paiton CFPP

(Based on formula provided by the MEMR, 2021)

Carbon Surplus/Deficit = Carbon Emission Quota – Paiton CFPP Actual Carbon Emissions
 = (Emission Cap x Gross Electricity Production of CFPP) – Paiton CFPP Emission
 = (0.918 tCO₂/MWh x 5,670,000 MWh) – 6,520,500 tCO₂
 = -1,315,440 tCO₂ (PTE Deficit)

Cost needed for Carbon Trading = -1,315,440 tCO₂ x IDR 30,000 /tCO₂e
 = IDR 39,463,200,000 (USD 2,659,065.93)

Carbon tax revenue =
 Total Cost for Carbon Trading – Total value of Carbon Trading and Offset acquired for one year

List of Data and Sources

Variable	Data/Calculation results	Source
Average emission factor of Indonesian coal	99,718 kg CO ₂ /TJ	R&D Centre for Mineral and Coal Technology, MEMR (2018)
Paiton Production (MWh) in 2021	5,670,000 MWh	PT. PJB (2021)
Paiton Net Plant Heat Rate in 2021	2750 Kcal/kWh	PT. PJB (2021)
Paiton Plant average net energy conversion efficiency	31,20%	Calculated by factoring Paiton Net Plant Heat Rate in 2021
Emission cap for CFPPs >400MW	0.918 tCO ₂ /MWh	MEMR (2021), based on the emission cap used in the carbon tax pilot programme in 2021.
Carbon Tax Rate	IDR 30,000/tCO ₂ e	MoF (2022)

Supporting the Energy Transition through Innovative Financing Schemes: Energy Transition Mechanism (ETM) and SDG Indonesia One



ADB's ETM pre-feasibility study recommended 1.77 GW of CFPPs for early retirement between 2022-2023, half of the total installed capacity until 2025

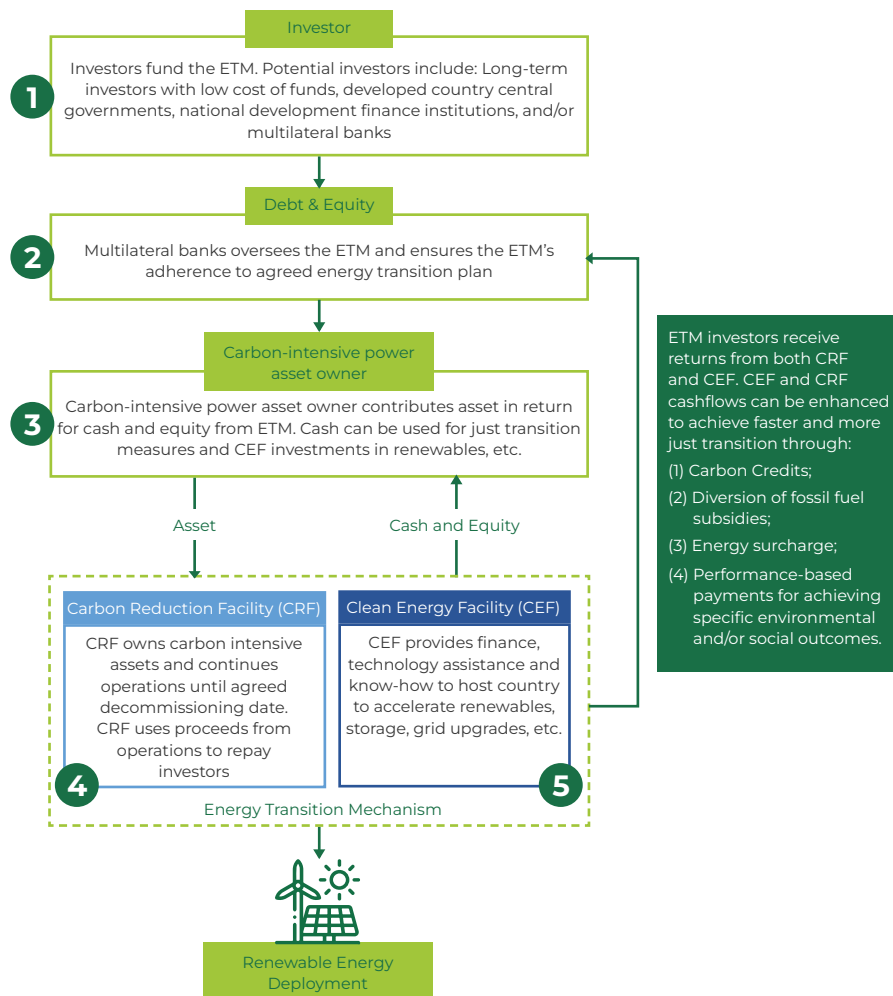
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ETM is a scalable, collaborative initiative developed in partnership with developing member countries (DMCs) that will leverage a market-based approach to accelerate the transition from fossil fuels to clean energy. Public and private investments—from governments, multilateral banks, private sector investors, philanthropies, and long-term investors—will finance country-specific ETM funds to retire coal power assets on an earlier schedule than if they remained with their current owners.”

—
Asian Development Bank (ADB)

- The ETM international platform aims to decommission coal-fired power plants that are under the age of 15 years, particularly CFPPs recommended by the pre-feasibility study analysed through parameters such as CFPPs' age, capacity, utilisation, security, Discounted Cash Flow (DCF) valuation, MCA ranking, and emitted tCO₂e/MWh. From a total of 30 non-IPP CFPPs assessed in ETM's pre-feasibility study, three CFPPs with a total capacity of 1.77 GW were nominated for early retirement through ETM between 2022 and 2023, as part of the plan to retire 5.5 GW of CFPPs by 2040.
- ETM will also seek commitments from current project investors to not develop any new coal power plants, as well as the commitment of the host country on energy transition as a pre-condition for any deal concerning ETM implementation.
- ADB pre-feasibility study for ETM concluded in September 2021. Results of the pre-feasibility study prioritised three CFPPs to undergo full feasibility starting October 2021 and to be retired early through ETM: Keban Agung (240 MW), Sumsel 5 (300 MW), and Paiton 1 (1,230 MW) CFPPs. These CFPPs were selected due to their size, maturity, utilisation, and pollutant volume.
- The total capacity of CFPPs planned for retirement between 2022-2023 is still 1.7 GW lower than the capacity of new CFPPs that will start operations in 2022. In addition, the nominated CFPPs only account for 46.8% of the total CFPP capacities planned until 2025, according to RUPTL 2021-2030.
- Funding commitments for the Pilot ETM is set to be ready in Q4 2022 and the disbursement of funds has been planned for Q1 2023. Based on this implementation timeline, ETM may lag behind the initial target to retire 1.77 GW of CFPPs between 2022-2023.

Asian Development Bank's ETM Implementation Scheme



Options of funding or transaction schemes on the types of agreements between CFPPs and the ETM:

- Acquisition Model (SPV level): Involves ETM acquisition of CFPPs' share capital and taking role as owner and operator of the power plant.
- Synthetic Model (SPV level): ETM invests in debt/mezzanine capital to the CFPPs. Equity ownership and operational responsibility kept with current asset owner.
- Portfolio Model (Corporate level): ETM provides funding to companies with CFPPs and greenfield energy projects, to ensure that clean energy projects are built and CFPPs retired ahead of schedule.

Source: Adapted from ADB (2021)

To speed up the energy transition, Indonesia has developed the Energy Transition Mechanism Country Platform, a blended finance instrument

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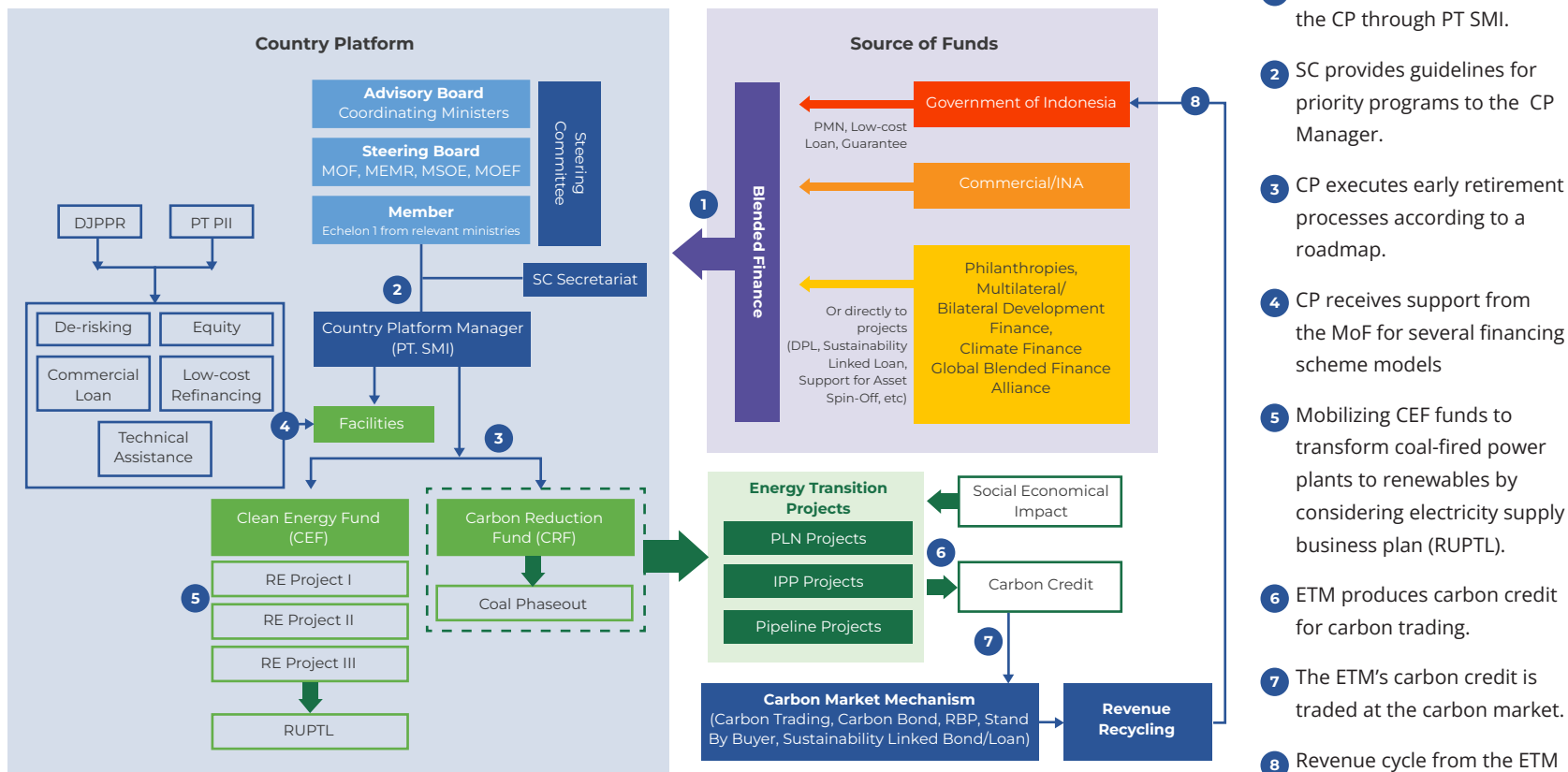
ETM country platform serves as a framework to provide the necessary financing for the acceleration of the energy transition and as a platform to mobilise both commercial as well as non-commercial funding sources in a sustainable manner”

—

Minister of Finance, 2022

- The ETM Country Platform aims to: (1) achieve optimum energy mix according to National Energy Policy; (2) reduce greenhouse gasses to achieve NDC and NZE in Indonesia's electricity sector; (3) shorten the economic performance of coal-fired power plants; and (4) accelerate investments for Renewable Energy Power Plants. It is important to note that ETM will support CFPP phase-out and RE deployment based on Indonesia's RUPTL 2021-2030, which aims to achieve 51.6% of RE and 48.4% of fossil fuel in the national energy mix by 2030.
- The ETM country platform Steering Committee, which consists of ministries and the country platform manager, will provide directions, establish the targets, and approve grants related to financing instrument provision at the project level. At the implementation level, similar to ADB's international ETM platform, the ETM Country Platform will also implement the Clean Energy Fund (CEF) and the Carbon Reduction Fund (CRF) facilities at its core. The CRF facility will focus on CFPP phase-out, while the CEF aims to support the development of RE to replace existing CFPPs. The ETM Country Platform also plans to produce carbon credits to be traded on the carbon market as bonds or loans. Revenue from carbon trading will be categorised as non-tax revenue, and used to fund ETM.
- Under Minister of Finance Decision (KMK) No.275/2022, PT. SMI is responsible for managing blended finance sourced from the state budget and other non-public sources (donors, philanthropies, bilateral and multilateral institutions, and private investors) and also providing financial de-risking instruments for projects. As stipulated in the KMK, PT. SMI is mandated to conduct a study assessing the fiscal support required for ETM and formulate the blended financing concept to leverage more non-public funds. As of September 2022, PT. SMI is still conducting this study in close coordination with the MoF, considering that the MoF is also planning to launch a ministry regulation on the ETM Country Platform. The MoF aims to finalise this regulation in November 2022, which will further define the ETM Country Platform, its mechanisms and financial instruments, and further elaborate on the role of PT. SMI in the ETM Country Platform, and stipulate the extent of fiscal support available to support the platform.

ETM Country Platform Scheme

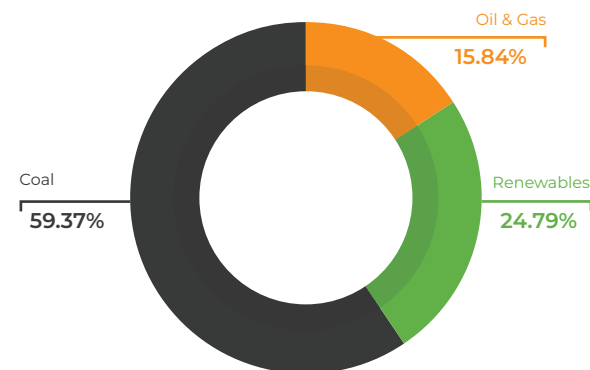


Source: Ministry of Finance (2022)

Due to energy oversupply, Indonesia still faces difficulties in balancing coal phase-out and RE deployment under the country platform, despite current progress and future goals

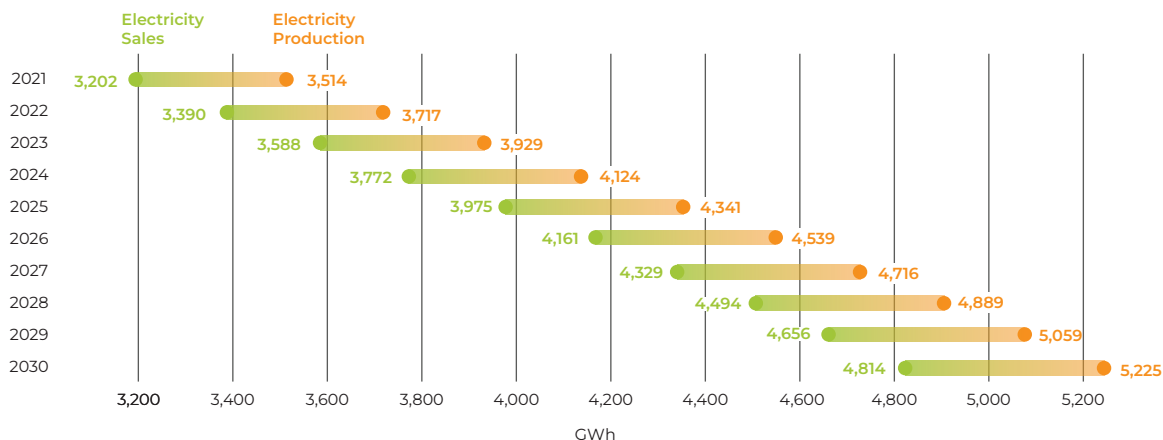
- As of September 2022, the Gol is currently assessing the financing needs of the platform and is engaging potential financiers, including multilateral banks, donors, philanthropies, and commercial sources such as local and foreign commercial banks and private investors. In line with the just and affordable principle, the Gol prioritises acquiring financing in the form of concessional loans and equity that incurs a low cost to support the Carbon Reduction Fund (CRF) to phase-out CFPP. Acknowledging the limited availability of the government budget, the Gol also plans to solely utilise the public budget to lessen interest rates so that loans can be more affordable for PLN and IPP projects. In addition, the Gol will also support projects under the ETM through government guarantees. Furthermore, the Gol through PT. SMI and INA plans to establish a business entity that will acquire and maintain IPP assets such as CFPPs, and raise equity capital from these assets. Lastly, the Gol is currently discussing the list of CFPPs to be decommissioned, referencing and aligning available study results and CFPP nominations from the PLN, the MEMR, and ADB.
- In terms of prospective partners to support the ETM Country Platform, PT. SMI is currently scoping out potential partners, starting with 35 existing partners of PT. SMI SDG Indonesia One (SIO) platform, and engaging new potential partners to provide financial support for coal phase-out under the ETM Country Platform CRF facility. One of these potential partners is the Global Energy Alliance for People and Planet (GEAPP).

Planned Electricity Generation Energy Mix in 2030 (Low-Carbon Scenario)



Source: RUPTL 2021-2030, Indonesia State-Owned Electricity Company (2021)

Projected Electricity Demand Versus Electricity Production (2021-2030)



Note: In this projection, annual electricity production always exceeds the annual electricity demand throughout 2021-2030

Source: RUPTL 2021-2030, Indonesia State-Owned Electricity Company (2021)

- The Gol encounters several challenges in implementing the ETM Country Platform. Firstly, considering Indonesia’s coal-dominated electricity system is currently oversupplied, the sole electricity off-taker, PLN, can be reluctant to prioritise and sign new power purchase agreements for new RE power plants. This condition suggests that the country platform may need to prioritise phasing out CFPP through the CRF facility first, and PLN may need to consider the potential of ETM CEF facility and incorporate it into its business plan (RUPTL). Thus, without effective implementation of the ETM CRF facility and buy-in from PLN for RE deployment supported by the country platform, utilisation of the CEF facility can be difficult. To address this challenge, the Gol is still assessing whether coal phase-out through the ETM CRF facility should be prioritised over the CEF facility to make room for RE deployment first.
- Secondly, PT. SMI has stated that the number of investors willing to financially support the ETM Country Platform’s CRF facility to support CFPP phase-out is lower than those willing to invest in RE development under the CEF facility. Most investors and lenders prefer to support RE projects or projects that aim to phase-out fossil fuels while also deploying RE. It must be taken into account that most potential lenders or investors have their own performance indicators or goals that lead them to prioritise RE deployment rather than supporting projects that are only aimed at phasing out CFPPs. This current investment trend indicates a mismatch between investors’ or lenders’ appetites in relation to available project pipelines, where in the current coal-dominated and oversupplied energy system, CFPP phase-out needs to be prioritised and supported.

SDG Indonesia One, as a blended financing platform, has supported approximately 50 renewable energy projects since 2018

- Managed by PT. SMI, SDG Indonesia One (SIO) mobilises financing from various sources respective to its four pillars of financing support schemes to back SDG-related projects, including renewable energy, throughout all project cycles (project preparation up to post-construction). This blended financing mechanism also channels financing sources through grants, loans, bonds, sukuk, equity, and technical assistance.
- SIO blended financing scheme offers four pillars to donors and investors to raise funds for development projects, consisting of SDG development facilities, de-risking facilities, financing facilities, and equity funds.
 - The SDG development facility encourages infrastructure project preparation on the national and regional level to acquire projects in quality and quantity through grants for project preparation, technical assistance, and research.
 - The de-risking and financing facilities aim to encourage and stimulate infrastructure development and gain the private sector's appeal and participation, particularly commercial banks and investors. Project de-risking support is provided through concessional loans, first-loss facility, interest subsidy, and viability gap fund (VGF), while financing facilities provide senior and subordinated loans.
- The equity fund facility provides opportunities for private investors to participate in infrastructure projects by strengthening the capital capacity of new (greenfield) projects and assists in recycling assets for already operating projects (brownfield).

Publicly Disclosed Renewable Energy Projects Financed through SDG Indonesia One (SIO) as of April 2022

Projects	Projects Cost/Capacity	SIO Facility Utilised
Air Putih Mini Hydro Power Plant, Bengkulu	USD 46.9 million / 21 MW	De-Risking (first loss facility), Senior loan, sub-debt
Bayang Nyalo Mini Hydro Power Plant, Pesisir Selatan, West Sumatera	USD 14.4 million / 3 x 2 MW	Senior Loan
Biomass, Merauke	USD 150 Million / 3.5 MW	Grant for Pre-FS and de-risking tools, Loan
PT. Pertamina Internal Solar Power Plant	USD 5 million / 25 x 500 kVA	Grant for feasibility study
Solar Rooftop in 7 Airports Across Indonesia	USD 323.788 for feasibility study	Grant for feasibility study
Waesano Geothermal Exploration Project	Potential up to 30 MW	Technical assistance

Source: PT. Sarana Multi Infrastruktur (compiled sources)

- As of March 2022, cumulative funding commitments of SDG Indonesia One partners has reached USD 3.2 billion. SIO has mobilised USD 789 million through grant and loan agreements and channels USD 223 million through other instruments. It has supported a total of 62 projects up to 2022, in which 90% of these are RE projects. Note that these projects are only those that acquired support only from PT. SMI's SIO platform. Specifically for 2022, SIO has supported 22 additional RE projects with PT. Pertamina, and two mini-hydro power plants supported by credit facilities, for example from the French Development Agency (AFD) for USD 150 million, and the ADB (USD 150 million). PT. SMI will officially publish the details of SIO's achievements in 2022 including supported RE projects in its next sustainability report.
- Despite facing few challenges in acquiring funds from financiers, SIO mainly faces challenges in channeling acquired funds towards projects due to the low number of projects that have acquired contractual agreements or power purchase agreements (PPAs) with the State Electricity Company (PLN). This creates a bottleneck in PT. SMI's project pipeline because PT. SMI can only support projects through grants and technical assistance until the pre-feasibility and feasibility study stages, but cannot mobilise financing facilities such as loans for projects without PPA with PLN. Conversely, donors often expect that grants mobilised to support projects during project preparation can serve as the basis for mobilising loans after projects have reached financial close.

Closing the Financing Gap: Financing Sources and Non-Conventional Financing Instruments



Bilateral support based on pledges made between Q4 2021 to Q1 2022 remains significant in supporting Indonesia's 23% RE target by 2025

Table A. Identified Bilateral Financing Support (Q4 2021 - Q1 2022)

Country	Type	Amount	Details
United Kingdom	Investment target	USD 340 Million	The U.K. government pledged GBP 25 million of public funding to help raise USD 340 million in investments for sustainable power infrastructure project pipelines in Indonesia, the Philippines, and India. The New Asian Renewables Fund launched by ThomasLloyd Energy Impact Trust will channel the USD 340 million in private investments.
Japan	Memorandum of Cooperation	N/A	Collaborations on a net zero energy transition roadmap development, technology development and dissemination (hydrogen, ammonia, carbon recycling, and CCS/CCUS), and support in multilateral forums to accelerate technological cooperation.
United States	Project	USD 38.8 million (Project Value)	Sustainable Energy for Indonesia's Advancing Resilience (USAID-SINAR) project (2021-2025). This program aims to mobilise USD 5 billion worth of private and public financing for investments in renewable energy and support the installation of 2,000 MW of RE.
Germany	Grants	USD 2 billion	Disbursed towards Indonesia's MEMR to help develop RE sources such as hydropower, mini-hydro, geothermal, and solar power plants, as well as provide training and capacity building.
France	Technical assistance	USD 544 million	Concession loan scheme for developing the Sustainable and Inclusive Energy Programme Policy; concession loans to PLN for transmission and distribution projects, grants for experts, and feasibility studies; opening opportunities for credit to state-owned banks for mini hydropower projects, among other RE technologies.
Norway	Technical assistance	USD 28.7 million	Channelled through Indonesia Sustainable Landscape Management Multi-Donor Trust Fund (SLM-MDTF). The technical assistance aims to enable climate and green finance investments in Indonesia through operationalisation and capacity building of BPD LH.
Singapore	Investment	USD 5 billion	Fund the development of a logistics hub in Tanjung Priok Seaport, and renewable energy projects in Batam, Riau Islands, Sumba Island, and West Manggarai (East Nusa Tenggara).
New Zealand	Project Grant	USD 3.6 million (Project value)	Grant funding agreement for the project "Renewable Energy: Accelerated Transition Indonesia (RE-ACT)", aiming to support policy framework implementation, stakeholder engagement and capacity development, as well as providing a design of de-risking instruments and financing mechanisms.
Australia	Cooperation Grant	USD 200 million	Climate and infrastructure partnership. No details available yet as of Q3 2022.

Source: Compiled Sources

- Between Q4 2021 and Q1 2022, nine countries have pledged future financial support for renewable energy development in Indonesia through investments, technical assistance, grants, projects, or technical cooperation. Note that financing consists of grants towards specified projects or channelled through implementation programmes, while investments require repayments of returns and liabilities.
- Only factoring pledges were made between Q4 2021 and Q1 2022 by countries with the highest investment pledges: the United States and Singapore; total projected investments for renewable energy until 2025 is USD 10 billion. The USD 10 billion consists of targets planned by the USAID-SINAR project (USD 5 billion) and planned investments from Singapore (USD 5 billion). The projected investment value from these two countries in 2025 accounts for 27% of the total financing required for Indonesia to achieve the 23% RE target in 2025.
- Based on recent pledges by eight countries in Table A, the total value of financial support through investments, technical assistance, grants, projects, or technical cooperation reached USD 13.1 billion. Considering that Indonesia needs USD 37 billion to achieve the 23% RE share in 2025, USD 13.1 billion accounts for 35.4% of the total projected financing needs by 2025, indicating positive international support for RE development in Indonesia.
- Indonesia's Ministry of Investment (BKPM) reported that investments for clean energy in 2020 reached a total of USD 2.1 billion, dominated by investments from Singapore (34.5%), followed by South Korea (16.6%), Netherlands (14.7%), Japan (12.2%), and China (5.6%). The previously mentioned countries, except Singapore and Japan, have not made recent financial pledges to support RE development in Indonesia.

CIF has mainly supported geothermal development in Indonesia since 2010. Through the ACT Programme, the international investment platform aims to further support the energy transition in Indonesia until 2047

- The provision of financial support from the Climate Investment Funds (CIF) for Indonesia dates back to 2010. Since then, there have been eight RE projects in Indonesia supported by CIF (Table B). However, six of these projects are mainly directed toward geothermal energy development, while one project implemented in 2017, Renewable Energy Programme (REP), has supported the deployment of mini-hydro and solar.
- In 2021, Indonesia joined the Climate Investment Fund (CIF) Accelerating Coal Transition (ACT) investment programme, implemented from March 2022 to 2047. Six multilateral development banks will support this programme through a comprehensive financial toolkit and technical assistance. Funds from the ACT programme will support programmes that enhance countries' resources to manage the energy transition shifting away from coal, repurpose or decommission coal assets, and create sustainable economic opportunities and social protection for coal-dependent communities.
- In detail, the ACT programme's activities will include: (1) Supporting the closure and decommissioning of coal mines and coal power plants; (2) supporting power plant repurposing towards renewable energy and energy storage; (3) providing funding support for labour retrenchment packages and reskilling or retraining packages, including a gender action plan, and; (4) developing a transition strategy as part of implementing investment projects. As per its investment plan preparation in June 2022, ACT will prioritise three main components: accelerated retirement of CFPPs, just transition and repurposing, and scaling up renewable energy for private investment.
- ADB and the World Bank Group have indicated several potential investment projects to implement under the ACT framework. The total investment project from ADB is USD 3.7 billion, while investment projects from the World Bank Group reached a total value of USD 2.08 billion. As of July 2022, the draft of the ACT investment plan is still in development and will be published in November 2022. In addition, the ACT project team has consulted several ministries and agencies in Indonesia, including PLN and the MEMR.



Table B. List of Projects Supported by Climate Investment Funds (CIF)

Project Title	Approved CIF Financing Amount	Starting Date
Accelerating Coal Transition (ACT)	USD 1 trillion (commitment)	March 3, 2022
Geothermal Upstream Development Project	USD 49 million (convertible grants)	March 8, 2016
Geothermal Electricity Finance (IGEF) Programme	USD 49.3 million (Loan)	December 19, 2013
Geothermal Clean Energy Investment Project	USD 125 million (Loan)	December 21, 2010
Private Sector Geothermal Energy Programme	USD 149.25 million (Loan)	October 11, 2013
Renewable Energy Programme (REP)	USD 37 million (Loan)	August 9, 2017
DPSP III: Geothermal Power Generation Project	USD 35 million (Loan)	November 18, 2019
DPSP III: Indonesia Geothermal Resource Risk Mitigation Project (GREM)	USD 75 million; USD 40 million in loans, USD 2.50 million in grants; USD 32.50 million in convertible grants	February 12, 2019

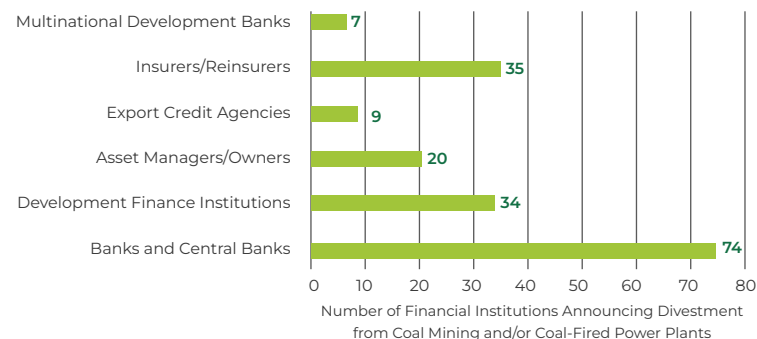
Note: Details on the value of funds disbursed to Indonesia as of July 2022 to implement the ACT programme from its total of USD 1 trillion financial commitment are not yet available to the public. As of July 2022, CIF is still in the process of acquiring potential investment projects to be implemented under the ACT framework.

Source: Climate Investment Funds, n.d.; Government of Canada n.d.

Despite the decline in global coal financing, 29 Indonesian financial institutions still financed coal until 2021

- Limiting the rise of global average temperatures to well below 2 degrees above pre-industrial levels in line with the Paris Agreement target requires an unprecedented reduction in global emissions. Thus, considerable reallocation of investments is needed to support the transition towards a low-carbon economy. This transition produces risks for the financial sector, including “transition risks”. This risk could also stem from the economic consequence of stranded assets, where assets suffer devaluations and even becomes obsolete.
- CFPPs are one of the potential assets that will be left stranded in the energy transition process, considering that 80% of coal reserves would need to remain unused to meet the 2-degree target, and the investment costs for RE will be more competitive than the investment costs of CFPPs. Additionally, the devaluation of fossil fuel assets can lead to lower debt carrying capacity of related companies and reduce the value of asset investments, increasing the risks for lenders and other financial market participants. Thus, an early transition, which implies a gradual phase-out of financing for fossil fuels, should be done to contain future losses borne by the banking sector and avoid disruptive effects on the financial system.
- A total of 179 financial institutions consisting of 74 central and commercial banks globally have announced their divestment from coal mining and/or coal-fired power plants. This trend further demonstrated the shift by financial institutions toward sustainability-oriented financing due to concerns about the risks of stranded assets. Overseas support for CFPPs in Indonesia follows similar trends. For example, more than 2 GW of CFPPs in Indonesia previously backed financially by China have been cancelled since September 2021 after six financial institutions pulled out of coal investments, including two prominent banks such as ICBC and Sinosure. Despite the rapidly growing trends of global financial institutions restricting coal and their withdrawals from coal investments in Indonesia, there are still a total of 29 Indonesian financial institutions that finance coal through lending, investment, and/or underwriting. These institutions consist of commercial banks, asset managers/owners, and insurers/reinsurers.
- In Indonesia, the lack of stringent policies and regulations limiting finance towards the fossil fuel sector results in the continuation of financial institutions’ involvement. POJK No.51/2017, as the only sustainable financing regulation governing financial institutions, does not mandate stakeholders in the financial sector to limit financing towards fossil fuels. The lack of regulatory frameworks that oblige divestment from fossil fuels and factors such as market unpredictability also hinder financial institutions in planning and setting targets on the value of credits issued for sustainable sectors per year.

Global Financial Institutions Restricting Coal as of 2022

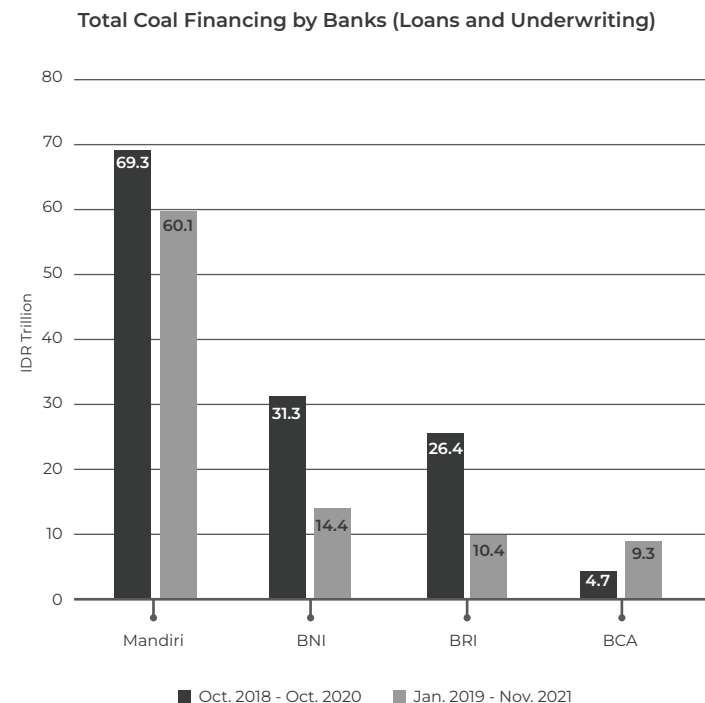


Note: Asset managers/owners included are those under management (AuM) greater than USD 50 billion. Banks and insurers/reinsurers included are those with AuM or loans outstanding larger than USD 10 billion.

Source: IEEFA (2022)

Financing of coal by commercial banks has declined in 2018-2021, but the four biggest lenders from banking sector still finance coal for a total of IDR 93.6 trillion

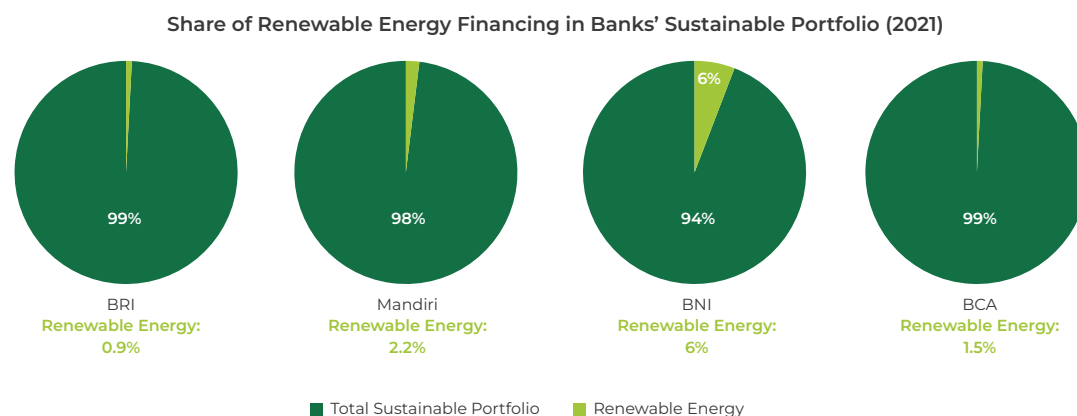
- In the banking sector, Bank Mandiri, Bank BNI, Bank BRI, and Bank BCA still financed coal through loans and underwriting from October 2018 to November 2021. Between 2018 and 2020 and 2019-2021, Bank Mandiri ranked as the highest coal financier, totalling IDR 69.3 trillion of loans and underwriting throughout 2018-2020 and IDR 60.1 trillion throughout 2019-2021.
- Comparing both periods (2018-2020 and 2019-2021), coal financing through loans and underwriting by Mandiri, BNI, and BRI have lessened, while coal financing by BCA has shown an increase of IDR 4.6 trillion. Between 2016 and 2020, the biggest lender to the coal industry was Bank BRI (IDR 98.91 trillion), followed by Bank Mandiri (IDR 83.14 trillion), BNI (IDR 30.02 trillion), and BCA (IDR 4.53 trillion). In sum, financing for coal through stock underwriting, bond issuances, and loans reached IDR 216.6 trillion.
- In comparison, between 2019 and 2021, Bank BRI, Bank Mandiri, Bank BNI, and Bank BCA channelled IDR 10.4 trillion, IDR 59.9 trillion, IDR 14 trillion, and IDR 9.3 trillion, respectively. All four banks combined have disbursed IDR 93.6 trillion for coal financing.
- In May 2022, Bank BRI announced that it will cease allocating credit to the fossil fuel sector and will keep its share of the fossil fuel sector credit portfolio below 3%, comprising of existing credit agreements. Our study calculated that out of IDR 177.6 trillion of Bank BRI's total corporate credit portfolio in Q1 2022, 3% was channelled to coal, accounted for IDR 5.3 trillion.
- Bank Negara Indonesia (BNI) has also started to limit credit allocation towards the mining sector and reported that credit allocations for the sector only in Q1 2022 accounted for 3.23% of the total credit portfolio, which is equal to IDR 19.1 trillion from the sum of their corporate credit portfolio (IDR 193.2 trillion) in the same period. Of the big four commercial banks in Indonesia that finance fossil fuels, only BNI and BRI have announced measures to limit the allocation of credit to the sector.



Source: *Financing Global Coal Exit List Report 2021 & 2022*

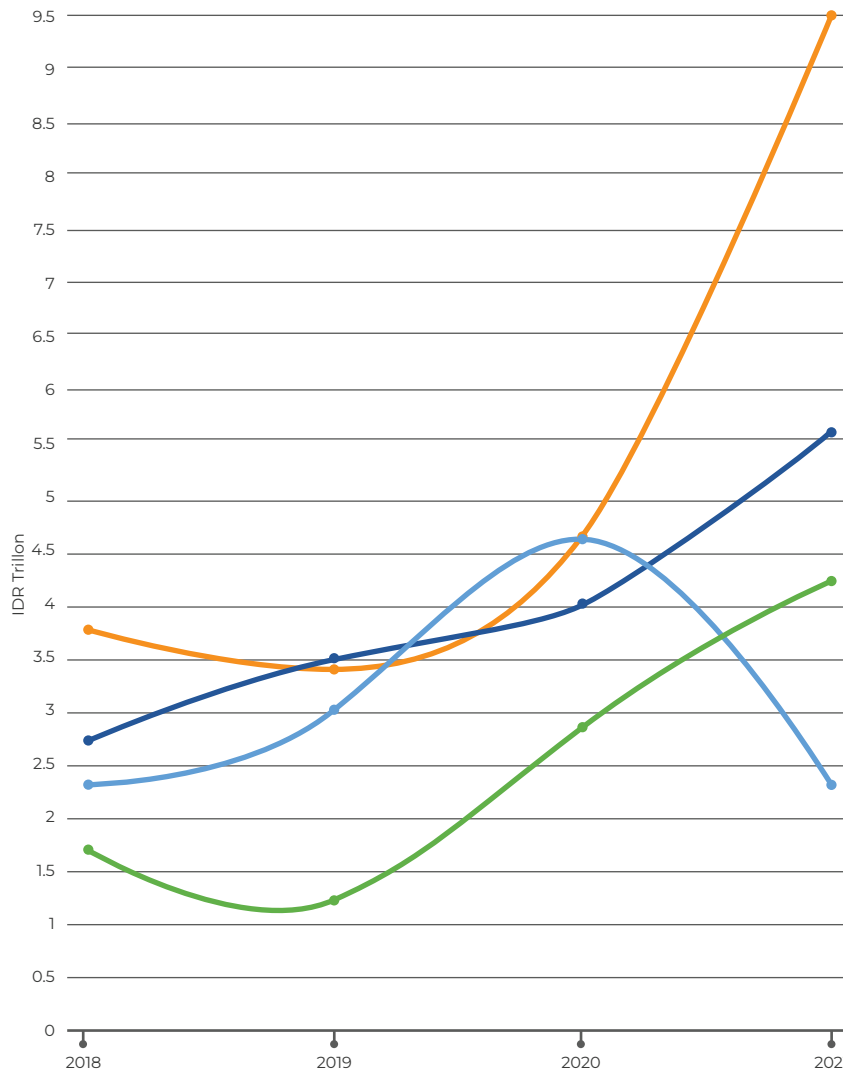
Financing for RE only accounts for 0.9%-5.5% of the total sustainable portfolio of four domestic commercial banks with the highest total asset value in 2021

- Among all renewable energy projects funded by banking credit in 2021, the most commonly funded renewable energy is hydropower, followed by biogas, solar PV, biomass, and geothermal. Banks have disbursed project-by-project financing for hydropower, biogas, biomass, and geothermal. Meanwhile, solar PV installations (e.g., by Bank Mandiri and Bank BCA), were supported through financing schemes involving instalments and non-collateral loans for their customers. However, the total credits disbursed for RE are still minuscule compared to the sum of their sustainable portfolio, only 0.9%-5.5% of these banks' sustainable portfolio in 2021.



- Surveys conducted by KIC (2022) towards users of financial products found that the most common barrier for potential investors looking to invest in “green” businesses is the awareness of companies classified as “green” (66.4%), followed by the lack of awareness of green investments (34.4%), prioritisation on the company's overall reputation rather than their green status (22.2%), and lack of additional profit from green investments (14.4%). The two most common reasons signal the need for a framework that can classify green and non-green businesses, along with improved efforts in socialisation to raise awareness of green investments.
- There are four reasons that caused low credit allocations for renewable energy from the banking sector: (1) Financial Services Authority Regulation No.51/POJK.03/2017 does not mandate banks to increase the share of their sustainable portfolio, including share of credit portfolio for renewables; (2) Lack of bankability and high risk of renewable energy projects, including high capital costs and the longer tenor required for project finance; (3) Lack of familiarity of banks with the features of renewable energy projects; banks need to analyse renewable energy projects and find ways on how it can mitigate the risks of renewable energy project financing; (4) Low awareness and confidence of domestic investors to invest in renewable energy.

Credit Mobilisation by Banks for Renewable Energy (2018-2021)



BNI

2021:

IDR 9.5 Trillion

In 2021, Bank BNI channelled credits towards the development of renewable energy infrastructures such as micro-hydro power plants in Malang (East Java), biogas through Hivos' Biogas Rumah (BIRU) Project, and credit transfer valued at USD 34 million supporting the development of PT Geo Dipa geothermal power plant.

BRI

2021:

IDR 5.6 Trillion

Throughout 2021, Bank BRI has channelled USD 35 million towards Poso Energy Hydropower Plant and USD 10 million towards Kerinci Merangin Hydropower Plant.

Mandiri

2021:

IDR 4.2 Trillion

Totalling IDR 4.2 trillion in 2021, Bank Mandiri financed one micro-hydro power plant developed by PT. Kencana Energi Lestari and Mandiri's financing scheme for solar PV home installations for its customers.

BCA

2021:

IDR 2.3 Trillion




Bank BCA has financially supported the construction of solar, mini-hydro, biomass, and biogas power plants with a total output of up to 35,000 MW in 2021.

Source: Source: Banks' Sustainability Reports

Indonesia's Green Taxonomy utilise a 'traffic light' system. Sectors undergoing transition, e.g., coal mining, fall under the yellow category

- In January 2022, the Financial Services Authority (OJK) launched Indonesia Green Taxonomy Document Edition 1.0, set as a "living document". Since this is the first iteration of Indonesia's taxonomy, the GoI plans to make continuous improvements to the taxonomy. The taxonomy aims to fulfil four strategic objectives:
 1. To develop a standardised definition and green criteria for activities in the economic sector that support climate change mitigation and adaptation in Indonesia by implementing a science-based approach;
 2. To encourage innovations and investments in economic activities that have positive impacts on the environment by implementing a science-based approach;
 3. To encourage the growth of the financial sector in funding and financing green economic activities;
 4. To provide a reference for the financial services sector, investors, and business actors (at the national and international level) to disclose information regarding financing, funding, and investment for economic activities.

Green Taxonomy Classification

Category		Descriptions
	Green (Do no significant harm, apply minimum safeguard, provide positive impact to the environment and align with the environmental objective of the taxonomy)	Business activities that protects, restores, and improves quality of environmental protection and management, as well as climate change mitigation and adaptation, and comply with the governance standards set by the government, and apply best practices at both national and international levels.
	Yellow (Do no significant harm)	Determination of business benefits for environmental protection and management must still be conducted through measurement of other best practices.
	Red (Harmful activities)	The Business Activities that do not meet the yellow and/or green criteria/threshold.

Source: Indonesia Green Taxonomy Document Version 1.0 (2022)

- The taxonomy classified 919 sectors, sub-sectors, groups, or business activities under Indonesian Standard Industrial Classification (KBLI) level 5 into three categories: Green, Yellow, and Red, based on clarifications with each of the sector's corresponding ministries. From these 919 sectors, the GoI determined that 15 sub-sectors were automatically categorised as green. Conversely, 904 sectors and sub-sectors do not qualify for the green category without fulfilling specific environmental safeguard requirements.

- The 15 sectors and sub-sectors that were categorised as green include eight plantation sub-sectors such as tobacco plantation, coconut, other oleaginous fruits, pepper, clove, aromatic/refreshment plant plantation, rubber and other sap-producing plants, as well as fir farms and other yearly plants. Furthermore, three sub-sectors under the street vendor and market stalls sector were deemed as automatically green, including those relevant to fishery, meat, poultry, fish, and livestock feeds. The remaining four green sub-sectors are (1) non-motorised passenger transportation; (2) non-motorised goods transportation; (3) rental activity for music instruments, and; (4) activities of government agencies in the fields of mining and excavation, electricity, water, and gas.

15 Sub-sectors Automatically Categorised as Green Under Indonesia's Green Taxonomy Document

KBLI Code	KBLI level 1	KBLI level 5
01150	Agriculture, forestry and fishing	Tobacco plantation
01261		Coconut fruit plantation
01269		Oleaginous fruit plantations
01281		Pepper plantation
01282		Clove plantation
01284		Aromatic plantation / fresh
01291		Rubber plantations and other gum producing plants
01299		Freedom agriculture and other annual plants
47815	Wholesale and retail trade; repair of motor vehicles and motorcycles	Five-foot retail trade and fishery product commodity market
47825		Retail trading of five feet and los processed meat and fish market
47828		Retail trading five feet and los food, poultry and fish food markets
49423	Transportation and storage	Non-motorized transport for passengers
49433		Non-motorised transport for general goods
77295	Administrative and support service activities	Business rental and rental activities without the right to option of music tools
84132	Public administration and defence; compulsory social security	Activities of government institutions in mining and quarry, electricity, water and gas

Source: Indonesia Green Taxonomy Document Version 1.0 (2022), Appendix Section

- Considering that the GoI utilised the KBLI for its classification, the taxonomy includes sectors and business activities that pose environmental harm. For example, the taxonomy document illustrated its use for the coal mining business (KBLI 05101), which falls under the yellow category. Interestingly, activities such as RE power generation that belong under the same KBLI category as power generation from non-renewable sources were not categorised as green. Whereas, activities of government agencies in the fields of mining and excavation, electricity, water, and gas (KBLI Code 84132) were automatically categorised as green.

Along with other required Improvements, the taxonomy’s yellow tier needs to be specified based on scientifically sound measurements in line with climate goals

- The classification utilises available safeguard mechanisms, standards, and procedural practices under corresponding ministries as the basis for how these sectors may or may not fulfil the green, yellow, and red criteria. However, some of these standards can be ambiguous. For example, it is unclear whether Indonesia’s PROPER award criteria align with international standards for green electricity generation activities.
- Although not recognising coal under the green category under any circumstance is applaudable, Indonesia’s unabated oil, gas, and coal-fired power projects are likely to fall under the yellow category, where most of these projects have acquired the gold PROPER award. The PROPER award can be given based on efforts, not solely geared towards climate change mitigation (e.g., local socio-economic impact). Taxonomies from other countries or regions such as the EU, Malaysia, Singapore, and South Africa also cover ‘transitional’ activities. However, some of these taxonomies also mandate financial institutions to engage with customers to encourage the transition, which is missing in the current version of Indonesia’s green taxonomy. In addition, the taxonomies of these countries utilise thresholds in line with climate policies and emission pathways to determine economic activities or projects under the ‘transitioning’ category.
- The ambiguity of the yellow tier is therefore concerning, considering that fossil fuel power projects lie under the category of “do no significant harm to the environment” and that the yellow tier is also not supported by defined greenhouse gas emissions criteria, which set a clear definition of the extent of environmental harm.
- The taxonomy rating system is also based on assessments of sub-sectors or business activities, not projects or assets. This broader approach can create ambiguity for financial institutions looking to finance green projects, requiring further verification in coordination with the corresponding sector’s ministries. In comparison, international taxonomies aimed to channel green finance, such as the Climate Bonds Taxonomy, use asset type and asset specifications as the objects of its rating system and how each asset category correlates with targets under the Paris Agreement.

Description of Green Taxonomy for Coal Mining

Category	Threshold set based on regulations/policies available in corresponding ministry
Green	There is no green category
Yellow	<p>Ministry of Energy and Mineral Resources (MEMR): Meet the requirements of: Reclamation guarantee, post-mining guarantee, implementation of reclamation, reclamation implementation report, have a carbon, capture and storage technology system</p> <p>Ministry of Environment and Forestry (MoEF): Have PROPER rating of green or gold, or fulfill the ministry’s criterias on air pollution control, water pollution, B3 waste management, and beyond compliance criteria.</p>
Red	Does not fulfill yellow criteria such as: placement of reclamation guarantee, placement of post-mining guarantee, does not conduct reclamation

Source: Summarised from Indonesia Green Taxonomy Document (2022) - Note that each criterion set by the MoEF under the yellow category consists of specific procedures or documentation based on available ministerial policies and regulations.

To achieve its strategic goals, several improvements to Indonesia's green taxonomy are required:

1

The classification relies heavily on available safeguard mechanisms, standards, and procedural practices of technical ministries corresponding with each sector. Financial Services Sector (SJK) can face further ambiguity in utilising this taxonomy and timely mobilise financial resources for specific activities, considering that the current version of the taxonomy does not provide a clear framework on how SJKs can implement the taxonomy for classifications of their portfolios and loan books.

2

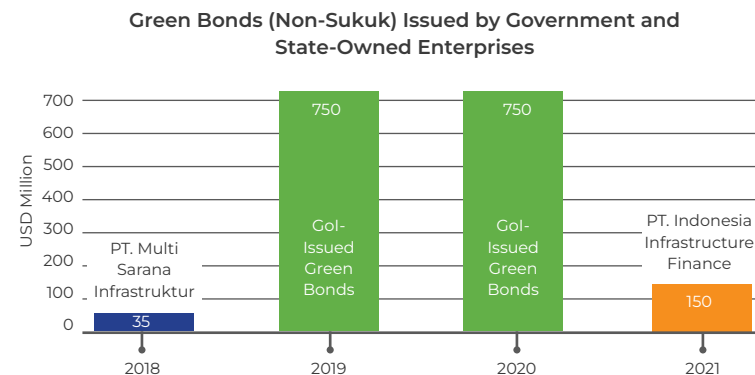
The GoI should ensure that the taxonomy can facilitate project-level classifications in future iterations. More specified criteria based on climate impact measurements are necessary to further provide clear pathways for SJK to mobilise finance for specific activities that are scientifically proven to have positively contributed to Indonesia's NDC targets and avoid financing activities that hinder Indonesia's climate efforts.

3

Indonesia needs to align its taxonomy with internationally acceptable standards, such as the Common Ground Taxonomy published by the International Platform on Sustainable Finance, to ensure the taxonomy's interoperability and cohesion between domestic and international market participants.

Green bonds account for 81% of the Green, Social, and Sustainability Bond (GSS) market in Indonesia, with sovereign bonds in Foreign Currency (FCY) seeing the most issuance

- As of November 2021, the total market value of Indonesia's Green, Social, and Sustainability Bond (GSS) stood at USD 7.7 billion. Green bonds accounted for USD 6.3 billion or 81% of the total amount of bonds issued, making it the most issued type of GSS bond.
- Non-Sukuk green bonds issued by the Gol (sovereign green bonds) have a total value of USD 1.5 billion, and green bonds issued by state-owned enterprises, e.g., PT. SMI and PT. IIF, accounted for USD 153 million. Sovereign green bonds are more dominant in the green bond market compared to green bonds issued by banks and corporates.
- Sovereign green bond issuance in foreign currencies (FCY) dominates the bonds issued in Indonesia, totalling USD 2.2 billion throughout 2019-2021 (ADB, 2021). In comparison, domestic green bond issuance (LCY) accounts for only 0.01% (USD 49.68 million) of the total green bond issuance throughout 2018-2021. The low share of LCY is one of the indicators that demonstrate the lack of domestic green bond market, the reliance on foreign currency lending, and the increased exchange rate risk of green projects.
- As of Q3 2022, Only two private companies have issued green bonds and allocated their use of proceeds solely for Renewable Energy Projects since the issuance of OJK regulation on green bonds in 2017. Small instances of corporate-issued green bonds in Indonesia for renewables are due to the uncertain fiscal and non-fiscal incentives to support green bond issuance, the novelty of Indonesia's green taxonomy, and the lack of bankable projects suitable for investor appetite.



Source: Compiled Sources.

Corporate-Issued Bonds for Renewable Energy Financing

Companies	Value (USD million)	Year of Issuance	Tenor (Years)	Interest rate
Star Energy Geothermal (Wayang Windu) Ltd	580	2018	15	6.75%
Star Energy Geothermal (Darajat II) Ltd	1110	2020	9	3.25%
PT. Tamaris Hidro (Series A)	13.3	2022	3	5.50%
PT. Tamaris Hidro (Series B)	16.6	2022	5	7.00%
PT. Tamaris Hidro (Series C)	19.9	2022	7	8.10%

The GoI has only allotted USD 371 million from 2019-2021 Green Sukuk earnings for renewable energy initiatives

- Value of Green Retail Sukuk issuance per year showed growth throughout 2019-2022, while Global Green Sukuk (GGS) issuance remains the same for three consecutive years but have longer tenor period. The increasing issuance value of Green Retail Sukuk and the longer tenor period of GGS indicate the growth of the local Green Sukuk Market and the attractiveness of Indonesian GGS in the global Green Sukuk market.
- Green Retail Sukuk, which is mainly directed toward domestic investors, nearly doubled its investor size between 2019 and 2021. Domestic investors in Green Retail Sukuk in 2019 accounted for 7,735 individuals, while investors in Green Retail Sukuk issued in 2021 accounted for 14,337 individuals.
- In May 2022, the GoI announced a total of USD 3.25 billion in Global Sukuk transaction, the highest amount of Global Sukuk issued globally to date. Directed mainly towards foreign investors, Indonesian GGS as of 2021 have attracted investors from Asia (34%), United States (27%), Europe (25%), the Middle East and Malaysia (8%), and Indonesia (6%).
- From USD 369 million Green Retail Sukuk use of proceeds issued in 2021, the GoI allocated 22.80% (USD 84.3 million) for refinancing of Fiscal Year 2017 renewable energy projects. In comparison, previously in 2020, the GoI allocated USD 79.2 million (21.1% of the 2020 USD 375 million use of proceeds) to refinance Fiscal Year 2017 RE projects. While in 2019, Indonesia allocated no Green Retail Sukuk use of proceeds for renewable energy projects.
- In terms of Global Green Sukuk (GGS) issued in 2020 (USD 750 million), no use of proceeds were allocated for renewable energy projects. While in 2019, the GoI allocated USD 42.9 million to finance and refinance Fiscal Year 2019 projects. In comparison, GGS's use of proceeds issued in 2021 channelled to RE accounts for USD 164.8 million from its total use of proceeds of USD 750.8 million. Specifically, the GoI allocated USD 1.9 million for financing of Fiscal Year 2021 RE projects, and 21.7% (USD 162.8 million) for refinancing of Fiscal Year 2017 RE projects.
- Ministry of Energy and Mineral Resources (MEMR) has acknowledged the potential of Green Sukuk for renewable energy development in its 2020-2024 National Strategic Plan and has planned to optimise Sukuk Utilisation for Renewables. However, the lack of bankable RE projects remains the main challenge in allocating finance sourced from Sukuk Use of Proceeds.

Issuance of Green Retail Sukuk and Global Green Sukuk by the Government of Indonesia (2019-2021)

Green Sukuk	Value (IDR Billion)	Tenor (Years)	Yield
Green Retail Sukuk (ST006) - 2019	1,460	2	6.75%
Green Retail Sukuk (ST007) - 2020	5,400	2	5.50%
Green Retail Sukuk (ST008) - 2021	5,308	2	4.00%
2019 Global Green Sukuk	11,090	5.5	3.90%
2020 Global Green Sukuk	11,090	5	2.30%
2021 Global Green Sukuk	11,090	30	3.55%

Source: Compiled Sources.

Spotlight: G20 Indonesia Progress on Sustainable and Climate Financing



The G20 Indonesia SFWG aims to address global challenges on sustainable financing, including transition finance, with a focus on accessibility and affordability

Global challenges on sustainable financing acknowledged and sought to be addressed by the G20 Indonesia Sustainable Finance Working Group (SFWG) through its priority issues are as follows:

1. The total proportion of green and sustainable finance in the global financing market remains very low (around 10% in some large economies).
2. There is a necessity for the financial sector to drive a much larger part of the global economy to support climate transition. A proper framework for transition finance and implementation of financial institution commitments are required.
3. Without proper frameworks and implementation of commitments, some sectors or firms will be unable to access financing to support the transition. Consequently, these sectors or firms can fail to decarbonise or be forced to exit the market, leading to disorderly transition, e.g., supply shortages, stranded assets, and unemployment.
4. There is a risk that GHG-intensive firms or sectors will secure financing via 'greenwashing', damaging the reputation and functioning of the sustainable finance market.
5. There is an urgent need to engage the private sector to scale-up financing for transition to ensure net-zero and related financing commitments and to secure the supply of capital.
6. Lack of bankable projects, underdevelopment of capital markets, and continued challenges faced by firms across jurisdictions in accessing sustainable finance markets.

Sustainable Finance Working Group (SFWG) Priority Issues

1

Developing a framework for transition finance and improving the credibility of financial institution commitments

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Identification of transition activities; 2. Corporate and project-level reporting; 3. Transition-relevant financial instruments; 4. Potential policy incentives; 5. Identifying and mitigating social and economic impacts; | <ol style="list-style-type: none"> 6. Analyse current commitments of financial institutions, assess ongoing process, and make recommendations on developing market practices. |
|--|--|

2

Scaling-up sustainable finance instruments, with a focus on accessibility and affordability

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Enhancing capacity building on sustainable finance; 2. Scaling-up blended finance and other de-risking facilities; 3. Introducing policy incentives; | <ol style="list-style-type: none"> 4. Developing and deploying digital technologies; 5. Adopting sustainable supply chain financing. |
|---|--|

3

Discussing policy levers that incentivise financing and investment that supports the transition

1. Stocktaking climate mitigation policies implemented across G20 jurisdictions that incentivise financing and investment to support the transition;
2. Identify specific areas where the SFWG can carry forward the work and priorities highlighted in the forum.

Source: SFWGa (2022); SFWGb (2022).

Agendas of the G20 Indonesia SFWG remain pertinent to critical concerns in Indonesia, such as financial institution pledges on transition finance and green project bankability

SFWG Priority Issues

1 *Developing a framework for transition finance and improving the credibility of financial institution commitments*

Relevant to

2 *Scaling-up sustainable finance instruments, with a focus on accessibility and affordability*

Relevant to

3 *Discussing policy levers that incentivise financing and investment that supports the transition*

Relevant to

Progress and Challenges in Indonesia Relevant to SFWG Priority Issues

- In line with the G20 Indonesia SFWG agenda, Indonesian Central Bank (BI) is currently developing a low-carbon banking industry in line with its commitments for 2021-2025, which include:
 1. Integrating considerations on climate-related risks into macroprudential policies to mandate banks to recognise debtors' carbon emissions as bank emissions and take into account debtors' emissions when approving loans.
 2. Developing a carbon calculator for financial firms to support better alignment with carbon reduction disclosure requirements.
 3. Developing green commercial paper, green Repo, and green derivatives to support sustainable business practices.
- G20 Indonesia's focus on accessibility and affordability of sustainable finance should be applauded, considering that this focus has not yet been prioritised by previous G20 summits. Emphasis on affordability and accessibility aims to address barriers such as high costs of sustainability-oriented financial instruments and crucial issues such as project bankability. Both of these issues are highly important for Indonesia, considering that collateral costs for green projects, including renewable energy projects, remain high in Indonesia and inaccessible for small-scale project developers. In addition, de-risking facilities in Indonesia still need to be developed to channel investments.
- Public policy levers such as fiscal spending, subsidies, monetary policy instruments, regulations, carbon pricing, and carbon markets are critical drivers for shifting customer, firm and investor's economic decisions. For jurisdictions to be able to support the transition, monetary public policy levers must align with climate mitigation policies that are in place.
- Presidential Regulation No.98/2021 on Carbon Economic Value (NEK), in alignment with Indonesia's NDC, will serve as a basis for the upcoming carbon cap, tax, and trade mechanism. However, technical regulations supporting this mechanism are still in development. Thus, discussions between the GoI and the G20 SFWG are needed to ensure that policies concerning carbon tax can also incentivise financing and investments for green infrastructures.

G20 Indonesia must continue to emphasise the issue of the USD 100 billion climate finance objective and loss and damage financing (L&D)

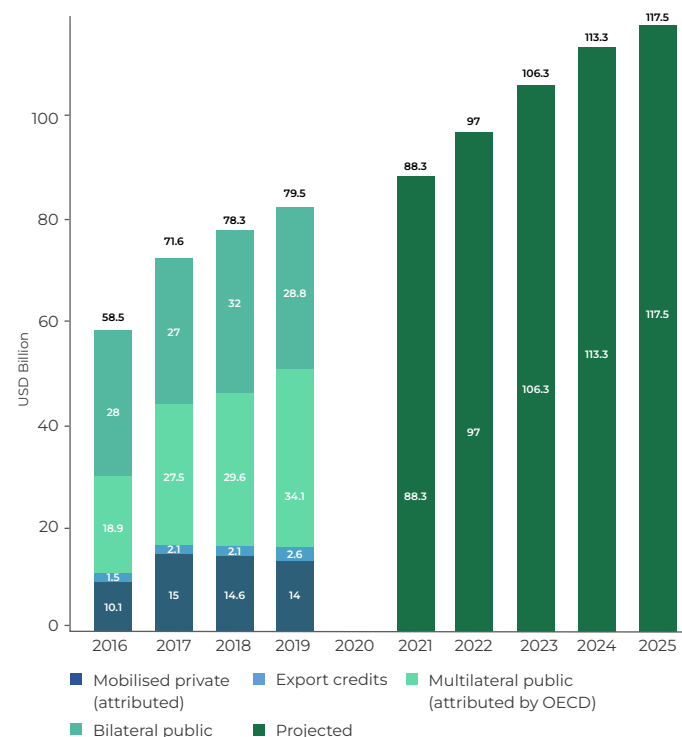
USD 100 billion climate finance Goal

- The commitment of developed countries to mobilise USD 100 billion per year by 2020 has fallen short by USD 20 billion in aggregate from its target in 2019, and donors have also collectively fallen short of the goal in 2020. The U.K. Government projected that the goal will not be met in 2021 and 2022. However, it was concluded that the goal is likely to be met in 2023. As per Q2 2022, the FMCBG reiterated that international pledges have amounted to USD 60 billion through the voluntary channelling of Special Drawing Rights (SDRs) to fulfil the USD 100 billion goal, and countries were encouraged to commit further pledges.

Finance for Loss and Damage (L&D)

- The last three years of G20 presidencies have addressed loss and damage indirectly, i.e., through commitments concerning the promotion of sustainable capital and cross-border payments, as well as noting the importance of providing financial resources to developing countries.
- There are already financing streams incorporating L&D financing, i.e., multilateral, bilateral, domestic, philanthropy, and private channels. However, the lack of an agreed definition of L&D makes it challenging to identify existing loss and damage finance. The IPCC March 2022 report cited that about 24% of all approved Green Climate Fund (GCF) projects correlated with L&D, but only 16% of the total number of projects explicitly refer to L&D. Other examples of financing sources for L&D also include UNFCCC Santiago Network on Loss and Damage and the Global Facility for Disaster Reduction and Recovery (GFDRR).
- Dialogues concerning loss and damage should be raised within the G20 for future developments of its enabling instruments and mechanisms, considering the increasing prevalence of climate-induced disasters. To do so, the G20 should further involve non-governmental actors in the field of L&D, particularly in vulnerable developing countries, and work to establish the necessary frameworks to encourage and ensure that economic pledges by G20 countries addressing climate change also include financing for L&D.

Mobilisation of Climate Finance under the USD 100 Billion Goal (2016-2025)



Note: Data for 2020 is not available yet as of August 2022.

Source: ISEAS-YII (2022); OECD (2021)

References

- Alika, R. 2022, January 25. *Singapura Tambah Investasi Rp 132 Triliun, Termasuk untuk Energi Hijau*. KataData. [URL](#).
- Anggraeni, R. 2022, June 16. *Tren pembiayaan berkelanjutan, Ini Arah Kebijakan BCA ke Sektor Energi*. Bisnis. [URL](#).
- Annur C. 2022. *Kenapa Investor Tidak Melakukan Investasi Hijau? Ini Hasil Survei Nya*. Databoks. [URL](#).
- Asian Bonds Online. n.d. Data Portal. Accessed August 2022. [URL](#).
- Asian Development Bank. 2021. Carbon Pricing for Green Recovery and Growth. [URL](#).
- Asian Development Bank. 2022. Energy Transition Mechanism. [URL](#).
- Asian Development Bank. 2022. ETM Introduction. [URL](#).
- Asian Development Bank. 2022. Promoting Local Currency Sustainable Finance in ASEAN+3. [URL](#).
- Asian Development Bank. 2019. Good Practices for Developing a Local Currency Bond Market: Lessons Learned from the ASEAN+3 Asian Bond Markets Initiative. [URL](#).
- Asian Development Bank. 2021. Regional: Opportunities to Accelerate Coal to Clean Power Transition in Selected Southeast Asian Developing Member Countries. [URL](#).
- Asian Development Bank. 2020. Renewable Energy Tariffs and Incentives in Indonesia: Review and Recommendations. [URL](#).
- Asian Development Bank. 2020. How Better Regulation Can Shape the Future of Indonesia's Electricity Sector. [URL](#).
- Badan Pusat Statistik. 2021. Statistik Keuangan Pemerintah Kabupaten Kota 2020-2021. Accessed August 2022. [URL](#).
- Badan Pusat Statistik. 2021. Statistik Keuangan Pemerintah Kabupaten Kota 2018-2021. Accessed August 2022. [URL](#).
- Badan Pemeriksa Keuangan. 2020. *Laporan Hasil Pemeriksaan Kinerja atas Efektivitas Program Peningkatan Kontribusi Energi Baru Terbarukan dalam Bauran Energi Nasional Tahun 2017 s.d. Tahun 2019*. Jakarta: BPK RI
- Bank Indonesia. 2022, July 15. The Roles of Macroprudential Policy in Scaling Up Green Finance. G20 Side Event Seminar on Scaling up Green Finance.
- Bank Mandiri. 2021. Sustainability Report PT. Bank Mandiri (Persero) Tbk. [URL](#).
- Bank Negara Indonesia. 2021. Annual Report 2021. [URL](#).
- Bank Rakyat Indonesia. 2021. Sustainability Report 2021 PT. Bank Rakyat Indonesia (Persero) Tbk. [URL](#).
- Bappenas & GGGI. N.d. RE-ACT: Supporting Indonesia in Accelerating Renewable Energy Transition. Indonesia Green Growth Program. [URL](#).
- Besalicto, B. 2021, December 2. Germany Pledges \$2B to Accelerate Renewable Energy Transition in Indonesia. Jakarta Daily. [URL](#).
- Bhandari, P., Warszawski, N., & Thangata, C. 2022, June 3. The Current State of Play on Financing Loss and Damage. World Resources Institute. [URL](#).
- Bhattacharya, A., Kyriakopoulou, D., & Stern, N. The G20's Crucial Role in Mobilising Climate Finance. Observer Research Foundation. [URL](#).
- Carthew, J. 2021, November 4. New Asian renewables fund – ThomasLloyd Energy Impact. QuotedData. [URL](#).
- Cindy, M., Fitriyanti, F. 2021, October 15. A Turning Point for Renewable Energy in Indonesia?. TheDiplomat. [URL](#).
- Clean, Affordable and Secure Energy (CASE) for Southeast Asia. 2022. Final Report: De-risking Facilities for the Development of Renewable Power Sector in Indonesia. [URL](#).
- Climate Policy Initiative. 2018. Energizing Renewables in Indonesia: Optimizing Public Finance Levers to Drive Private Investment. [URL](#).
- Climate Bonds Initiative. 2021. Climate Bonds Taxonomy. [URL](#).

- Climate Bonds Initiative. 2022. Green Infrastructure Opportunities – Indonesia: Green Recovery. [URL](#).
- Climate Investment Funds. 2022. Indonesia. [URL](#).
- Climate Investment Funds. 2022. Climate Investment Funds (CIF) Accelerating Coal Transition (ACT) Investment Plan (IP) preparation for Indonesia 1st Joint Mission, 14-17 June 2022 Fiscal Policy Agency (BKF), Ministry of Finance, Indonesia. Indonesia CIF ACT IP 1st Joint Mission Aide Memoire 14-17 June 2022. [URL](#).
- CREA. 2022, July 29. The Impact of 'No New Coal' Pledge on China's Overseas Coal Investments. IESR Webinar on The State of Southeast Asia Energy Transition.
- Coordinating Ministry of Maritime and Investment. 2022, July 15. *Potensi Investasi Hijau di Indonesia*. Bali. G20 Side Event.
- Damayanti, R., & Khaerunissa, H. 2018. Carbon Dioxide Emission Factor Estimation from Indonesian Coal. Indonesian Mining Journal Vol. 21, No.1, April 2018: 45-58. [URL](#).
- Deloitte. n.d. What the new carbon tax means for SA industry. [URL](#).
- Dinas Energi dan Sumber Daya Mineral Provinsi Jawa Barat. 2021. Laporan Kinerja Instansi Pemerintah 2020. [URL](#).
- Eloksari, E. 2021, November 5. Indonesia Joins Countries Seeking Faster Coal Exit. JakartaPost. [URL](#).
- Energy Connects. 2021, July 8. Norway to Invest USD 1.14bn in Clean Energy. [URL](#).
- European Parliament. 2022. Financial Institutions' Exposures to Fossil Fuel Assets. [URL](#).
- European Union. 2017. EU ETS Handbook. [URL](#).
- Financial Services Authority (OJK). 2022. Indonesia Green Taxonomy Edition 1.0 - 2022. [URL](#).
- Financial Services Authority (OJK). 2022. Indonesia Green Taxonomy Edition 1.0 – 2022 (Dataset, Appendix). [URL](#).
- Financial Stability Board. 2020, November 23. The Implications of Climate Change for Financial Stability. [URL](#).
- Financial Times. 2021. UK Government to invest in Asian Renewable Energy Investment Trust. [URL](#).
- Fodha, M., Kirat, D., & Zaki, C. 2021. On Stranded Assets and Climate Risk: Are Financial Markets the Last Resort?. Economic Research Forum. Working Paper No. 1526. [URL](#).
- Global Coal Exit List. 2022. Financing the Global Coal Exit List 2021 Full Ranking of Banks and Investors. [URL](#).
- Global Coal Exit List. 2021. Financing the Global Coal Exit List 2020 All Banks & Investors. [URL](#).
- Government of Canada. n.d. Project profile — Climate Investment Funds - Accelerating Coal Transition Investment Program (CIF-ACT). [URL](#).
- G20. 2022, July 15. Indonesia Launched Energy Transition Mechanism Platform. [URL](#).
- G20 Finance Ministers and Central Bank Governors. 2022. Communiqué G20 Finance Ministers and Central Bank Governors Meeting 17-18 February 2022, Jakarta, Indonesia. [URL](#).
- G20 Indonesia Sustainable Finance Working Group. 2022. Presidency and Co-Chairs Note on Agenda Priorities. [URL](#).
- G20 Indonesia Sustainable Finance Working Group (SFWG). 2022, June 30. Sustainable Finance Working Group (SFWG). Jakarta. C20 Workshop.
- IESR. 2021. Signed the Global Declaration to Phase Out Coal, Indonesia Needs to Prepare a Coal Transition Roadmap. [URL](#).
- IESR & Climate Transparency. 2021. Coal as stranded assets: Potential Climate-related transition risk and its financial impacts to Indonesia banking sector. [URL](#).
- IESR. 2019. Levelized Cost of Electricity in Indonesia: Understanding the Levelized Cost of Electricity Generation. [URL](#).
- IESR. 2019. *Realisasi investasi EBTKE hanya US\$ 1.60 miliar atau 79.60% dari target*. [URL](#).
- Intan, G. 2022, September 3. *Pemerintah Resmi Naikkan Harga BBM Bersubsidi*. VOA Indonesia. [URL](#).
- International Capital Market Association. 2021. Overview and Recommendations for Sustainable Finance Taxonomies. [URL](#).

- International Energy Agency. 2018. Perspectives for the Energy Transition. [URL](#).
- International Energy Agency. 2020. Attracting Private Investment to Fund Sustainable Recoveries: The Case of Indonesia's Power Sector. [URL](#).
- Institute for Energy Economics and Financial Analysis. 2022, May 11. Indonesia's Green Taxonomy Walks a Tightrope in Balancing Industries of the Past and the Future. [URL](#).
- Institute for Energy Economics and Financial Analysis. 2019. Over 100 Global Financial Institutions Are Exiting Coal, With More to Come. [URL](#).
- Idris, M. 2022. BNI Bantah Beri Kredit ke Perusahaan Tambang Besar Tanpa Agunan. Kompas. [URL](#).
- Institute for Energy Economics and Financial Analysis. 2021. ADB Backs Coal Power Retirement In Southeast Asia. [URL](#).
- Institute for Energy Economics and Financial Analysis. n.d. Coal Divestment Dashboard. [URL](#).
- International Finance Corporation. 2016. How Banks can Seize Opportunities in Climate and Green Investment. EMCompas Note 27. [URL](#).
- International Institute for Sustainable Development. 2022. Indonesia's Energy Policy Briefing. [URL](#).
- International Institute for Sustainable Development. 2022. Indonesia Must Quadruple its Annual Renewable Investment Target to Reach its Climate Objectives. [URL](#).
- International Institute for Sustainable Development. 2022. Using Public Funding to Attract Private Investment in Renewable Energy in Indonesia. [URL](#).
- International Institute for Sustainable Development. 2022. Switching Fossil Fuel Subsidies in Indonesia to Support a Green Recovery. [URL](#).
- International Institute for Sustainable Development. 2022. Indonesia's Energy Support Measures: An Inventory of Incentives Impacting the Energy Transition. [URL](#).
- International Institute for Sustainable Development. 2019. Indonesia Coal Price Cap: A Barrier to Renewable Energy Deployment. [URL](#).
- IRENA. 2022. Renewable Power Generation Costs in 2021. International Renewable Energy Agency, Abu Dhabi. [URL](#).
- IRENA. 2021. Renewable Power Generation Costs in 2020. International Renewable Energy Agency, Abu Dhabi. [URL](#).
- Jong, H. Indonesia's Coal Phase Out is just more business as usual, report says. Mongabay. [URL](#).
- Kempa, L., Zamarioli, L., Pauw, W., & Cevik, C. 2021. Financing Measures to Avert, Minimise, and Address Loss and Damage: Options for the Green Climate Fund (GCF). Frankfurt School FS-UNEP Collaborating Centre for Climate & Sustainable Energy Finance. [URL](#).
- Konrad Adenauer Stiftung. 2020. Carbon Pricing in Sub-Saharan Africa. [URL](#).
- Langer, J., Quist, J., & Blok, K. 2021. Review of Renewable Energy Potentials in Indonesia and Their Contribution to a 100% Renewable Energy System. *Energies* 2021, 14, 7033. [URL](#).
- Larasati, L., & Mafira, T. 2022, July 22. Indonesia Green Taxonomy 1.0: Yellow Does Not Mean Go. Climate Policy Initiative (CPI). [URL](#).
- Liputan6. 2022, June 24. *Pajak Karbon Batal Diterapkan 1 Juli 2022*. [URL](#).
- Mahardhika, L. 2022, May 25. *Pemerintah Terbitkan Sukuk Global US\$3,25 Miliar, Oversubscribed 3,3 Kali. Bisnis*. [URL](#).
- Malik A. 2021, November 23. *Terjual Rp 5 Triliun, ini 9 capaian Green Sukuk Ritel ST008*. Bareksa. [URL](#).
- MediaIndonesia. 2021, December 29. *Proper 2021, 47 Perusahaan Raih Kategori Emas*. [URL](#).
- Melinda, M., Jiahui, Q. 2022. Climate Finance in Southeast Asia: Trends and Opportunities. ISEAS - Yusof Ishak Institute. [URL](#).
- Meilanova, D. 2022, Mei 25. *Investasi Energi Terbarukan Capai Rp30 Triliun Sepanjang 2020*. Bisnis. [URL](#).
- Ministry of Energy and Mineral Resources. 2022. *Capaian Kinerja Sektor ESDM tahun 2021 dan rencana 2022*. [URL](#).
- Ministry of Energy and Mineral Resources. 2022. *Laporan Kinerja Kementerian ESDM 2021*. [URL](#).

- Ministry of Energy and Mineral Resources. 2022, February 17. *Ini Lanskap Pendanaan Pengembangan EBT*. [URL](#).
- Ministry of Energy and Mineral Resources. 2022. Handbook of Energy & Economic Statistics of Indonesia: 2021. [URL](#).
- Ministry of Energy and Mineral Resources. 2020. *Energi Kolaborasi: Refleksi di Tengah Pandemi*. Volume II. [URL](#).
- Ministry of Energy and Mineral Resources. 2021. *Laporan Kinerja Ditjen EBTKE Tahun 2020*. [URL](#).
- Ministry of Energy and Mineral Resources. 2018. *Laporan Kinerja Ditjen EBTKE Tahun 2017*. [URL](#).
- Ministry of Energy and Mineral Resources. 2022. *Pemerintah Terapkan Penyesuaian Tarif Listrik kepada Golongan Masyarakat Mampu Berdaya 3.500 VA ke Atas dan Golongan Pemerintah*. [URL](#).
- Ministry of Energy and Mineral Resources. 2022, January 20. *Indonesia-Jepang Teken Kerja Sama Transisi Energi*. [URL](#).
- Ministry of Energy and Mineral Resources. 2021, December 2. *Uji Coba Perdagangan Karbon pada PLTU Batu Bara*. Webinar Penyelenggaraan Nilai Ekonomi Karbon di Subsektor Ketenagalistrikan. [URL](#).
- Ministry of Energy and Mineral Resources. 2021, August 13. *50% Pasokan Listrik Kabupaten Merauke Bersumber dari EBT Dapat Diwujudkan*. [URL](#).
- Ministry of Energy and Mineral Resources. 2020, May 19. *Rencana Strategis Direktorat Jenderal Energi Baru, Terbarukan dan Konservasi Energi 2020-2024*. [URL](#).
- Ministry of Energy and Mineral Resources. 2021, August 13. *50% Pasokan Listrik Kabupaten Merauke Bersumber dari EBT Dapat Diwujudkan*. [URL](#).
- Ministry of Finance. 2021. Indonesia Third Biennial Update Report Under the United Nations Framework Convention on Climate Change. [URL](#).
- Ministry of Finance. 2020. *Laporan Anggaran Mitigasi dan Adaptasi Perubahan Iklim Tahun 2018-2020*. [URL](#).
- Ministry of Finance. 2022. *Realisasi Sementara Belanja Negara 2021 Rp. 2786.8 triliun, Menkeu: Cukup Kuat dan Masih Ekspansif*. [URL](#).
- Ministry of Finance. 2022. *Laporan Pemerintah Tentang Pelaksanaan Anggaran dan Belanja Negara Semester Pertama Tahun Anggaran 2022*. [URL](#).
- Ministry of Finance. 2022. *APBN Kita 2021*. January 2022 Edition. [URL](#).
- Ministry of Finance. 2022. *APBN Kita*. August 2022 Edition. [URL](#).
- Ministry of Finance. 2021, November 22. *Meskipun Masih di Tengah Pandemi, Minat Investor Sangat Luar Biasa, Target Green Sukuk Ritel- Sukuk Tabungan Seri St008 Tercapai Sebelum Masa Penawaran Berakhir*. Press Release. [URL](#).
- Ministry of Finance. 2021. Green Sukuk Allocation and Impact Report May 2021. [URL](#).
- Ministry of Finance. Green Sukuk Allocation and Impact Report May 2022. [URL](#).
- Ministry of Finance. 2020, August 12. Study on Indonesia's Retail Green Sukuk. [URL](#).
- Ministry of Finance. 2019, February 13. *Republik Indonesia Melanjutkan Komitmen dalam Pembiayaan berkelanjutan Melalui Penerbitan Green Sukuk Global*. Press Release. [URL](#).
- Ministry of Foreign Affairs. 2022, June 2. Joint Communique: Indonesia-Australia Annual Leaders' Meeting. [URL](#).
- Ministry of Foreign Affairs. 2022, August 27. The Embassy of the Republic of Indonesia in Singapore Presents Temasek with the First Adinata Award. [URL](#).
- Nugraha, D. 2022, June 27. *Penerapan Pajak Karbon Ditunda Lagi*. Kompas. [URL](#).
- OECD. 2021, June 28. *Tinjauan Kebijakan Pembiayaan dan Investasi Energi Bersih Indonesia*. OECD Publishing, Paris, <https://doi.org/10.1787/97320cf7-id>.
- OECD. 2021. The Clean Energy Finance and Investment Policy Review of Indonesia. Clean Energy Finance & Investment Mobilisation. [URL](#).
- OECD. 2021. Financial Markets and Climate Transition: Opportunities, Challenges and Policy Implications. [URL](#).
- OECD. 2021. Forward-looking Scenarios of Climate Finance Provided and Mobilised by Developed Countries in 2021-2025: Technical Note, Climate

- Finance and the USD 100 Billion Goal. OECD Publishing, Paris. <https://doi.org/10.1787/a53aac3b-en>.
- Pemerintah Provinsi Jawa Tengah, Dinas Energi dan Sumber Daya Mineral. 2021. *Capaian Kinerja Dinas ESDM Provinsi Jawa Tengah Tahun 2020*. [URL](#).
- Pemerintah Provinsi Jawa Tengah, Dinas Energi dan Sumber Daya Mineral. 2022. *Capaian Kinerja Dinas ESDM Provinsi Jawa Tengah Tahun 2021*. [URL](#).
- Pemerintah Provinsi Jawa Tengah, Dinas Energi dan Sumber Daya Mineral. 2022. *Capaian Kinerja Dinas ESDM Provinsi Jawa Tengah Tahun 2022, Triwulan 1*. [URL](#).
- Pemerintah Provinsi Jawa Tengah, Dinas Energi dan Sumber Daya Mineral. 2022. *Laporan Kinerja Instansi Pemerintah (LkjiP) Tahun 2021*. [URL](#).
- Pemerintah Provinsi Jawa Tengah, Dinas Energi dan Sumber Daya Mineral. 2021. *Laporan Kinerja Instansi Pemerintah (LkjiP) Tahun 2020*. [URL](#).
- Pemerintah Provinsi Jawa Timur, Dinas Energi dan Sumber Daya Mineral Provinsi Jawa Timur. 2021. *Revisi Laporan Kinerja Instansi Pemerintah (LKJIP) Tahun 2020*. [URL](#).
- Pemerintah Provinsi Jawa Timur, Dinas Energi dan Sumber Daya Mineral Provinsi Jawa Timur. 2022. *Revisi Laporan Kinerja Instansi Pemerintah (LKJIP) Tahun 2021*. [URL](#).
- Pemerintah Aceh, Dinas Energi dan Sumber Daya Mineral Aceh. 2021. *Laporan Kinerja (Lkj) Tahun 2020*. [URL](#).
- Perusahaan Listrik Negara (PLN). 2022, June 30. *Persiapan Operasionalisasi Nilai Ekonomi Karbon pada Kegiatan Pembangkit Listrik*. BRIN Carbon Tax Webinar.
- Perusahaan Listrik Negara (PLN). 2021. *Rencana Usaha Penyediaan Tenaga Listrik (RUPTL) PT PLN (Persero) 2021-2030*. [URL](#).
- PT. Bank Central Asia Tbk. 2021. Sustainability Report 2021. [URL](#).
- PT. Pembangunan Jawa-Bali. 2022. *Statistik Perusahaan 2021*. [URL](#).
- PT. Sarana Multi Infrastruktur. 2019, November 12. Role of PT. SMI for Accelerating Infrastructure Development in Indonesia. Jakarta. KNKS-BI-ADFIMI Joint Event Seminar. [URL](#).
- PT. Sarana Multi Infrastruktur. 2022, April 7. PT. SMI's Blended Finance for Clean Energy. Jakarta. 1st Workshop on Blended Finance Guidance for Clean Energy. [URL](#).
- PT. Sarana Multi Infrastruktur. 2022, April 19. SDG Indonesia One Blended Finance Platform. Jakarta. Tri Hita Karana Blended Finance Deep Dive Workshops. [URL](#).
- PT. Sarana Multi Infrastruktur. 2021. *Peran PT. SMI (Persero) Dalam Pengembangan Infrastruktur Hijau di Indonesia*.
- PT. Sarana Multi Infrastruktur. 2021. 2021 Annual Report: Accelerating Recovery & Sustainability. [URL](#).
- PT. Sarana Multi Infrastruktur. 2021. Sustainability Report: Momentum of Recovery and Sustainable Growth. [URL](#).
- PT. Sarana Multi Infrastruktur. 2020. 2020 Sustainability Report: Rise to the Challenge with Unity, towards Sustainability. [URL](#).
- PT. Sarana Multi Infrastruktur. 2020, March 3. SDG Indonesia One. Jakarta. Catalyzing Private Capital for the SDGs, A Workshop on Blended Finance. [URL](#).
- PT. Sarana Multi Infrastruktur. 2021. *Indonesia Sustainable Development Day (ISDD): Sinergi Pemulihan Ekonomi dan Pembangunan Berkelanjutan di Indonesia*. [URL](#).
- Purnama, S. 2021. *Bank Mandiri Sediakan Skema Pembiayaan Panel Surya di Rumah*. Antara. [URL](#).
- Pusat Kajian Akuntabilitas Keuangan Negara, Badan Keahlian Dewan DPR RI. 2021. *Permasalahan dan Tantangan Program Peningkatan Kontribusi Energi Baru dan Terbarukan dalam Energi Nasional*. [URL](#).
- Putri, C. 2022, January 19. *Pajak Karbon PLTU Berlaku April 2022 Picu Tarif Listrik Naik?*. CNBC. [URL](#).
- Putri, C. 2022, September 6. *BBM Naik Kok Subsidi Masih Bengkok Rp 649 T? Ini Penjelasannya*. CNBC. [URL](#).
- RenewablesNow. 2021. New ThomasLloyd Trust Eyes USD-340m IPO for Asia Green Energy Investments. [URL](#).
- Reuters. 2021, November 19. Indonesia to Keep Carbon Trade Local Until Greenhouse Gas Target Met. Reuters. [URL](#).

- Said, A. 2022, September 5. *Subsidi Energi Tetap Bengkok Jadi RP 649 T Meski Harga BBM Naik. Katadata.* [URL](#).
- Sari, F. 2022. *Kredit Berkelanjutan Bni Capai Rp 172,4 Triliun Pada Tahun Lalu.* Kontan. [URL](#).
- Sekretariat Kabinet Republik Indonesia. 2022, June 6. *Pernyataan Pers Bersama Presiden Republik Indonesia dan Perdana Menteri Australia, di Istana Kepresidenan Bogor, Provinsi Jawa Barat, 6 Juni 2022.* [URL](#).
- Shalal, A. 2021, November 4. India, Indonesia and Philippines join coal transition programme. Reuters. [URL](#).
- Sustainable Energy for All. 2022. Paris Alignment of Power Sector Finance Flows in Indonesia: Challenges, Opportunities and Innovative Solutions. [URL](#).
- Ulya, F. 2022. *Anggaran Mitigasi Perubahan Iklim tak Terserap Sempurna, Sri Mulyani: Kalau Minta Rajin Banget.* Kompas. [URL](#).
- UNFCCC. 2018. Methodological Tool (Version 01.1): Tool to Calculate the Emission Factor for an electricity system. [URL](#).
- UNFCCC. n.d. About the Santiago Network. [URL](#).
- United Nations. 2021. United Nations Handbook on Carbon Taxation for Developing Countries. [URL](#).
- Umah, A. 2021, June 29. *Pajak Karbon RI Rp 75/kg Jauh dari Rekomendasi Bank Dunia.* CNBC. [URL](#).
- USAID. 2022, June 9. *Mempercepat Penerapan Energi Berkelanjutan di Indonesia.* [URL](#).
- VOI. 2022. Official! Government Postpones Carbon Tax Implementing July 1, 2022. [URL](#).
- Wahad, M. 2021, November 26. France Pledges €520 Million Towards Indonesia's Energy Transition. Jakarta Daily. [URL](#).
- Wahyudi, Nyoman A. 2022, June 6. *Investasi Sektor Energi Baru Terbarukan Masih Seret, Apa Penyebabnya?.* Bisnis. [URL](#).
- Wahyudi, Nyoman A. 2022. *Realisasi Investasi EBTKE Rendah, Kementerian ESDM: Ini Alasannya.* Bisnis. [URL](#).
- Walfajri, M. 2022. *Penyaluran Kredit BNI ke Sektor Energi Terbarukan Capai Rp 9,5 Triliun.* Kontan. [URL](#).
- Walfajri, M. 2022. *BRI Salurkan Kredit ke Sektor Energi Baru Terbarukan Senilai Rp 5,6 Triliun pada 2021.* Kontan. [URL](#).
- Walfajri, M. 2021. *Realisasikan Proyek Geo Dipa, BNI Biayai 2 PLTP Senilai US\$ 34 Juta.* Kontan. [URL](#).
- Wet, N., & Daniel, J. 2020, April 1. Who is Affected by The Carbon Tax?. South African Institute of Taxation. [URL](#).
- World Bank. 2022. Carbon Pricing Dashboard. [URL](#).
- World Bank. 2021. A Green Horizon: Toward A High Growth and Low Carbon Economy. [URL](#).
- World Bank. 2021. Carbon Pricing for Climate Action. [URL](#).
- World Bank. 2020. Developing a National Green Taxonomy, A World Bank Guide. [URL](#).



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