

CIF Accelerating Coal Transition (ACT): Indonesia Country Investment Plan (IP) REVISION

by the Government of Indonesia

12 May 2023



Fiscal Policy Agency
Ministry of Finance
Republic of Indonesia

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CURRENCY EQUIVALENTS

(Exchange Rate Effective as of 6 April 2023)
 Currency Unit = Indonesia Rupiah (IDR)
 US\$1 = IDR 14,947
 US\$0.000066 = IDR 1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank	KfW	Kreditanstalt für Wiederaufbau, The Reconstruction Credit Institute of Germany
ACT	Accelerating Coal Transition	kWh	kilowatt-hour
BAPPENAS	National Planning and Development Agency	LULUCF	Land use, land use change and forestry
BAU	Business as usual	LUCF	Land use change and forestry
BPPT	Agency for the Assessment and Application of Technology	MDB	Multilateral Development Bank
CDM	Clean Development Mechanism	MEMR	Ministry of Energy and Mineral Resources
CFPP	Coal-fired power plant	Mtoe	million ton of oil equivalent
CIF	Climate Investment Funds	MtCO ₂ e	million ton of carbon dioxide equivalent
CO ₂	Carbon dioxide	MW	Megawatt
CTF	Clean Technology Fund	NAP	National Action Plan for Climate Change
DPL	Development Policy Loan	NCCC	National Council on Climate Change
EE	Energy efficiency	NCRE	Non-coal Renewable Energy
ETM	Energy Transition Mechanism	NO _x	Nitrogen oxides
ETMCP	Energy Transition Mechanism Country Platform	PCG	Partial credit guarantee
FI	Financial intermediary	PGE	PT. Pertamina Geothermal Energy
G20	Group of Twenty	PLN	PT. Perusahaan Listrik Negara
GDP	Gross domestic product	PPA	Power purchase agreement
GHG	Greenhouse gas	PPP	Public-private partnership
GOI	Government of Indonesia	RE	Renewable energy
GWh	gigawatt-hour	RBL	Results-based loan
IBRD	International Bank for Reconstruction and Development	RUPTL	Indonesia's Electricity Supply Business Plan for 2021-2030
ICCTF	Indonesia Climate Change Trust Fund	SESA	Strategic Environmental and Social Assessment
IEA	International Energy Agency	SESMP	Strategic Environmental and Social Management Plan
IFC	International Finance Corporation	SME	Small and medium enterprise
IP	Investment plan	SOE	State-owned enterprise
ISO	International Standards Organization	SO ₂	Sulfur dioxide
JET	Just Energy Transition	tCO ₂ e	ton of carbon dioxide equivalent
JETP	Just Energy Transition Partnership	UNFCCC	United Nations Framework Convention on Climate Change
JICA	Japanese International Cooperation Agency	WBG	World Bank Group

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1 Proposal Summary

1. **ACT program objectives.** In March 2021, the Climate Investment Funds (CIF) established the Accelerating Coal Transition (ACT) Program to support developing countries that are heavily reliant on coal to accelerate the transition away from coal to renewable energy (RE) while ensuring a holistic, integrated, socially inclusive, and gender-equal transition. The program is structured around three pillars of governance, people and communities, and infrastructure. In October 2021, Indonesia, along with three other countries namely, South Africa, India, and the Philippines, was selected as an ACT pilot country and invited to develop its ACT Investment Plan (IP). This IP, developed by the Government of Indonesia (GOI) in collaboration with the Asian Development Bank (ADB) and the World Bank Group (WBG), is a business plan that identifies potential areas for ADB and WBG investment and support to initiate the accelerated retirement and repurposing of coal-fired power plants (CFPPs) and repurposing of closed mines sites, mitigate the impacts of the transition for people and communities, and enable the financing of clean energy power generation alternatives. The IP is designed to proactively address associated challenges linked to the energy transition as it applies to national strategies, people and communities, and land and infrastructure.

2. **CIF-ACT IP as first tranche of I-JETP.** As currently structured, the IP represents the first tranche of US\$20 billion committed over a three-to-five-year period as part of the Indonesia Just Energy Transition Partnership (I-JETP) between GOI and the Governments of Japan, the United States of America, Canada, Denmark, the European Union, the Federal Republic of Germany, the French Republic, Norway, the Republic of Italy, and the United Kingdom of Great Britain and Northern Ireland (together, the “International Partners Group” or IPG), as well as the Glasgow Financial Alliance for Net Zero (GFANZ) Working Group.¹ Launched in Bali, Indonesia in November 2022, at the G20 Leaders’ Summit in Indonesia, I-JETP represents the largest GOI partnership in support of ambitious new targets for Indonesia’s just energy sector transition.²

3. **Indonesia’s ambitious GHG reduction plans.** Indonesia is heavily dependent on domestic coal for electric power generation and is the world’s largest coal exporter (see Section 2). The fact that coal is an abundant domestic resource underpinning the majority of electricity generation in the country creates structural challenges to transitioning away from coal. However, the GOI has started to lay the foundation for its clean energy transition. On 21 July 2021, Indonesia submitted the Indonesia Long-Term Strategy for Low Carbon and Climate Resilience 2050 (LTS) to the United Nations Framework Convention on Climate Change (UNFCCC), which sets out a framework for reaching Net Zero emissions by 2060. Under its Enhanced Nationally Determined Contributions (Enhanced NDC), submitted on 23 September 2022, Indonesia committed to reducing emissions by 31.89% relative to a business-as-usual (BAU) baseline of 2.87 gigatons (GT) of carbon emission equivalent by 2030. With sufficient international support, it plans to reduce emissions by 43.2% over the same period.³ This has been followed by the development of broader ambitions under the I-JETP partnership. Specifically, this IP supports Indonesia’s trajectory toward meeting its broader commitment to peaking power sector emissions

¹ GFANZ, the world’s largest coalition of financial institutions with ambitious science-based commitments to net-zero transition. The initial Working Group members – Bank of America, Citi, Deutsche Bank, HSBC, Macquarie, MUFG, and Standard Chartered – have been working with the IPG in support of the I-JETP.

² Ministry of Finance, Japan. *Joint Statement and joint Press Release of Just Energy Transition Partnership (JETP) for Indonesia*. Tokyo. https://www.mof.go.jp/english/policy/international_policy/others/20221115_1.pdf

³ GOI NDCs were initially submitted in 2016 and revised and updated in 2021. The enhanced NDC was submitted and published in September 2022.

in 2030 at an absolute limit of 290 metric tons of carbon dioxide (MT CO₂); achieving net zero emissions in the power sector by 2050; and, accelerating the deployment of renewable energy so that renewable energy comprises at least 34% of all power generation by 2030.

4. **Clean energy transition in the context of coal-dominated grid overcapacity.** With excess coal generation capacity (i) coming from a young fleet with an average age of ~12 years, and (ii) contributing to reserve margins up to 30% in excess of planned targets, Indonesia can only advance its RE and climate ambitions in a timely manner by initiating the early decommissioning and/or repurposing of CFPPs. Repurposed CFPPs can enhance grid stability and flexibility with respect to absorbing variable renewable energy. As a first step toward managing overcapacity, the state national utility, PT. Perusahaan Listrik Negara (PLN), shared early plans in 2022 to begin permanently retiring grid-connected CFPPs, either PLN-owned or PLN-contracted (i.e., IPPs), which are part of the national power system and subject to annual national planning, budgeting, and expenditure frameworks. In the first stage, PLN planned to retire 2-3 CFPPs with a combined capacity of about 1 gigawatt (GW) by 2030, and about 9 GW by 2035. In the next stage, from 2030 to 2055, it aimed to retire a further 49 GW of CFPPs. A formal Early Retirement Road Map is under development and will be issued by the GOI by mid-2023 to accelerate this momentum.

5. **Industrial development and coal-fired generation.** Despite the decarbonization potential through PLN actions, challenges remain with respect to coal-fired captive plants that serve a dedicated or portfolio of industrial load in remote regions where grid connection had been cost-prohibitive or unreliable to date. The growth of these off-grid demand centers, i.e. industrial estates, has largely stemmed from a GOI policy priority to (i) increase domestic processing and value add for Indonesia's extractive industry, (ii) promote industrialization outside of dominant economic centers, (iii) support job creation and (iv) contribute to economic diversification. Indonesia's recent full export ban on nickel ore (effective January 2020) and upcoming expected bans on exports of other raw minerals (e.g., bauxite, tin, copper) are only projected to accelerate power demand. But this demand will grow where there is limited access to power supply at the scale and quality needed for minerals processing, unless baseload, reliable, low cost and continuous power is provided through on-site facilities or made available through grid connection.⁴

6. Consequently, the reliance on low-cost coal in captive power development remains a critical aspect for consideration in Indonesia's energy transition. Leveraging data collected from 2021-2030 Indonesia's Electricity Supply Business Plan for 2021-2030 (RUPTL), *Direktorat Jenderal Ketenagalistrikan* (DJK) - Directorate General of Electricity under the Ministry of Energy and Mineral Resources (MEMR), Global Energy Monitoring and additional research, the total installed capacity for electricity generation (inclusive of captive power plants) across Indonesia is estimated to be 92.69 GW as of 2022.⁵ The captive power installed capacity is estimated to be approximately 17 GW, or around 18.5% of total installed generation capacity in Indonesia. Within the captive power sector, CFPPs account for 72% of total installed capacity in the captive power sector, with over 60% of the captive CFPPs serving the nickel industry, consistent with recent developments after export bans highlighted in Paragraph 5. Nickel smelting also drives over 75% of the 11GW identified pipeline for captive CFPPs, of which 6 GW are under construction, 2.2 GW undergoing permitting and 2.8 GW have merely been announced. Given the magnitude and immediacy of the challenge posed by decarbonizing industry in remote regions, the GOI aims to

⁴ In specific circumstances, the development of new CFPPs can be considered, in line with the exemption provided in recent Presidential Regulation (Paragraph 25).

⁵ ADB 2023. *Captive Power Pipeline Analysis for Energy Transition in Indonesia*. KPMG Consultant's report. Manila (TA 6744-REG).

leverage its work with I-JETP to intervene soon, in accordance with the prevailing regulation, and restrict the development of captive coal-fired power plants to prevent the lock-in of a new, large, young CFPP fleet. The GOI intends to collaborate to find and implement affordable, reliable, accessible and timely, zero-emission and renewable solutions for power generation facilities, including captive power facilities (Paragraph 26). Subject to these conditions, options being considered include expansion of grid connection and pursuit of abatement alternatives, e.g., hybrid renewable, co-firing and carbon capture use and/or storage.⁶

7. Need for international concessional financing for the energy transition. In order to achieve Paris alignment, unabated coal must be phased out in developing Asia between 2040-2050, including both on-grid and off-grid assets. Further international support and concessional capital, by way of CIF and multilateral development bank (MDB) support, will be required to accelerate PLN and MEMR's planned retirements by 5-10 years and pave the way for a range of power sector actions in the medium term that include RE generation capacity scale-up, alternatives analysis to minimize captive CFPP development, network infrastructure development, CFPP retirement, and CFPP repurposing (including flexibility), and mitigation of impacts of the coal phase-down for people and communities for a just transition.

8. Institutionalizing the clean energy transition. For RE and storage to meet power demand in the event of accelerated coal retirements, the right clean energy enabling environment must be in place. The following represent foundational steps toward institutionalization:

- *Establishment of initial policy framework.* The highly anticipated Presidential Regulation No. 112 of 2022 on the Acceleration of Renewable Energy Development for the Supply of Power (RE PR), which was signed and enacted by President Joko Widodo on 13 September 2022. The RE PR creates a broad framework for the clean energy transition and calls for the drafting of detailed road maps and implementing guidelines to address some of the historical bottlenecks in Indonesia's RE development.
- *Identification of GOI financing platform.* The GOI has also identified a key financing partner for clean energy transition activities, PT Sarana Multi Infrastruktur (Persero) (PT SMI), a state-owned enterprise overseen by the Ministry of Finance (MoF). MoF has assigned PT SMI as the Energy Transition Mechanism Country Platform⁷ (ETMCP) secretariat and manager. The ETMCP will play a critical role in coordinating various energy transition activities, channeling fiscal support where needed, and supporting the just transition framework and implementation.
- *Launch of I-JETP secretariat.* Launched in February 2023, the I-JETP secretariat will be hosted in the Ministry of Energy and Mineral Resources (MEMR) and supported by the ADB. It will serve as the coordinator for internal and external stakeholders on the I-JETP, facilitating the initial mobilization and deployment of the \$20 billion in public and private I-JETP financing over the next three-to-five-year period. The secretariat will also play an important planning and project development function for the I-JETP, supporting the GOI in achieving the I-JETP objectives including the development of a comprehensive investment and policy plan that reflects targeted greenhouse gas emissions reductions and support to impacted communities.

9. Gender and just transition opportunity within energy transition. As mentioned above, successful acceleration of CFPP retirements will not only require a (i) robust policy framework for

⁶ Coordinating Ministry of Maritime Affairs. 2023. JETP Meeting with GFANZ: Updates and Way Forward. Presentation for Glasgow Financial Alliance for Net Zero (GFANZ). Jakarta. 27 February.

⁷ The Indonesian ETM program and country platform is distinct from the ADB Energy Transition Mechanism (see footnote 22 and Appendix 7 for more details). ADB's ETM is a regional effort which is being piloted in select Asian developing countries including Indonesia. ADB's ETM is broadly aligned with the Indonesian ETM and will seek to support specific activities and projects being pursued by the Indonesia ETM Country Platform.

the broader energy transition alongside the (ii) development of pilot transactions; but it will also need to integrate (iii) just transition considerations at plant, community, subregional and national levels, considering direct, indirect, and induced impacts, as well as an (iv) increased effort to equip the workforce with the new skills, training, and perspectives to capitalize on the opportunities that will come with the expanded deployment of renewable energy and transition impacting other industries. Further considerations include the following:

- Special emphasis will be needed to ensure that women participate equitably and fully in this ongoing energy transition. Women only made up 12% of all graduates of science, technology, engineering and mathematics (STEM)-related fields in Indonesia in 2018, and according to the Ministry of Women Empowerment and Child Protection, less than 1% of women participate in the electricity and gas labor force.⁸
- Prior to the coronavirus disease (COVID-19) pandemic, the main factor constraining growth had been a low productivity growth, partly attributed to (i) limited technology sophistication in Indonesian industries (use of advanced operations and technologies with extensive research and development (R&D) in production and industry processes), and (ii) lack of absorptive capacity for technology and innovation across Indonesia's workforce.⁹
- As the coal phase out efforts scale up, coal-producing regions (i.e., Kalimantan and South Sumatra) and centers of coal power generation (i.e., Sumatra-Java-Bali grids) will be disproportionately affected and will need tailored consideration in the design of just transition approaches. Impacts will also vary between these regions and a place-based approach that responds to the specific needs of communities and regions is needed.
- Given that Indonesia currently exports a significant proportion of its coal, indirect and induced socioeconomic impacts as a result of closure of CFPPs, including impacts along the coal value chain and in coal mining communities, are expected to be manageable between now and the time when international coal demand declines (unless there is a very significant acceleration of CFPP closure which could lead to worsening compounding impacts). This provides time for early just transition interventions including to promote economic diversification, creation of green jobs, realization of jobs from renewable energy investments, and reskilling of workforce. In addition, as mines are being closed on depletion and opened in other regions in the ordinary course of business, there are already community-level impacts, the mitigation of which could serve as useful case studies for a broader just transition.

10. **The IP is structured to maximize transformational change.** With US\$500 million in CIF-ACT funding leveraging US\$2.0 billion in MDB cofinancing and US\$1.3 billion in other cofinancing (see Table 1),¹⁰ this IP proposes a project pipeline of investments that will pilot the implementation of Indonesia's accelerated energy transition under a holistic coal phase-down approach. The program design considers just transition issues along the entire value chain, including enabling activities that can support workers to capitalize on energy transition and other economic diversification opportunities. The IP is designed to align to ACT priorities with approximately ~5% of the financing dedicated to governance, ~25% to people and communities and ~70% to infrastructure.

⁸ Data concerning the employment of women across different energy sectors (e.g., RE or conventional) is limited.

⁹ A study by ADB and the MoF indicates that adoption of new technologies could result in an additional annual GDP growth of 0.55 percentage points over the next two decades, thereby putting Indonesia's economy in the high-income group. Designing support to enhance workforce productivity will be critical in achieving more transformative, lasting shift across the Indonesian energy sector.

¹⁰ The allocation range in Table 1 reflects the design of the underlying projects and likely allocation within each component. Specific allocation amounts and program details are still subject to change based on internal review processes at ADB and WBG and will be presented to the CIF-TFC during project-level approvals.

Table 1: Indicative Financing Plan (\$ Million)

#	Component	MDB Sector	ACT	MDB	Other/ Private	GoI ^a	TOTAL	Pillars		
								Governance	People & Communities	Infrastructure
Component 1: Accelerated Retirement of Coal Plants								[3-7%, \$7-18]	[10-25%, \$25-63]	[68-87%], \$169-217]
1.1	State-owned CFPP early retirement		149	632	750	1,112	2,643			
	a. PLN early retirement program	ADB Public	50	530	600 ^b	612 ^c	1,792	✓	✓	✓
	b. PT SMI early retirement program	ADB Public	98 1 (grant)	102	150	500	851		✓	✓
1.2	Private CFPP early retirement program	ADB Private	100	400	300 ^d	N/A	800		✓	✓
Component 2: Repurposing, Repowering and Just Transition								[2-5%, \$5-13]	[20-35%, \$50-88]	[60-72%, \$150-180]
2.1	Repurposing and Just Transition Program (Phase 1 & 2)	WB Public	192	748	0	[160]	1,100			
	a. CFPP Site Repurposing		125 5 (grant)	620	0	[150]	900	✓	✓	✓
	b. Just Transition in Coal Regions		57 5 (grant)	128	0	[10]	200	✓	✓	
2.2	RE Repowering Program (on + off grid)	IFC Private	50	140	200	N/A	390		✓	✓
2.3	Reskilling for RE (Prime STeP)	ADB Public	9 (grant)	139	0	21	169		✓	
TOTAL			500	2,059	1,350	1,293	5,102			

Note: CFPP = Coal-fired Power Plant, RE = Renewable Energy, Prime STeP = Promoting research and innovation through modern and efficient science and technology parks.

Source: ADB, GOI (Ministry of Finance, PLN, PT SMI, Ministry of Education, Ministry of Energy and Mineral Resources) and WBG.

^a GOI contribution figures subject to further discussion of program or project needs as well as annual budget approvals or endorsements. These numbers do not include broader MoF corporate support for implementing agencies such as PLN and PT SMI.

^b Bilateral cofinancing from KfW (Germany) and AFD (France).

^c Not inclusive of more than US\$2 billion private sector mobilization for RE replacement power.

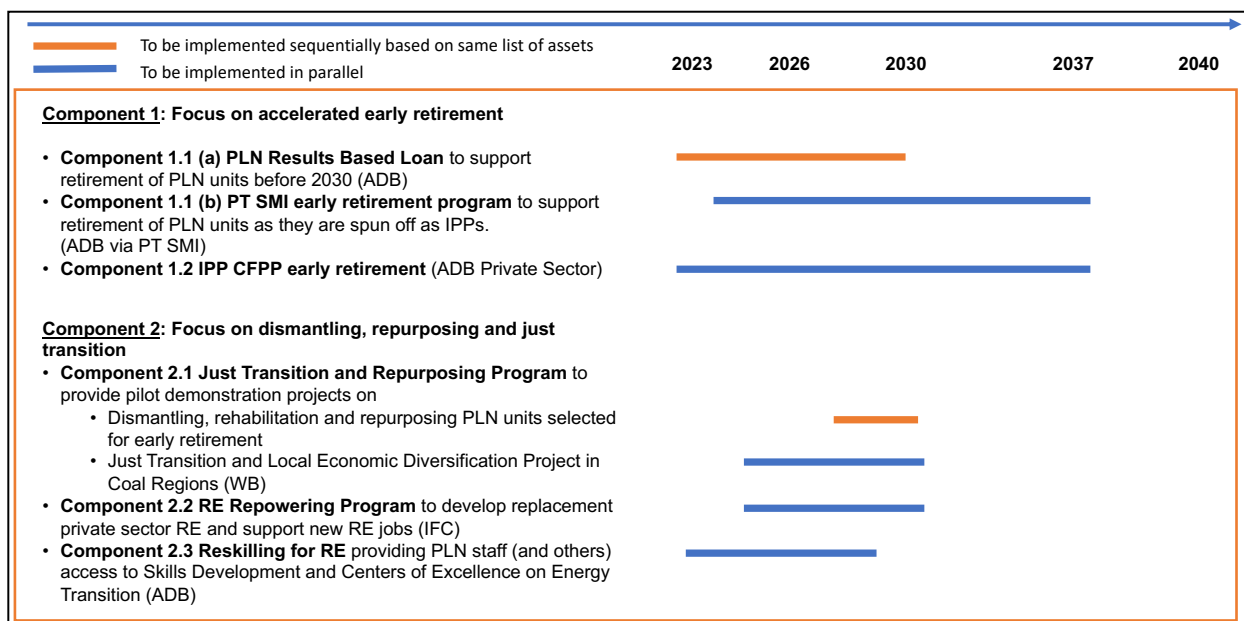
^d To be determined post market sounding.

11. IP content and complementarity. Activities under Component 1 will enable the early retirement of 2-3 GW of both PLN-owned and privately-owned CFPP assets and the related financial implications of existing debt, termination of contracts and closure preparedness. This stage secures the commitment for early retirement. Activities under Component 2.1(a) will focus on the dismantling, remediation and repurposing of PLN-owned CFPPs, looking at various replacement technologies such as battery storage, solar photovoltaic (PV), and other technologies that can provide ancillary services. Specific assets considered for repurposing under Component 2.1(a) could include, but may not be limited to, the assets targeted for early retirement under Component 1.1(a).¹¹ Component 2 will also include repurposing activities of closed mine sites¹² and activities that will support the just transition. These include community-driven economic diversification projects (Component 2.1(b)); a private sector repowering and storage program (Component 2.2) and reskilling of the relevant workforce to support renewable energy development (Component 2.3). While activities under Components 1.1(a) and Components 2.1(a) may be naturally sequenced, it is expected that other activities will happen in parallel. An indicative timeline of each activity can be found in Figure 1, and each of the activities in Table 1 are discussed in greater detail in subsequent sections of this document along with crosscutting priorities (Sections 2 and 3).

¹¹ A preliminary list of CFPPs considered for repurposing is presented in section 2.3.

¹² Pilot projects for coal mine repurposing will be identified during project preparation.

Figure 1: Summary of IP Activities by Component and Implementation Timeline



12. IP target outcomes. In summary, the IP aims to achieve the following outputs/outcomes:

- **Governance:** The adoption or amendment of up to 4 policies, regulations, standards, or codes (i.e., may include updating PLN environmental and social management system for early retirement, MoF dispensation with respect to PLN asset early retirement, MoF regulation establishing scope and mandate of ETMCP), 1 accelerated CFPP retirement road map (e.g., Early Retirement Roadmap), and 1 National Just Transition Framework, including policies and regulations that are explicitly inclusive of gender and other social exclusion factors and/or the gaps/barriers faced by specific social groups and targeted actions to address those gaps.¹³
- **People:** Up to 1,140 (i.e., 89% of) employees of CFPPs/coal mines assets related to IP projects with access to sustained income and up to 2,300 direct beneficiaries of social plans and economic regeneration activities, to be disaggregated by gender, and reflecting other social characteristics (age, disability status, formal vs. informal workers etc.) as well as documented information about the quality of the jobs (income, skilled/ non-skilled positions) whenever relevant and possible.¹⁴
- **Infrastructure:** Avoided greenhouse gas emissions of up to 65 million tons carbon dioxide equivalent (CO₂e) through the accelerated retirement of up to 3 GW of CFPP generation capacity, as well as up to 40 million tons of coal diversion, up to 150 hectares (ha) of mine area reclaimed, reforested or restored, and an increase of up to 300 megawatts (MW) of installed RE and 90 MW of energy storage capacity.¹⁵

13. MDB and development partner coordination mechanisms across projects and crosscutting priorities. ADB and WBG will be leading and contributing to the following coordination mechanisms to ensure harmonized approaches and investment results:

- **PLN assets.** MDBs will coordinate on PLN assets to be retired through IP investments, where the same assets are targeted for early retirement, repurposing, repowering, and just transition

¹³ Tracked by ACT Core Indicator 1 and 2.

¹⁴ Tracked by ACT Core Indicators 3 and 4.

¹⁵ Tracked by ACT Core Indicators 5, 6, 7, 8, 9 and 11.

support (subject to each MDB's own due diligence and limitations on the choice of instruments).

- **Safeguards.** MDB safeguard teams, along with safeguards teams from KfW and AFD, to participate and contribute to PLN Development Partners (DPs) Safeguards Working Group every two weeks, to ensure PLN's updated environmental and social safeguards system is developed in a manner consistent with IP and DP considerations. This dialogue will feed into broader Strategic Environment and Social Assessments (SESA) that provides high-level analysis for just and affordable energy transition environmental and social implications (see Section 3.2).
- **Just transition.** The I-JETP Secretariat has established a Just Transition Working Group led by UNDP and comprising the MDBs, ILO and GIZ, to (i) coordinate approaches and share outcomes from upstream analytics; (ii) strengthen capacity and the enabling environment for just transition including coordination across ministries, agencies, and stakeholder groups; (iii) coordinate to ensure the development of a coherent just transition approach (i.e. National Just Transition Framework) at national, subnational, and asset-level, and along the coal value chain (from mining through to CFPPs); (iv) coordinate on stakeholder engagement and consultations¹⁶ including sharing outcomes of consultations and identified needs; and (v) mobilize investments and design interventions, particularly for early just transition interventions needed ahead of the expected closure periods.
- **Gender.** A coordination mechanism is being established between ADB and the WB to ensure consistent and comprehensive support through the proposed investments in line with their corporate gender mainstreaming requirements and targets. In addition, knowledge collaboration is planned between the CIF Gender and Just Transition team, ADB and the WB teams and other development partners (i.e. UNOPS Energy Transition Partnership) to deepen understanding of gender impacts and required policy and programmatic support as well as interventions to promote gender equality through the Just Transition Working Group under I-JETP. In addition, further collaboration and coordination will continue as ADB and the WB engage on preparatory activities to develop their respective proposals for funding under the Women-Led Coal Transition Mechanism (WOLCOT) mechanism.

14. Through the IP, the GOI, ADB, WBG, and IPG partners will collaborate to lay a strong foundation for sustainable change, by (i) taking coal off-line and paving the way for more opportunities for RE scale up by both PLN and the private sector; (ii) promoting realization of environmental and socioeconomic co-benefits for sustainable development; (iii) crowding-in capital; and (iv) enabling more integrated, innovative approaches for a greener, more inclusive and affordable and gender-equal energy transition.

¹⁶ This will include women, women's rights organizations, and gender equality advocates and organizations as stakeholders.

2 Country Context – Accelerating the Coal-to-Clean Energy Transition

15. **Indonesia’s extraordinary development record and ongoing challenges.** Indonesia is the largest economy in Southeast Asia. It is also the world’s fourth-most populous country, seventh-largest economy, twelfth-largest energy consumer, and the largest coal exporter.¹⁷ Its solid macroeconomic fundamentals, supported by two decades of political stability from 2000 to 2022, have allowed for robust economic growth. While economic growth slowed from an average of 5.0% per year over 2015-2019 to 3.7% in 2021 during the COVID-19 pandemic, the Indonesian economy is projected to accelerate to 5.1% growth in 2022 and 5.3% in 2023 due to the release of pent-up demand, improved consumer confidence, and improved terms of trade.¹⁸ In tandem with the economic expansion, the proportion of the population living below the national poverty line almost halved between 2006 and 2019, reaching a record low of 9.4%.

16. Despite the country’s economic achievements, there remains a longer path to becoming a more advanced economy. GDP per capita at purchasing power parity today is 30% lower than the world average. Economic development is regionally imbalanced and highly resource dependent. While the whole archipelago encompasses 17,000 islands, the two islands of Java and Bali are home to 60% of the country’s population and 75% of the manufacturing GDP. Other regions specialize in natural resource extraction. Moreover, the poor remain the most vulnerable to external shocks such as the COVID-19 pandemic and adverse climate change impacts.

2.1 Coal as a Driving Factor of Emissions Intensity

17. **Emissions intensive growth to date.** Given the importance placed on inclusive growth, the energy sector in Indonesia has the twin challenge of meeting an anticipated continuous demand growth while ensuring reliable, sustainable, and affordable access to energy. From 2000 to 2021, PLN electricity sales grew nearly 6% year-on-year, while GOI GDP growth averaged nearly 5% year-on-year in that same time period.¹⁹ Given the need for low-cost expansion of service to serve consistent growing demand and achieve universal electrification, there was a 60% increase in Indonesia’s total energy supply fueled by lower-cost coal—an abundant domestic natural resource. Consequently, however, total energy sector emissions have grown faster than energy demand, more than doubling since 2000. Coal is responsible for over 70% of the increase, with the lion’s share coming from coal-fired electricity generation (Figure 2). Today, Indonesia has one of the most emissions-intensive electricity sectors in the world at over 750 grams carbon dioxide (CO₂) per kilowatt-hour (CO₂/kWh). This compares to under 600 grams CO₂/kWh in the People’s Republic of China (PRC) and 710 grams CO₂/kWh in India in 2021.²⁰

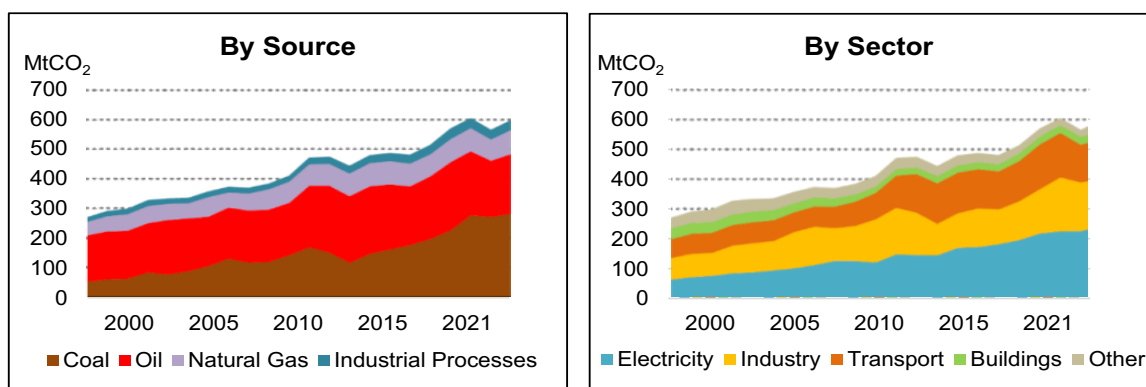
¹⁷ International Energy Agency (IEA). 2022. *An Energy Sector Roadmap to Net Zero Emissions in Indonesia*. Paris: IEA. <https://www.iea.org/reports/an-energy-sector-roadmap-to-net-zero-emissions-in-indonesia>.

¹⁸ World Bank. 2022. *Indonesia Economic Prospects. Financial Deepening for Stronger Growth and Sustainable Recovery*. Washington, DC. <https://openknowledge.worldbank.org/bitstream/handle/10986/37584/IDU087850cba0b204043f608dea019acef5f2be1.pdf?sequence=5>

¹⁹ Ministry of Energy and Mineral Resources. 2014 and 2022. *Handbook of Energy & Economic Statistics of Indonesia 2014 and 2021*. Jakarta. Table 6.4.4. and Table 46. <https://www.esdm.go.id/en/publication/handbook-of-energy-economic-statistics-of-indonesia-heesi>.

²⁰ IEA. 2022. *An Energy Sector Roadmap to Net Zero Emissions in Indonesia*. Paris: IEA. <https://www.iea.org/reports/an-energy-sector-roadmap-to-net-zero-emissions-in-indonesia>. p.67.

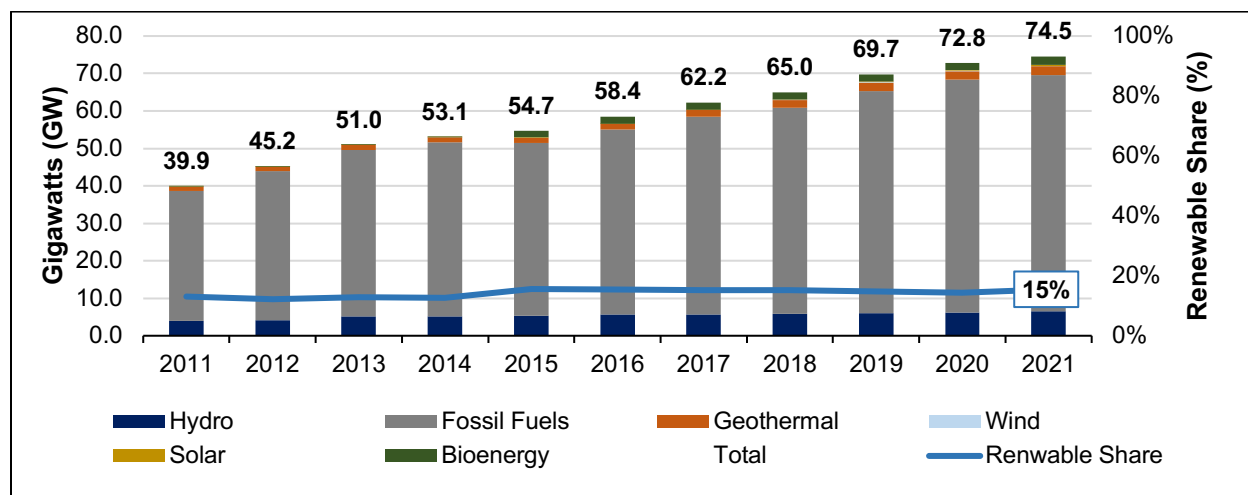
Figure 2: Energy Sector Carbon Dioxide Emissions in Indonesia, 2000–2021



Source: International Energy Agency (IEA). 2022. *An Energy Sector Roadmap to Net Zero Emissions in Indonesia*. Paris: IEA. <https://www.iea.org/reports/an-energy-sector-roadmap-to-net-zero-emissions-in-indonesia>.

18. **History of coal’s rising share in electricity generation.** Currently, Indonesia has a grid-connected installed power generation capacity of 74 GW. PLN’s power supply comes from a mix of its own generation, totaling 44 gigawatt (GW) and purchases from independent power producers (IPPs) totaling 21 GW. The progressive reliance on coal is reflected in the evolution of the installed capacity since 2010, as Indonesia was pressed to meet the rising power demands of the fast-growing economy (Figure 3). The same reliance on coal is seen in the baseline analysis of captive power (Paragraph 6), which supplements 74 GW of on-grid power generation with over 17 GW of off-grid power generation in 2022, 75% of which comprise CFPPs.

Figure 3: Indonesia On-grid Installed Capacity Trend, 2011 – 2021



Source: Ministry of Energy and Mineral Resources. 2022. *Handbook of Energy & Economic Statistics of Indonesia 2021*. Jakarta. <https://www.esdm.go.id/en/publication/handbook-of-energy-economic-statistics-of-indonesia-heesi>.

19. **Key driver #1: Coal as the fuel of choice for fast-tracked power programs.** Total grid-connected power generation capacity increased from 52.8 GW in 2016 to 74 GW in 2021.²¹ However, most of the capacity expansion in this period is a result of a series of fast-tracked programs (mostly CFPPs) introduced in 2015 aimed at adding 42.5 GW of capacity by 2024. In

²¹ Government of Indonesia, Ministry of Energy and Mineral Resources. 2022. *2021 Handbook of Energy and Economic Statistics of Indonesia*. Jakarta.

its own planning, PLN is obliged to reflect government policies and initiatives in its operations, and a key GOI priority in preceding years was to ensure low-cost power supply was sufficient to keep up with high prospective economic growth.²² As a result of these fast tracked programs, coal now makes up 50% of installed capacity, with a further 35% represented by oil and gas and only 15% from renewable energy sources. While the predominance of CFPPs has clearly increased emission intensity, the emissions management challenge is coupled with the financial and operational burdens of grid overcapacity as well. In past years, demand forecasts have been consistently above realized demand growth, as power supply was developed to meet more ambitious GDP targets. This has led to a high reserve margin of 59.5% in Java-Bali and 34.8% in the Sumatra system where 88% of Indonesia's electricity is consumed. The reserve margins above the targeted ~30% threshold are expected to persist until 2030.

20. Key driver #2: Coal as the fuel of choice for captive power. While PLN's overbuild of CFPPs on-grid was a direct result of energy policy prerogatives, the increase of coal off-grid was an indirect result of a separate industrial policy. As noted in Paragraph 5, Indonesia's rapid industrialization outside of strong grid-connected regions has been a key GOI tool to promote inclusive growth across Indonesia. The development of mineral processing facilities and local manufacturing industry outside of key business centers is meant to support economic diversification in remote regions. However, the unintended impact has been a deeper reliance on CFPPs to provide highly reliable, cheap, and continuous power required for these activities to develop (Paragraph 6). Further detail is provided in Appendix 1, which includes the executive summary of a captive power landscape assessment, produced with CIF-ACT support.

21. Indonesia's Energy Resources. The historic emissions pathway is tied closely with Indonesia's role as a net energy exporter given its vast domestic fossil-fuel resources.²³ While the country became a net oil importer in 2004, it soon rose to be the world's largest thermal coal exporter. As of 2020, coal resources were estimated at 143 billion tons and reserves at 38.8 billion tons, while production totaled 563 million tons, and consumption 131 million tons (Box 1).

22. Renewable Energy Potential. Though Indonesia has relied on fossil fuels to date, it has abundant renewable energy resource potential. Indonesia's national energy plan (Rencana Umum Energi Nasional, RUEN) as officiated in Presidential Regulation No. 22/2017, mentions that Indonesia has the potential of 29.5 GW of geothermal power, 75 GW of large hydropower, 19.4 GW of mini and micro hydropower, 32.7 GW of bioenergy, 207 GW of solar power, 60.6 GW of wind power, and 18 GW of tidal power. From this combined RE potential of 443.2 GW from RE, RE installed capacity only stood at 11.6 GW as of 2021 (Figure 4).

23. The GOI is pursuing its goal to achieve a 23% share of renewable energy in its primary energy mix by 2025 as stipulated in the National Energy Policy 2014.²⁴ Since the policy was put in place, the RE as a share of primary energy supply increased from 5% in 2014 to 12% in 2021,²⁵

²² Under the Electricity Law 30/2009 and its subsidiary regulations, PLN is required to obtain government approval for its system expansion plans, as set out in its annual Electricity Power Supply Business Plan (Rencana Usaha Penyediaan Tenaga Listrik (RUPTL)) and for its tariffs.

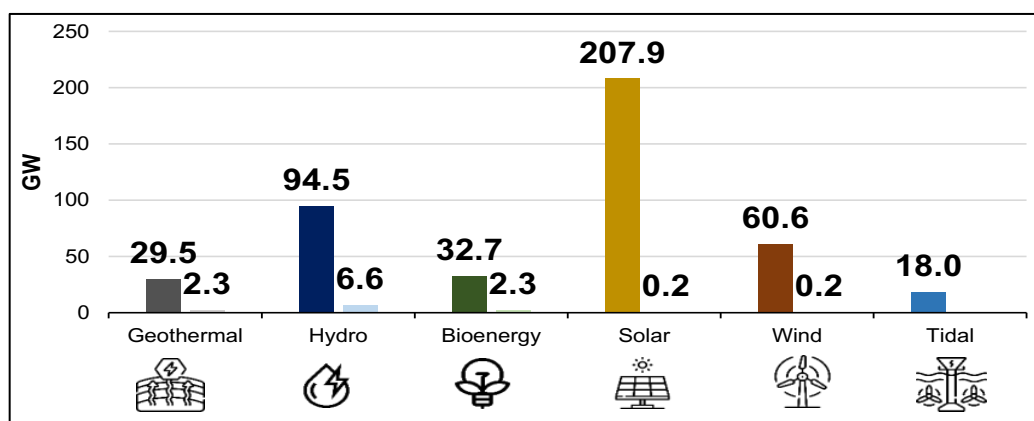
²³ Government of Indonesia, Ministry of Energy and Mineral Resources. 2021. *2020 Handbook of Energy and Economic Statistics of Indonesia*. Jakarta. As of 2021, Indonesia is the seventh largest liquefied natural gas exporter with proved natural gas reserves of 43.57 trillion standard cubic feet, production of nearly 2,442,381 million standard cubic feet, and consumption at 8 million tons. Proved reserves of oil stood at 2.44 billion barrels and production at 259 million barrels, while consumption totaled 258 million barrels.

²⁴ Government of Indonesia, National Energy Council. 2014. *National Energy Policy, 2014–2050*. Jakarta.

²⁵ Ministry of Energy and Mineral Resources. 2022. *Handbook of Energy & Economic Statistics of Indonesia 2021*. Jakarta. Table 1.6. <https://www.esdm.go.id/en/publication/handbook-of-energy-economic-statistics-of-indonesia-heesi>.

and RE contribution to the electricity generation mix grew from 11% to 18% in the same period.²⁶ Under I-JETP, the GOI is establishing a trajectory toward RE providing at least 34% of power generation by 2030. Increasing RE contribution to the electricity generation mix remains a pivotal driver to achieve the policy goal. However, key challenges to accelerating RE generation contributions have included: (i) environmental, social and financial challenges in the construction and operation of large- and small- hydro; (ii) high upfront capex and development risks including environmental, social, gender, health and safety risks for geothermal; (iii) higher costs of wind development in more remote Eastern Indonesian islands (location of best wind resource and smaller grids); (iv) complex licensing and permitting processes; (v) lack of transparency on tariffs and procurement; (vi) unbalanced risk allocation in power purchase agreements; (vii) local content requirements for RE development; (viii) lack of incentive for self-generation (such as rooftop solar); (ix) limited market mechanisms to incentivize development of smart grid technologies; (x) lack of implementing guidelines for power wheeling; (xi) limited progress connecting demand centers with RE-rich geographies; (xii) lack of transparency for operational data and power system planning; and (xiii) distortions in the price of fossil-fuel based generation through various forms of subsidies, rendering RE comparatively uncompetitive. Consequently, Indonesia lags its regional peers both in terms of the extent of deployment of renewables, and in terms of the levelized cost of generation achieved.²⁷ Many of the issues are being discussed and addressed in some capacity as the GOI demonstrates further commitment to achieve carbon neutrality in the medium term.

Figure 4: Indonesia 2019 RE Estimated Potential (LHS) vs. Installed Capacity (RHS)



Note: GW = gigawatt. RE = Renewable Energy.

Source: Institute for Essential Services Reform. 2021. 2021. *Beyond 443 GW: Indonesia's infinite renewable energy potentials*. <https://www.scribd.com/document/541766726/IESR-Beyond-443-GW-Indonesias-Infinite-Renewable-Energy-Potentials>

2.2 National Ambitions for a Net Zero Pathway

24. Especially considering the opportunity RE presents in Indonesia, an emissions-intensive path to economic growth remains unsustainable for Indonesia going forward. Impacts of the physical hazards brought about by climate change will be felt across Indonesian society.²⁸

²⁶ Ministry of Energy and Mineral Resources. 2022. *Handbook of Energy & Economic Statistics of Indonesia 2021*. Jakarta. Table 6.4.4. <https://www.esdm.go.id/en/publication/handbook-of-energy-economic-statistics-of-indonesia-heesi>.

²⁷ Countries with a much smaller grid and lower investment grade such as Cambodia have managed to conduct large reverse auctions that have delivered rapid relative capacity expansions at lower prices. https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/cif_gdi_case_study_cambodia_national_solar_park.pdf

²⁸ World Bank and ADB. 2021. *Climate Risk Country Profile Indonesia*. Washington and Manila.

According to the INFORM Risk Index, Indonesia ranks 5th in the world when it comes to exposure to disasters caused by natural hazards, with high exposure to several weather disasters exacerbated by climate change, including floods, tsunamis, and tropical cyclones. Considering other factors such as vulnerability and lack of coping capacity, Indonesia ranks 57th (out of 191 countries) in terms of risk.²⁹ The International Energy Agency (IEA) estimates that these impacts could cost up to 7% of the country's GDP, with the poorest bearing the brunt of this burden.³⁰ In recognition of these risks, the GOI has recently presented a strong series of targets to ensure Indonesia can continue its growth trajectory without outsized contributions to growing climate risks (Figure 5):

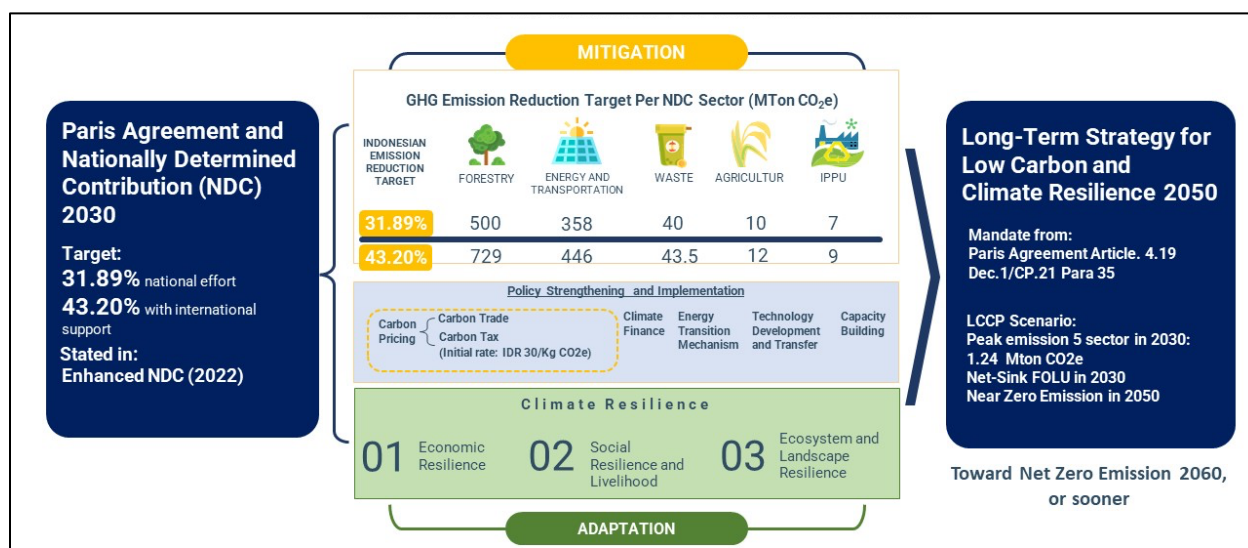
- **Nationally Determined Contributions (NDC) submitted to UNFCCC.** Indonesia's Intended NDC under the Paris Agreement, submitted in 2015, pledged to reduce CO₂ emissions by 29% in 2030 relative to a business-as-usual baseline. Indonesia ratified the Paris Agreement in 2016, reiterated the 29% target and assigned the Ministry of Energy and Mineral Resources (MEMR) responsibility to achieve 11 percentage points of the target emissions reduction from the energy sector.³¹ Indonesia's enhanced NDC, submitted to the UNFCCC in September 2022, reiterated the unconditional target to reduce CO₂ emissions by 31.89% in 2030 relative to a BAU baseline and also included a reduction target of up to 43.2% in 2030, conditional on international assistance. These will be further updated in 2023 to bring them in line with Gol's further ambitions (e.g., RE generation and peak power sector emissions) under I-JETP (Paragraph 3).
- **Net zero emissions (NZE) by 2060 or earlier.** Indonesia submitted its first Long-Term Low Emissions Strategy (LTS) along with its updated NDC to the UNFCCC in 2021. The LTS sets out three long-term development scenarios. The most aggressive mitigation scenario, the Low Carbon Scenario Compatible with the Paris Agreement (LCCP), envisages total GHG emissions peaking around 2030 and declining thereafter. Under the LCCP, "Indonesia is expected to gain optimistically [the] opportunity for more rapid progress toward net zero emission in 2060 or sooner" (Government of Indonesia, 2021b). This forms the basis for Indonesia's target of reaching net zero emissions by 2060.

²⁹ INFORM. 2021. INFORM Risk Index 2022.

³⁰ IEA. 2022. *An Energy Sector Roadmap to Net Zero Emissions in Indonesia*. Paris: IEA. <https://www.iea.org/reports/an-energy-sector-roadmap-to-net-zero-emissions-in-indonesia>.

³¹ Indonesia's Paris Agreement commitments. United Nations Framework Convention on Climate Change. 2016. Indonesia's First NDC (Updated). Paris and Codified in the National Action Plan on GHG Emission Reduction, under Presidential Regulation No. 61/2011.

Figure 5: Nationally Determined Contributions and Net Zero Emissions



LCCP = Low Carbon and Climate Resilience.
 Source: Government of Indonesia, Ministry of Finance.

25. Decarbonization of its power sector represents a cornerstone of Indonesia’s efforts to achieve its emissions related goals. Recent regulation and implementation plans include:

- **Emissions Trading System (ETS).** The development and implementation of a domestic ETS for the power and industry sectors is one of the government’s key policy mechanisms to help meet its NDC targets and to foster low-carbon sustainable development. A presidential regulation to provide a national framework for carbon pricing instruments, including an ETS, was signed in October 2021.³² Following this presidential regulation, in December 2022 MEMR issued Regulation 16/2022 on Procedures for the Implementation of Carbon Economic Value in the Power Plant Sub-Sector, which builds on a previous voluntary pilot ETS for the power sector. MEMR Regulation 16/2022 creates a mandatory “cap and trade” system, first for grid-connected coal-fired power plants, then, in subsequent phases starting in 2025, for other fossil-fuel based plants as well as off-grid plants. The first phase was officially launched in February 2023 and is expected to include 99 plants. Each plant is allocated allowances based on their historical emissions, and a cap is set for the overall sector. The plants can then trade those allowances, or purchase additional allowances through auction/carbon offsets, depending on whether they expect to emit more or less than their allocation.
- **Carbon tax.** The Law No. 7/2021 on Harmonization of Taxation System (UU HPP) also introduced a carbon tax. It was initially set at a minimum price of 30 IDR per kilogram of CO₂e (about US\$ 2.13 per tCO₂e). The carbon tax will be implemented in phases, beginning in the power sector. It will first apply to all grid-connected coal-fired powerplants. Commencement of this phase will begin once the Ministry of Finance (MoF) has issued two relevant regulations, though an exact date has not yet been confirmed. In the next step, the tax will extend to coal-fired powerplants that provide direct power to industry, such as in cement or steel manufacturing. The carbon tax is also expected to be implemented in selected sectors beyond the power sector, including potentially the transport sector and land use emissions, but the details are still being developed as part of the Ministry of Finance (MoF)’s carbon tax roadmap. Full implementation of the carbon tax roadmap planned is expected by 2025.
- **Indonesia’s G20 Presidency and Energy Transition Goals.** Indonesia had identified

³² Government of Indonesia. Government Regulation 98/2021. Presidential Regulation on Carbon Emission Economic Value.

“sustainable energy transition” as one of the three top priorities under its Presidency of the 17th G20 during 2022. To plan and set some of the key milestones for energy transition leading to the G20 Leaders’ Summit (held in Bali on 15-16 November 2022), MoF, in partnership with ADB, has been conducting a series of focus group discussions (FGDs) in March (FGD #1), June (FGD #2), August (FGD #3) and October (FGD #4) 2022. The FGDs brought together an inter-ministerial forum comprising all the relevant government stakeholders (including MEMR, PLN, PT SMI) to take stock of ongoing efforts in the country and set goals to be announced at G20 and COP27. FGD #3 refined the outcomes of the first and second FGD, focusing on the updated draft shortlist of PLN CFPPs that can be retired before 2030, IPP early retirement transactions that can be announced immediately, existing pipeline plants that can be cancelled, as well as the preliminary roadmap and updated list of IPP and PLN CFPP retirements beyond 2030. FGD#4 was able to derive broad consensus with key government stakeholders and flesh out remaining discussion areas for near term goals on energy transition activities that could be announced at the G20. The most recent FGD (FGD#5), now being led by PT SMI as the ETMCP, focused on carbon pricing and the taxonomy of transition finance, critical parts of the energy transition toolkit that will have to be utilized to mobilize requisite financing.

- **Renewable Energy and Coal Phase out Presidential Regulation.** The highly anticipated Presidential Regulation No. 112 of 2022 on the Acceleration of Renewable Energy Development for the Supply of Power (RE PR) was signed and enacted by President Joko Widodo on 13 September 2022. The regulation essentially: (i) announced an upcoming MEMR/PLN plan for energy transition and the early retirement of coal-fired power plants (CFPPs) (with target disclosure in [mid 2023], conditional upon international support); (ii) articulated a more viable ceiling pricing regime for the purchase of electricity from RE projects (vs. benchmarking RE against subsidized coal generation); (iii) outlined tendering schemes for the procurement of RE projects by PLN; and (iv) laid out broad incentives for RE projects.

26. Other related initiatives in development are referenced in the I-JETP Joint Statement³³:

- **Local content road map.** Consistent with the JETP Joint Statement, the GOI intends to work the IPG and its Development Partners to align local content requirements with the road map for domestic renewable manufacturing capability in order to achieve the renewable goals and to scale renewable deployment to support robust domestic renewable energy manufacturing capability. The progression of local content requirements should take into account the size and scale of the viable domestic market.
- **Prioritizing captive power decarbonization.** Given the magnitude of the challenge posed by decarbonizing industry in remote regions, the GOI aims to leverage its work with I-JETP to restrict the development of captive coal-fired power plants in accordance with the prevailing regulation and collaborate to find and implement potential zero-emission and renewable solutions for power generation facilities, including captive power facilities. This will be done provided that the solutions are affordable (priced similar or better than the non-renewable alternatives), reliable (can provide base load), accessible, and timely (can be deployed within similar or better than the non-renewable alternatives) to balance the imperative of industrial development and economic growth of Indonesia with the commitment on net zero. Further articulation of the conditions and plans, beyond initial thoughts described in Paragraph 6, will be part of the I-JETP roadmap under development.

³³ Ministry of Finance, Japan. *Joint Statement and joint Press Release of Just Energy Transition Partnership (JETP) for Indonesia*. Tokyo. https://www.mof.go.jp/english/policy/international_policy/others/20221115_1.pdf

2.3 Implementation Framework for Clean Energy Transition

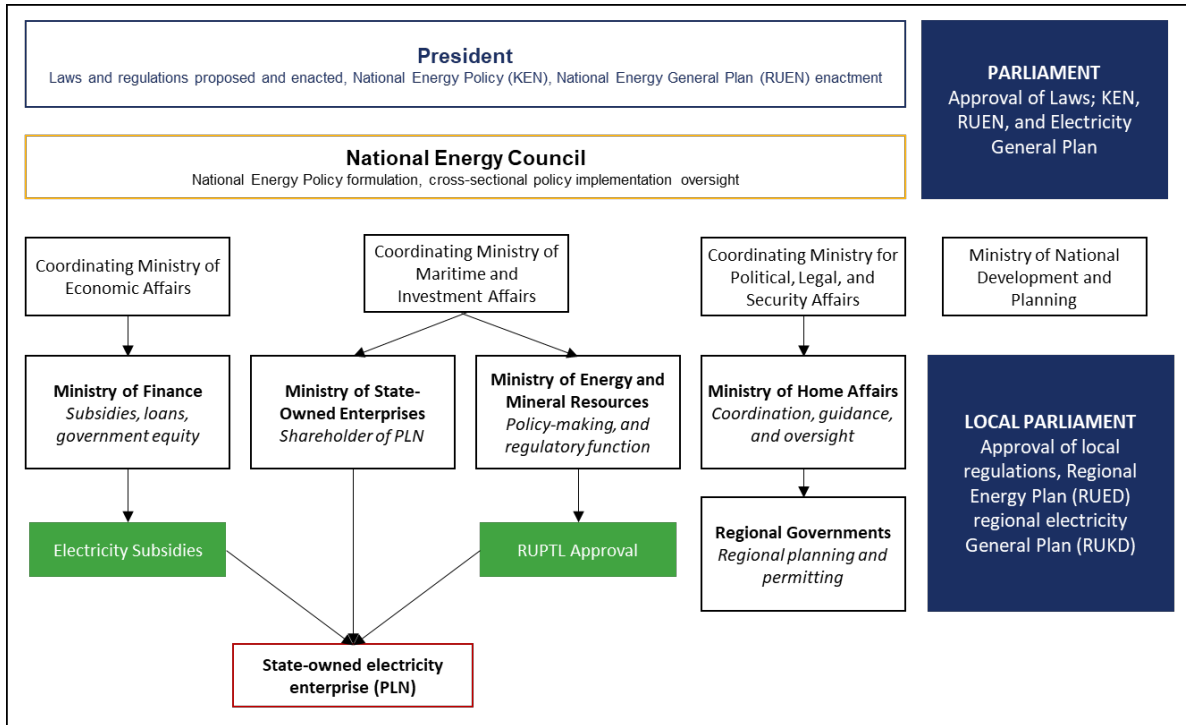
27. **PLN as a key player in energy sector decarbonization.** Within the energy sector, power generation is implemented by Perusahaan Listrik Negara ([PLN] State Electricity Corporation)—the sole buyer, transmitter, and distributor of electricity in Indonesia. Because Indonesia is an archipelago, PLN infrastructure for electricity generation, transmission, and distribution remains fragmented. The distribution infrastructure consists of eight major grid networks and 600 isolated grid systems. As wholly state-owned utility, its planning and operations are overseen by three main ministries: (i) the Ministry of Energy and Mineral Resources (MEMR), the primary government body setting energy sector policies and regulation; (ii) the Ministry of State-Owned Enterprises (MSOE), the government body overseeing governance and operations of state-owned enterprises; and (iii) the Ministry of Finance (MoF), involved in all aspects from subsidies to planning (see Figure 6).

28. **I-JETP's role as a coordinating platform for international energy transition support.** The I-JETP secretariat, hosted in MEMR and supported by ADB, will serve as the coordinator for internal and external stakeholders on the I-JETP. The Secretariat will also play an important planning and project/program identification function for the I-JETP, coordinating the mobilization and deployment of an initial \$20 billion in public and private financing support from the IPG and GFANZ Working Group over a three-to-five-year period. Broadly speaking, the Secretariat will report to and take direction from GOI, represented by the National Taskforce, and the IPG on implementation of an agreed action plan set forth in the Joint Statement. The Secretariat's key deliverables will include: (i) a road map for 2030 in the power sector in line with net zero target, (ii) strategies to reform energy and financial sector policies and leverage financial resources to support Indonesia's just energy transition activities, (iii) a work program that addresses the social and economic impacts of Indonesia's just energy transition, and (v) an Investment and Policy plan. Initially four working groups are expected to be established to focus on technical, policy, financing and just transition workstreams and channel recommendations to the Secretariat following robust stakeholder consultations. Fundamentally, the platform will serve to coordinate the many efforts to accelerate the Indonesian energy transition through international support.

29. **PT Sarana Multi Infrastruktur (Persero) (PT SMI) and ETMCP – other critical partners in clean energy transition implementation.** Established in 2009 to catalyze Indonesia's infrastructure development, PT SMI is a state-owned enterprise overseen by the MoF. PT SMI has extensive experience in lending to commercial and public infrastructure projects and has expertise in project development, structuring, financing, risk management, and safeguards, which support its infrastructure lending transactions. PT SMI is the first Green Climate Fund (GCF) Accredited Entity in Indonesia as a Direct Accredited Entity (DAE).

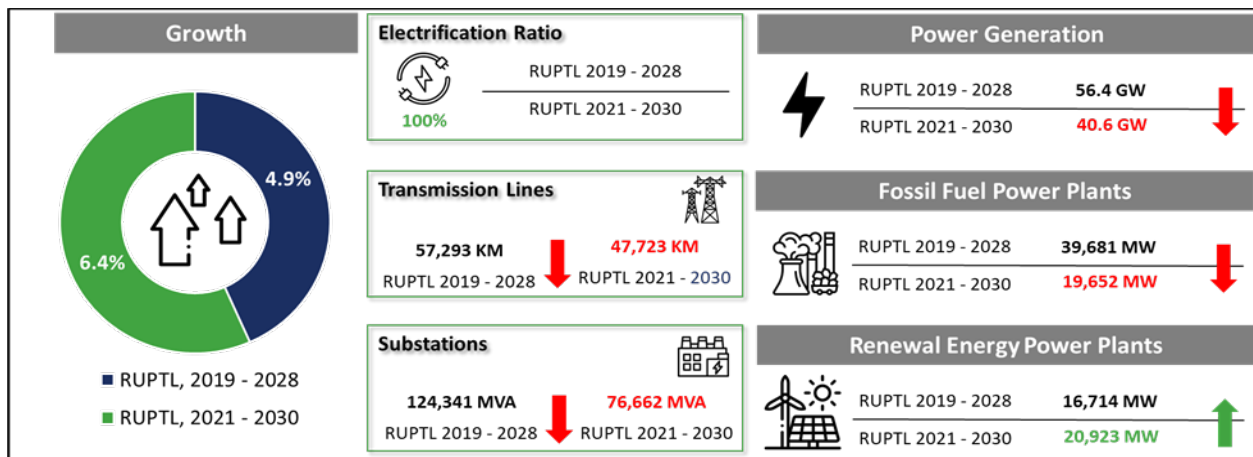
30. Specific to the clean energy transition, the MoF through the decree no. 275/KMK.010/2022 has assigned the SDG Indonesia One platform managed by PT SMI as the ETM Country Platform (ETMCP) secretariat and manager (see Figure 8). The MoF decree and the upcoming ministerial regulation provide PT SMI the operational legal basis as the ETMCP. The ETMCP will play a critical role in coordinating various energy transition activities and channel fiscal support where needed. It has been tasked with deploying a range of traditional and innovative financing instruments such as debt (loans), equity, guarantees, bonds, and carbon finance. As a platform that channels GOI's fiscal support to strategic projects, the ETMCP can use the Government Investment Fund (OIP) and government guarantees to support ETM transactions. PT SMI will also play a critical role in implementing the National Just Transition Framework, as a key implementing and coordinating party for clean energy transition.

Figure 6: Indonesia National Power Sector Stakeholder Map



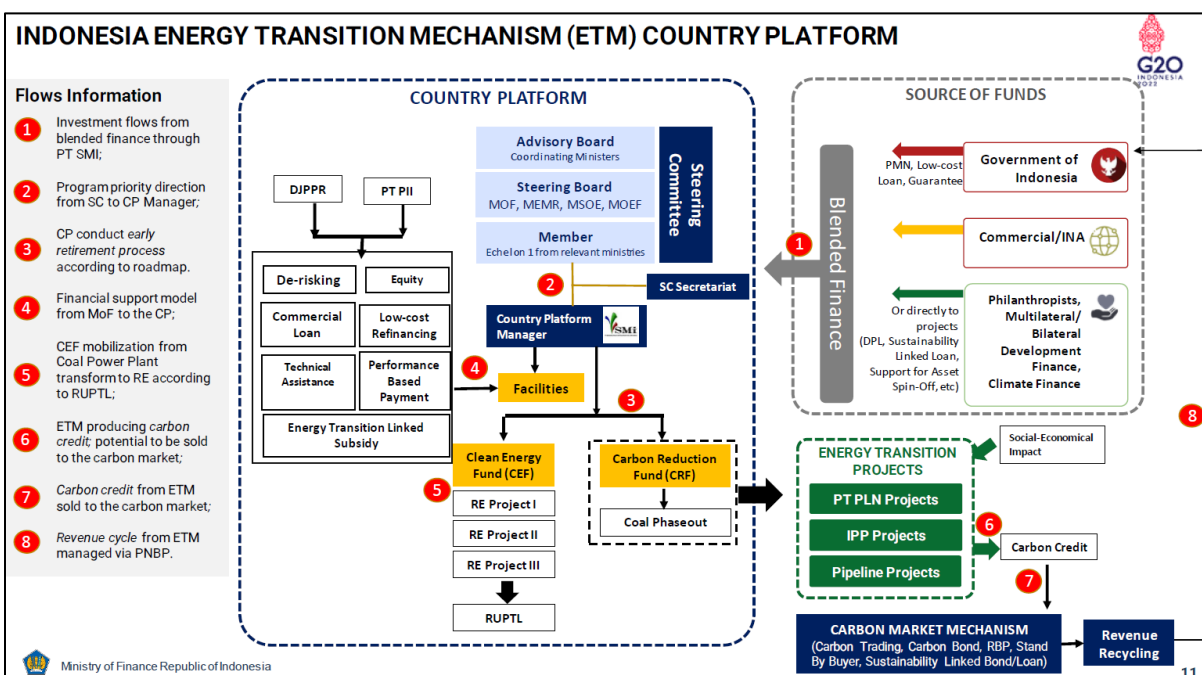
Source: Asian Development Bank.

Figure 7: Changes Planned under the Electricity Power Supply Business Plan 2021-2023



Source: Adapted by the Asian Development Bank from HHP Law Firm. <https://www.hhp.co.id/en/>

Figure 8: PT SMI Energy Transition Mechanism Country Platform



Source: Government of Indonesia, Ministry of Finance.

31. **PLN launches clean energy transition plans.** PLN released its most recently approved Electricity Power Supply Business Plan (RUPTL), 2021–2030, in October 2021. This long-anticipated RUPTL marks a pivotal milestone for PLN. Considering the impacts of the pandemic in terms of reduced growth and electricity demand forecasts, as well as the national climate targets, RUPTL 2021-2030 complements and supports the “reset” initiated across GOI agencies in support of a greener agenda. For the first time, the majority of power generation projects to be developed are RE projects, accounting for 51.6% of 40.6 GW of new generation (see Figure 7). PLN plans to increase renewable energy capacity from 15% of total generation in 2021 to 24.8% by 2030.³⁴ The RUPTL also allocates a bigger share to private sector IPPs in developing new RE generation capacity to catalyze more private sector financing. The share of coal in total generation is targeted to decrease from 67% in 2021 to 59.4% by 2030 due increased RE penetration. It is likely that the next RUPTL will be further amended to reflect more ambitious I-JETP targets (see Paragraph 3), conditional upon further international support.

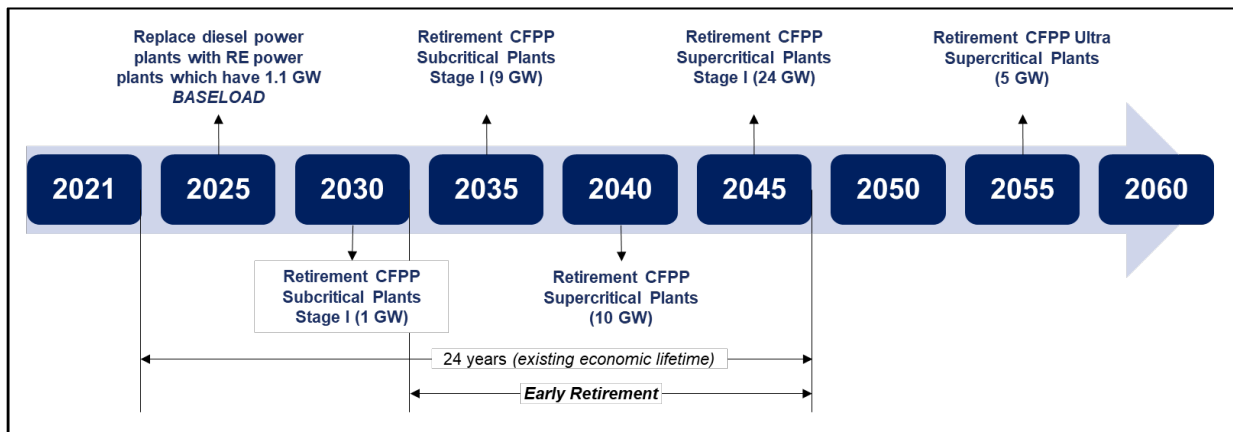
32. **Detailed path for CFPP early retirement.** In 2021, Indonesia had a total of 37.04 GW of operating on-grid CFPPs, with an additional 13.8 GW of CFPPs under various stages of construction. The bulk of these operating CFPPs are based in Java-Bali and Sumatra. Given surplus capacity reserves compared to historical levels and benchmarks, until about 2029-2030, the implication is that a reduction or delay in new generation capacity is appropriate until load growth resumes and catches up with pre-pandemic levels. This allows for the early retirement of less efficient, older power plants, which in turn could pave the way for a sooner scale-up of renewable energy than otherwise. Further, another effective strategy is to convert some of the middle-aged CFPPs to flexible operations for a few years to allow for their overall lower utilization (and concomitant lower emissions), while providing the grid services necessary for greater

³⁴ PLN. 2021. *Electricity Power Supply Business Plan, 2021–2030*. Jakarta. <https://web.pln.co.id/statics/uploads/2021/10/ruptl-2021-2030.pdf>

integration of variable renewable energy, with the eventual goal of retiring these CFPPs.³⁵ Consequently, it is possible for Indonesia to develop a CFPP phase-out plan comprising some pilot early retirements followed by a structured and staged annual phase out of the remaining plants over time. The plants that are being retired would then be taken through a typical coal-fired power decommissioning process, which includes termination of operation followed by retirement, dismantling, remediation, and if possible, repurposing.

33. **Development of GOI CFPP early retirement road maps is ongoing.** MEMR and PLN initially worked together to devise such staged preliminary retirement plan in mid-2022, as summarized in Figure 9. Priority lists prepared by PLN, MSOE and MEMR along with the technical analysis undertaken by ADB under its ETM feasibility study (Appendix 2) were all used as inputs to the process. Designed to meet the country’s NZE 2060 goals, PLN initially aimed to retire the first 1 GW of power plants before 2030, then proceed with a series of retirements until 2055, at which point the last unabated CFPP would have been retired. It is now expected that this will be adapted as a basis for the official Early Retirement Roadmap, in line with more ambitious targets (see Paragraph 3). This is expected to be disclosed and issued by Ministerial regulation, as required under the RE PR, by mid-2023.

Figure 9: Initial PLN Pathway for CFPP Retirement to Support Net Zero Emission 2060



Source: Perusahaan Listrik Negara (PLN), Indonesia. <https://portal.pln.co.id/>.

34. **Sample analysis: Retirements before 2030 – piloting the first 1-2 GW.** As an illustrative example of the kind of analysis being conducted, Table 2 presents a shortlist of nine units (totaling nearly 5 GW of capacity) that had been suggested for retirement by 2030 under the ADB ETM Feasibility Study. All the units are PLN-owned. Since the security of supply is a critical consideration when prioritizing assets to retire in the near term, these plants are all connected to the 500kV network. The analysis suggests that Suralaya unit 1 and 2, and Paiton unit 1 are best suited within this shortlist, and it may be feasible to terminate their operations as early as 2024.³⁶ Following this, they may be dismantled, remediated and repurposed starting 2026, with the interim period being used for planning and permitting of the dismantling and repurposing project.

35. **Sample analysis: Post 2030 – medium term.** Under the ADB ETM Feasibility Study, CFPPs suitable for retirement post-2030 include plants owned by PLN and IPPs. While the joint task force has identified power plants suited for retirement post 2030, it is expected that the early retirement plan for CFPPs that is currently under development by MEMR/PLN would provide

³⁵ Central Electricity Authority (CEA), Ministry of Power, Government of Indonesia. 2019. *Flexible Operation of Thermal Power Plants for Integration of Renewable Energy*. New Delhi.

³⁶ Please see Appendix 2, paragraph 6 for further rationale.

further details on the sequencing of the retirements, especially of the PLN plants. The early retirement schedule of the IPPs would ultimately depend on the willingness of the private owners. As an illustration, Figure 10 provides a summary presentation from the ADB ETM³⁷ feasibility analysis (Appendix 2) of a CFPP retirement road map out to 2035 for Indonesia with annual targets segregated by grid systems and asset ownership. This roadmap was designed to allow for the retirement by 2035 of approximately half the operating CFPP fleet of the Java-Bali and Sumatra grids in that year.

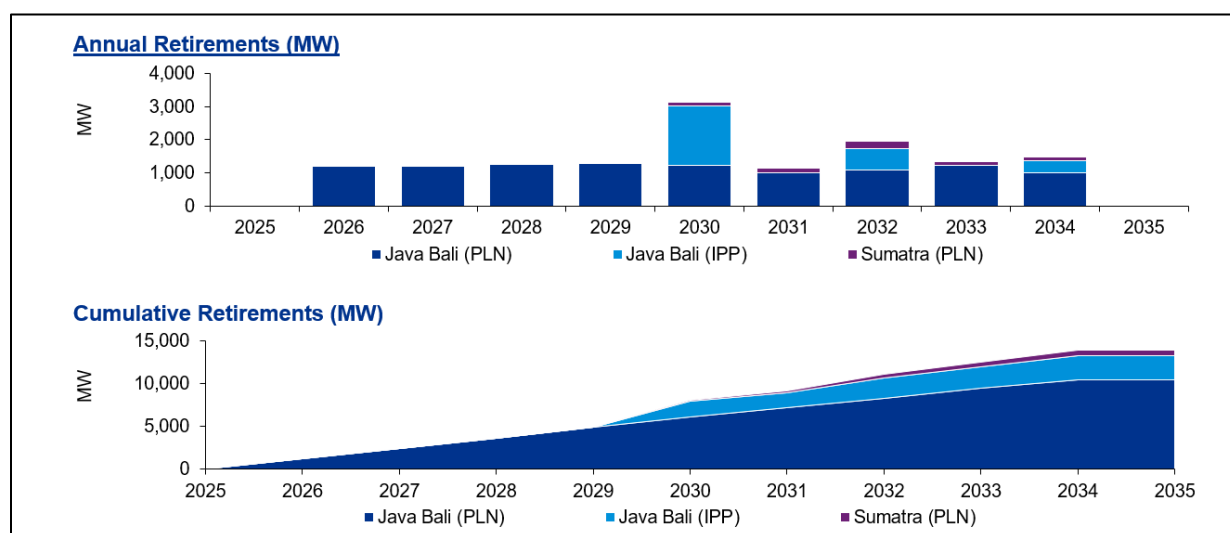
Table 2: Initial Proposed List of PLN Coal-Fired Power Plants for Retirement by 2030

No.	Facility / Unit Name	Capacity (MW)	Book Value (TR Rp)	Book Value (USD MN)	Book Value (USD MN/ MW)	COD (Year)	Remaining Life	Decommissioning Year	Age at Decommissioning
1	Suralaya U1	400	5.85	390	0.49	1985	33	2055	70
2	Suralaya U2	400				1986	33	2055	69
3	Suralaya U5	600				1996	33	2055	59
4	Suralaya U6	600	45.20	3,013	1.67	1997	33	2055	58
5	Suralaya U7	600				1997	33	2055	58
6	Suralaya U8	625	8.60	573	0.92	2011	23	2045	34
7	Paiton U1	400	5.05	337	0.84	1993	33	2055	62
8	Paiton U9	615	6.50	433	0.70	2012	23	2045	33
9	Adipala	660	12.30	820	1.24	2015	23	2045	30
Total		4,900	83.50	5,567					

Note: Book values by unit of capacity vary according to numerous factors, which may include initial and maintenance capex, revaluations in line with PLN accounting practices, age and accumulated depreciation.

Source: Perusahaan Listrik Negara (PLN), Indonesia. <https://portal.pln.co.id/>.

Figure 10: Road Map for ~14GW of Early Retirement by 2035



IPP = independent power producer, MW = megawatt, PLN = Perusahaan Listrik Negara.

Source: Asian Development Bank ETM Study.

³⁷ The Government of the Republic of Indonesia, the Government of the Republic of the Philippines, and the Asian Development Bank (ADB) announced a partnership in November 2021 at the 26th UN climate change conference (COP26) to design and launch an Energy Transition Mechanism (ETM) to accelerate the transition from coal to clean energy in Southeast Asia, in a just and affordable manner. Under the partnership with Indonesia, ADB is currently engaged in carrying among other things, identifying through a feasibility study, a pool of candidate coal-fired power plants for early retirement/repurposing; initiating the establishment of an ETM Fund/Vehicle through the issuance of a request for concepts from the private sector; and establishing and operationalizing the ETM Partnership Trust Fund to be administered by ADB; and catalyzing active participation from G-7 countries (I-JETP). (Appendix 7)

36. **RE scale up – Role of private sector, innovation and leverage of resources.** Power generation is open to IPPs, and the government is introducing reforms to expand private sector investments. While some older IPPs will be explored for early retirement, the RUPTL provides opportunities for IPPs to develop 56% of the 20.9 GW of renewable energy capacity to be added before 2030, implying the need for nearly US\$6 billion in commercial debt financing for new infrastructure.³⁸ PLN does not generate sufficient cash flow to fund significant investments and remains largely dependent on borrowing to fund investments.³⁹ To the extent concessional climate finance can support the crowding-in of public and private capital to support energy transition works in an inclusive, holistic and gender-balanced manner, while minimizing environmental and social risks associated with capacity expansion, the greater the likelihood of a successful commercial scale up of RE capacity in the medium term. The accelerating expansion of renewable energy capacity will inevitably require skilled and trained workforce providing an opportunity to increase the number of women in the energy sector and to transition workers impacted by the retirement of CFPPs.

37. **Future RE sector development considerations.** While the RE PR provided strong endorsement for RE scale up (including the important steps of (i) de-linking renewable energy pricing from the average cost of generation of the grid heavily based on subsidized low-cost coal, (ii) supporting competitive procurement for certain renewables technologies, and (iii) codifying the moratorium on coal) it may not directly address a potential structural challenge related to local content that has purportedly been an ongoing bottleneck for RE development. The National Electricity Law requires the prioritization of domestic products and services when developing generating assets. The GOI will continue to review options to support the RE scale up and address these issues within and outside of I-JETP, alongside sector-wide capacity building. Paragraph 26 highlights key related local content initiatives.

2.4 Just Transition, Gender and Safeguards for Clean Energy Transition

38. **GOI commitment to a just transition.** The GOI is strongly committed to a just and affordable transition informed by wide stakeholder consultation that focuses on “(i) stability of the availability of vital essential services such as electricity, (ii) stability of energy prices, food, and public transport, (iii) social protection for the poor and vulnerable, and (iv) the application of sustainable development principles.”⁴⁰ A just transition of the coal sector is critical due to the role coal plays as a source of employment, public and private revenue, and power in Indonesia. If the transition is not well-managed, potential adverse impacts are likely to be felt throughout the country. This could include direct and indirect impacts on formal, informal and contract workers, their families and communities, as well as induced impacts on communities and the economy due to reduced spending and government revenue, and potential electricity price rises. Women (especially considering intersectional identities of Indonesian women) and other marginalized groups—minority ethnic groups, rural communities, and youth—are particularly at risk. A just transition needs to consider impacts from power generation to coal mining, and related industries up and down the value chain, such as coal transport, manufacturers (including small and medium-sized enterprises [SMEs] and other formal and informal vendors, including street vendors and sex workers). Aligned with the ILO Guidelines for Just Transition (2015), the design and

³⁸ HHP Law Firm. 2021. *Client Alert - PLN's New 2021 - 2030 Business Plan: High hopes and 'greener' projects*. October. <https://legalcentric.com/content/view/169264>.

³⁹ PLN has a public service obligation to provide affordable electricity to the people of Indonesia and receives compensation from the government for selling power below the electricity supply cost for certain demographics.

⁴⁰ Government of Indonesia. 2022. *Indonesia G20 Presidency 2022 Prepares Roadmap, Policies, and Social Impact Mitigation Plan for Just and Affordable Climate Transition*. News Release. 14 July.

implementation of a just transition strategy should be propped upon coherent policies across the economic, environmental, social, education/training and labour portfolios. These coherent policies will also provide the just transition framework for all to promote the creation of more decent jobs, including anticipating impacts on employment, adequate and sustainable social protection for job losses and displacement, skills development and social dialogue.

39. Just transition is not only about managing negative impacts, but also taking advantage of opportunities to improve livelihoods and drive growth and sectoral transformations through green industry diversification, promoting new sustainable business models, entrepreneurship, and cleantech innovation, reskilling and upskilling, strengthening social protection, and education reforms. Strong GOI commitment to the just and affordable transition anchors discussions on energy transition in Indonesia, and this can increase public buy-in for climate change action and higher climate ambition. Indonesia's NDC calls for the "creation of decent work and quality jobs for an effective and inclusive transition to low greenhouse gas emissions and climate-resilient development."⁴¹ To do so, Indonesia aims to focus its efforts on tackling challenges in low-carbon development, creating decent jobs by promoting economic activities with low GHG emissions, addressing the needs and challenges of disadvantaged groups, and enhancing social participation to improve work standards and conditions, including facilities, services, and equitable wage provided for workers. Just transition is also a strategic matter in the country's Long-Term Strategy for Low Carbon and Climate Resilience 2050 (LTS-LCCR)⁴² as it relates to workers' transition, gender equality and women empowerment, intergenerational equity, and impacts on vulnerable groups, while recognizing the strategic role of Masyarakat Hukum Adat (MHA)⁴³ and local communities.

40. **Institutionalizing Just Transition.** Achieving a just transition requires upstream analytics and planning, development of a framework and implementing policy or regulation for managing just transition during implementation, and protocols for monitoring. It will require cooperation between various government ministries, PT SMI, PLN and IPPs as each has a different role to play with respect to implementing a just energy transition. Projects, programs and expertise of non-energy ministries such as labor and education, as well as women empowerment and child protection, will also be essential and these need to be mobilized and coordinated to support the energy transition. The I-JETP Secretariat has established a Just Transition Working Group led by UNDP and comprising the MDBs, ILO and GIZ, to develop a National Just Transition Framework for energy transition that clearly articulates roles and responsibilities of government and other counterparts, as well as a process for undertaking analytical work, stakeholder engagement and designing a just transition plan for individual retirements/closures, as well as other key priority areas for I-JETP investments (e.g. transmission and distribution, renewable energy supply chain). Furthermore, as part of PT SMI's appointment as ETM Country Platform Manager they will have an important role in ensuring consistency and credibility of the implementation of the framework as well as monitoring outcomes.

41. **Gender in Energy and Mining.** A key focus across development activities has been exploring gendered vulnerabilities alongside susceptibilities of the marginalized. Indonesia has a strong legal framework and regulations to mainstream gender and promote nondiscrimination in the workplace that applies to the energy sector and extractives industry. Indonesia is party to

⁴¹ Government of Indonesia. 2021. *Updated Nationally Determined Contribution*.

⁴² Government of Indonesia. 2021. Long-Term Strategy for Low Carbon and Climate Resilience 2050. <https://unfccc.int/documents/299279>.

⁴³ Masyarakat Hukum Adat are groups of people who have lived for generations in certain geographical areas in Indonesia because of ties to ancestral origins and strong relations with the land, territory, and natural resources. They have customary government institutions and customary law order in the territory.

international conventions on gender equality, including the United Nations Convention on the Elimination of All Forms of Discrimination against Women.⁴⁴ Since the issuing of a Presidential Instruction No. 9 Year 2000 on Gender Mainstreaming in National Development acknowledging the importance of improving the status and roles of women for national development, Indonesia has made significant progress in removing barriers to gender inequality. It has adopted regulations that provide equal opportunities, treatment, and equal pay for men and women. In 2021, Indonesia was ranked⁴⁵ as ‘moderately improving’ toward Sustainable Development Goal 5 – gender equality and women’s empowerment. The GoI’s National Mid-Term Development Plan (RPJMN) 2020-2024 reflects country’s gender agenda, by enlisting gender equality as one of the six aspects that should be mainstreamed into national development strategy.

42. Energy sector institutions also enhanced their corporate gender mainstreaming commitments by creating the enabling environment for advancing women in the energy sector. In 2021 PLN established the CEO Statement of Support for the Women’s Empowerment Business, while also encouraging other energy sector leaders to do the same. To prevent and address gender-based violence in the workplace, PLN issued a Board of Directors Directive⁴⁶ concerning Protection, Prevention, and Treatment of Sexual Harassment, which also applies to third parties (e.g., outsourcing, consumers, business partners, and consultants). Aligned with the MSOE enhancement program on women’s empowerment, PLN formed the Srikandi Task Force Team which aims to build awareness of all parties on competency-based career development and employee performance and to enhance the capacity of women within PLN. In April 2022 PLN issued a Statement of Corporate Intent committing to mainstreaming gender. More can be done to design and advocate for non-biased gender equality policies and regulations across the energy and extractive sectors.

43. **MDB support for environmental and social governance in the energy sector.** ADB and the World Bank are providing technical assistance to support the GoI’s energy reform agenda working with CMMI, MEMR, MOEF, and MoF, as well as energy SOEs. In the geothermal sector, this support included dedicated assistance to close the gaps in the regulatory framework and to develop guidelines on geothermal project selection, design, and implementation and best practice management of environmental and social risks in forest areas. Support has also been provided to Geo Dipa Energy (GDE) to develop a corporate Environmental and Social Governance (ESG) policy and to report progress on commitments in an annual Sustainability Report.

44. ADB and World Bank have also been supporting PLN to establish its corporate ESG strategy and to develop Environmental and Social Management Systems (ESMS) to enable better alignment with investors requirements, improve overall environmental and social risk management, and improved reporting of progress delivering on ESG commitments and targets. The ESG strategy under preparation aims to improve PLN’s performance across seven key areas: (1) climate change mitigation and adaptation, (2) environmental management with circular innovation, (3) ecological harmony and biodiversity, (4) gender mainstreaming, (5) community engagement and social protection, (6) ESG governance, and (7) ESG reporting and communication. Implementation of the ESG framework will enhance PLN’s profile in the sustainable financing market and strengthen investor confidence in PLN’s ability to adequately manage environmental and social risks. PLN’s ESMS was launched in 2022 and will be pilot-tested under the proposed Indonesia Sustainable Least-cost Electrification (ISLE) P4R and under

⁴⁴ Yuli Adiratna. 2020. The Indonesian Ministry of Labor, Director of Labor Inspections Norms, on a Women in the Extractives in Indonesia Seminar.

⁴⁵ Sustainable Development Report. Indonesia. <https://dashboards.sdgindex.org/profiles/indonesia>

⁴⁶ PLN BOD Directive No. 0015.P/DIR/2020.

other future World Bank funded projects such as the Green Financing Facility with a view to gradually expanding the application to other foreign-funded projects. PLN is preparing to launch the ESG Strategy within 2023. The MDBs' plan to provide sustained support to PLN in establishing and operationalizing the ESG and ESMS and developing the capacity of PLN staff. ADB's Accelerating Indonesia's Clean Energy Transition Program – Phase 1 (AICET) RBL will build on the approved ESMS and will update it as needed to cover early coal retirement, and de-dieselization aspects based on the ongoing program safeguards system assessment findings. Together, the ESG framework and ESMS will help PLN secure funding to cover the cost of energy transition.

45. On the mining side, a shrinking CFPP fleet will underscore the pressure faced by the coal mining industry across the country and introduce potential social and environmental impacts brought about by unprepared closures. From a global perspective, even without the trigger from coal plant decommissioning, the projected fall of coal demand due to importing countries' NZE commitments will ultimately put additional pressure on coal mines. Systematic mine closure is a relatively new concept in Indonesia; reclamation requirements were first introduced in 2010 and continued to be refined through to 2018.⁴⁷ There are provisions that outline the requirements and guidelines for the preparation of Mine Closure Reclamation Plans (MCRP). There are also legally binding requirements for progressive rehabilitation to be included in the mining plan and for the posting of environmental bonds or similar financial assurance methods, equivalent to the estimated cost of environmental rehabilitation and reclamation post-mining. However, the enforcement of these regulations has never been fully assessed and tested with regards to the effectiveness of the implementation of land rehabilitation requirements across the mining operators.

46. A World Bank Study in 2019⁴⁸ found that although legal and regulatory requirements are satisfactory, the implementation of these requirements needs to be improved. A significant finding of the study was that "Environmental and Social Impact and Mine Closure Management," was a shared priority for government and civil society, as both groups are concerned about mines that are yet to be reclaimed. However, the GOI has noted that there is limited funding for monitoring, especially in provinces. CSO respondents cited a number of issues including: inadequate and incomprehensive institutional skills; limited efforts of mining companies to conduct reclamation activities and to consult with communities when developing and updating the MCRP.

47. Overall, strengthening of regulatory and governance frameworks and strategies and capacity building for agencies are needed, with designated responsibility for planning and management of environmental and social aspects of CFPP and mine closures, decommissioning and development of economic diversification including renewable technologies. Local governments will need support to develop their local economic development strategies, building on a sound assessment of risks and opportunities associated with CFPP and mine closures, to create gainful jobs while ameliorating the impact of job losses and reduction in demand especially for vulnerable groups. Targeted efforts would be made to include women and marginalized groups in development of these strategies and ensure inclusion of activities addressing their specific needs.

⁴⁷ The Government Regulation no. 78/2010 on Reclamation and Post-Mining continues to be updated. The government regulation was implemented with a ministerial regulation in 2014, which was then later revised in 2018 with Ministry for Energy and Mineral Resources (MoEMR) Regulation No. 26/2018 on the Implementation of Good Mining Practices and Supervision of Mineral and Coal Mining.

⁴⁸ World Bank. 2019. Indonesia Mining Sector Diagnostic (MSD) Report. <https://openknowledge.worldbank.org/handle/10986/33087?show=full>.

3 Programs – Description and Financing Proposal

3.1 Overview of Process and Collaboration across MDBs and Stakeholders

48. **ADB and WBG engagement with the GOI.** Since October 2021, when Indonesia was selected as an ACT pilot country and was invited to develop its ACT IP, the MoF has worked together with key line ministries to diligently collaborate with the ADB, WBG, and civil society organization (CSO) stakeholders to establish a strong foundation for IP design and development. Table 3 outlines key milestones in the design process and presents where key IP workstreams are today. For a review of stakeholder consultations during the design process, see Appendix 4.

Table 3: IP 2022 Design and Development Timeline

Timeline	GOI, ADB and WBG	Just Transition	SESA
March 2022	Scoping mission		
June 2022	Presentation and discussion of 3-Component approach to investment; Briefing to donors through the Friends of Indonesia Renewable Energy (FIRE) Dialogue post MDB joint mission.	(i) MoF agreed as lead ministry for SESA and Just Transition, namely through BKF (Fiscal Policy Agency within MoF). (ii) MoF to establish steering committees for national SESA and JT	(i) National SESA workplan agreed with key stakeholders (ii) Update stakeholder mapping and agree stakeholder engagement plan
July 2022	Project early screening	Data collection and in-country consultations	Baseline data collection and in-country consultations
Stakeholder Consultation on Plans to prepare Investment Plan (1 July 2022)			
August 2022	ADB and WBG discussions with GOI counterparts to refine project concepts (e.g., site selection, CFPP prioritization in roadmap to 2030 accelerated retirement).	Socioeconomic impact analysis, research, and stakeholder consultation, to support development of just transition approach.	Workshop with stakeholders, CSOs and NGOs to launch National SESA (9 August 2022).
September 2022	(as above)	(as above)	BKF agrees to members of National SESA Consultative Forum and Key Stakeholders
October 2022	MoF review of IP allocation and submission for CIF-TFC endorsement	JT approach for IP consulted with MoF, PT SMI and other ministries through FGD4	National SESA Scoping Workshop (4 October) SESA prospectus disclosed and feedback mechanism established for stakeholders on BKF website.
Stakeholder Consultation on Draft Investment Plan (3 October 2022)			
November and December 2022	I-JETP announced and CIF-TFC comments received	(i) Initiate JT capacity development with PLN, PT SMI and the GOI. (ii) Finalize research to support JT approach roll-out (ii) Finalize plant repurposing and/or mine closure roadmaps through stakeholder consultative process, incl. stakeholder engagement plan and communications strategy (iii) Conduct workshop with Mineral and Coal Directorate	

Timeline	GOI, ADB and WBG	Just Transition	SESA
January 2023		(DGMC) on planning and preparing a Just Transition Completed spatial mapping of coal assets as basis for further socioeconomic assessments in coal regions	Draft SESA Scoping Report prepared and disclosed to stakeholders (January 2023). National Workshop conducted on draft SESA Scoping Report with government and civil society stakeholders.
February 2023	I-JETP Secretariat established	Design of socioeconomic impact study on coal communities and revisiting of the regulatory review and stakeholder mapping in the sector Learning session with DGMC on land use and repurposing assessment tools	
March 2023	IP integrated CIF-TFC comments and brought in alignment with I-JETP	Finalization of socioeconomic impact assessment for CFPPs retirement and initiate assessment of cost of mitigation interventions	Scoping report to be finalized based on the feedback from stakeholders by 31 March and disclosed on BKF website by 30 April 2023
Q2 2023	MoF review of IP allocation and submission for final CIF-TFC endorsement	I-JETP Just Transition Working Group development of National Just Transition Framework and related deliverables.	Regional consultations to discuss energy transition scenarios and associated environmental and social impacts, risks, and opportunities (15-30 May 2023) National workshop on energy transition scenarios and assessment (30-31 May 2023)

ADB – Asian Development Bank, BKF – Fiscal Policy Agency (within MoF), CIF-TFC – Climate Investment Fund Trust Fund Committee, CFPP – Coal-fired power plant, FGD – Focus Group Discussion, GOI – Government of Indonesia, I-JETP – Indonesia Just Energy Transition Partnership, JT – Just Transition, MoF – Ministry of Finance, PLN – national electric utility, SESA – Strategic Environmental and Social Assessment, WBG – World Bank Group.
Source: ADB, WBG.

3.2 IP Crosscutting Priorities: Supporting Just Transition, Gender and SESA

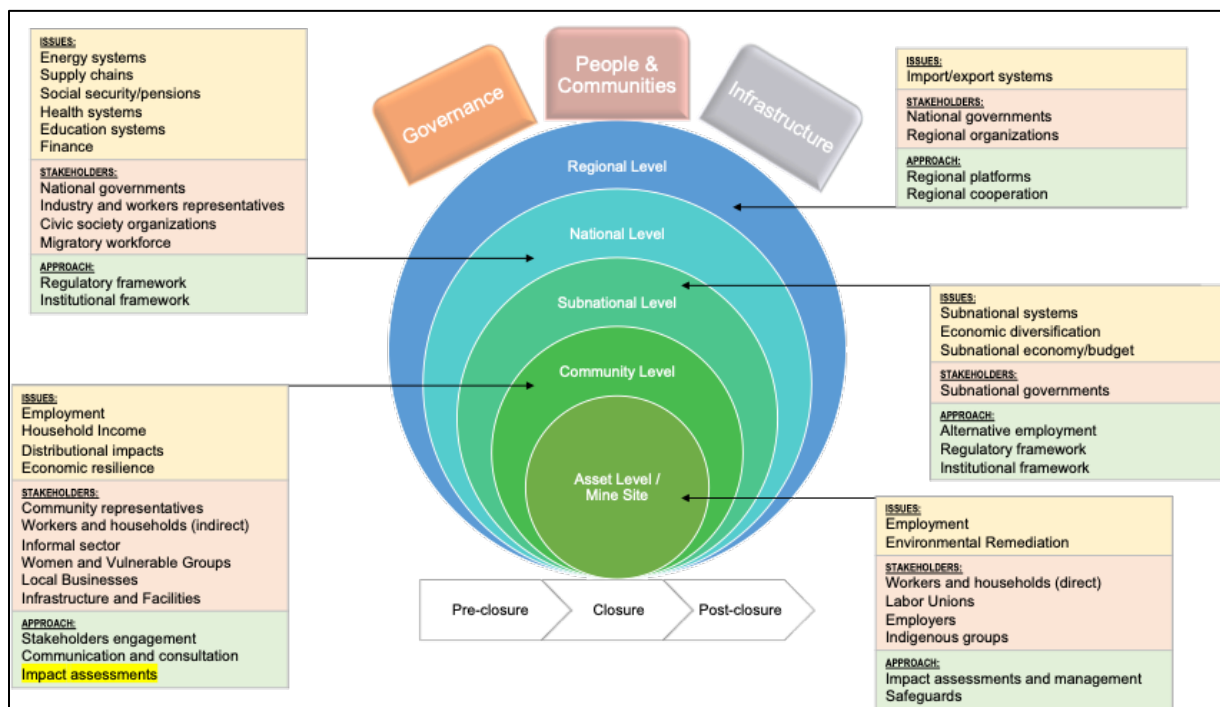
49. **Just Transition Framework.** Transitioning to an affordable, reliable, clean energy system while meeting growing energy demand is a development challenge leading to 2050. A Just Transition during a coal phase down must put people and the environment at the center, helping workers and communities build and access new economic opportunities in the transition to clean energy. Furthermore, it must ensure that communities most impacted by the transition have the support to create the plans, policies, and reforms that will strengthen the institutions; while

mobilizing investments needed to remediate the land, support impacted people in their post-transition jobs and lives, and build a new economic future.

50. Large parts of the local economy need to be restructured and/or substituted to replace the economic / financial impact of closures. Targeted activities are needed to strengthen programs for reskilling and education, active labor market policies, community driven development to implement local strategies, and undertake environmental remediation for repurposing of lands and infrastructure assets. Regional diversification and transformation to a new, lower-carbon economy in coal regions must leverage the human, natural and physical capital that is available there today, all set against the backdrop of good environmental remediation and land and asset repurposing activities, in alignment with the CIF-ACT mandate.

51. Proper planning across the three pillars of governance, people, and infrastructure well ahead of closure actions, is critical to understand how positive early interventions can strengthen the enabling environment for just transition to avoid or manage impacts at the time of asset repurposing. ADB and the WB have undertaken various assessments to inform the approach to just transition in the IP. The initial research and analyses underway provide a good understanding of the macro context for just transition in Indonesia, gaps in policy and institutional capacity that would be required to lead the transition. They highlight where deeper targeted assessment and analysis is required and what needs to be considered to ensure robust framework development (e.g., National Just Transition Framework, Just Transition Framework for Energy Transition in Indonesia, to be developed by PT SMI). For a detailed overview of the ongoing ADB and WBG activities supporting IP just transition, see Appendix 5.

Figure 11: Just Transition Framework



Source: Asian Development Bank.

52. **Gender mainstreaming in IP design.** The proposed IP includes several actions to ensure that women participate equitably and fully in the ongoing energy transition. This includes work on critical policies, regulations, standards, or codes that explicitly include gender and other social

factors. All projects will ensure that the mitigation of the coal transition on the majority of men employed in the sector does not ignore potential adverse impacts on women, which can lead to the reproduction of existing inequalities between men and women. Overall, gender mainstreaming activities would be incorporated into design of each individual investment project, in line with policy requirement of ADB and WBG. ADB, building on the findings of a national SESA consultation, will be conducting environmental and social impact assessment with dedicated gender and just transition analysis to deepen the understanding of the site-specific gendered impacts of coal plant early retirement, and develop action plans to address them. ADB will also continue ongoing efforts on broader capacity building for PLN, including conducting independent environmental, social, health and safety compliance assessments of targeted plants. Similarly, the World Bank and IFC will include Gender Action Plans into the design of investment projects. Gender would be specifically prioritized under the World Bank's Coal Repurposing and Just Transition Program (see Appendix 13).

53. In addition to gender mainstreaming, resources under WOLCOT Grant Mechanism would be tapped to prepare the groundwork for triggering a collective action to promote women's voices and empower their agencies to play a more critical part of decision-making processes in the transition dialogue. This work would be carried out as a collaborative effort between the MDBs and in close coordination with I-JETP Secretariat and engagement with the Ministry of Women Empowerment and Child Protection, as well as other development partners working on gender and energy transition in Indonesia. Broader consultations with stakeholders on the basis of the SESA findings will form an important foundation to further dialogue on the establishment of a women's coalition at a national scale.⁴⁹ The coalition should optimize available national frameworks and regional initiatives such as dialogue platforms and complement these to achieve the desired amplification of women's collective voices in a transition.⁵⁰ WOLCOT resources would be leveraged for capacity building programs for women-led organizations, cooperatives, and enhancing the capacity of existing women-led associations and coalitions in the energy sector, including renewables to enable them to participate in the policy dialogue. The resources would also be used to provide the seed to pilot women-led initiatives, which would be further scaled up through the investment projects.

54. **Strategic Environmental and Social Assessment (SESA) Approach.** Implementing a clean energy transition will provide many environmental and socioeconomic benefits and opportunities but may also present risks that could result in significant negative environmental and socioeconomic impacts, if not effectively assessed and managed. An initial IP preparation grant is supporting a Strategic Environmental and Social Assessment (SESA) to help ensure environmental and socioeconomic considerations are integrated in decision-making processes on energy transition, to make recommendations on improving the legal/regulatory and governance framework and to develop a Strategic Environmental and Social Management Plan (SESMP) outlining required implementation measures to mitigate identified impacts.

⁴⁹ Existing groups such as Women in Mining and Energy, Indonesian Women's Coalition, Women in Geothermal (WING) Indonesia Association play important roles in building women coalitions, collective action, and power to strengthen female involvement in the decision-making process of the energy transition. Their participation is critical to advancing the gender agenda in an accelerated coal retirement and RE scale up scenario. These stakeholders will continue to be engaged and invited to the SESA and just transition assessments to better formulate gender-just and inclusive frameworks and approaches planning of options, mitigation measures, and relevant livelihood restoration strategies.

⁵⁰ WOLCOT is a grant mechanism developed by CIF under the ACT program in FY2022. Its purpose is to enhance women's climate leadership and effective participation in the design, decision-making, and implementation of coal transition strategies and plans in the countries that are eligible for ACT.

55. The national SESA builds on the findings of a regional SESA scoping study undertaken by ADB between January and August 2022.⁵¹ The national SESA will assess the environmental and socioeconomic opportunities, risks, and impacts (positive and negative) associated with the CIF-ACT energy transition investments proposed up to 2030 and investments associated with the MEMR/PLN energy transition plan post 2030. The National SESA involves two phases: Scoping (July-November 2022) and Assessment (December 2022-June 2023). More details are provided in Appendix 6.

56. **SESA and Stakeholder Engagement.** Energy transition stakeholders comprise many groups with diverse interests and objectives. A Steering Committee for the SESA has been established, led by MoF with representatives from key Line Ministries/SOEs, CSOs/NGOs and academics. Stakeholder consultation is a fundamental principle of SESA to provide a platform to engage on energy transition issues and to identify differing views. Opportunities will be provided throughout the SESA process for stakeholders to present their perspectives on energy transition, to identify and validate key issues, and to comment on draft documents prepared for the SESA. This input will be through workshops, focus groups and key informant interviews undertaken at national to local levels. The SESA will integrate the outputs of stakeholder engagement with the work on just transition. An additional important consideration for the SESA will be the inclusion of a gender lens and evaluation of gender-related risks and impacts of energy transition implementation. Key findings of the regional SESA scoping study were presented at a workshop with key stakeholders during the launch of the national SESA on 9 August 2022 in Jakarta. Initial findings from the national SESA scoping study were discussed and refined with stakeholders in the SESA scoping workshop on 4 October 2022. A further workshop was conducted to consult on the draft national SESA scoping report on 26-27 January 2023. A series of regional workshops are also planned for May 2023. Two further national workshops are planned: (i) the first in May to consult on the objectives, scenarios, and impact assessment and the second in June to consult on the SESA and SESMP draft report with a view to finalizing by August 2023.

3.3 IP Financial Plan and Instruments

57. The IP financial plan is set out in Table 4. Activities under Component 1 will enable the early retirement of 2-3 GW of both PLN-owned and privately-owned CFPP assets and the related financial implications of existing debt, termination of contracts and closure preparedness. This stage secures the commitment for early retirement. Activities under Component 2.1(a) will focus on the dismantling, remediation and repurposing of PLN-owned CFPPs, looking at various replacement technologies such as battery storage, solar photovoltaic (PV), and other technologies that can provide ancillary services. Specific assets considered for repurposing under Component 2.1(a) could include, but may not be limited to, the assets targeted for early retirement under Component 1.1(a).⁵² Component 2 will also include repurposing activities of closed mine sites⁵³ and activities that will support the just transition. These include community-driven economic diversification projects (Component 2.1(b)); a private sector repowering and storage program (Component 2.2) and reskilling of the relevant workforce to support renewable energy development (Component 2.3). While activities under Components 1.1(a) and Components 2.1(a) may be naturally sequenced, it is expected that other activities will happen in parallel.

⁵¹ ADB. 2022. *Regional: Accelerating the Clean Energy Transition in Southeast Asia: Regional Scoping Report for Strategic Environmental and Social Assessment Applied to the Energy Transition Mechanism in Southeast Asia. Technical Assistance Consultant's Report.* Manila. <https://www.adb.org/sites/default/files/project-documents/55124/55124-001-tacr-en.pdf>

⁵² A preliminary list of CFPPs considered for repurposing is presented in section 2.3.

⁵³ Pilot projects for coal mine repurposing will be identified during project preparation.

Overall, the IP is designed to align to ACT priorities with approximately ~5% of ACT funds dedicated to governance results, ~25% of ACT funds for people and communities and ~70% of ACT funds flowing to infrastructure. The Component-level allocation range in Table 4 reflects the evolving designs of the underlying projects and likely allocation within each component to be presented to the CIF-TFC during project-level approvals. This IP will cover CFPP retirement from enabling policies and financial incentives to asset-level retirement and repurposing. The program design considers just transition issues along the entire value chain, induced impacts in the economy, as well as enabling activities that can support Indonesia to capitalize on energy transition opportunities.

Table 4: Indicative Financing Plan (\$ Million)

#	Component	MDB Sector	ACT	MDB	Other/ Private	GoP ^a	TOTAL	Pillars		
								Governance	People & Communities	Infrastructure
Component 1: Accelerated Retirement of Coal Plants								[3-7%, \$7-18]	[10-25%, \$25-63]	[68-87%, \$169-217]
1.1	State-owned CFPP early retirement		149	632	750	1,112	2,643			
	a. PLN early retirement program	ADB Public	50	530	600 ^b	612 ^c	1,792	✓	✓	✓
	b. PT SMI early retirement program	ADB Public	98 1 (grant)	102	150	500	851		✓	✓
1.2	Private CFPP early retirement program	ADB Private	100	400	300 ^d	N/A	800		✓	✓
Component 2: Repurposing, Repowering and Just Transition								[2-5%, \$5-13]	[20-35%, \$50-88]	[60-72%, \$150-180]
2.1	Repurposing and Just Transition Program (Phase 1 & 2)	WB Public	192	748	0	[160]	1,100			
	a. CFPP Site Repurposing		125 5 (grant)	620	0	[150]	900	✓	✓	✓
	b. Just Transition in Coal Regions		57 5 (grant)	128	0	[10]	200	✓	✓	
2.2	RE Repowering Program (on + off grid)	IFC Private	50	140	200	N/A	390		✓	✓
2.3	Reskilling for RE (Prime STeP)	ADB Public	9 (grant)	139	0	21	169		✓	
TOTAL			500	2,059	1,350	1,293	5,102			

Note: CFPP = Coal-fired Power Plant, RE = Renewable Energy.

Source: ADB, GOI (Ministry of Finance, PLN, PT SMI, Ministry of Education, Ministry of Energy and Mineral Resources) and WBG.

^a GOI contribution figures subject to further discussion of program or project needs as well as annual budget approvals or endorsements. These numbers do not include broader MoF corporate support for implementing agencies such as PLN and PT SMI.

^b Not inclusive of more than US\$2 billion private sector mobilization for RE replacement power.

^c To be determined post market sounding.

58. **Financial instruments.** Projects benefiting from the public sector lending terms will follow the financial terms and conditions for public sector concessional loans for ACT financing. As of the second quarter of fiscal year (FY) 2023, the public sector concessional lending terms for Indonesia are as follows (Table 5). Lending rates follow International Development Association (IDA) terms and are determined based on IDA effective service charge rate in the FY quarter. The effective CIF lending rate for public sector projects will be determined and fixed at the time of loan agreement.

59. For private sector projects, MDBs will seek to retain flexibility (in terms of approach, project selection, and application of CIF funds) to accelerate implementation and maximize impact on both a project-by-project and IP-wide basis most effectively. The financial instruments (e.g., concessional senior and subordinated debt), pricing and terms of the concessional funds will be tailored for each individual transaction to address the specific needs of each project, while adhering to the DFI Enhanced Blended Concessional Finance Principles for Private Sector operations, as applicable.

Table 5: Climate Investment Fund Public Concessional Loan Lending Terms (FY23 Q4)

CIF Country (Lending terms for Public Sector)	IDA-only Regular Service Charge (as of FY-23 Q4) [A]	Applicable percentage of IDA-only Regular Service Charge [B]	Applicable CIF Lending Rate (as of FY-23 Q4) for Tier 3 countries [C=A*B]	Maturity (years)	Grace period (years)	Principal repayments
Philippines/Indonesia/India [for USD] TIER 3A	1.31%	75%	0.98%	Up to 20	8	Equal semi-annual installments after grace period
Philippines/Indonesia/India [for USD] TIER 3B	1.31%	90%	1.18%	Up to 30	8	Equal semi-annual installments after grace period

FY = fiscal year, Q = quarter.

Source: World Bank. IDA Financial Products. Lending Rates and Fees.

<https://treasury.worldbank.org/en/about/unit/treasury/ida-financial-products/lending-rates-and-fees>

Note: Tiering refers to Indonesia’s pricing status for CIF as a lower middle-income country still qualifying for development assistance.

60. **Financial imperative.** The IP is structured to provide concessional financial support to key stakeholders while fostering opportunities for crowding-in financing from both the public and private sectors to address a unique stalemate situation whereby:

- There is oversupply in the largest demand center of the country till the end of this decade, which makes it hard for new renewable energy capacity to make inroads.
- PLN, as a national utility, has a 16 GW CFPP fleet and can continue to operate its plants under current financial terms unless otherwise incentivized as they are compensated on a cost-plus basis (i.e., the MoF pays a subsidy to PLN to ensure it is fully compensated for its annual operating costs, inclusive of a minimal predetermined return).
- CFPPs owned by IPPs operate with strong, bankable long-term PPAs with fixed tariffs ensuring a fixed return to sponsors, and do not suffer from “stranding” pressure. As such, without an actual financial incentive, no amount of political will would be sufficient to accelerate the first set of CFPP retirements and repurposing projects and initiate the transformational change required for the transition from coal-to-clean energy.

3.4 Component 1: Accelerated Retirement of Coal-fired Power Plants

61. While the GOI is increasingly moving toward cleaner forms of energy, legacy infrastructure development programs and energy access priorities mean that coal-fired power still features prominently in the electricity mix. Positive change is already happening, but not yet at the required scale or pace. In Indonesia especially, the average age of the CFPP fleet is 11.9 years. If not retired from operation, the CFPPs fleet will remain for decades—blocking meaningful pathways to reduce emissions and make space for renewable energy. Furthermore, it is evident if emissions from existing CFPPs are not addressed, Paris Agreement targets will not be met. *To this end, Component 1 Projects are designed to accelerate the retirement or repurposing of qualified CFPPs ahead of schedule while ensuring just transition considerations are taken into account by*

using concessional climate finance to support project operators absorb the early termination of revenue flows and repurpose resources for energy transition.

62. **Project 1.1 (a) – PLN early retirement program.** The overall objective of the Results-Based Loan to PLN is to help PLN accelerate the development of renewable energy as an alternative source of electricity supply to reduce electricity supply from CFPPs. The first phase of this RBL program (US\$50m CIF-ACT, US\$530m ADB, US\$300m KfW, US\$300m AFD) will focus on activities and expenditures on (i) increasing the share of electricity supply from renewable energy sources (i.e., main driver being the termination of operations and retirement of ~1-2 GW of highest polluting CFPPs before 2030, as well as cancellation of PPAs for planned CFPPs); (ii) expanding the transmission grid infrastructure; and (iii) strengthening PLN institutional capacity to manage the energy transition including just transition considerations for its own workers as well as people and communities. PLN has already shortlisted 9 candidate CFPPs in Java-Bali grid slotted for retirement by 2030. ADB undertook a socioeconomic impact assessment of these 9 plants to understand potential direct, indirect and induced impacts from retirement, and the results will be used to support PLN on just transition as well as to inform the development of the national framework in cooperation with government and PT SMI. Further research and analysis are ongoing, examining the potential for economic diversification, capacity of the education system to support just transition, as well as potential costs associated with mitigating measures. The RBL is also an opportunity to promote broader institutional change throughout PLN, support activities such as workforce and skills planning and integration of just transition into ESG, paving the way for further accelerated retirements in the coming decade.

63. **Project 1.1 (b) – PT SMI early retirement program.** ADB proposes to provide a financial intermediation loan (FIL) (US\$98m CIF-ACT, US\$1m CIF-ACT grant, US\$102m ADB, commercial financing US\$150m, US\$500m GOI) to PT SMI with two components.

- The first component, the Accelerating Coal Retirement Facility (ACRF), will provide debt financing to support the accelerated retirement of PLN-owned CFPPs. ADB's FIL, a CIF-ACT loan and financing from commercial lenders will be blended with the Government Investment Fund (Operator Investasi Pemerintah, OIP) contributing to ACRF, which may be established as a trust fund within PT SMI. ACRF is envisaged to complement SDG Indonesia One Green Finance Facility (SIO-GFF), which is supporting the development and financing of renewable energy projects.⁵⁴ It will be used to invest in ETMCP initiatives such as an “asset spin-off scheme” whereby PT SMI provides (i) an investment loan (debt) to a sponsor or special purpose vehicle (SPV) of a CFPP (a previous PLN asset, now IPP to be spun off and/or repurposed) whose power purchase agreement (PPA) term will be decreased (i.e., early retirement); and/or (ii) equity through acquisition of majority shares of the CFPP's SPV, thereby shortening the operational and economic life of the CFPP and contributing to the reduction of carbon dioxide emissions. It is important to note that while the project entails both a debt and equity investment, the ACRF will only go towards the investment loan (i.e. debt). PT SMI will be sourcing equity funding from other budgets internally.
- The second component will be a US\$1 million CIF-ACT grant for an ADB technical assistance to be designed and deployed ahead of the ACRF to support the “Implementation Guidelines of Just Transition Framework for Energy Transition.” This involves translating the requirements of the National Just Transition Framework developed by the I-JETP Just Transition Working Group for the context of PT SMI as the ETM Country Platform and lead financier of energy transition activities for the GOI and to build the capacity of PT SMI to implement and monitor the framework. Funds deployed in 2023-2024 will be used to provide

⁵⁴ ADB. Indonesia: Sustainable Development Goals Indonesia One - Green Finance Facility (Phase 1). <https://www.adb.org/projects/54152-001/main>.

requisite staffing and the development of ETMCP-specific implementation guidelines. The PT SMI ETMCP Just Transition Implementation Guidelines will take the national framework one step further by stipulating requisite audit, mitigation, monitoring and evaluation requirements, as well as financial and legal obligations at the asset-level. It will also develop a feedback mechanism to allow for challenges and gaps in implementation to promote adjustments at the national level. Overall, the grant will build on early support ADB has provided to MoF and PT SMI on just transition and may include further analytical work to support the further design and adjustment of the framework as required. This can be complemented by support under ADB's Just Transition Support Platform⁵⁵ including support for policy dialogue and stakeholder engagement.

64. **Project 1.2 – IPP CFPP early retirement program.** ADB has been canvassing the market by engaging with IPPs that are interested in early retirement of CFPPs. ADB proceeded to sign nondisclosure agreements with IPPs and is pursuing discussions accordingly. The first proposed project in the program would involve a US\$300 million refinancing (US\$50m CIF-ACT, US\$250m ADB) under a commitment to retire the CFPP several years before the end of the PPA (i.e., accelerated retirement). Just transition requirements are integrated into the proposed project, recognizing that the IPP will need to coordinate with government on the issue. CIF-ACT concessional financing terms will be reviewed in accordance with other private sector projects as the project structuring is finalized. Through the proposed refinancing, the first project aims to open the pathway for further coal-fired IPP early retirements by demonstrating the tangible willingness of PLN and the broader GOI to operationalize the CFPP early retirement roadmap.

3.5 Component 2: Repurposing, Repowering and Just Transition

65. International best practices for coal plant closure have shown that a phased deployment of public concessional resources is needed for these projects as the projects aim to address structural impediments to the energy transition and coal phase down, and cover costs to dismantling, remediation and repurposing, including just transition costs, that are not able to be recouped through future revenue flows. In the case of Indonesia, technical studies by the World Bank have indicated that the coal plants likely to be retired first are most suitable to be repurposed with technologies that add grid flexibility and storage options, which will require public funding. Therefore, Component 2 projects are designed towards repurposing of closed coal plants and mines, as well as repowering in co-located or off-grid areas, and just transition, reskilling and jobs programs.

66. **Project 2.1 – Repurposing and Just Transition Program (Phase 1 & 2).** The WB aims to support the government and PLN (US\$182m CIF ACT, US\$10m CIF ACT grant, US\$748m IBRD) with the repurposing of closed coal plants comprising: (i) demolition, rehabilitation, and reclamation of land from sites of closed CFPPs; (ii) development of renewable energy, storage, and ancillary services; and (iii) mitigating economic and social impacts and developing pilot economic diversification projects in coal regions.

67. **2.1 (a) CFPP Repurposing.** The WB will target sites selected for early retirement and closure by PLN for dismantling, remediation and repurposing through a just transition. In addition to removal of regulated materials, structural demolition, remediation, and restoration of a site suitable for beneficial use, this repurposing component will look at different possible technologies,

⁵⁵ ADB. 2022. ADB Launches Just Transition Support Platform. News Release. 14 November. <https://www.adb.org/news/adb-launches-just-transition-support-platform>

such as solar plant for energy; biomass plants for both energy and capacity; pumped hydropower or battery storage for providing frequency control ancillary services, energy storage, and capacity; and synchronous condensers for delivering reactive power and inertia. While PLN has not yet reached a final decision on the specific assets which will first be decommissioned and repurposed, the World Bank is undertaking electrical and planning studies on the CFPPs that are being considered by PLN for early retirement before 2030. CFPPs with earliest retirement dates are Suralaya and Paiton. World Bank analysis indicates that dismantling and repurposing of the oldest generating units (*Suralaya 1 and 2, Paiton 1*) is expected to be viable post 2024, helping avoid operations and maintenance costs and enabling greater use of Renewable Energy (RE) generation and more efficient CFPPs. *Suralaya* units 1 and 2 could be repurposed into a flexibility center comprising of Battery Energy Storage Systems (BESS) and SYNCON with significant benefits to the grid and PLN; the *Paiton1* generating unit could be reconverted to run on biomass after determining the technical and economic viability of reconversion.

68. **2.1 (b) Just Transition in Coal Regions.** The World Bank has been in dialogue with GOI and mining industry to identify sites in coal regions, which can support Just Transition demonstration projects, providing critical learning opportunities. This activity will strengthen local capacity for economic diversification and just transition in Indonesia's coal-dependent areas through upstream investments in three areas: (a) local development planning and infrastructure to fill critical service gaps and create enabling conditions for economic diversification; (b) skills, livelihoods, and entrepreneurship activities to equip local workers, communities, and businesses to thrive in a diversified economy; and (c) community outreach and citizen engagement activities to promote stakeholder dialogue, social risk management, and citizen oversight on the transition process. The World Bank is also looking at specific closed coal mining areas for potential rehabilitation and repurposing, for example, into renewable energy.

69. **Project 2.2 – RE Repowering program (on-grid and off-grid).** Under this Component, the CIF-ACT funds will be utilized to facilitate private sector financing into a pipeline of RE+Storage projects which would explore the removal of on-grid coal plants, disincentivize captive coal plants for off-grid usage, and also promote sustainability-linked loans to private energy companies seeking to decarbonize their generation fleet. By targeting grids which have a high percentage of coal plants that are suitable for early retirement, IFC is looking for ways to rapidly scale up the dispatchable RE to drive down the costs and demonstrate a path to repowering decommissioned CFPPs at scale. IFC is also engaging with IPP clients that develop power generation assets to serve commercial and industrial consumers (e.g. manufacturing, logistics, etc.). IFC would support these players, who would otherwise develop thermal plants, in pursuing renewable energy generation sources instead – such as solar, batteries, hydropower, and even assist the private sector in exploring new technologies such as hydrogen for off-grid power. For the effective utilization of concessional funds and providing targeted support to high impact projects, IFC is exploring various financing structures, including traditional project finance approach and sustainability-linked financing. The latter is designed to incentivize the borrower's decarbonization targets which are Paris-aligned. To avail of this form of funding, the projects would need to demonstrate clear targets, and corporate-level commitment, in order to have line-of-sight toward coal retirement.

70. **Project 2.3 – Reskilling for RE (Prime STeP).** The Promoting Research and Innovation through Modern and Efficient Science and Technology Parks Project (PRIME STeP) project supports the longer-term energy transition with a focus on higher education and other human resource development as part of a just transition. The ADB project (US\$9m CIF-ACT grant, US\$138.52m ADB) intends to support R&D, innovation facilities, improving the innovation ecosystem, and strengthening the institutional capability of science and technology parks

operating under the nation's premier higher education institutions. The project will strengthen knowledge base in the deployment of new technologies including those which accelerate green transition. The project will also provide workers with the means to access new skillsets necessary to work in the clean energy sectors. The ADB technical assistance, supported by CIF-ACT, will seek to expand the existing engagement scope through (i) establishing clean energy training facilities for research and training purposes; (ii) training 500 Technical and Vocational Education and Training (TVET) teachers and higher education teaching faculties in new curriculum for clean energy transitions; (iii) training 1,000 workers in the fossil fuels energy (including those at PLN) in new renewal energy skillsets; (iv) developing the PRIME STeP Applied Research Program by supporting students' startup companies with innovative solutions to accelerate transition to clean energy; and (v) developing the one clean energy transformation map identifying the economic value chain and corresponding jobs demand and skills supply in Indonesian labor market with respect to a just energy transition. The project also serves to demonstrate the importance of mobilizing investment in key non-energy sectors (e.g., education, health) aligned with national energy transition planning to contribute to a just transition. The PRIME STeP project was approved on 8 December 2022 and became effective on 23 January 2023.

4 Additional Development Activities

71. **Just Energy Transition Partnership (JETP).** At the UNFCCC COP26 in November 2021, the governments of South Africa, with France, Germany, UK, US, and EU—together forming the International Partners Group (IPG)—announced JETP to support South Africa’s decarbonization effort in the context of domestic climate policy, including transitioning its economy toward cleaner energy sources. Chaired by the United Kingdom, the IPG undertook to mobilize an initial amount of \$8.5 billion over the next 3-5 years.

72. Subsequently, In Bali, Indonesia in November 2022, at the G20 Leaders’ Summit, Indonesia and leaders of the IPG, co-led by the United States and Japan, and including Canada, Denmark, the European Union, France, Germany, Italy, Norway, and the United Kingdom, alongside the GFANZ Working Group, launched a partnership in support of ambitious new targets for Indonesia’s just energy sector transition (Paragraph 3). To achieve these targets, an initial \$20 billion in public and private financing over a three-to-five-year period will be mobilized and deployed through the coordination of the I-JETP Secretariat (Paragraph 28). The Secretariat, hosted in the MEMR and supported by the ADB, was established in February 2023 and will serve as the coordinator for internal and external stakeholders on the I-JETP.

73. **GOI energy sector collaboration across development partners.** The GoI’s principal development partners in the energy sector are the ADB, WBG, Japan International Cooperation Agency (JICA), and German development cooperation through KfW. The Governments of New Zealand, the United Kingdom, and the United States also provide support to the government on energy. ADB’s policy-based loans for the Sustainable and Inclusive Energy Program have been the key tool for development partner coordination in Indonesia from 2015–2020. This dialogue includes the French Development Agency, JICA, KfW, Korea Exim Bank, and the World Bank. In 2019, the United States Agency for International Development started a wider development partner coordination meeting on energy, which it aims to hold biannually, and which included additional bilateral actors such as Denmark, and the Association of Southeast Asian Nations Centre for Energy. Regarding geothermal energy development, a focused development partner coordination mechanism has been in place since 2015, which brings together the key geothermal development partners, including ADB, French Development Agency, JICA, KfW, New Zealand, the United Kingdom, and the World Bank every 6 months. Key loans, grants, and technical assistance programs by the main energy sector development partners are on Table 6.

Table 6: Summary of Additional Development Activities

Development Partner	Project Name	Duration	Amount (million)
Energy			
ADB	Sustainable and Inclusive Energy Program, Subprogram 3	2018–2022 (pending)	\$500.0
	Sustainable and Reliable Energy Access Program	2021–2025	\$600.0
	Sustainable Energy Access in Eastern Indonesia: Electricity Grid Development Program (Phase 2)	2020–2025	\$600.0
	Geothermal Power Generation Project	2020–2024	\$335.0
	Sustainable and Inclusive Energy Program, Subprogram 2	2015–2017	\$400.0
	Sustainable Energy Access in Eastern Indonesia: Electricity Grid Development Program	2017–2021	\$600.0
AFD	Sustainable and Inclusive Energy Program, Subprogram 1	2015–2017	€140.0
	Sustainable and Inclusive Energy Program, Subprogram 2	2017–2018	€100.0
	Green Credit Line I	2015–2019	\$100.0
	Green Credit Line II	2020–2023	\$150.0

JICA	Hululais Geothermal Power Plant Project	2015–2021	\$6.0
KfW	Result-based Loan Sulawesi Nusa-Tenggara	2020–2024	€255.2
	Sustainable Hydropower II	2018–2026	€225.0
	Sustainable Hydropower I	2017–2025	€85.0
	Sustainable and Inclusive Energy Program, Subprogram 2	2017–2018	\$220.0
	1,000 Islands Renewable Energy for Electrification Program Phase 2	2018–2026	€69.7
	Geothermal 1, Kamojang Rehabilitation	2015-2021	€60
	Geothermal 1, Ulumbu and Mataloko Development	2018-2026	€150
World Bank Group	Development of Pumped Storage Hydropower in Java-Bali	2021–2027	\$610.0
	Indonesia Geothermal Resource Risk Mitigation Project	2019–2029	\$325.0
	Indonesia's Infrastructure Finance Development	2016–2022	\$8.3
	Geothermal Energy Upstream Development	2017–2025	\$50.0
	Power Distribution Development Program	2016–2020	\$920.0
	Indonesia Energy Sector Development Policy Loan	2015–2016	\$500.0
	Indonesia Second Power Transmission Development Project	2013 - 2019	\$138.0
	Geothermal Clean Energy Investment Project	2011 - 2018	\$175.0
	Pumped Storage Technical Assistance Project	2011 - 2021	\$620.0
	Indonesia Power Transition Development Project	2010 - 2019	\$225.0
ADB = Asian Development Bank, AFD = Agence Française de Développement (French Development Agency), JICA = Japan International Cooperation Agency, KfW = Kreditanstalt Für Wiederaufbau (German Development Bank).			
Source: Indonesia Country Pipeline Meeting. 2022. Jakarta.			

74. **Captive power working group.** With respect to captive power intentions outlined in Paragraph 6 and 26, ADB is collaborating with the U.S. Agency for International Development (USAID) (and affiliated agencies) to: (i) establish a shared understanding of the current installed capacity of captive coal; (ii) identify captive coal power assets that are looking into more sustainable alternatives; and (iii) study and demonstrate the near-term and mid-term alternatives available to industry currently located off-grid. The collaboration will formalize and broaden to include other key development partners, as well as GOI stakeholders such as MEMR, once the I-JETP working groups identify tangible next steps.

5 Implementation Potential with Risk Assessment

75. Table 7 presents a summary of risk, mitigants and implementation potential assessments for the CIF-ACT Indonesia IP as proposed.

Table 7: Implementation Potential and Risk Summary

RISK	MITIGATION	RESIDUAL RISK
<p>Macroeconomic Instability: Prior to the COVID-19 pandemic, the trend in the value of the rupiah versus the United States dollar, and commodity prices for Indonesia’s main exports, with the exception of gold, was downward. Nevertheless, real GDP had been growing at about 5% annually. COVID-19 resulted in a decline in real GDP growth to –2.0% in 2020, followed by an increase to an average of 4.5%–5.3% in 2021 as aggregate demand recovered and stabilized.^a A prolonged pandemic and the Russian invasion of Ukraine may result in continued low or negative GDP growth and lower domestic and foreign currency revenues, entailing risks to macroeconomic and fiscal stability.</p>	<p>The GOI is instituting structural policy reforms to support growth and to reduce reliance on near term macroeconomic stimulus.</p> <p>ADB and the World Bank is providing economic and financial advice and analytics as well as sovereign lending to support an inclusive and sustainable pandemic recovery, continued growth and broad fiscal stability.</p>	<p>Low</p>
<p>Institutional: Better coordination across agencies will be pivotal for the smooth implementation of a clean energy transition, especially with respect to the issuance of corresponding implementing regulations by various agencies in line with recent policy reforms as well as collaboration for multifaceted just transition approaches.</p>	<p>Recent RE regulation, together with the RUPTL 2021-2030, provides a clearer mechanism and pathway for MoF, CMMA, MEMR, MSOE and PLN coordination with respect to coal phase-out and renewable energy scale up.</p> <p>Agency coordination will be further enhanced by the extent to which a clear list of retirement assets is identified by the Early Retirement Roadmap, to be issued by Ministerial Regulation by mid-2023.</p> <p>The I-JETP Secretariat and PT SMI ETMCP will further serve as coordination vehicles for all energy transition activities.</p> <p>ADB upcoming Affordable and Sustainable Energy Transition Program (ASET 1 – 2023) will help build policy cohesion and strengthen implementation capacity.</p>	<p>Low</p>
<p>Policy and Regulatory Framework: Clarity of policies and implementing regulations related to energy transition.</p> <p>In addition, given the ongoing global energy crisis and the war in Ukraine, there is a risk of policy reversal and increased reliance on coal.</p>	<p>The World Bank is leading the Policy Working Group under JETP, which also comprises ADB, USAID Sinar, UK Mentari, and IEA. The policy working group will propose a series of policy recommendations on key topics to achieve the JETP goals, including around local content and local manufacturing of RE components, PPAs and procurement, supply-side incentives, licensing and permitting, and other enabling policies. The recommendations will form part of the Comprehensive Investment and Policy Plan</p>	<p>Medium</p>

RISK	MITIGATION	RESIDUAL RISK
	(CIPP) to be endorsed by the Government of Indonesia and the International Partners Group.	
<p>Technology: As energy transition plans remain in early implementation stages globally, new technology solutions (cost, design and application) for CFPP repurposing and RE scale up (i.e., integration of storage and hybrid solutions) presents ongoing uncertainty.</p>	<p>There is a growing body of research^b to support energy transition decision-makers (i.e., PLN, IPPs) with widely accepted methodologies to assess the most efficient, economic, and just options for consideration. While potential technology options continue to evolve, the projects and programs under the IP are taking the evolving context into account in project design and governance.</p>	<p>Low/Medium</p>
<p>Private Sector Engagement:</p> <p>CFPP early retirement: Active private sector engagement in CFPP early retirement has been hindered by: (i) lack of precedent; (ii) limited access to finance given lack of inclusion in prior green finance taxonomy; and (iii) uncertainty about what early retirement entails from a financial, contractual or just transition cost standpoint.</p> <p>RE: Active private sector engagement in RE has been hindered by (a) limited tenders with invitations to prequalify issued only periodically; (b) lack of transparency in the tender process with the results often not published; (c) lengthy licensing and permitting procedures; and (d) local content and supply chain challenges that increase investment cost in an environment where renewables must prove competitive and affordable in the local context.</p>	<p>The support for the development of a precedent transactions under Component 1.1 (b) and 1.2 will be critical to reduce uncertainties on contractual and cost implications, and to clarify abatement calculation methodologies as well as definitions for upcoming transition finance taxonomy discussions.</p> <p>Recent regulation has introduced greater clarity on tendering mechanisms and timelines (with MEMR holding PLN accountable for mandated deadlines) and tariff regimes. Uncertainty remains with respect PPA bankability (especially with implementation of storage and hybrid solutions), but the WBG and ADB continue to provide extensive guidance on market expectations and international best practice.</p> <p>Recent auctions have demonstrated the potential for lower prices for RE and this trend is only expected to continue and lead to improved project financing prospects. Should project sponsors and IPPs be able to resolve initial contractual uncertainties and local content hurdles (to be address under I-JETP local content roadmap), there will be strong financing interest.</p>	<p>Medium</p>
<p>Livelihood and Community risks from a clean energy transition:</p> <p>A just transition can help countries achieve their climate ambitions while enhancing their ability to manage natural resources sustainably, increase energy efficiency and reduce waste, while also promoting social justice and addressing poverty, inequality, and gender gaps. Just Transition is an approach that is used to avoid and mitigate any risks of implementing climate change efforts that are not well prepared and managed. Therefore, the <u>risks</u> lie in the</p>	<p>The I-JETP Just Transition Working Group activities includes a comprehensive approach to just transition, including development of a just transition framework to anticipate and mitigate key aspects that can pose huge challenges in an energy transformation process.</p> <p>Following the development of the National Just Transition Framework, Government of Indonesia (through PTSMI) will be supported by ADB to develop and adopt an implementing guideline of the National Just Transition Framework for PTSMI to cover the upfront planning pre-closure through to long-term transformation aligned with the CIF-ACT pillars,</p>	<p>Medium</p>

RISK	MITIGATION	RESIDUAL RISK
<p>implementation of climate change policy and processes <u>without</u> the inclusion of a just transition framework.</p> <p>If climate mitigation efforts are not carefully managed through a just transition approach, economic changes could result in increased social inequality, worker disillusionment, strikes or civil unrest and reduced productivity, as well as less competitive businesses, sectors and markets (ILO, 2015).</p> <p>Just transition requires cross government coordination on policies and regulations as well as how to ensure just transition is integrated into implementation of climate policy.</p>	<p>and considering institutional capacity and governance, people, workers and communities, environmental rehabilitation and land, asset, infrastructure repurposing.</p> <p>Comprehensive preparatory work to understand the three dimensions of the framework with support by ongoing stakeholder dialogue will deliver: (a) economic restructuring, resulting in the preparation of displacement of workers and possible job losses and job creation attributable to the greening of enterprises and workplaces; (b) increased capacity of enterprises, workplaces and communities to adapt to climate change to avoid loss of assets and livelihoods and involuntary migration; and (c) protection against adverse effects on the incomes of poor households from higher energy and commodity prices.</p> <p>The World Bank is also working on a Just Transition Roadmap and will pilot a just transition economic diversification project under the CIF-ACT, as well as continue to support Gol on incorporating gender and community level stakeholder consultation in its energy transition.</p>	
<p>Environmental and Social impacts: Lack of continuity for environmental and social safeguards management, thin domestic market for environmental and social expertise, and inadequate assignment of resources as well as weak integration of environmental and social processes at institutional level may limit capacity to manage complex projects (e.g., closure of CFPPs, decommissioning, repurposing and impact assessment of new renewable technologies). CFPP legacy issues may be complex to address.</p>	<p>PLN, PT SMI, MEMR and other key counterparts' commitment to assign sufficient and dedicated resources and integrate environmental and social safeguard processes in project management.</p> <p>MDB support programs to continue to address institutional and capacity gaps.</p> <p>Comprehensive due diligence, stakeholder engagement and participatory planning of mitigation measures.</p>	Medium
<p>Limited Scale-up and Replication: Challenge of designing replicable demonstration or pilot projects</p>	<p>With respect to working with PLN, PT SMI, MEMR and other key counterparties, the IP has factored in strong support for capacity development and knowledge transfer to ensure replicability and scalability within each agency and across agencies.</p> <p>Initial dialogues with counterparts in the mining sector, both government and the industry had signaled strong support for the design of pilot projects that reflect the implementation of the Just Transition approach. This exercise will help build ownership of and better dialogue between national and subnational governments to replicate just transition projects across the nation and better prepare themselves for the oncoming transition.</p>	Medium

RISK	MITIGATION	RESIDUAL RISK
	<p>With respect to private sector interventions for coal phase out, the first project will be designed to address “initial viability” concerns. The first project aims to be a pathfinder project, allowing ADB and other institutions to collect practical knowledge about the full suite of considerations in the design and planning of early retirement. Concessionality will be critical to maximize accelerated retirement and compensate for the additional engagement with PLN, MEMR, MoF, IPP advisors and the like to establish a roadmap for other CFPP IPPs.</p> <p>For RE IPP scale up, private sector financing will be designed in line with prior CIF/ CTF programs, with a view to demonstrate clear pathways to sustainability.</p>	
<p>Project Readiness: Extent to which projects have been approved as part of GOI budget and/or been tendered, awarded, or mandated (for private sector).</p>	<p>CFPP early retirement projects to be considered under the PLN RBL and for Repurposing Investment are all to be selected from a shortlist of assets to be approved by PLN and MEMR (as well as MSOE and MoF) directly. Engagement with PLN and MEMR has been underway since May 2022 and processing for RBL is already underway in 2023.</p> <p>On the mining side, discussions with relevant parties in the government (DG Mineral and Coal of MEMR and Coordinating Ministry of Maritime and Investment) are underway, including propositions for site selection. The approach to tackle closure issues here is understandably delicate in nature considering the still lucrative coal business; nevertheless, there is a forward-looking view to prepare for a coal transition in West Sumatra and East Kalimantan.</p> <p>ADB discussions with the PT SMI and MoF under the selected modality are already underway for 2024/2025 project processing.</p> <p>IPP CFPP early retirement program has first project MOU announced at G20 and due diligence is underway.</p>	<p>Low</p>

ACT = Accelerating Coal Transition, ADB = Asian Development Bank, CFPP = coal-fired power plant, CIF = Climate Investment Fund, CMMA = Coordinating Ministry for Maritime and Investment Affairs, COVID-19 = coronavirus disease, DG = Directorate General, FIL = financial intermediation loan, G20 = Group of Twenty, GDP = gross domestic product, GOI = Government of Indonesia, I-JETP = Indonesia Just Energy Transition Partnership, IPP = independent power producer, MEMR = Ministry of Energy and Mineral Resources, MOEF = Ministry of Environment and Forestry, MoF = Ministry of Finance, MOU = memorandum of understanding, MSOE = Ministry of State-Owned Enterprises, PLN = Perusahaan Listrik Negara (State Electricity Corporation), RE = renewable energy, RUPTL = PLN Medium Term Business Plan, TA = technical assistance.

^a World Bank. 2020. *East Asia and the Pacific in the time of COVID-19*. Washington, DC.

^b Shrimali, Gireesh; Jindal, Abhinav. 2021. *Coal Plant Repurposing for Ageing Coal Fleets in Developing Countries: Technical Report (English)*. Energy Sector Management Assistance Program Washington (ESMAP), DC: World Bank Group. Others: <https://initiatives.weforum.org/micee/ctr-toolkit-technology/aJY68000000CaSZGAO>

Other Source: MDB Joint Mission and project teams.

6 Monitoring and Evaluation

76. **Indonesia Theory of Change.** If Indonesia (i) develops a road map for closure of CFPPs and unviable coal mines, including associated policy reforms and stakeholder consultations; (ii) creates a financing mechanism and catalyzes public, private and concessional financing to further accelerate the retirement of coal-fired power plants (CFPPs); (iii) conducts pilot repurposing on decommissioned CFPP asset sites, (iv) reduces policy, regulatory, procurement bottlenecks in RE scale-up (for PLN and IPPs) and (v) supports economic regeneration, social plans and income support for affected employees and communities (with a special focus gender and disadvantaged groups), then Indonesia will accelerate the retirement of existing coal assets and their replacement with RE and other needed systems investments (i.e., grid-upgrades and storage), while ensuring a holistic, integrated, socially inclusive and gender-equal just transition away from coal, resulting in a cleaner energy mix, reduced carbon emissions, and a more resilient workforce.

77. The IP is designed with clear impact pathways to achieve the transformational change ambition. ADB's RBL project is an important means to (i) accelerate the implementation of the Early Retirement roadmap and (ii) enhance PLN's ESG frameworks to ensure a just, gender-balanced and affordable transition with integrated requirements for broad stakeholder consultation. Separately, ADB's support for the PT SMI country platform aims to establish a central financing mechanism to sustainably scale up blended finance support for the broader energy transition in Indonesia with CIF-ACT funding and beyond. ADB will further help PT SMI enhance its ESG policies with just transition elements and support pilot implementation across initial clean energy transition investments (i.e., early retirement). These efforts will be bolstered by ADB's direct support for storage and PV-related technology training (with special focus on gender-balanced participation) in leading science and technology parks around the country in acknowledgment of tangible workforce transition needs.

78. The World Bank Coal Repurposing and Just Transition Program will support "first mover" pilot coal transition projects along the value chain. These include: (i) dismantling, remediation and repurposing of retired PLN-owned coal plants with new RE capacity or other services, such as battery storage or ancillary services; (ii) repurposing closed coal mine sites with renewable energy, sustainable landscape management and other activities; and (iii) supporting a community-level economic diversification project in coal regions, including local planning, economic development and stakeholder consultations, while ensuring social protections for women and vulnerable populations at the local level. IFC is also developing a RE repowering program looking at both on and off-grid renewable energy. This holistic program will help reduce the coal overcapacity in the system and create space for development and facilitate the integration of renewable energy. It will also enable the reuse of the existing power transmission infrastructure to support increased low-carbon generation capacity and pilot of new and emerging technologies to improve the system's flexibility to integrate variable renewable energy generation.

79. Specific to how the IP will support economic regeneration, social plans and income support for affected employees and communities (with a special focus gender and disadvantaged groups), just transition principles are woven into every step of project assessment, design and implementation. The IP outcomes will have implications on formal, informal and contract job losses across CFPP value chain including coal mines, CFPPs, transport systems as well as businesses engaged in the support chain. Further job losses could arise due to induced impacts on aggregated income in the economy, particularly because of reduced government revenue. Recognizing this, the ADB and World Bank are undertaking various upfront assessments to understand the potential scale of these impacts examining direct, indirect, and induced impacts.

The assessments will provide information regarding differentiated impacts in across regions dependent on factors such as current poverty rate, unemployment rate, which will impact availability of new jobs. The assessments will further consider issues around the suitability of transition from fossil fuel-based employment to clean energy employment such as skills mismatch, geographical separation of opportunities and reskilling required. Induced social issues, such as incidence of gender-based violence will be overlaid on the results to highlight where further attention and detailed assessment is needed. The results of the ADB and World Bank upfront assessments will be available to the GOI in mid-2023.

80. As the concepts presented in the IP are further developed, detailed situational assessments will be conducted, including on ground data gathering and consultation, to inform a robust design and development of mitigation plans. These mitigation plans will need to consider creation of alternative quality employment opportunities, support for economic diversification e.g., support for MSMEs, and financing arrangements. These considerations will also be integrated into the development of the National Just Transition Framework, as well and the implementation framework being developed by PT SMI with ADB support and aligned with World Bank's support to the GOI for a programmatic approach to just transition for coal regions, including specific local economic development and women's empowerment projects. Further research is also underway to identify programs that could support employment transition toward greener jobs, as well as key activities to mitigate the impacts on gender and social issues, especially in the most vulnerable regions, including impacts in the informal sectors. Target for completion of this additional research is mid- to end-2023.

81. **Integrated Approach to Monitoring, Evaluation and Learning.** The IP has been structured to deliver on the necessary outcomes to support the broader impact ambition for a sustainable, just and affordable clean energy transition across Indonesia. In summary, through US\$500 million in CIF-ACT funding, together with US\$2.1 billion in MDB cofinancing and US\$1.3 billion in cofinancing, the IP aims to achieve the following:

- **Governance:** The adoption or amendment of up to 4 policies, regulations, standards, or codes (i.e., may include updated PLN environmental and social management system for early retirement, MoF dispensation with respect to PLN asset early retirement, MoF regulation establishing scope and mandate of ETMCP), 1 accelerated CFPP retirement road map (e.g., Early Retirement Roadmap), and 1 National Just Transition Framework, including policies and regulations that are explicitly inclusive of gender and other social exclusion factors and/or the gaps/barriers faced by specific social groups and targeted actions to address those gaps.⁵⁶
- **People:** Up to 1,140 (i.e., 89% of) employees of CFPPs/coal mines retired through IP projects with access to sustained income and up to 2,300 direct beneficiaries of social plans and economic regeneration activities, to be disaggregated by gender, and reflecting other social characteristics (age, disability status, formal vs. informal workers etc.) as well as documented information about the quality of the jobs (income, skilled/ non-skilled positions) whenever relevant and possible.⁵⁷
- **Infrastructure:** Avoided greenhouse gas emissions of up to 65 million tons carbon dioxide equivalent (CO₂e) through the accelerated retirement of up to 3 GW of CFPP generation capacity, as well as up to 40 million tons of coal diversion, up to 150 hectares (ha) of mine area reclaimed, reforested or restored, and an increase of up to 300 megawatts (MW) of installed RE and 90 MW of energy storage capacity.⁵⁸

⁵⁶ Tracked by ACT Core Indicator 1 and 2.

⁵⁷ Tracked by ACT Core Indicators 3 and 4.

⁵⁸ Tracked by ACT Core Indicators 5, 6, 7, 8, 9 and 11.

82. The Indonesia IP responds to CIF's integrated approach to results measurement, as presented within the ACT Integrated Results Framework (IRF) in Appendix 2. CIF's integrated approach combines essential monitoring and accountability functions with a holistic multi-level and multi-dimensional approach, including a complex systems orientation, and emergent learning opportunities. Within this integrated approach, measurement of program and project impacts are captured via the multiple dimensions of monitoring, evaluation, learning, gender, and other key crosscutting approaches, coalesced within the objective of delivering a nuanced and complete understanding of the program's progression, and thematic specificities, in delivering a complex and multifaceted program goal.

83. The left-side columns of the ACT IRF, tracking the key performance indicators of program and project performance, are captured within the Indonesia IRF (Appendix 2), wherein the program's performance is tracked via targeted, core indicators defined within the ACT IRF, in response to the ACT Theory of Change and its constituent objectives. The right-side columns of the ACT IRFs, focused on evaluation of learning approaches (encompassing transformational change signals across dimensions, Just transition studies, co-benefits/development impact evaluations, gender and social inclusion analytics, and other targeted evaluations and learning activities) are captured via CIF, country, and MDB-driven evaluations and studies responsive to the program's evidence needs and priorities, as outlined below. In sum, the approaches allow for a duality between systemized tracking and responsive research and evaluation, designed to complement each other, and leverage mixed methods approaches utilizing different tools, methods, and forms of evidence, but strategically combining them when applicable.

84. The Indonesia IP is therefore also structured to outline the program's results chain—from program-level activities, outputs, outcomes, and impacts (based on the anticipated investment pipeline and the related activities to be funded within the program, the overall program design, and the theory of change) and incorporates elements related to (i) evaluation and learning, (ii) transformational change, (iii) gender and social inclusion, (iv) just transition, (v) SDGs, and (vi) development impacts/co-benefits in addition to the fundamental program results and corresponding indicators.

85. **Monitoring and Reporting.**

- **System-wide Analysis.** The IP's Integrated Results Framework serves as a fundamental instrument that grounds the country program's high-level goal statement on measurable national indicators and targets, and thereafter links the program's theoretical objectives with the measurable outcome-level results anticipated via its constituent project pipeline. As the IP is developed collaboratively among the Government, implementing MDB partners, and other stakeholders, the process of defining project objectives, and aggregating the related results via the IRF, constitutes a consistent and system-wide approach on the coherence of and between interventions, and on accountability between proposed goal statements and pragmatic results estimations.
- **Anticipated program impacts.** The Indonesia IP currently expects to deliver on 10 of the 11 core objectives of the ACT Investment Program, and the country's IRF therefore tracks core indicators as relate to each of these outcomes, with the expected target values collating the fractional outcomes expected from each of the 5 individual projects within the program pipeline. Each target value delineates the share of results anticipated from each discrete project, allowing for a differentiated analyses of the varying levels of impacts, vis-à-vis investment volumes and targeted approaches. As such, the IRF will be responsive to any changing dynamics within individual projects, and under- or over-achievement of program level results will allow for learning and adaptation based on challenging or opportune investment environments.

- **Protocols for tracking.** The monitoring and reporting of results will be a collaborative process among all stakeholders. Country focal points and implementing agencies, with support from the CIF AU Monitoring and Reporting team, will lead on tracking the country IP impact indicators set out at IP approval. Implementing MDBs will monitor, and report annually to the CIF AU, all outcome-level core indicators relevant to each approved project, in accordance with the methodologies, reporting requirements and timelines set out within the ACT IRF, and within the forthcoming ACT M&R Toolkit.⁵⁹ As such, MDBs will be responsible for incorporating these outcome-level indicators into the monitoring and reporting frameworks and mechanisms for each implemented project, alongside any optional outcome indicators and at least one co-indicator per project, also in accordance with the ACT IRF and ACT M&R Toolkit. Country IP M&R workshops, anticipated at inception, midterm, and IP-conclusions along with any, as needed, interim country M&R workshops, will allow for multi-stakeholder cross-sectoral consensus on indicator progress, targets, methodologies, and related gaps, lessons, or enhancements, in accordance with the guidance set out by the CIF AU for the ACT program.

86. **Proposed approaches for tracking and evaluating transformational change, just transition, and inclusivity aspects of IP.** The IP and associated activities present an important opportunity for learning through an evaluative lens on key themes and goals related to transformational change and just transition. As per the right-hand side of the IRF, in addition to the MDBs own evaluation processes through their independent evaluation offices or other efforts, the MDB and country counterparts will participate in evaluation activities of the CIF. This includes independent program level mid and end-term evaluations and evaluations on key themes such as transformational change and just transition. Evaluative insights could also relate to diagnostic, design, implementation, economic value, and synthesis evaluations of programs and projects. Any evaluation effort will not replicate existing country evaluation systems but will aim to reflect them as part of the overall approach, drawing data from all existing, credible sources.

87. Any evaluation on transformational change will use the dimensions of transformational change as identified through the transformational change learning partnership (TCLP) and documented in the program design documents and evaluation guidance provided. Similarly, any evaluation of just transition will consider the CIF just transition framework and its associated dimensions. The guidance and questions provided in the ACT design document related to just transition, transformational change and gender will be used to structure both formative and summative evaluative processes. Key questions to consider include:

- Who is involved and empowered during transition processes? (Procedural Justice)
- Who benefits and who loses in transition processes? (Distributional Justice)
- What is needed, what is planned and are they aligned? (Relevance)
- What systems need to be changed and how? (Systemic Change)
- What is the relationship between urgency and complexity and how is this being managed? (Speed)
- What scaling is required/ was achieved? (Scale)
- What capacity is being built to achieve sustainable development pathways? (Adaptive Sustainability)

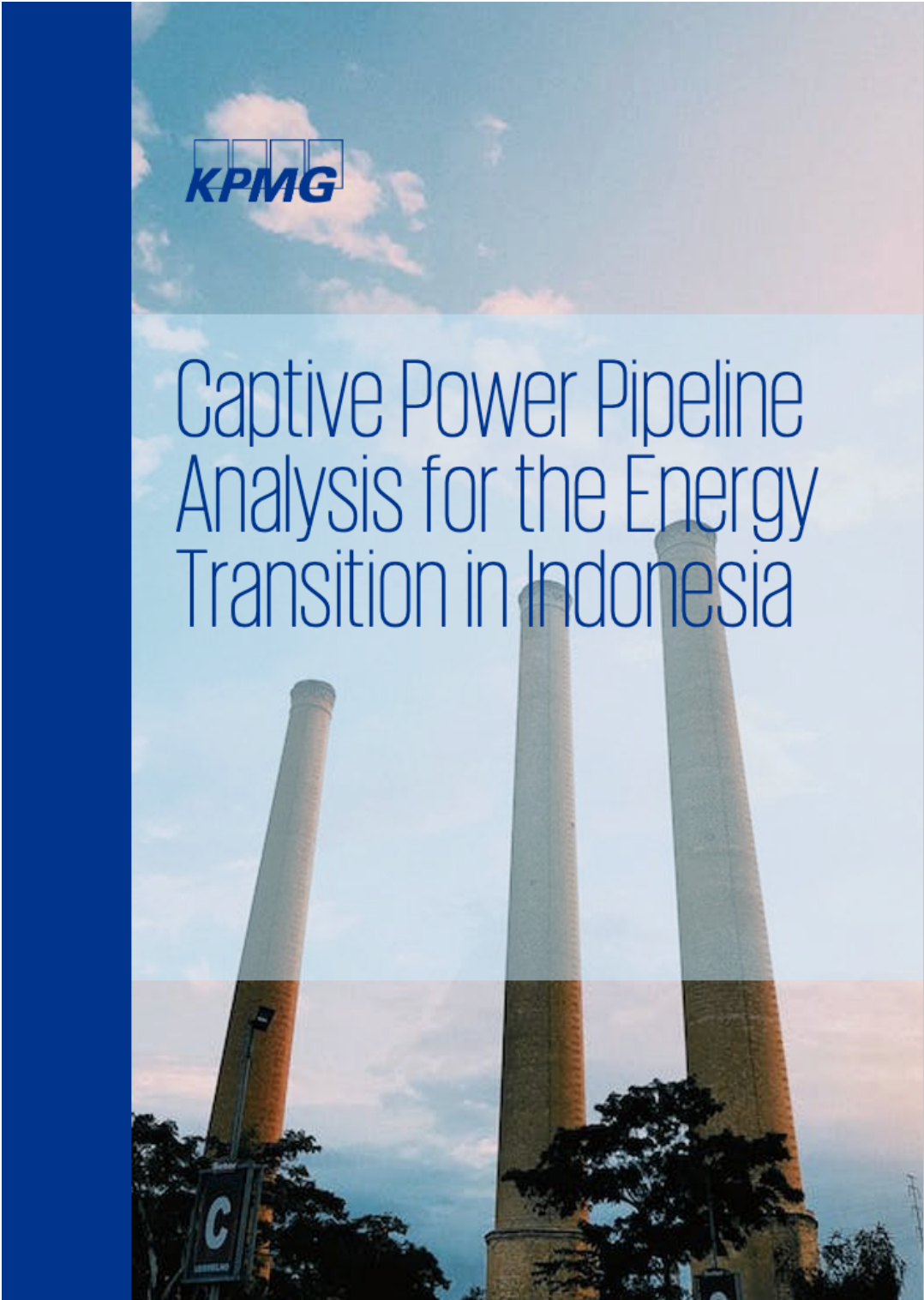
⁵⁹ The ACT M&R Toolkit translates the ACT IRF into a practical and detailed guide which sets out definitions of indicators, measuring methods/approaches and frequency, roles, and responsibilities etc.

89. A variety of evaluation methodologies may be deployed with a particular emphasis on enhancing participation in evaluation and learning processes as well as ensuring the rapid use of information for learning and course correction where required.⁶⁰

⁶⁰ The ACT program's monitoring, evaluation and learning framework is also supplemented and supported by rigorous, independent research via the CIF-DIME Research Program. The program encompasses, among others, bespoke scientific and data-driven research, modelling, and randomized control trial-based analyses of the program's impacts and effectiveness. DIME, and its team of economists and researchers, offers a variety of different research tools, depending on the topic, context, and partnering nation: from, at the front end, computable-general-equilibrium (CGE) macroeconomic modelling and original microdata collection to, on the ground, randomized-controlled trials that leverage local DIME team members providing close, hands-on field support. At the early and IP stages, the CIF-DIME program provides research capacities to establish baselines, and fill evidence gaps and test lines of impact within the IP's theory of change. At advanced stages of the pipeline, the program can be utilized to conduct diagnostics and establish comparative lines of inquiry that test the effectiveness of varying modes of policy and programming. At project deployment stage, DIME's economists and research teams will deploy rigorous impact evaluations, working closely with project teams on the ground to conduct robust testing and learning, and provide the project, the country and the ACT program with data inputs and real-time analytics that can raise the effectiveness and quality of implementation.

APPENDICES

APPENDIX 1: Captive Power Landscape Assessment



Introduction

1. With the aim of identifying “coal-to-clean transition” as one of its priorities, the Climate Investment funds (CIF) announced the establishment of the Accelerating Coal Transition (ACT) Investment Program in April 2021. With support from a Joint MDB team comprising ADB and WBG, Indonesia is currently identifying potential investment projects and technical assistance activities for inclusion in the country’s ACT Program Investment Plan.

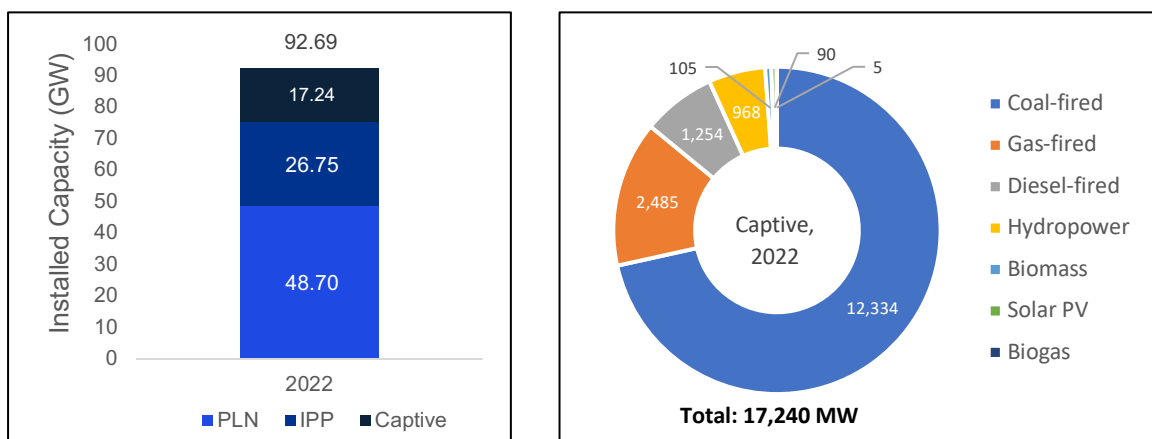
2. On January 2023, KPMG was engaged by ADB to undertake relevant studies (“the Study”) to understand opportunities in the private sector captive power pipeline for energy transition projects in Indonesia. The Study aims to cover Indonesia’s captive power market landscape assessment, its applicable regulatory and licensing regime, and clean energy alternatives to support its transition, and to support the identification of a potential private sector "Coal Transition Investment Pipeline" over a 3/5/10-year horizon for Indonesia at the country level.

Captive Power Market Landscape Assessment

3. Leveraging data collected from 2021-2030 RUPTL, *Direktorat Jenderal Ketenagalistrikan* (DJK), Global Energy Monitoring and additional research, total installed capacity for electricity generation (inclusive of captive power plants) across Indonesia is estimated to be 92.69 GW, as of 2022. The captive power installed capacity is estimated to be c. 17 GW, around 18.5% of total installed generation capacity in Indonesia.

4. Within the captive power sector, coal-fired power plant (CFPPs) is the primary fuel type. With 12.33 GW installed, CFPPs cover almost 72% of total installed capacity in the captive power sector. Gas and diesel-fired power plants contribute second and third largest share with 2.49 GW and 1.25 GW of installed capacity, respectively. Hydroelectric contributes the highest captive power for renewables with 0.97 GW and other renewables, including biomass, solar PV and biogas, contribute relatively smaller portions of the total installed capacity.

Total Installed Capacity in Indonesia and Breakdown of Captive Power by Type, 2022



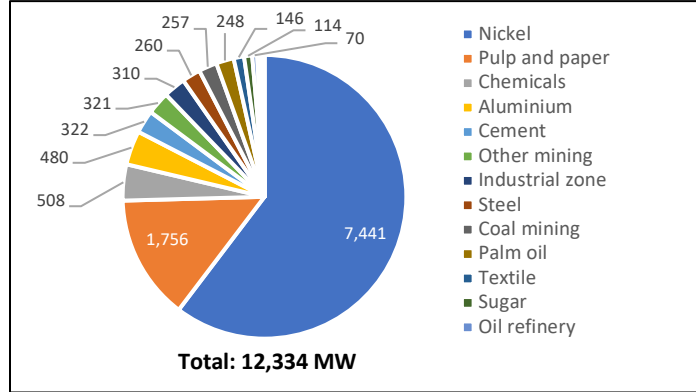
Source: 2021-2030 RUPTL, DJK, GEM, KPMG research

5. Distribution of captive CFPPs is not equal across Indonesia. Majority of existing captive CFPPs, about 45% of total captive CFPPs, has been installed in Sulawesi to power industrial activities in the nickel industry. Maluku Islands are the second region with the most installed captive CFPP with about 1.99 GW, followed by Java, Sumatra, Kalimantan, Riau Islands, Papua and Nusa-Tenggara.

Captive CFPP Installed Capacity Breakdown by Island and Industry, 2022

Island / Industry	Captive CFPP Installed Capacity (MW)
Sulawesi	5,599
Maluku Islands	1,988
Java	1,922
Sumatra	1,416
Kalimantan	821
Riau Islands	281
Papua	195
Nusa-Tenggara	112
Grand Total	12,334

Source: DJK, GEM, KPMG research



Note: The captive power dataset is an amalgamation of datasets from DJK, GEM and additional KPMG research. Duplication of captive power plants has been omitted from the datasets to prevent double counting of captive power plants. A caveat for this dataset is there is still a potential data gap on IO license-holding non-coal captive power plants that was approved prior to the Omnibus Law enactment.

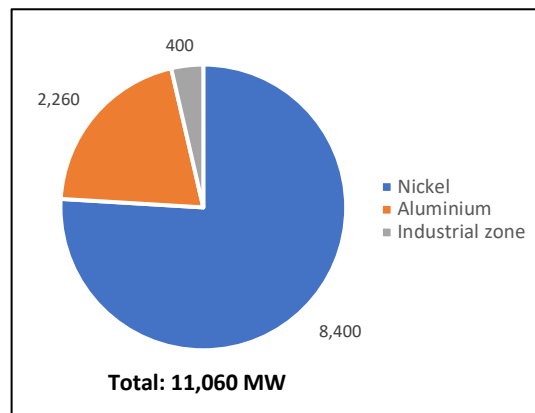
6. Captive CFPPs utilization is also not equal across different industries. Majority, 60.3% of total captive CFPPs, is being used in the nickel industry, followed by the pulp and paper industry which comprise 14.2% of total captive CFPPs. Captive CFPPs for the nickel industry is concentrated in Sulawesi and Maluku Islands, where the 2.48 GW Sulawesi Mining (Morowali Industrial Park) and 2.37 GW Delong Nickel power stations are located.

7. In addition to existing captive CFPPs, 11.06 GW of planned privately-financed, captive CFPPs have also been identified. The definition of planned captive CFPPs includes captive CFPPs that have been announced, in pre-permit and in-construction stage which comprise 2.82 GW, 2.19 GW and 6.05 GW, respectively. In theory, only those planned captive CFPP already in construction will be realized in the near future, and there is potential for other planned captive CFPPs, that have only been announced or still in pre-permit stage, to still consider alternative power sources.

Planned Captive CFPP Breakdown by Stage, Island and Industry, 2022

Stage	Planned Captive CFPP (MW)	Island / Industry	Planned Captive CFPP (MW)
Announced	2,820	Maluku Islands	4,780
Pre-permit	2,190	Sulawesi	3,620
In-construction	6,050	Kalimantan	2,600
Grand Total	11,060	Riau Islands	60
		Grand Total	11,060

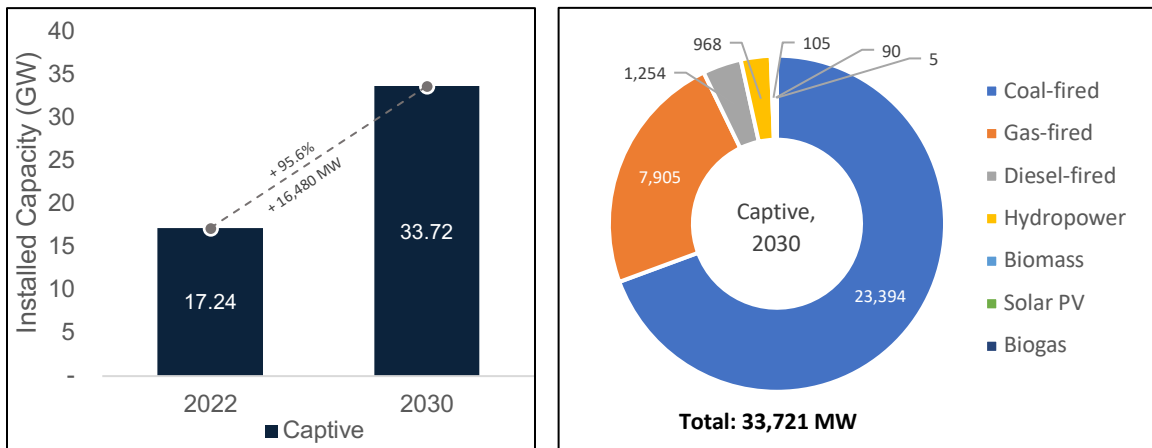
Source: GEM, KPMG Research



8. Similar with existing captive CFPPs, the nickel industry also contributes to the majority of planned captive CFPPs, with 8.4 GW in the pipeline. These planned captive CFPPs are either extensions of existing captive CFPPs, such as the 2.54 GW Weda Bay and 2.03 GW Halmehara Persada power station extensions, or entirely new captive CFPP projects such as the 3.36 GW Sulawesi Labota power station.

9. Projecting into the near future, captive power is expected to grow 95.6% between 2022 and 2030, from 17.24 GW to 33.72 GW, and CFPP is expected to stay dominant in the captive power market at 23.40 GW, followed by gas-fired, diesel-fired, hydropower and other renewables. This projection is based on the assumption that each identified planned captive power plants in our data set will be realized.

Projection of Captive Power and Breakdown by Type, 2030

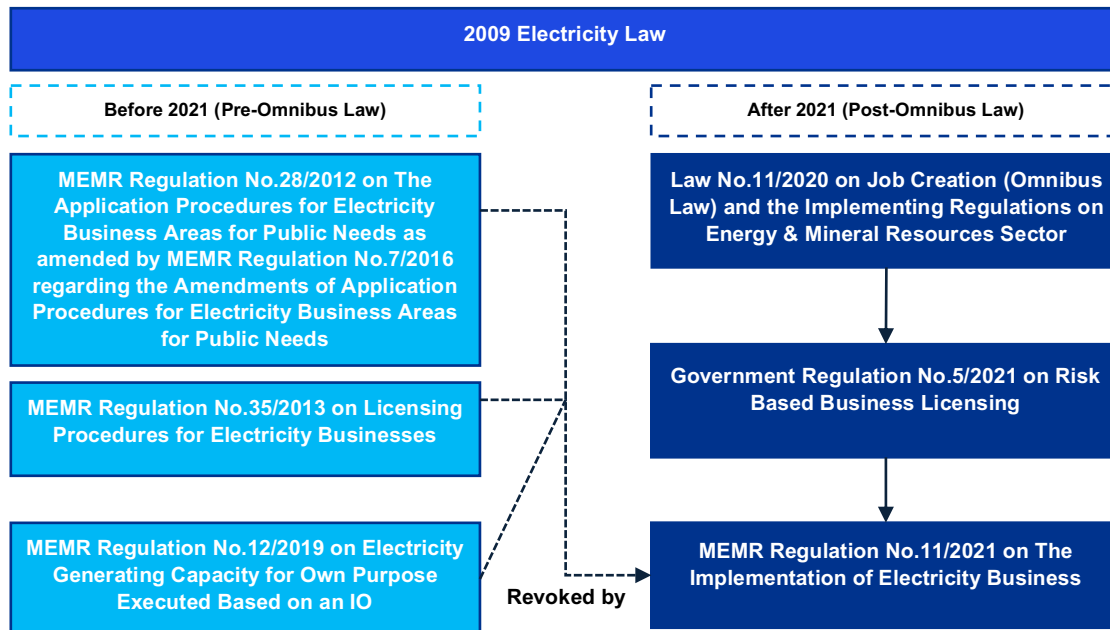


Source: DJK, GEM, KPMG Research

Regulatory Framework and Licensing Regime Review

10. The electricity regulatory framework in Indonesia is currently being regulated under the Law No.30/2009 regarding electricity (“Electricity Law”). This regulation oversees high-level proposition of the national electricity market such as electricity planning, control & assignment, and permitting matters.

Governing Electricity Law – Pre and Post-Omnibus Law Enactment



11. The Central Government issued Law No.11/2020 regarding Jobs Creation or frequently called as the “Omnibus Law.” This law was enacted to encourage investment, harmonize the central-regional policies, and provide ease for doing business.

12. With the Omnibus Law being implemented, Government of Indonesia implemented Government Regulation No.5/2021 namely ‘Risk-Based Business Licensing’ aimed to improve the investment ecosystem and simplify business permits, through the One Single Submission (OSS) platform. Furthermore, the GOI released MEMR Regulation No.11/2021 regarding Implementation of Electricity Business as the derivative regulation of Omnibus Law. This regulation shifted the authority to provide permits for captive power generation from the Governors to the Central Government and amended the *Izin Operasi* (IO) terminology to License for Electricity Generation for Own Interests or *Izin Usaha Penyediaan Tenaga Listrik untuk kepentingan Sendiri* (IUPTLS). The table below compares the licensing regime pre- and post-omnibus law:

Comparison between Pre- and Post-Omnibus Law

Item	Pre-Omnibus Law	Post-Omnibus Law
License Required	IO, IUPTL, and PWU	IUPTLS, IUPTLU, and PWU
Application System	Decentralized	Centralized
Approval Authority	Local Government, Provincial Government, or the MEMR (subject to plant location)	Provincial Government (Governor) or MEMR (subject to plant location)
Duration Required to Obtain License	>30 Working Days	<=30 Working Days*
Approval Platform	Respective government website	OSS platform as provided by the Investing Coordination Board (“BKPM”)
Capacity Thresholds for License Requirement	>200 kW (2018) & >500 kW (2019)**	>500 kW

*30 working days is the duration that MEMR will take to process a single IUPTLS, IUPTLU or PWU application; if and only if the application is complete and eligible. This excludes the processing time for other licenses that may be required for the operation of captive power plants, i.e., location permit

**= Capacity threshold was adjusted in MEMR Regulation No. 20 Year 2019

Clean Energy Alternatives

13. A key task of this study is to determine the key factors that companies use to select captive power sources through the development of case studies. This largely involves unpacking the technical considerations (e.g., stability of electricity supply, availability of grid-connected electricity), and economic considerations (e.g., LCOE of different electricity supply options including clean energy alternatives). As of March 2023, discussions are being planned with selected companies with the aim to address the following topics:

- Decision-making process and economic considerations in greenlighting captive coal power plant
- Clean energy transition strategy and plans
- Economic analysis and funding requirement of the transition
- Regulatory and technological challenges in achieving clean energy transition

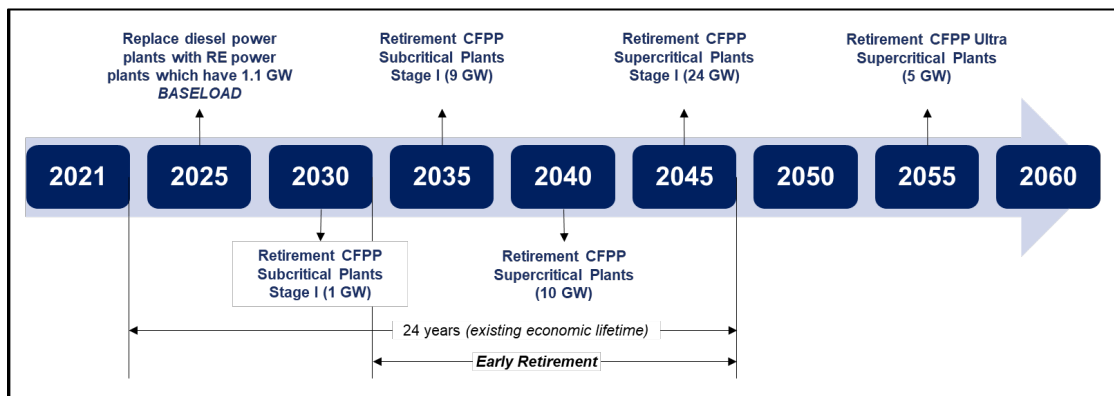
The target captive coal-fired power plants for the case study development include those supporting pulp and paper, nickel smelting and other mineral processing (copper and gold) industries.

APPENDIX 2: Assessment of Indonesia’s Capacity for Coal Asset Retirement and Phase-Out Activities

1. As noted, the formal Early Retirement Roadmap jointly prepared by MEMR and PLN, will be published mid-2023. However, as an illustrative analysis, an indicative roadmap for accelerated retirement of Coal-Fired Power Plant (“CFPP”) assets in Indonesia was developed by ADB in collaboration with Government of Indonesia, PT Perusahaan Listrik Negara (“PLN”), and other development partners. This was prepared as an input to the government’s ongoing efforts to prepare a CFPP retirement roadmap as required under the newly issued renewable energy regulation (RE PR).

2. Following instruction from the Government of Indonesia, this initial roadmap focuses on Java-Bali and Sumatra (the two grids with the highest demand in Indonesia) and covers both state-owned assets and Independent Power Plants (“IPPs”). Of the c. 26GW of operating CFPPs in the two grids as of beginning of 2022⁶¹, the road map that has been developed seeks to accelerate retirement of a cumulative 14GW from the beginning of 2026 to the end of 2034. In rough terms, this represents a 5 to 10 year acceleration in retirement dates of close to a half of the current operating CFPP fleet, relative to the current schedule for retirement of CFPPs prepared by PLN based on the technical lifetime of operational CFPPs in the country.

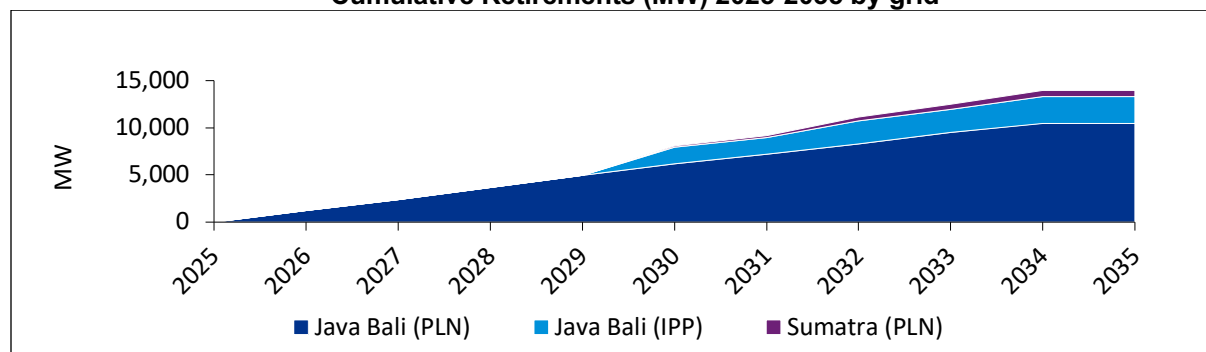
Initial PLN Pathway for CFPP Retirement to Support Net Zero Emission 2060



Source: Perusahaan Listrik Negara (PLN), Indonesia. <https://portal.pln.co.id/>.

3. Retirements before 2030 are expected to focus on PLN assets in the Java-Bali grid which are connected to the 500kV transmission line and are therefore less likely to have significant impacts on security of supply. Post 2030, PLN assets in both Java-Bali (including those outside of the 500kV grid) and Sumatra are included alongside a number of IPPs. The indicative cumulative capacity identified for early retirement is shown in the chart and table below.

Cumulative Retirements (MW) 2025-2035 by grid



Source: ADB ETM Study.

⁶¹ 23GW in Java-Bali and 3GW in Sumatra

	PLN (Java-Bali)	PLN (Sumatra)	IPP (Java-Bali)	Total (MW)
2026	1,200	-	-	1,200
2027	2,400	-	-	2,400
2028	3,660	-	-	3,660
2029	4,945	-	-	4,945
2030	6,175	115	1,782	8,072
2031	7,190	230	1,782	9,202
2032	8,135	430	2,442	11,007
2033	9,500	540	2,442	12,482
2034	10,490	650	2,817	13,957

Source: ADB ETM Study.

4. The choice of units to retire is based on a unified list of CFPPs that was compiled from independent studies carried out by ADB’s Energy Transition Mechanism (ETM) feasibility team⁶², MEMR, and PLN to identify suitable candidate CFPPs for early retirement. The different studies had different approaches:

- **ABD’s ETM Feasibility team** used a Multi Criteria Analysis Approach that assigned each plant a score according to several criteria covering Grid Security, Plant Technical and Operational Characteristics, Commercial and Financial, Environmental and Just Transition considerations.
- **MEMR** used a two-step approach to first select candidates based on-grid security and then assess cost of early retirement.
- **PLN’s** approach focused purely on PLN assets and considered plants viable for their spin-off model (asset divestment model) and then a wider pool of assets where PLN considered Grid Security, Plant Technical and Operational Characteristics, Commercial and Financial, and Environmental considerations as key parameters.

5. While the three studies considered similar factors and often identified many similar plants, the use of different approaches and priorities meant that the list were not identical. A screening process was therefore undertaken among a taskforce of major stakeholders (with members from MoF, MSOE, MEMR, PLN, ADB, IFC and World Bank) to merge these lists to develop a **single unified list of candidate CFPPs for early retirement**. This work was conducted during May– July 2022. The final unified list reflects the same projects as included in the roadmap.

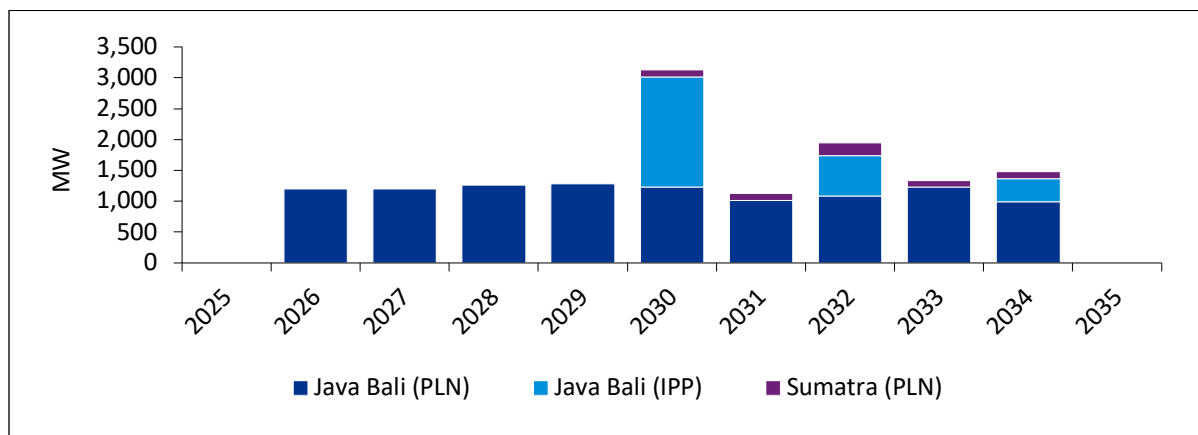
6. The scheduling of retirement of units within the unified list was developed based on the following key criteria:

- **Pre-2030:** Nine assets were identified by PLN as being suitable for early retirement. All of these assets were in the Java-Bali grid and connected to the 500kV line.
 - Within these nine plants, assets were ranked such that assets with the lowest operating costs and highest carbon emissions would be prioritized for retirement
 - Retirements were then scheduled to have an approximately equal retirement in each year from 2026-2029
- **Post 2030:** A differentiated approach was applied to PLN assets and IPPs

⁶² The Government of the Republic of Indonesia, the Government of the Republic of the Philippines, and the Asian Development Bank (ADB) announced a partnership in November 2021 at the 26th UN climate change conference (COP26) to design and launch an Energy Transition Mechanism (ETM) to accelerate the transition from coal to clean energy in Southeast Asia, in a just and affordable manner. Under the partnership with Indonesia, ADB is currently, among other things, identifying through a feasibility study a pool of candidate coal-fired power plants for early retirement/repurposing; initiating the establishment of an ETM Fund/Vehicle through the issuance of a request for concepts from the private sector; establishing and operationalizing the ETM Partnership Trust Fund to be administered by ADB; and catalyzing active participation from G-7 countries (Just Energy Transition Partnership or JETP).

- For PLN assets (in both Java-Bali and Sumatra), assets were ranked such that assets with the highest heat rates (lowest efficiency) would be retired first.⁶³
- For IPPs, assets were assumed to have an operating lifetime of 20 years. This was to reflect the fact that IPP retirements could not be accurately planned as they would be dependent upon the outcome of commercial negotiations with project sponsors. Where shortening of lifetime to 20 years did not result in the plant retiring between 2030-2034, the retirement was adjusted so that it fit in this window.

Annual Retirements (MW) 2025-2035 by grid



Source: ADB ETM Study.

	PLN (Java-Bali)	PLN (Sumatra)	IPP (Java-Bali)	Total (MW)
2026	1,200	-	-	1,200
2027	1,200	-	-	1,200
2028	1,260	-	-	1,260
2029	1,285	-	-	1,285
2030	1,230	115	1,782	3,127
2031	1,015	115	-	1,130
2032	945	200	660	1,805
2033	1,365	110	-	1,475
2034	990	110	375	1,475

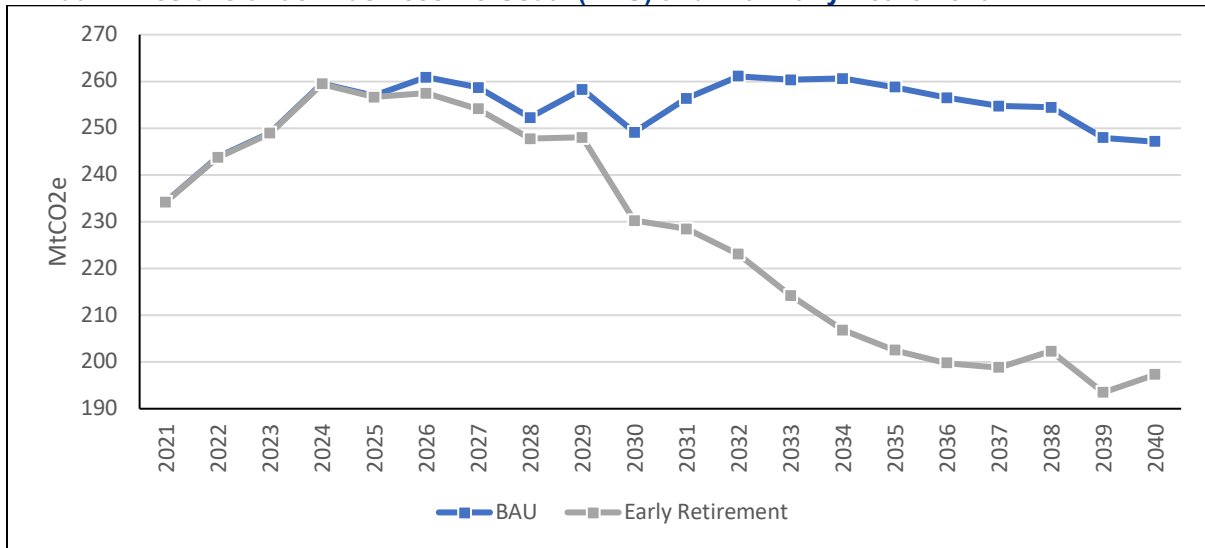
Source: ADB ETM Study.

7. The roadmap provided remains indicative. Further changes would likely target a similar quantum and pace of retirement; however, it is expected that the order of PLN assets to retire will be re-assessed and the timing of IPP retirements (and ultimately the selection of plants to retire) will be based on commercial negotiations. Nevertheless, according to initial system modeling analysis, a retirement roadmap similar to the above, combined with a replacement of capacity with clean energy could help to abate over 530MtCO₂ by 2040⁶⁴.

⁶³ Heat rate used as a proxy for both operating costs (as it will impact fuel costs) and carbon emissions (as it impacts the quantity of coal that needs to be burned)

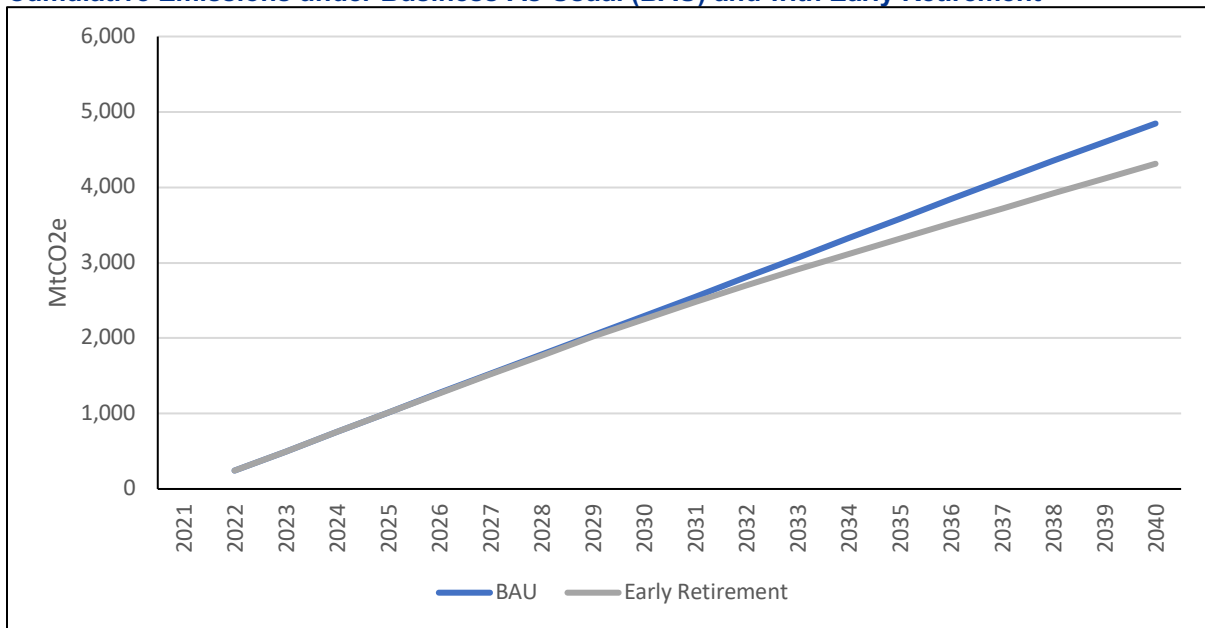
⁶⁴ We note that the below analysis was performed in May 2022 and there have been small refinements to the retirement roadmap since then that raised the total capacity set to undergo accelerated retirement before 2035 from 13GW to 14GW alongside an adjustment in the retirement timeline for some units. An update to this analysis will be completed pending final confirmation on the roadmap from Government of Indonesia by November 2022 but we do not expect a significant change in impact as the total volume of capacity to undergo accelerated retirement is similar and all retirements will continue to be completed by 2035.

Annual Emissions under Business-As-Usual (BAU) and with Early Retirement



Source: ADB ETM Study.

Cumulative Emissions under Business-As-Usual (BAU) and with Early Retirement



Source: ADB ETM Study.

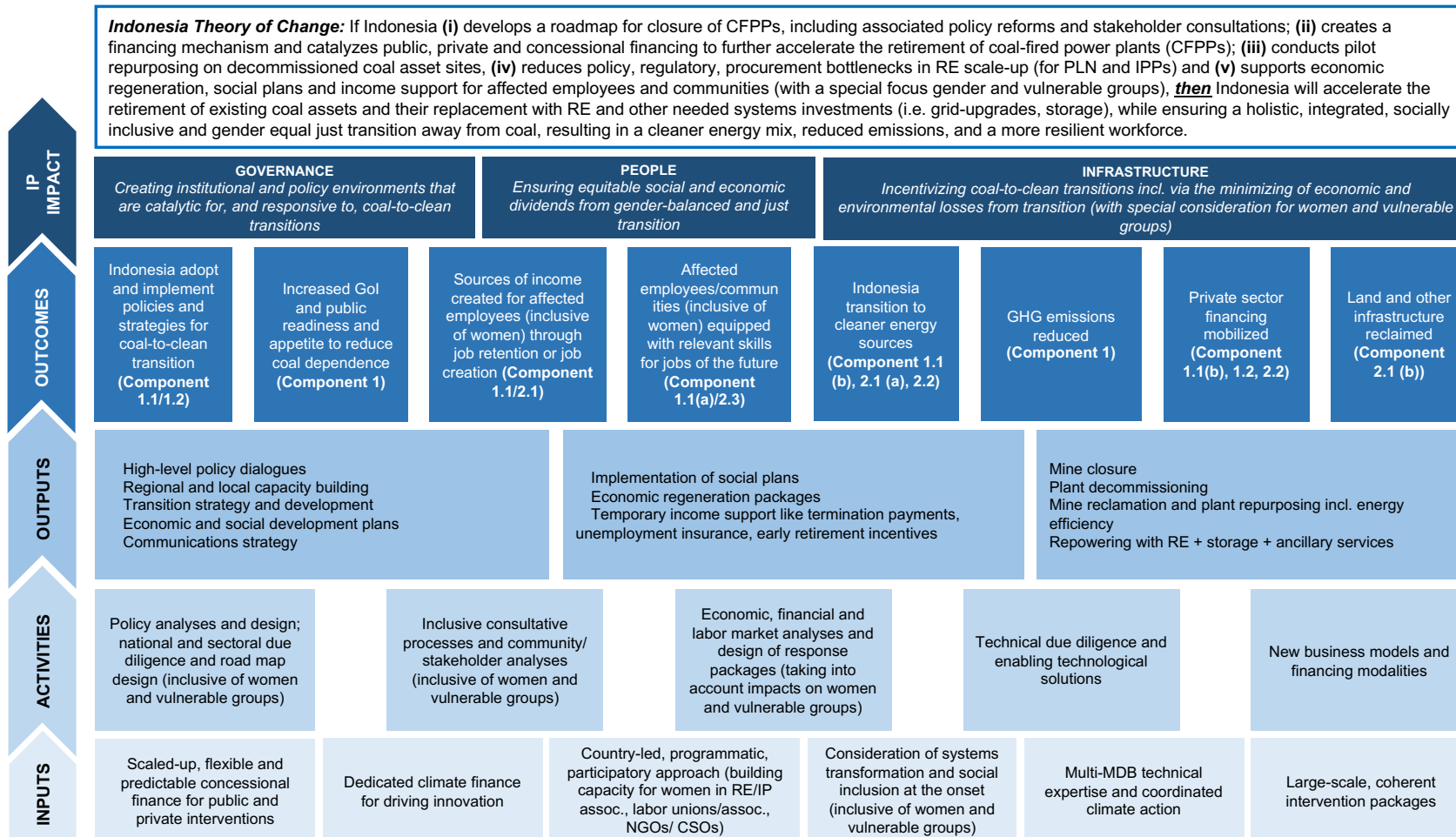
Annex 1: Roadmap to 2030

Year	Plant/Unit	Capacity (Installed MW)	Plant Owner and Location
2026	PLTU Suralaya #1	400	PLN (Java-Bali)
	PLTU Suralaya #2	400	PLN (Java-Bali)
	PLTU Paiton #1	400	PLN (Java-Bali)
2027	PLTU Suralaya #5	600	PLN (Java-Bali)

	PLTU Suralaya #6	600	PLN (Java-Bali)
2028	PLTU Suralaya #7	600	PLN (Java-Bali)
	PLTU Paiton #9	660	PLN (Java-Bali)
2029	PLTU Suralaya #8	625	PLN (Java-Bali)
	PLTU Adipala	660	PLN (Java-Bali)
2030	Labuan U1	300	PLN (Java-Bali)
	Labuan U2	300	PLN (Java-Bali)
	Lontar U1	315	PLN (Java-Bali)
	Lontar U2	315	PLN (Java-Bali)
	Labuhan Angin U1	115	PLN (Sumatra)
	Paiton 2 U5	610	IPP (Java-Bali)
	Paiton 2 U6	610	IPP (Java-Bali)
	Cilacap U1	281	IPP (Java-Bali)
	Cilacap U2	281	IPP (Java-Bali)
2031	Lontar U3	315	PLN (Java-Bali)
	Tanjung Awar-Awar U1	350	PLN (Java-Bali)
	Tanjung Awar-Awar U2	350	PLN (Java-Bali)
	Labuhan Angin U2	115	PLN (Sumatra)
2032	Rembang U1	315	PLN (Java-Bali)
	Rembang U2	315	PLN (Java-Bali)
	Pacitan U1	315	PLN (Java-Bali)
	Ombilin U1	100	PLN (Sumatra)
	Ombilin U2	100	PLN (Sumatra)
	Cirebon	660	IPP (Java-Bali)
2033	Pacitan U2	315	PLN (Java-Bali)
	Pelabuhan Ratu U1	350	PLN (Java-Bali)
	Pelabuhan Ratu U2	350	PLN (Java-Bali)
	Pelabuhan Ratu U3	350	PLN (Java-Bali)
	Nagan Raya U1	110	PLN (Sumatra)
2034	Indramayu U1	330	PLN (Java-Bali)
	Indramayu U2	330	PLN (Java-Bali)
	Indramayu U3	330	PLN (Java-Bali)
	Nagan Raya U2	110	PLN (Sumatra)
	Celukan Bawang U1	125	IPP (Java-Bali)
	Celukan Bawang U2	125	IPP (Java-Bali)
	Celukan Bawang U3	125	IPP (Java-Bali)

APPENDIX 3: Theory of Change and Integrated Results Framework (IRF)

Accelerated transition from coal-powered to clean energy while supporting socio-economic goals and environmental remediation



ACT IMPACT - Accelerate transition from coal-powered to clean energy while supporting socioeconomic goals & environmental remediation

ACT Program Theory of Change: If CIF addresses funding gaps related to the successful implementation of country-level strategies and associated kick-start projects; builds support at the local and regional levels to reconsider the development of new coal plants; and supports policy and investment activity in economic regeneration, social plans and income support for affected employees and communities, then national governments, public sector utilities and private sector operators will act to accelerate the retirement of existing coal assets and their replacement with new sources of renewable energy while ensuring a holistic, integrated, socially inclusive and gender-equal just transition away from coal.

INDONESIA ACT INVESTMENT PLAN IMPACT

Accelerating the transition from coal to renewable energy while securing a just, inclusive, affordable and gender-equal future.

Indonesia IP Theory of Change: If Indonesia (i) develops a roadmap for closure of CFPPs, including associated policy reforms and stakeholder consultations; (ii) creates a financing mechanism and catalyzes public, private and concessional financing to further accelerate the retirement of coal-fired power plants (CFPPs); (iii) conducts pilot repurposing on decommissioned coal asset sites, (iv) reduces policy, regulatory, procurement bottlenecks in RE scale-up (for PLN and IPPs) and (v) supports economic regeneration, social plans and income support for affected employees and communities (with a special focus gender and disadvantaged groups), then Indonesia will accelerate the retirement of existing coal assets and their replacement with RE and other needed systems investments (i.e., grid-upgrades, storage), while ensuring a holistic, integrated, socially inclusive and gender-equal just transition away from coal, resulting in a cleaner energy mix, reduced emissions, and a more resilient workforce.

MONITORING APPROACH

EVALUATION AND LEARNING APPROACH

RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS
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INDONESIA INVESTMENT PLAN-LEVEL IMPACTS

<i>Accelerating the transition from coal to renewable energy while securing a just, inclusive, affordable and gender-equal future.</i>	Impact Proxies:					
	Share of renewable energy in primary energy supply (%)	12% (2021)	25% ⁶⁵ (2025)	National statistics (Handbook of Energy and Economic Statistics by MEMR), macro-level indicators, World Bank and MDB country data	IP-level impacts focus on alignment with preexisting NDCs, national development priorities, and available statistics at the Investment Plan and/or country level.	Signals of transformational change: Signals of transformational change at the program level might focus on more narrowly bounded aspects of energy systems transformation than in the section above (i.e., CIF-level impact). They might cover lower levels of systems transformation and be more closely tied to individual ACT Investments Plans and/or project-level impacts. Definitions & methodologies are TBD. Gender and just transition elements: The program impact level allows space for further evaluations, assessments, and other approaches to take place as the program evolves in these areas. These activities may be tailored to specific recipient countries or applied more broadly across the program.
Share of renewable energy for total installed capacity (%)	15% (2021)	34% ⁶⁶ (2030)		Share of RE may consider both the share of NCRE in total national installed capacity (%) and the share of NCRE in total national consumption over a 12-month reporting period (%)		

⁶⁵ Government of Indonesia, National Energy Council. 2014. *National Energy Policy, 2014–2050*. Jakarta.

⁶⁶ Ministry of Finance, Japan. *Joint Statement and joint Press Release of Just Energy Transition Partnership (JETP) for Indonesia*. Tokyo. https://www.mof.go.jp/english/policy/international_policy/others/20221115_1.pdf

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
INDONESIA INVESTMENT PLAN-LEVEL OUTCOMES						
PILLAR 1: GOVERNANCE						
A. Country X adopts and implements policies and strategies for coal-to-clean transition	<p>ACT CORE 1. Policies: Number of policies, regulations, codes, or standards that have been amended or adopted (#)</p> <p>- Disaggregation: as relate to energy</p> <p>- Disaggregation: as relate to Just Transitions</p>	0 (2022)	4 (2029)	MDB project data/country data	<p>Projects with no policy component should report a target of 0.</p> <p>Given the role of national and subnational entities in coal transition, policies could be at the national, subnational or local level depending on the nature of the activities.</p> <p>Policies, regulations, codes, or standards might include policy objectives covering, but not limited to: energy and mining sectors, the financial sector; Just transition, social protection, and jobs; vulnerable groups- and gender- responsive protections and support as relate to transition; and the environment (reclamation)⁶⁷.</p>	<p>Changes in policies, plans, and institutional capabilities may also be incorporated in analyses of signals of transformational change, which contribute toward the fundamental systems change described above. For example, specific policy analysis might help support the overall understanding of coherence across international and national policies (i.e., relevance) and linkages between national policy and institutional capacity (i.e., scale).</p> <p>CIF's targeted evaluations and/or sector studies to fill strategic knowledge gaps: Moving down the results chain, the monitoring function becomes increasingly important to capture program outcomes and outputs. Evaluation and learning function will complement core indicators by filling strategic evidence and knowledge gaps. Evaluation and learning activities will be selected based on overall stakeholder demand, evidence gaps, and cross-learning opportunities.</p>

⁶⁷ Energy sector policies may relate to the development/deployment of NCRE and related markets and coal capacity abatement; financial sector policies, to financing of EE, NCRE and related markets, and products that support transition; Just Transition, social protection, and jobs, to labor market policies, economic regeneration policies, labor/livelihood protection policies such as those relating to vocational support and mobility assistance education, training and small business support services; vulnerable groups-responsive policies may relate to younger and older workers, persons with disabilities, labor migrants, racial and ethnic minorities etc.

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
	- Disaggregation: as relate to gender		TBD		Components 1.1 and 1.2	
	ACT CORE 2. Readiness. Coal transition strategies finalized (#)	0 (2022)	2 (2029)	MDB project data	The indicator would track strategies, action plans, road maps, etc. committed to by stakeholders and covering, but not limited to, strategies as relate to: energy and mining; gender-responsive and socially inclusive strategies to mitigate negative transition impacts and ensure that women and men, and vulnerable groups equally benefit from opportunities (e.g., jobs); and Just transition, social protection, and jobs; environment (reclamation) Components 1.1 and 1.2	

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
PILLAR 2: PEOPLE						
C. Sources of income created for affected employees through job retention or job creation	ACT CORE 3 Income security for employees of subset industries Number and percentage of employees of retired coal plants/mines that have access to sustained income (#,%)	0 (2022)	1,140, 88% (2029)	MDB project financial data	<p>This indicator feeds into CIF Impact 3 (Beneficiaries).</p> <p><u>Sub-indicators</u></p> <ul style="list-style-type: none"> -Coal-sector employees retained or redeployed to new jobs (#, %) - Non-retained and non-redeployed coal sector employees that receive income support (#, %) <p>For non-retained employees receiving income support, the following instruments may be considered: severance or other forms of termination payments; unemployment insurance; social assistance payments; early retirement incentives; other.</p> <p><u>Disaggregation (as available):</u></p> <ul style="list-style-type: none"> - by gender (%) - vulnerable groups (%) 	<p>Quality and distribution of jobs: Through both just transition and gender-responsive approaches, further evaluative and learning-oriented analyses may center on the types of jobs created (and lost), and which subpopulations are gaining (and losing) employment opportunities. For example, this might include generating evidence on decent jobs created and plans for addressing jobs lost through skills development and economic diversification activities. Alternatively, it might include analyses of women’s access to medium- and high skilled green jobs, STEM-education and vocational training, and school-to-work transitions.</p> <p>Modeling: Indirect job creation, such as induced employment along the supply chain, may be estimated using modeling techniques alongside projects’ reporting of direct job creation.</p> <p>Gender-responsive aspects can be studied in more detail through targeted research, evaluations, and/or case studies. These will seek to understand the program’s impacts in reducing gender imbalances and expanding inclusion, including interventions’ relevance and access to the female labor force and the inclusion and viability of female owned enterprises in economic regeneration programs, driven by potential activities such as:</p> <p>a. <u>Coal plant or coal mine retirement/repurposing phase:</u> Gender and social policy and strategy preparedness assessment; including mapping of: i) institutional linkages through gender focal points in</p>

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
					<p>- permanent vs. temporary/construction jobs (#) - types of jobs</p> <p>Component 1.1(a) Component 2.1</p> <p><u>Key Assumptions:</u> (i) Approximately 100 persons per CFPP facility affected, with 80% of them ultimately retrained and provided with sustained income opportunities. With 3-4 state facilities targeted under Components 1.1 (a) and (b), this leads to a conservative estimate of 240 persons. (ii) Approximately 1000 persons per mine closed in Component 2.1, with 90% ultimately provided with sustained income, this leads to a conservative estimate of 900 persons.</p>	<p>line ministries (including in Social Protection and Labor, and Education ministries, as well as Environment, and Energy); ii) expected poverty impacts of the transition, including social and gender-based care burdens for workers affected directly and indirectly by the energy transition; and iii) policy mandates and measures to ensure gender equality outcomes in skill development and workforce transition.</p> <p>b. <u>Post-coal regional transformation phase:</u> Social protection assessment of readiness and completeness of short and long-term social assistance programs, active labor market programs, and education and reskilling programs targeting jobs of the future including gender assessments of gaps between women and men in education, skills, employment, and participation rates in new or similar jobs-related programs; and measures to reduce gender imbalances in impact of proposed interventions.</p> <p>Just transition-framed analyses:</p> <ul style="list-style-type: none"> • Procedural Justice: may examine the enhancement of social inclusion processes and procedures, such as stakeholder engagement at local and national levels, the extent to which vulnerable groups in impacted areas have been represented, gender inclusion, and the scope of social partners involved,

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
D. Equip affected employees/communities with relevant skills for jobs of the future	ACT Core 4. Social Plans and Economic Regeneration Packages: Number of direct beneficiaries of implemented social plans and economic regeneration activities (#)	0 (2022)	2,300 (2029)	MDB project data	<p>For Social Plans, this will measure beneficiaries of implemented plans, including labor retrenchment packages, reskilling/retraining packages, and gender and local communities action plans.</p> <p>Targets to include # of persons reached via ADB collaborations with top universities for skills mapping and development and retraining required for the labor transition.</p> <p>For Economic Regeneration, this will measure beneficiaries of programs/packages operationalized that create new sources of income for participants of sunset industries/entities, including regeneration stimulus packages.</p> <p>Targets to include # of coal sector workers/community members reached via repurposed assets and related additional economic activity.</p>	<p>i.e., government, labor, business, civil society, race, etc.</p> <ul style="list-style-type: none"> • Distributional impacts: may also be further examined along other evaluative lines or with additional focus on specific subpopulations, such as ethnic, religious, and racial minorities, female-headed households, Indigenous People and local communities, migrants, youth, and persons with disabilities.

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
					<p><u>Disaggregation:</u></p> <ul style="list-style-type: none"> - by gender (%) - vulnerable groups (%) - types of jobs <p>Component 1.1 Component 2.1</p> <p><u>Key Assumptions:</u></p> <p>(i) Approximately 100 persons per CFPP counted as direct beneficiaries of social plans and economic regeneration packages. With 3-4 state facilities targeted under 1.1 (a) and (b), this leads to a conservative estimate of 300 persons.</p> <p>(ii) Approximately 2000 persons per mine in Component 2.1 counted as direct beneficiaries of social plans and economic regeneration packages.</p>	
PILLAR 3: INFRASTRUCTURE						
E. Reduce GHG emissions	ACT CORE 5 (= CIF 1). Mitigation: GHG	0 (2022)	up to 65 million (starting in 2029)	Annual and lifetime reporting by projects	This indicator feeds into CIF Impact 1 (Mitigation) and should be reported as direct vs. indirect	MDBs are encouraged to undertake “whole of energy systems” analyses as baselines during the Investment Plans and project appraisal process and to fully incorporate MEL aspects into such analyses. Integrated,

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
	emissions reduced or avoided (mt CO ₂ eq) – direct/indirect	(reference scenario to be established per project)			<p>reductions (per MDB-approved methodologies) with evidence provided.</p> <p>Emission reductions will be calculated by subtracting projected lifetime emissions of a CIF-financed intervention from the projected lifetime emissions of the business-as-usual program/project that would have otherwise been pursued.</p> <p>Component 1.1 and Component 1.2 <i>(NOTE: CFPP early retirement emission reduction methodology development is underway and potential allocation between Component 1 and Component 2 (specifically, any same grid RE power replacement) is TBD. To avoid double counting for the present, the full allocation is going to Component 1 for now.)</i></p>	<p>systems-levels analyses can be used to build a theoretical model and reference scenario for how interventions will affect multiple results areas: renewable energy installation, coal retirement/abatement, asset reclamation and reuse, landscapes restoration, etc. Both estimated and real operational data can also then be consolidated effectively to report across these multiple indicators.</p>

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
F. Mobilize private sector financing	ACT CORE 6 (= CIF 4). Co-Finance: Volume of co-finance leveraged (USD)	0	up to 4,602 (2029)	MDB project financial data	Total of non-CIF resources leveraged in ACT projects. Reporting on this indicator feeds directly into CIF Impact 4 (Co-Finance) . <u>Disaggregation:</u> Source of cofinancing (MDB, Government, Private Sector, Bilateral, and Other)	
	Disaggregation: Volume of co-finance leveraged, MDB (USD)	0	2,059 (2029)			
	Disaggregation: Volume of co-finance leveraged, Commercial (USD)	0	650 (2029)			
	Disaggregation: Volume of co-finance leveraged, Bilateral (USD)	0	600 (2029)			
	Disaggregation: Volume of co-finance leveraged, Government (USD)	0	1,293 (2029)			

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
G. Cleaner energy sources	ACT CORE 7 Plant decommissioning: Capacity of existing coal power generation assets accelerated for retirement (MW)	0	up to 3,000 (2029)	MDB project financial data	Existing capacity of coal-based generation that was retired ahead of life of asset due to replacement via operationalized NCRE capacity (i.e., solar and wind energy). Component 1.1 (a) ~1GW Component 1.1 (b) ~1680MW Component 1.2 ~600MW	
	ACT CORE 8 Repowering Installed capacity of renewable energy (MW)	0 (2022)	up to 300 MW new installed capacity (2029)	MDB project financial data	NCRE capacity (i.e., solar and wind energy) operationalized as a result of ACT interventions <u>Disaggregation:</u> - Renewable energy type (solar, wind, etc.) - Grid-connected vs. off-grid/distributed energy supply Energy storage indicators relevant for projects that include components for storage installation.	
	GESP 1 Power rating (MW)		up to 90 (2029)		This indicator corresponds to GESP-Specific Indicator 1 in the GESP M&R System and should only be reported by ACT projects	

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
					<p>with energy storage components.</p> <p>Disaggregation: By type of technology (i.e., thermal, mechanical, electrochemical)</p> <p>By location on the energy value chain (generation, transmission, distribution, stationary end use, mobile end use)</p> <p>Distributed storage vs. utility-scale applications</p> <p>Components 2.1 (a) and 2.2.</p>	
	<p>ACT CORE 9 Coal Abatement: Amount of coal diverted (MT)</p>	0	up to 40 (2029)	MDB project financial data	<p>The measure can span the entire architecture of the coal industry, including but not limited to power plants, industrial companies, district heating systems, transport companies and residential users.</p> <p>Component 1 projects</p>	

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS (Evaluation and Learning)
					<p><u>Key assumptions:</u> Approximately 65% capacity factor, with 1 ton of coal providing 2.65MWh, and ~5 year early retirement of assets.</p>	
		0	TBD	MDB project financial data	<p>Expected/future capacity additions replaced with NCRE capacity</p> <p>Component 2.1 (a)</p>	
H. Reclaim land and other infrastructure	<p>ACT CORE 10 Plant closure, repurposing: Annual energy savings (GWh/yr)</p>	0	0	MDB project financial data	<p>A measure of increased energy efficiency as a result of ACT interventions that include energy savings objectives.</p> <p><i>Note: The proposed closure or repurposing projects do not currently calculate energy savings.</i></p>	
	<p>ACT CORE 11 Mine closure, reclamation: Mine area reclaimed and reforested/restored (Ha)</p>	0	up to 150 (2029)	MDB project financial data	<p>Including:</p> <ul style="list-style-type: none"> - reforestation/afforestation - restoring the quality of soils / ecosystems to pre-mining level <p>Component 2.1 (b)</p>	

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS
INDONESIA INVESTMENT PLAN-LEVEL CO-BENEFITS						
I. Social, Economic, and Environmental Development Co-Benefits	CO-BENEFIT 1. Pollutants				MDBs will only need to report on one co-benefit indicator per ACT project and can select among a range of options or propose another co-benefit.	
	Atmospheric Pollution: Decrease in PM _{2.5} concentration	TBD		Global satellite data or related	This measures reductions in emissions of air pollutants from energy and related activities, including electricity production and transportation, as well as reducing contaminant discharges in liquid effluents from energy systems.	
	Terrestrial Pollution: Reduction in volume of contaminants discharged	TBD	TBD	Project appraisal data		
	Health Benefits Value of avoided health costs due to reductions in pollutants (USD)	TBD		National health data		
	CO-BENEFIT 2. Just Transition: Social Inclusion and Distributional Impacts	0	(i) Training 500 trainers in new clean energy transition & (ii) Training	MDB project data	Component 2.3 scope and implementation plan	Just transition-framed analyses: <ul style="list-style-type: none"> Procedural Justice: may examine the enhancement of social inclusion processes and procedures, such as stakeholder engagement at local and national levels, the extent to which vulnerable groups in impacted

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS
			1,000 fossil fuel workers in RE skillsets (2029)			<p>areas have been represented, gender inclusion, and the scope of social partners involved, i.e., government, labor, business, civil society, race, etc.</p> <ul style="list-style-type: none"> • Distributional impacts: with focus on specific subpopulations, such as ethnic, religious, and racial minorities, female-headed households, indigenous People and local communities, migrants, youth, and persons with disabilities.
	<p>CO-BENEFIT 3. Enhanced Energy Access</p> <p>National RISE Scores (ESMAP)</p> <p>National MTF rates (ESMAP) / SE4All Global Tracking Framework (GTF)</p>	TBD	TBD	National statistics, macro-level indicators, World Bank and MDB country data	Indicators may measure increased, more affordable and/or more reliable access to clean energy	

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS
	<p>CO-BENEFIT 4. Gender- and vulnerable groups-specific co-benefits</p> <p>Number of beneficiaries of gender-specific labor transition and skill development programs (#)</p> <p>Dollar share tracking (amount and %) of stand-alone gender activities withing CIF project.</p>	0	TBD	MDB project data	<p>This would include beneficiaries of, for example:</p> <ul style="list-style-type: none"> -Improved renewable energy employment -Science, technology, engineering and math (STEM) skill development - Livelihood and skills development/entrepreneurship training and credit access - Gender-specific financial products, especially for productive-use applications; gender-specific design measures in energy-related services or outreach - Institutional measures, such as policy, planning, and budgeting support, inclusive human resources policies, or other policies targeted at reducing inequality, including in procurement practices, actions against gender-based violence, and measures, such as subsidies, to reduce burden of connection fees for vulnerable groups like female-headed households 	

Monitoring Approach						Evaluation and Learning Approach
RESULT STATEMENT	INDICATORS	BASELINE (Date)	TARGET (Date)	MEANS OF VERIFICATION	NOTES	KEY AREAS
					- Other measures designed to reduce gender and inequality gaps in the sector/subsector in which the program/project proposed for CIF funding is taking place	

APPENDIX 4: Stakeholder Consultations Under CIF-ACT IP

1. As per guidance provided under the CIF-ACT program, the joint MDB team has made key efforts to engage with a multitude of stakeholders as part of the joint missions conducted during June and stand-alone consultations to share details on the Indonesia IP. Participants who joined these sessions included other development partners, nongovernmental organizations (NGOs), civil society organizations (CSOs), think-tanks, and the private sector.

2. **Initial Meetings with Development Partners.** As part of the 1st Joint mission during mid-June, the joint MDB team met with several development partners in Jakarta to provide an overview session of the ongoing CIF exercise and get inputs/feedback on the development of the IP. These included the Agence Française de Développement (AFD), Kreditanstalt für Wiederaufbau (KfW) and the several stakeholders as part of the ongoing FIRE Dialogue (FIRE stands for Friends of Indonesia Renewable Energy), which comprises the Governments of UK, Australia, Netherlands and Denmark, United States Agency for International Development (USAID), Climate Works, International Labour Organization (ILO), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), United Nations Operations (UNOPS) and International Energy Agency (IEA) among others. The sessions were well received with key interest to further follow the process, as the CIF projects would be identified and to continue engagement with the joint MDB team as the IP progressed.

3. **Consultations with NGOs and CSOs.** The 1st consultation with NGOs and CSOs was organized virtually on 1 July 2022 and focused on: (i) providing an overview of the CIF-ACT program and IP development process; (ii) the strategy and planning for carrying out Just transition assessments and Strategic Environmental and Social Assessment (SESA) under the CIF-ACT program to ensure that the environmental and social impacts (including gender), are identified and addressed in the IP; (iii) the importance of stakeholder engagement and plans to ensure an inclusive and transparent feedback mechanism. Over 40 attendees joined the consultation virtually, from an estimated 25+ organizations, which included local NGOs in Indonesia such as Institute for Essential Services Reform (IESR), Trend Asia, Climate Action and Energy Transition Yayasan Indonesia CERAH (CERAH), Association for Ecological Action and People's Emancipation (AEER), and several international think-tanks including Rocky Mountain Institute (RMI), World Wildlife Fund (WWF), and Climate Policy initiative (CPI). The response from the attendees was very positive and several attendees appreciated to being provided the opportunity to participate in the IP development process.

4. **Stakeholder Consultation for IP draft.** As part of the two-week public disclosure period under the CIF-ACT process guidelines, the final consultation took place on October 3, 2022 (two-hour virtual meeting) and was attended by several external stakeholders that had already been engaging through the CIF-ACT IP development process such as IESR, CERAH, WWF, AFD, KfW, as well as additional invitees such as the International Trade Union Confederation (ITUC) and its affiliates. The IP draft was jointly presented by ADB and World Bank group, and provided a detailed overview of the proposed IP financing table, the relevant project concepts and updates to the studies carried out as part of the ongoing Just transition and SESA assessments. At the end of the presentation, the public link to the IP posted on the BKF website was shared, with a deadline for comments on 13th October 2022. The attendees welcomed the detailed conceptual information provided on each of the project concepts. A recording of the session and the slides were further shared with the attendees and an extended email list of over 100+ invitees, to ensure that those who couldn't attend were also able to participate as part of the 2-week disclosure process and provide any feedback on the IP. Further comments from the CIF-TFC were received through the formal submission to the TFC on 26th October 2022 and are reflected in the current revision of the IP.

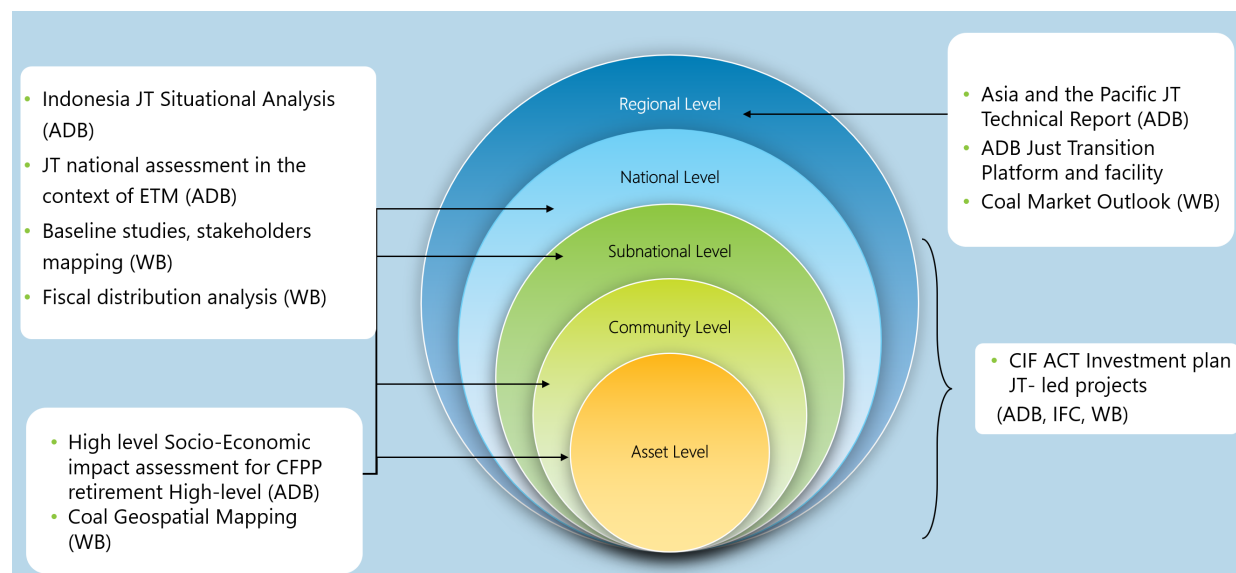
5. **Stakeholder consultations as part of SESA funded by the CIF-ACT (IP) preparation grant.** As part of the national SESA being carried out in Indonesia to understand the opportunities, risks, and impacts

(positive and negative) associated with the CIF-ACT IP projects, all stakeholders are provided an opportunity to express their perspectives on and concerns about the energy transition in Indonesia, and to voice their opinions on key environmental and socioeconomic issues to be considered in the SESA. As a first step in this process, ADB and BKF launched the SESA on August 9th, 2022, which invited both governmental and nongovernmental stakeholders to understand the concept of SESA, the requirements of SESA which make it a transparent, inclusive and participatory approach, and the importance of the exercise to support Indonesia's goal of a just and affordable energy transition. Post launch, a scoping workshop was held by MoF and ADB, on October 4, 2022. An additional workshop was conducted on 26-27 January, 2023 to consult on the national SESA scoping report, regional consultations are planned to be held by May 2023 to consult on the objectives, scenarios, and impact assessment and by June 2023 to consult on the SESA draft reports. The SESA stakeholder consultations complement the CIF-ACT consultations and provide direct feedback on the social and environmental aspects of the IP. More details on the SESA approach, strategy and process are explained in Appendix 6.

APPENDIX 5: Overview of Just Transition Activities Supporting CIF-ACT IP

1. The Figure below describes ongoing engagement on just transition in Indonesia by ADB and WBG across all aspects of the agenda, that informs CIF-ACT IP programming. Parties are now working together (e.g., meeting on a weekly basis through I-JETP Just Transition Working Group) with other development partners to ensure consistency across just transition activities in Indonesia and maximize the utility of the work through research, analysis, consultation and implementation.

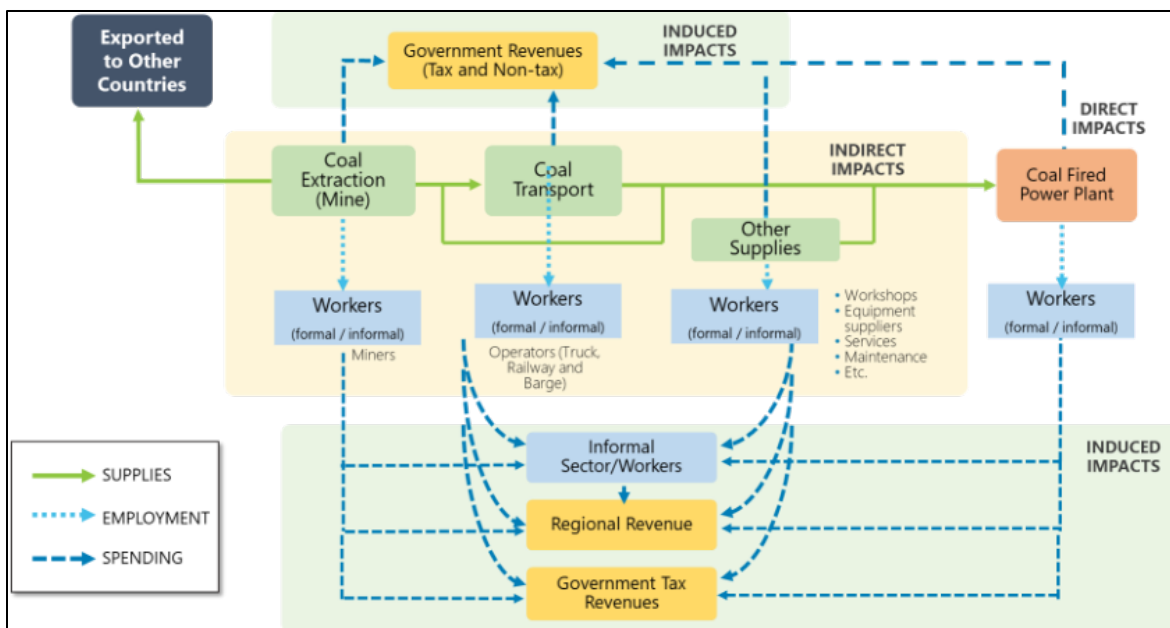
Just Transition Ongoing support to Indonesia



2. **ADB's just transition assessments.** In 2021-2022, in collaboration with MoF, ADB undertook a series of consultations across government ministries, and with other stakeholders, to inform the development of an economy-wide situational analysis, that assesses the presence of an enabling environment for a just transition in Indonesia. The analysis included a high-level assessment of aspects such as social protection; gender equality; informal sector employment; state-owned enterprises (SOEs); micro, small, and medium-sized enterprises (MSMEs); and just transition governance, among others. Based on the work undertaken ADB provided recommendations to the GOI on key steps to move forward with developing a national approach to just transition including the creation of a just transition roadmap, appointment of coordinating entity and active integration of just transition into government, private sector and labor dialogues.

3. In parallel, ADB is undertaking further work as part of developing its comprehensive approach to just transition in the Energy Transition Mechanism (ETM). A high-level socioeconomic impact assessment is being conducted for the early CFPP retirement (Figure below). This assessment provides an initial, high-level quantification of the potential impacts of CFPP retirement for a group of CFPP plants and units located in Java-Bali and Sumatra including direct, indirect, and induced impacts in local businesses and regional revenue and government revenue, as well as multiplier effects due to closure of more than one CFPP. The outputs of the assessment will provide indicative impacts on employment, poverty rates, income loss, gender issues such as employment disparity and domestic violence, and government revenue and its potential effect on local government expenditure on public services. The results of the assessment will allow GOI and ADB to better understand the nature and scale of potential impacts, thus informing the design of appropriate mitigation measures, and identifying whether more detailed assessments are further required (e.g., of individual assets).

Just Transition Stakeholders and Impacts – CFPP focus



4. To complement the socioeconomic impact assessment, ADB is undertaking further research into the Indonesian national context, as relevant to just transition, to identify and assess areas that need strengthening and potential investment to facilitate a just transition. This research will also identify opportunities for further support to Indonesia, including informing the detailed design and implementation of the IP projects (see Table below).

Assessment to Inform Future JT Programs and Initiatives

Reskilling and retraining	Education	Informal sector participation
<ul style="list-style-type: none"> Map Indonesia's current reskilling and retraining schemes Identify relevant skills in emerging and green sectors Undertake gap analysis of reskilling and retraining programs Identify opportunities for policy reform to strengthen Indonesia's reskilling and retraining programs 	<ul style="list-style-type: none"> Identify relevant skills and tertiary education programs that will be useful in fulfilling Indonesia's climate goals based on national climate policy documents Determine availability of such programs in Indonesia's top academic institutions Consider existing ADB-led education projects Analyze the state of crosscutting issues such as gender, rural access, research and development, digitalization, and collaboration Identify opportunities for policy reform to improve Indonesia's educational system 	<ul style="list-style-type: none"> Identify the types of informal occupations that support the sectors along the fossil-fuel value chain, both directly and indirectly Analyze qualitatively the impacts that the transition away from fossil fuels will have on informal workers, with special focus on women. Identify opportunities for the informal sector, e.g., in the development of MSMEs Identify opportunities for policy reform.

5. Each of these lines of research shall be framed around the state of industry diversification in Indonesia. They shall consider options that have been highlighted in the country's various national strategy and policy documents, especially those outlined in Indonesia's NDC and LTS, as well as those identified in the country's long-term development plans. Other considerations include the state of MSME development

in the country and other crosscutting issues, including research and development, digitalization, and technology transfer.

6. Based on this assessment, and other just transition work ongoing, a just transition framework will be developed that defines an approach and templates for assessing impacts, identifying potential mitigation measures and costing of such measures, outlines consultation requirements and approach, identifies responsible parties and financing support on three levels:

- (i) *National Just Transition Framework* to be piloted for the energy transition. Government will be supported to develop a national framework, that will be informed by analytical work ongoing (e.g., ADB's socioeconomic impact assessments, World Bank baseline studies, stakeholder mapping, and a fiscal distribution analysis). It will (a) identify key principles for impact assessment], (b) requirements and process for designing and costing mitigation measures for district-, provincial- and national-level impacts, (c) requirements and process for stakeholder mapping and consultation, (d) national body that will oversee and be responsible for implementing and monitoring just transition activities including coordination across government and (e) establish means [i.e., fiscal mechanisms] to provide district- and provincial-level support for just transition implementation at the local and regional levels. The framework will also provide the basis for synchronized just transition support to cover indirect and induced impacts of the retired coal assets, that are outside the responsibility of the IPPs (e.g., basis for and templates for MOUs etc.), but are part of a comprehensive just transition approach. The I-JETP Just Transition working group led by UNDP and including the participation of WB, ADB, ILO and GIZ will be supporting the development of this framework in 2023 as a key deliverable.
- (ii) *Just Transition Framework Implementation Guidelines (to be developed by PT SMI)*. Alongside the development of the national framework, CIF-ACT US\$1 million in grant funds will be used to translate the requirements of the *National Just Transition Framework* within the context of PT SMI as the ETM Country Platform and lead financier of energy transition activities for the GOI and to build the capacity of PTSMI to implement and monitor the framework. Funds deployed in 2023-2024 will be used to provide requisite staffing and the development of ETMCP-specific implementation guidelines. The PT SMI ETMCP Just Transition Implementation Guidelines will take the national framework one step further by stipulating requisite audit, mitigation, monitoring and evaluation requirements, as well as financial and legal obligations at the asset-level. It will also develop a feedback mechanism to allow for challenges and gaps in implementation to promote adjustments at the national level.
- (iii) *Just Transition at the asset-level (including specific private CFPP assets)*. ADB will use existing and ongoing assessments to inform the development of Just Transition Plan at the asset-level for private CFPPs (i.e., IPPs) to be retired or repurposed to outline (a) the scope of just transition assessment for CFPPs to be decommissioned or repurposed, (b) the references to national laws and regulations, obligations under relevant international treaties (e.g., ILO etc.) and national just transition framework, (c) the parties responsible for mitigation and redress for the specific asset, (d) IPP role in participatory planning process, as well as financial and legal obligations under the National Just Transition Framework, (d) sources of additional transition/[financial] support available to the transition-affected parties at the asset-level as well as district- and/or provincial-levels and (e) process for stakeholder mapping, engagement, consultation and grievance redress mechanism.

7. **World Bank baseline studies, stakeholder mapping, and a fiscal distribution analysis.** The socioeconomic impact and environmental remediation baseline studies, stakeholder mapping and fiscal distribution analysis are prioritized activities under the World Bank's Global Standardized Baseline Assessments for building the foundation of the Just Transition Roadmap are underway. With regards to specific priority issues in the energy and mining sector, the World Bank Team are collaborating closely with government counterparts to secure alignment between activities planned under the CIF-ACT assessments and the government's own program. This will ensure that findings from the studies will inform decision-making for policy action and pave the way toward an enabling policy and regulatory ecosystem conducive for the design and implementation of the Just Transition Roadmap. The outputs of the analytics will be available in draft and final form on Q4 this year and Q2 2023. They include:

(a) Geospatial database: It will provide a detailed baseline of Indonesian coal operations from which to conduct further analysis and an asset-by-asset total cash cost and margin analysis, facilitating the identification of marginal producers.

(b) Map fiscal revenues distribution: The mapping exercise seeks to understand the coal production revenue and distribution scheme across regions and at subnational level as well as other fiscal mechanisms in place within the coal sector including subsidies

(c) Existing labor profiles demographic survey: Mapping of existing labor profiles including direct/indirect workforce, informal labor (incl. age, income, and skill dimensions), coal transport, and SMEs along the coal value chain.

(d) Baseline assessment of socioeconomic conditions: Also accompanied by a social cost analysis of a transition, this baseline assessment of socioeconomic conditions and linkages at the granular community level and across coal regions uses stakeholder perception surveys. A critical component of the assessment involves a mapping of Community Driven Development (CDD) Framework to needs under Just Transition.

(e) Impacts to gender and vulnerable groups and gender skill gaps assessment: Conduct gender-sensitive impacts of the transition and gender skill gaps assessment in the coal mining industry, based on case studies/ existing coal mines to provide insights how women and men can be affected differently using an intersectionality lens and relate this with existing and projected skill gaps in the (new) industry.

(f) Assessment of technical closure standards: As part of the Environmental Aspects Mapping: Reclamation & Land Repurposing Assessment under the JT standardized Global Baseline Assessment, the review and strengthening of Technical Closure Standards & regulations includes the packaging of surface/ subsurface data with regards to abatement of methane. A fundamental part of the work will be informed by the Global JT working in partnership with UN ECE.

(g) Baseline assessments of land & assets: Also part of the Mapping of Environmental Aspects, this baseline assessment serves the purpose of environmental reclamation and land repurposing. Some World Bank environmental assessment tools developed by the Global JT which will be put to use here are: (a) Remediation Costs and (b) Land-Use Repurposing Assessment.

8. **Distributional Impacts of Coal Transition and link to Institutional Support.** The baseline analytics presented in the IP will generate better understanding of the distributional impacts of a coal transition across the dimensions of social, economic, and environment. The studies will include investigation of such effects of a transformation on typically marginalized and disadvantaged groups that may further exacerbate gender inequalities. The findings will be translated into response measures and inform decision-making that strives to reduce inequalities, boost social inclusivity, and close the gaps between winners and losers; to ensure that nobody is left behind.

9. The results of the distributional impact assessments will also be able to inform design of reskilling, job placement, and unemployment social support packages, in particular for those underrepresented groups in the sector – and men and women are equally provided opportunities and benefits to mitigate the adverse effects of the transition. The studies will also provide inputs to the optimization of potential new economic diversification in the formerly coal-dependent regions, therefore, enabling sustainable regional economic growth.

10. A transition toward a low-carbon future clearly requires policy responses that match the scale of transformations taking place in the coal sector. Here is where the analytics link closely with the institutional support envisioned by the IP. Strengthened capacity of decision-makers propped by a strong basis of a more nuanced understanding of the distributional impacts of mine downscaling across society result in increased effectiveness of low-carbon transition policy-making and implementation of climate-resilient action plans. This way policy responses and subsequent measures can ensure that the impacts brought about on workers, affected communities, and the environment are thoroughly and equally addressed.

11. At the asset level, the World Bank will be supporting the Just Transition Plan for PLN-owned CFPPs being supported under Repurposing and Just Transition Program. The World Bank will also be developing a Just Transition pilot project for selected coal mining areas, based on the ongoing baseline studies and analytical work being conducted as described above, and continuing, including as part of the WOLCOT grant.

APPENDIX 6: Overview of National Strategic Environmental and Social Assessment (SESA)

- 1. Approach to assessment.** The Strategic Environmental and Social Assessment (SESA) for the ETM in Indonesia builds on the findings of a regional scoping exercise undertaken by ADB which identified key environmental and socioeconomic issues, risks and opportunities likely to be associated with ETM implementation in Southeast Asia.⁶⁸ These issues will be reviewed and adapted throughout the SESA process, and modified where required, to accord with the Indonesian context and relevant domestic key environmental and social concerns identified through stakeholder engagement and the scoping process.
- 2.** The SESA will adopt best international practice as set out in the OECD DAC Guidance for Strategic Environmental Assessment (SEA) (2006) (equivalent to SESA) which includes international principles for conducting SEA.
- 3. Stakeholder engagement.** A fundamental principle of SESA is to involve key stakeholders and encourage public involvement throughout the SESA process. A stakeholder engagement plan is being developed based on initial stakeholder mapping which has identified key stakeholders including government organizations (national, local, municipal), relevant parastatals, concerned groups (e.g., CSOs, NGOs, labor organizations, religious groups), local communities, marginalized groups (e.g., indigenous peoples, women), technical experts, etc.
- 4.** Opportunities will be provided throughout the entire SESA process for all stakeholders to present their perspectives on the ETM, to identify and validate key issues, and to comment on draft documents prepared for the SESA. This input will be through workshops, focus groups and key informant interviews undertaken at national to local levels. The SESA will integrate the outputs of stakeholder engagement with the work to further Just Transition (JT). An additional important consideration for the SESA will be the inclusion of a gender lens and evaluation of gender-related risks and impacts of ETM implementation.
- 5.** Workshops have been held with key stakeholders in August (national SESA launch event), October (national SESA scoping of issues) and January (sharing draft SESA Scoping Report). Two further national workshops are planned at the end of May (to consult on the objectives, scenarios, and impact assessment) and August (to consult on the SESA and SESMP draft reports). A series of regional consultations are also planned in May.
- 6. Impacts and Risks.** Expert judgment by the SESA team has found that the key environmental and socioeconomic issues that will need to be addressed by the national SESA are closely aligned with those identified during the regional scoping exercise (see Annex 1). Preliminary analysis identifies a range of environmental and socioeconomic risks summarized as follows:
 - *Environmental risks:* while coal-fired power plant (CFPP) retirement will eliminate GHG emissions from those plants, there remains a risk that the coal formerly supplied to them may be exported and burned elsewhere, resulting in no net reduction in emissions. Other risks include: ongoing GHG emissions (from CFPPs/coal mines and some RE developments); reduced air and water quality, land and water (surface and groundwater) contamination by toxic substances and other materials, noise and disruption to communities; damage to ecosystems and loss of terrestrial and aquatic biodiversity; impacts to important ecosystem services; impaired community access to land and water resources; accumulation of wastes; land use change; land degradation; visual, landscape and cultural heritage impacts; and health, occupational and community safety and security risks.
 - *Socioeconomic risks:* Legacy issues from CFPP and coal mine development; adverse effects on regional and local economies and livelihoods; loss of jobs from CFPP retirement/mine closure; out-migration; disadvantages for women and vulnerable groups (e.g., indigenous communities); decline in local public services; displacement of people; and weakened community cohesion.

⁶⁸ ADB. 2022. *Accelerating the Clean Energy Transition in Southeast Asia: Regional Scoping Report for Strategic Environmental and Social Assessment Applied to the Energy Transition Mechanism in Southeast Asia. Consultant's Report*. Manila. <https://www.adb.org/projects/documents/reg-55124-001-tacr>

Opportunities. The scoping of key issues identifies a range of opportunities that ETM will provide including the following (see Annex 1 for further detail):

- *Environmental opportunities:* Many of the opportunities of ETM relate to the restoration of environmental quality associated with retirement of CFPPs including remediation of contaminated soil, surface and groundwater, removal of waste, including hazardous waste, restoration of landscapes and changes in land use, restoration of terrestrial and aquatic biodiversity values and ecosystem services and improvements to public health. Opportunities with the replacement of renewable energy sources include clean, no or low carbon energy generation with no or few greenhouse gas emissions (depending on renewable energy source), the potential for rational planning of new energy projects on a regional basis, rather than a project-by-project basis.
- *Socioeconomic opportunities:* Similarly, there are a number of social opportunities associated with CFPP retirement and coal mine closure including compensation for legacy contamination and land reclamation and restoration, job opportunities in site remediation and land reclamation and opportunities for retraining and skill development, potential in renewable energy development. There will also be economic diversification opportunities for renewable energy project construction and operation, business opportunities for small scale renewable energy development with microfinance services and opportunities for women and indigenous ownership of renewable energy projects.

7. These risks and opportunities (see below) of key SESA issues were discussed in the October scoping workshop and compiled into a preliminary SESA scoping report which was shared with stakeholders in January 2023. The next steps in the SESA process planned between March and August:

- Finalize scoping report based on stakeholder feedback.
- Agree scenarios for energy transition to be assessed.
- Regional workshops and national workshop on energy transition scenarios and assessment of impacts and opportunities.
- Develop Draft SESA and SESMP Report
- National workshop to review Draft SESA and SESMP Report
- Finalize SESA and SESMP Report and disclose.

8. **Institutional framework and capacity.** An assessment of the institutional structure and capacity of the various government organizations that will be involved in ETM implementation in Indonesia has been undertaken as part of the SESA scoping study. This includes an assessment of responsibilities in relation to the identified PPPs, organizational structure and program delivery, capacity, and functionality across the national, provincial, district and local levels. It also includes an assessment of redundancy and/or conflict in terms of overlapping inter-institutional delivery and responsibility.

9. **Gap / barrier analysis and needs assessment.** As part of the legal and regulatory analysis, relevant policies, programs, and plans have been screened as to how they will be impacted positively or negatively because of ETM implementation. As mentioned, the national environmental and social baseline and review of the legal/regulatory and institutional framework has been reviewed and assessed along with relevant PPPs during the scoping phase of the SESA and gaps identified. Recommended actions will be developed to address these gaps including a) additional data collection; b) formulation of new policies and regulations, and c) improved governance structures and institutional functionality.

10. Based on the key issues identified during scoping, the results of the gap analysis and identification of objectives already set out in PPPs covering such issues, a suite of environmental and socioeconomic objectives (ESQOs) are being developed and prioritized. Ideally no more than 25-30 ESQOs (for reasons of manageability) will be selected against which the performance and risks/impacts of developments likely to arise due to ETM implementation in Indonesia can be measured. The ESQOs will be designed either to (a) avoid, reduce/minimize the scale of the issue (mainly for environmental concerns), or (b) to enhance/promote measures to address the issue (mainly for socioeconomic issues).

11. **Assessment.** The assessment itself will be conducted considering two timelines as follows.

- Stage 1: 2022 – 2030 – initial retirement of up to three coal-fired power plants (CFPPs) representing 1-2 GW of baseload, closure of two coal mines, initial scale up of replacement renewable energy project, planning for grid expansion and interconnection and initiation of other RE projects not associated with CFPP retirement.
- Stage 2: 2030 – 2050 – additional retirement of CFPPs and closure of coal mines, accelerated scale up replacement RE projects, build out of power grid and interconnections and build out of other RE projects not financed by MDBs.

12. An assessment is being made of the likely risks and impacts of implementing ETM proposals followed by preparation of a strategic environmental and social management plan (SESMP). This is anticipated to be completed by August 2023.

References

OECD/DAC. 2006. Applying Strategic Environmental Assessment: Good Practice Guidance for Development Cooperation. *DAC Guidelines and Reference Series*. Paris: Development Assistance Committee. Organization for Economic Cooperation and Development.

Key Environmental Risks and Opportunities of ETM in Indonesia

The following table presents a ranking of key environmental risks and opportunities that have been identified for CFPP retirement, coal mine closure and renewable energy replacement in Indonesia. Ranking of the risks and opportunities are presented in three categories: High, moderate and low. The ranking has been determined using the results of the regional SESA scoping report and professional judgment of the SESA team. This evaluation is subject to further modification from the results of public consultation and further analysis by the SESA team.

Issue	Risks	Rating	Opportunities	Rating
GHG emissions	<ul style="list-style-type: none"> GHG emissions may occur in other locations from sale of coal to other markets Emissions from uncontrolled mine abandonment Emissions from dams, machinery and vehicles 	M	<ul style="list-style-type: none"> Reduction of GHG emissions from retirement of CFPPs Clean energy supplies from RE projects 	H
		H		H
		M		
Air quality	<ul style="list-style-type: none"> Particulates released by fires in uncontrolled abandoned mines Dust from construction of renewables, land clearing and vehicular movements) Air pollution from machinery and vehicles Emissions from bioenergy and geothermal facilities 	M	<ul style="list-style-type: none"> Improved air quality with reduced emissions following CFPP/mine closure 	H
		M		
		L		
		L		
Noise	<ul style="list-style-type: none"> Construction noise from renewable energy development Operational noise from RE (particularly wind) 	M	<ul style="list-style-type: none"> Reduction in noise levels due to CFPP retirement and mine closure 	M
		M		
Water quality	<ul style="list-style-type: none"> Groundwater and surface water contamination from mines and abandoned CFPPs Water quality issues from renewable projects – different for each type Pollution from development and operation of renewables 	H	<ul style="list-style-type: none"> Improved water quality through reduction of discharges from CFPPs and mines Remediation of groundwater and surface water polluted by CFPPs and mines 	H
		H		
		M		
Water quantity and use	<ul style="list-style-type: none"> Water usage by renewables (particularly for onshore wind and solar) Reduction in environmental flows from hydroelectric facilities 	M	<ul style="list-style-type: none"> Reduction in water demand from CFPP retirement and coal mine closure 	M
		H		

Issue	Risks	Rating	Opportunities	Rating
Access to land and water	<ul style="list-style-type: none"> Impaired access to land and water resources 	H	<ul style="list-style-type: none"> Restoration of access to land and water through reclamation of abandoned CFPPs and mine sites 	M
Contaminated land and groundwater	<ul style="list-style-type: none"> Land contamination following CFPP/mine closure Contamination during development of RE projects (particularly during construction phase) 	H M	<ul style="list-style-type: none"> Remediation of contaminated CFPP/mine sites 	H
Waste management	<ul style="list-style-type: none"> Residual hazardous waste and toxic impoundments following closure of CFPPs/mines – can cause pollution Spoil from construction of renewables Hazardous decommissioning and replacement component waste from wind and solar plants Crop waste from biofuel production 	H M H L	<ul style="list-style-type: none"> Remediation of contaminated sites 	H
Aesthetics	<ul style="list-style-type: none"> Visual footprint of renewables – wind, solar, hydro Shadow flicker and solar glare from wind and solar projects 	H M	<ul style="list-style-type: none"> Improved landscape following reclamation and repurposing of CFPP and coal mine sites 	H
Land use change	<ul style="list-style-type: none"> Abandoned mine sites Land clearing for renewables – wind, solar, hydro Inundation by reservoir creation for hydroelectric projects Loss of production land and reduced access to land taken for renewables Biofuels displace food crops Geotechnical stability and safety issues of abandoned coal mines Impacts to tourism 	H M H M M H M	<ul style="list-style-type: none"> Landscape improvements through remediation and repurposing of CFPPs and coal mines 	H

Issue	Risks	Rating	Opportunities	Rating
Land degradation	<ul style="list-style-type: none"> • Legacy contamination from CFPP and coal mines • Slumpage from collapse of underground mine works • Failure of tailings dams, and stockpiles • Soil erosion from construction of RE projects and associated infrastructure such as road and transmission line construction • Waterlogging caused by artificial land contours and drainage patterns 	<p>H</p> <p>H</p> <p>H</p> <p>M</p> <p>M</p>	<ul style="list-style-type: none"> • Landscape improvements through remediation and repurposing of CFPPs and coal mines 	<p>H</p>
Mineral extraction	<ul style="list-style-type: none"> • Over-extraction of minerals (metals) and other material demands for wind and solar energy development 	<p>H</p>		
Terrestrial biodiversity	<ul style="list-style-type: none"> • Loss of and fragmentation of habitats and loss of biodiversity due to renewable energy development (land clearing, road construction, plantations from biofuels) • Increased poaching and hunting due to increased access and/or loss of jobs in CFPPs or coal mines • Increased illegal land clearing and logging due to loss of jobs in CFPPs or coal mines • Introduction of invasive species • Bird/bat collisions with powerlines and wind turbines 	<p>H</p> <p>M</p> <p>M</p> <p>M</p> <p>H</p>	<ul style="list-style-type: none"> • Improved biodiversity following habitat restoration at CFPP sites and coal mines 	<p>H</p>

Issue	Risks	Rating	Opportunities	Rating
Aquatic biodiversity	<ul style="list-style-type: none"> • Loss of riparian habitats, fragmentation and alteration of aquatic habitats, and changed sediment/nutrient flows in rivers due to hydroelectric development • Loss of aquatic organisms due to deoxygenation of dams • Eutrophication in river systems due to hydropower reservoirs • Changes in water quality and ecology in lakes and reservoirs caused by floating solar installations (e.g., shading, reduced mixing, reduced wind exposure) • Dams and barriers in river systems can prevent fish migration • Mercury liberation from hydroelectric development • Introduction of invasive species • Underwater vibration and noise (from offshore wind farms) can change behavior of marine biodiversity • Marine fauna can be killed by vessels during construction of offshore wind farms • Increased fishing pressure in marine and freshwater systems due to reduced income / loss of jobs from coal mines / CFPPs 	<p>H</p> <p>M</p> <p>M</p> <p>M</p> <p>H</p> <p>H</p> <p>M</p> <p>M</p> <p>M</p> <p>M</p>	<ul style="list-style-type: none"> • Improvements to quality of aquatic habitats and biodiversity from CFPP and coal mine closures 	<p>H</p>
Cultural heritage	<ul style="list-style-type: none"> • Loss or damage to tangible and intangible cultural heritage from development of renewable energy facilities 	<p>H</p>		
Health, Safety and Security	<ul style="list-style-type: none"> • Exposures to waste and hazardous material from disposal 	<p>H</p> <p>M</p>	<ul style="list-style-type: none"> • Improvements to public health (due to reduced air and noise pollution and reduced occupational 	<p>H</p>

Issue	Risks	Rating	Opportunities	Rating
	<ul style="list-style-type: none"> • Loss of community health services on closure of CFPPs/mines • Safety impacts from hydroelectric reservoirs • Community health and safety risks during construction of renewable projects, e.g.: communicable disease transmission with influx of migrant workers, injury and morbidity due to increased industrial traffic, vector-borne disease risks, mental health and stress-mediated health outcomes due to resettlement • Occupational health and safety risks associated with both development (injury, exposures and death) and retrenchment (mental health and stress-mediated health outcomes e.g., hypertension, CVD) 	<p>M</p> <p>M</p> <p>M</p>	<p>hazards following CFPP/mine closure)</p>	

Key Social Risks and Opportunities of ETM in Indonesia

The following table presents a ranking of key social risks and opportunities that have been identified for CFPP retirement, coal mine closure and renewable energy replacement in Indonesia. Ranking of the risks and opportunities are presented in three categories: High, moderate and low. The ranking has been determined using the results of the regional SESA scoping report and professional judgment of the SESA team. This evaluation is subject to further modification from the results of public consultation and further analysis by the SESA team.

Issue	Risks	Rating	Opportunities	Rating
Legacy socioeconomic issues	<ul style="list-style-type: none"> Legacy issues from CFPP and coal mine development Unresolved socioeconomic issues (e.g., lack of compensation for land and property loss, lost livelihoods and income) linked to CFPPs 	H H	<ul style="list-style-type: none"> Reclamation of disturbed and contaminated sites may address legacy issues Revisit and seek to improve upon CFPP livelihood compensation, community development agreements, and restoration plans 	H M
Regional economy	<ul style="list-style-type: none"> Reduced tax revenue Reduced reliability of energy supply and higher energy costs Sale of coal to other markets Change in coal supply chains and disruption of associated businesses 	M H M M	<ul style="list-style-type: none"> Diversification of economy as a result of renewable energy development More collaboration between all levels of government and in partnership with relevant nongovernmental partners 	H H
Illegal mining	<ul style="list-style-type: none"> Increased illegal mining 	M	<ul style="list-style-type: none"> Reduced illegal mining 	M
Employment and labor conditions	<ul style="list-style-type: none"> Loss of jobs (direct and indirect) in CFPPs/coal mines, and when people relocated (e.g., due to dam construction) Increased pressure on welfare/social protection Use of forced labor and child labor 	H H L	<ul style="list-style-type: none"> Long-term opportunities for employment, improved labor standards and working conditions in CFPPs and supply chains during retirement period New job opportunities and improved working conditions in renewable energy development Potential for retraining and learning new skills 	M M H

Issue	Risks	Rating	Opportunities	Rating
Local economy and livelihoods	<ul style="list-style-type: none"> • Reduced livelihood and business development opportunities due to CFPP retirement and mine closure • Increased households' indebtedness and vulnerability to poverty related to individuals and businesses unable to repay their loans • Reduced revenues from renting properties and values of properties as a result of out-migration • Loss of income from agriculture/fishing due to land/marine area take for renewables • Land acquisition for renewable energy projects • Loss of livelihoods due to relocation • Loss of jobs (direct and indirect) in CFPPs/coal mines, and when people relocated (e.g., due to dam construction) 	<p>M</p> <p>M</p> <p>M</p> <p>M</p> <p>H</p> <p>H</p> <p>H</p>	<ul style="list-style-type: none"> • Opportunities for retraining and skill development in renewable energy • Rehabilitation/ redevelopment of CFPP sites will create income generation activities • Communities can gain from benefit-sharing schemes • Opportunities for small business associated with renewable energy developments. 	<p>H</p> <p>L</p> <p>L</p> <p>H</p>
Local economy and livelihoods	<ul style="list-style-type: none"> • Reduced livelihood and business development opportunities due to CFPP retirement and mine closure • Increased households' indebtedness and vulnerability to poverty related to individuals and businesses unable to repay their loans • Reduced revenues from renting properties and values of properties as a result of out-migration • Loss of income from agriculture/fishing due to land/marine area take for renewables 	<p>M</p> <p>M</p> <p>M</p> <p>M</p> <p>H</p> <p>H</p>	<ul style="list-style-type: none"> • Opportunities for retraining and skill development in renewable energy • Rehabilitation/ redevelopment of CFPP sites will create income generation activities • Communities can gain from benefit-sharing schemes • Opportunities for small business associated with renewable energy developments. 	<p>H</p> <p>L</p> <p>L</p> <p>H</p>

Issue	Risks	Rating	Opportunities	Rating
	<ul style="list-style-type: none"> Loss of livelihoods due to relocation Loss of access and rights to use resources in areas occupied by new renewable development 			
Gender and vulnerability	<ul style="list-style-type: none"> Women and vulnerable groups, such as the poor, persons with disabilities, children, the elderly, and Indigenous communities may be disadvantaged and at particular risk Incomes will be lost following closure of CFPPs/mines and competition for jobs in other sectors may well increase Increased competition from former male workers in CFPPs may arise in women-dominated industries (such as manufacturing and garment industries) following closure Increased domestic and gender-based-violence due to loss of income and influx of migrant workers 	H M M H	<ul style="list-style-type: none"> Provisions for capacity building, training plans, and loan programs including microfinance Opportunities for women and vulnerable groups to acquire new skills and learn new technologies Opportunities for vulnerable groups to engage in the decision-making process and in inclusive dialogue for CFPP retirement and the transition to renewable energy sectors 	H H M
Migration	<ul style="list-style-type: none"> Out-migration due to job loss Increased vulnerability of abandoned household members whose income depends on skilled migrants Tension between immigrants and local workers Pressure on preexisting health services and infrastructure 	H M M M	<ul style="list-style-type: none"> Promotion of migrant small and local business opportunities and skills enhancement programs 	M
Public services and infrastructure	<ul style="list-style-type: none"> Decline in public services from CFPP retirement and mine closure 	M	<ul style="list-style-type: none"> Opportunities for investment in communities by renewable energy developers (e.g., 	M

Issue	Risks	Rating	Opportunities	Rating
	<ul style="list-style-type: none"> Decreased public services due to less local government tax revenues Heavy vehicles and transportation damage existing roads and bridges 	M L	roads and bridges, schools, health centers, and administrative buildings)	
Land acquisition	<ul style="list-style-type: none"> Displacement due to land acquisition required for renewable energy projects 	H		
Indigenous peoples	<ul style="list-style-type: none"> Unresolved legacy land take and resource issues related to CFPP and coal mine development Impacts to land and access to resources from renewable energy development Impacts to ecosystem services and natural resource use from renewable energy development Impacts to cultural, spiritual, and hereditary values from renewable energy development 	H H H H	<ul style="list-style-type: none"> Restoration of land following reclamation of abandoned CFPPs and coal mines Promotion of Indigenous small and local business opportunities and skills enhancement programs Opportunities for Indigenous peoples to engage in the decision-making process and in inclusive dialogue for CFPP retirement and the transition to renewable energy sectors 	M H M
Social cohesion and engagement	<ul style="list-style-type: none"> Weakened community cohesion from out-migration and relocation Risk of internal social friction due to increased stress as income lost Tension/conflict between communities, NGOs, activists and renewable energy developers 	M H M	<ul style="list-style-type: none"> Focus on small business opportunities to avoid out-migration after decommissioning Opportunities for the communities to engage in the decision-making processes 	M M
Community and Spiritual Health	<ul style="list-style-type: none"> Loss of tax revenue into nongovernmental, public health services and infrastructure 	M H	<ul style="list-style-type: none"> Opportunities for community organizations and non-profits to engage with nongovernmental and government organizations 	M

Issue	Risks	Rating	Opportunities	Rating
	<ul style="list-style-type: none"> • Poor timing of opportunities for retrenchment, livelihood reconstruction, etc. could further weaken spiritual, physical and mental - familial, individual and community dynamics • Increasing pressure on community service organizations in focus areas such as addictions treatment and counseling, violence against women and girls, human trafficking, sex work, suicide, aids prevention, etc. 	M		

APPENDIX 7: Overview of Gender Mainstreaming Activities Supporting CIF-ACT IP

1. **Women's representation in Indonesia's energy sector.** In 2022, the share of female employment in Indonesia's mining and energy industries is below 10%,⁶⁹ concentrated in jobs requiring low STEM (Science, Technology, Engineering and Mathematics) skills which are more vulnerable to a shift to automation.⁷⁰ While women only comprised 12% of total STEM graduates in 2018, there was no gender gap in overall educational achievement in recent research, indicating that the gap in STEM fields was heavily influenced by gender stereotypes, such as the belief that men are a more 'natural fit' in STEM subjects.⁷¹

2. With respect to the workforce itself, there are 11 women holding directors' positions out of a total of 55 units (20%) in MEMR. There has been an increase in women's participation in decision-making roles since 2011, when MEMR only had 6 women in director positions out of 47 units in total (12.7%). Meanwhile, overall participation of women in MEMR as employees has also increased from 22.8% in 2011 to 27.5% in 2021. Women are underrepresented in Geo Dipa Energy (Persero, GDE) a state-owned geothermal holding company. Women made only 5% of the total number of employees at its Dieng office, 13% in Patuha, and 29% of the total employees in its headquarters in Jakarta in 2018. In Pertamina, the national energy company, 100% owned by the Government of Indonesia with the Minister of State-Owned Enterprise (SOE) as the Shareholder Proxy, two of the six Board of Directors and around 16% of senior management level are women. In the past, some of the energy sector job vacancies (e.g., for operator positions) explicitly referenced the need for male applicants, a practice that was not aligned with Act No. 3 of 2003 on Manpower (Law No. 13/2003) and Equal Employment Opportunity. Further, community consultations were rarely carried out, including with women residing in the affected communities. Even smaller numbers of women occupy high-level management positions in mining and energy companies. A lack of gender-sensitive policies can contribute to low representation of women in the sector. Without efforts to include women in the decision-making process, community-led RE efforts may replicate or further entrench existing inequalities and keep women in their traditional domestic roles.

3. **ADB approach and tentative gender categorization of the proposed projects under CIF-ACT IP.** The ADB gender categorization system is a 4-tier system to measure, count, and report on the extent to which gender equality issues are integrated into project design. It is a mechanism for reporting ADB's "at entry" gender mainstreaming commitments and for monitoring performance against the corporate results targets under Strategy 2030's Operational Priority 2: Accelerating Progress in Gender Equality (OP2).⁷² All sovereign and nonsovereign projects of the ADB are assigned one of four gender mainstreaming categories: (i) Category I: gender equity theme (GEN); ii) Category II: effective gender mainstreaming (EGM); (iii) Category III: some gender elements (SGE); and (iv) Category IV: no gender elements (NGE). The initial gender categorization for the proposed investments under the Indonesia CIF-ACT-IP is summarized below. Gender Action Plans will be prepared for projects that are categorized GEN, EGM based on the poverty, social and gender analysis at the project preparatory stage. For RBL type program specific gender program action plans will be developed and implemented.

⁶⁹ Indonesia Central Bureau of Statistics. (2022). *Labor Force Situation in Indonesia*. Indonesia Central Bureau of Statistics.

⁷⁰ International Labour Organization. (2021). *Women in STEM Programme in Indonesia: Promoting and demonstrating STEM-related hard and soft-skills through adaptive, creative and innovative approaches in the midst of COVID-19 pandemic*. Available at https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-jakarta/documents/publication/wcms_809227.pdf

⁷¹ Marshan J. and Nikijuluw, R. (2020, November 16). *Will Indonesia's 4.0 Revolution leave women behind? Indonesia at Melbourne*. <https://indonesiatmelbourne.unimelb.edu.au/will-indonesias-4-0-revolution-leave-women-behind/>

⁷² ADB, 2019. Strategy 2030. Operational Plan for Priority 2. Accelerating Progress in Gender Equality 2019-2024.

Proposed ADB Projects	Initial Gender Categorization	Remark
PLN RBL	Effective Gender Mainstreaming (EGM) at the concept stage	Category will be confirmed at project approval stage.
PT SMI ETM Country Platform	To be assigned at the stage of concept review and approval	Category will be confirmed at project approval stage.
IPP CFPP early retirement program	Some Gender Elements (SGE) based on preliminary concept review	Category will be confirmed at project approval stage.
Prime STeP: Supporting research & development and application of viable renewal energy in Indonesia	Effective Gender Mainstreaming (EGM) at concept stage.	Category will be confirmed at project approval stage.

4. World Bank approach and tentative gender categorization of the proposed projects under CIF-ACT IP.

The World Bank, grounded in its principle of equality, works to ensure that its operations bring benefits for all, including to the vulnerable groups such as women. In Indonesia, this is conducted through studies and analytics, such as gender mainstreaming assessment in mining industry (The World Bank unpublished report, 2021) and socioeconomic survey of Artisanal and Small-scale Mining Communities in West Lombok (Lahiri-Dutt, Amor and Perks, 2021). These efforts are being strengthened during the pandemic, taking into account the disproportionate impacts of COVID-19 to women in the mining sector (Devi et al., 2022). More attention is then directed to provide female miners with necessary assistance to bounce back from the pandemic. With regards to energy transition, the Bank's Just Transition approach Pillar 2 fully acknowledges the potential transition impacts to people and communities, including women, and works to prepare so that they are bolstered against any adverse transition impacts. Two large-scale global research processes were conducted to provide an overview of gender challenges in coal transition (Lahiri-Dutt et al., 2022). Results from the qualitative study noted that the idea of an 'elite development coal economy' cannot be applied universally, particularly to the Global South countries which have informal coal sector with high participation of women. Thus, this segment of coal economy demands greater attention, including focus on informal coal mining, indirect dependence on incomes from coal, and most importantly, the role and contributions of women in the care economy. While the quantitative exercise found no statistical effect of coal reliance on human development and gender equality measures, it does not imply that coal reliance has no impacts to both variables as the analysis is only at cross-country level. Thus, different level of analysis, such as at subnational level where coal has been the driver of economic development is worth pursued. All studies highlight the need for more contextual research in order to be able to specifically understand the challenges of coal transition with respect to its gender aspect. Finally, a feminist approach was also developed to provide guidelines for a gender and intersectionality informed mechanism when transitioning to low the carbon future.

5. The World Bank uses a 'Gender Tag' system to assess whether a project integrates gender aspect in its development and implementation. To meet the criteria for a gender tag, projects should include the following components:

- Gender Analysis: Identify and substantiate that the gaps between or among females and males in a given sector or project context, especially those identified through the systematic country diagnostic (SCD) and the country partnership framework (CPF), are relevant to the project development objective (PDO) and the four pillars of the WBG's gender strategy;
- Gender Actions: Aim to address identified gender gaps by designing specific actions that are supported by the project; and
- Gender Indicators: Link these actions to indicators included in the RF to measure the progress of the proposed actions.

A gender-tagged project will cover the gender gaps analyzed during its initial stage (Gender Analysis component), particularly those potential inequalities pre-identified through the Systematic Country Diagnostic (SCD) and the Country Partnership Framework (CPF). Actions are then developed to close the identified gender gaps (Gender Actions component). Gender Indicators are then included in the Results Framework to assess the actions' progress. The Bank's 'gender-tagging' system focuses on the quality and

depth of the project's outcomes, rather than on processes and quantitative measurements alone. For the proposed projects under this CIF-ACT IP, the initial gender categorization can be seen in the table below.

Proposed World Bank Projects	Initial Gender Categorization	Remark
Just Transition and Repurposing Investment Project (Phase 1 &2)	Gender-tagged at the concept stage, with potential activities including gender-disaggregated data collection in the labor and community profiling	Category will be confirmed at project approval stage
Repowering with RE (IFC)	Gender-tagged at the concept stage, with potential activities including gender-disaggregated data collection in the labor and community profiling	Category will be confirmed at project approval stage

6. **Further considerations for IP implementation.** A good starting point for promoting greater gender equality is collecting gender-disaggregated information—social and economic data that measures differences between females and males through national statistics. Understanding of detailed gender-disaggregated data could form the basis for developing targeted gender-sensitive socioeconomic assessments that could foster better equality and social inclusion. Special focus on gender equality and inclusion of disadvantaged groups could be achieved through provision of legal services, inclusive education, reproductive health care and broader health services, and addressing the threat of sexual and gender-based violence perpetrated on women, girls and gender/sexual minorities particularly in construction/new development and heavy industries. This should include survivor-centered supportive systems through government and in partnership with mining companies delivered through CSOs working closely with local communities. Engaging community and religious leaders working through community dialogue to dispel notion that gender equality is only for women, develop a narrative of mutual respect among men and boys.

7. Improved understanding of the current status of gender knowledge in Indonesia and the portray of the gender-related stakeholder landscape and gender-mainstreamed regulatory framework gives a notion to next action items that need to be designed using both the WOLCOT resources as well as that of the CIF-ACT's. As mentioned in an earlier section, both frameworks are complementary to each other and emphasize the “just” element of bringing the voices of women and marginalized groups forward. The WOLCOT mechanism prepares the baseline research and early kick-start projects for deployment of larger funding under this IP to unleash the potential of a women-led coal transition.

APPENDIX 8: ADB Energy Sector Support Program and Experience in Indonesia

1. Since 1970, ADB has financed 39 energy projects and programs with total lending of \$6.8 billion in Indonesia. With few exceptions, completed loan projects have delivered their expected outputs and achieved their immediate objectives. The Independent Evaluation Department of the ADB rated the country energy program *successful* in 2019.⁷³ ADB sovereign investments during 1999–2021 totaled \$3.9 billion and included (i) the Power Sector Restructuring Program (\$380 million), (ii) the Renewable Energy Development Sector Program (\$161 million), (iii) the West Kalimantan Power Grid Strengthening Project (\$49.5 million), (iv) the Sustainable and Inclusive Energy Program, Subprograms 1 and 2 (\$1 billion), (v) the Electricity Grid Strengthening–Sumatra Program (\$600 million), (vi) the Sustainable Energy Access Program Electricity Grid Strengthening in Sulawesi and Nusa-Tenggara (\$600 million), (vii) the Sustainable Energy Access Program Electricity Grid Strengthening in Kalimantan, Maluku, and Papua (\$600 million), (viii) Geothermal Power Generation Project (\$335 million), and (ix) Sustainable and Reliable Energy Access Program–Western and Central Java (\$600 million). Private sector operations in Indonesia have had a strong focus on renewable energy, funding Wind and Solar Power South Sulawesi (\$133.5 million) and three geothermal projects: Sarulla (\$250 million), Muara Laboh (\$70 million), and Rantau Dedap (\$173 million).

2. ADB is also supporting the government in its reform efforts through a range of technical assistance activities focused on (i) reduced subsidies in favor of cost-reflective tariffs for fuels and electricity; (ii) price incentives for geothermal, wind, and solar energy; (iii) energy efficiency-related policies and programs, including support for energy service companies and appliance standards; (iv) gas sector reform; (v) least-cost electrification planning to support the national electrification program; and (vi) pilot testing of carbon capture and storage. In 2019, ADB prepared a White Paper helping the government in setting energy-related RPJMN priorities and targets.⁷⁴

3. Overall, ADB's energy sector plans in Indonesia are designed to support boosting competitiveness by improving infrastructure connectivity, which is one of three strategic pillars in the Indonesia country partnership strategy 2020–2024.⁷⁵ ADB's engagement in the sector is centered on three areas: (i) knowledge and awareness; (ii) improved policy and mainstreaming of best practices; and (iii) the financing of energy infrastructure to increase renewable energy, grid reliability, and energy sector innovation. ADB's policy support helps the government realize sustainable and gender-equal policy reforms to promote renewable generation, full electricity access, affordable pricing, and energy security. ADB's private sector operations will continue to support renewable energy. Given the synergies between sector policies and project outcomes, ADB's energy sector strategy, as elaborated in the country partnership strategy, aims to deploy policy-based lending, project financing, and results-based lending in a mutually reinforcing way. For example, programs for 2023–2025 currently under development and addressing these key engagement areas include the Accelerating Indonesia's Clean Energy Transition Program (results-based loans or RBLs) and Affordable and Sustainable Energy Transition Program (policy-based loans or PBLs).

4. **ADB Energy Transition Mechanism.** The Government of the Republic of Indonesia, the Government of the Republic of the Philippines, and the Asian Development Bank (ADB) announced a partnership in November 2021 at the 26th UN climate change conference (COP26) to design and launch an Energy Transition Mechanism (ETM) to accelerate the transition from coal-to-clean energy in Southeast Asia, in a just and affordable manner. Under the partnership with Indonesia and the Philippines, ADB has made significant progress and has moved from concept to an operational program. ADB is currently engaged in the following:

⁷³ Independent Evaluation Department. 2019. *Country Assistance Program Evaluation: Indonesia, 2005–2018*. Manila: ADB.

⁷⁴ Government of Indonesia, Ministry of National Development Planning; Asian Development Bank; and Government of Australia, Department of Foreign Affairs and Trade. 2020. *Independent Assessment of Indonesia's Energy Infrastructure Sector*. Jakarta.

⁷⁵ ADB. 2020. [Country Partnership Strategy: Indonesia, 2020–2024—Emerging Stronger](#). Manila.

- i) identifying through a feasibility study, a pool of candidate coal-fired power plants for early retirement/repurposing;
- ii) initiating the establishment of an ETM Fund/Vehicle through the issuance of a request for concepts from the private sector;
- iii) establishing and operationalizing the ETM Partnership Trust Fund to be administered by ADB;
- iv) catalyzing active participation from G-7 countries (Just Energy Transition Partnership or I-JETP) and providing institutional support to the I-JETP Secretariat in Indonesia.
- v) initiating Strategic Environment and Social Assessment (SESA) and Just Transition assessments to identify impacts of the energy transition as it unfolds and related mitigation measures; and
- vi) collaborating with additional developing member countries in Asia, which are embarking on their own energy transition strategies and exploring early retirement of coal-fired power plants within such strategies.

5. Overall, ETM is being designed to be a scalable, collaborative mechanism developed in partnership with developing countries that will leverage a market-based approach to accelerate the transition from fossil fuels to clean energy. It prioritizes a country-specific approach that seeks government buy-in and seeks to apply innovative finance approaches to leverage public, private, and concessional capital to accelerate fossil-fuel retirement, develop renewable replacement capacity, and fund a just transition. Multilateral bank involvement ensures appropriate governance and legal structure to ensure monitoring and follow-through.

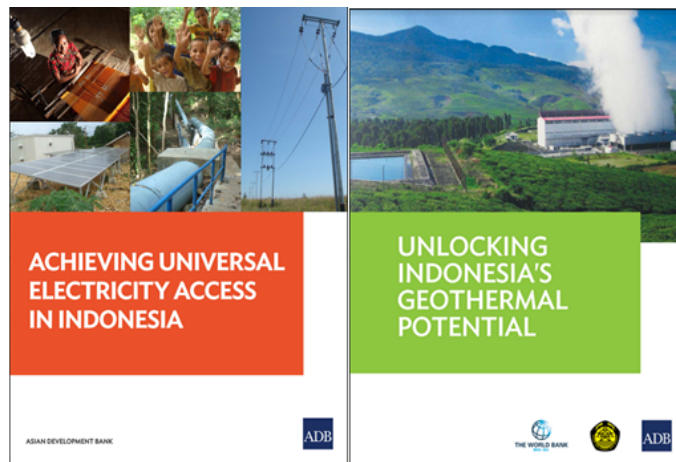
ADB Major Public and Private Sector Projects Approved in Indonesia since 2012

Public Sector Project Name	Amount (\$ million)	
Java–Bali Electricity Distribution Performance Improvement Project		50
West Kalimantan Power Grid Strengthening Project		50
Java–Bali 500-Kilovolt Power Transmission Crossing		224
Sustainable and Inclusive Energy Program–Subprogram 1 and 2		1,000
Sustainable Energy Access in Eastern Indonesia: Electricity Grid Development Program Results Based Loan		600
Electricity Grid Strengthening–Sumatra Program		600
Sustainable Energy Access Program Electricity Grid Strengthening in Sulawesi and Nusa Tenggara		600
Sustainable Energy Access Program Electricity Grid Strengthening in Kalimantan, Maluku, and Papua		600
Geothermal Power Generation Project		335
Sustainable and Reliable Energy Access Program–Western and Central Java		600
Private Sector Project Name	Location	Amount (\$ million)
Riau 275 MW Combined-Cycle Gas-Fired Power Plant	Sumatra	70
Jawa-1 Liquefied National Gas-to-Power (1,760 MW)	West Java	185
Eastern Indonesia Renewable Energy Project Phase I Tolo Wind (72 MW)	South Sulawesi	69
Eastern Indonesia Renewable Energy Project Phase II One 21 MW Solar (21 MW)	Sulawesi	
Eastern Indonesia Renewable Energy Project Phase II-three 7 MW Solar (21 MW)	West Nusa Tenggara	
Rantau Dedap Geothermal (90 MW)	South Sumatra	173
Sarulla Geothermal (321 MW)	Sumatra	250
Muara Laboh Geothermal (80 MW)	Sumatra	70

ADB Major Technical Assistance (Grant) support in Indonesia since 2016

- RPJMN Energy Sector Assessment including analysis on solar rooftop PV, autonomous electricity regulator, least-cost electrification modelling (BAPPENAS / MEMR / PLN)
- RENSTRA Strategic Planning (MEMR)
- Scaling-Up Energy Efficiency (DG EBTKE MEMR)
- Renewable energy tariff reform (PT SMI / MOF),
- Renewable energy and energy efficiency financing (MEMR/MOF),
- Electric transport (MEMR / PLN / Trans Jakarta)
- Preparation of ADB financed energy projects (MEMR / PLN / Geodipa)

Select Energy Sector Analytical Reports Produced by ADB (2014-2022)



APPENDIX 9: WBG Energy Sector Support Program and Experience in Indonesia

1. **History of World Bank Group (WBG) support for the development of Indonesia's energy sector.** The WBG's work with the Government of Indonesia on developing its energy sector began in 1969, not long after WBG established its resident mission in Jakarta in 1968. At the time, Indonesia's power supply was inadequate and electric power facilities were in need of significant investment, as a result of years of difficult political and economic conditions. WBG's first funding to the energy sector, a \$15 million IDA credit, aimed to expand the electricity distribution system in and around the capital city of Jakarta and improve the organization and efficiency of the entire power sector by providing assistance and training in operations, engineering, finance, and management.⁷⁶

2. In the 1970s and 80s, WBG proceeded to support dozens of projects in the power sector to develop and diversify Indonesia's sources of electricity production, mainly through the use of geothermal, hydro and coal, to improve the operational efficiency of the state utility PT Perusahaan Listrik Negara's (PLN) distribution networks, reduce PLN's system losses and provide technical assistance for the continued institutional development of PLN.⁷⁷ Examples of projects included support for the construction of the 200 MW Muara Karang thermal station; developing the hydroelectric potential of the Citarum River (through construction of a storage dam, water conductor system and 700 MW power station); construction of two 400 MW coal-fired units at the Suralaya steam power plant in West Java, and expansion of the distribution facilities in East and Central Java and in the Jakarta area, targeting 400,000 residential consumers in urban and rural areas.

3. Through the 1990s to 2010s, WBG continued to support the development of electricity supply, with a particular focus on efficient rural electrification. Loans were provided to support the construction of facilities to electrify several thousands of villages and bring down the unit cost of distribution in rural areas.⁷⁸ In addition to financing the development of physical infrastructure components of the energy sector, WBG was also supporting the GOI on several policy issues, such as establishing a policy framework for private sector participation, the restructuring of PLN and establishing its commercial operations as a limited liability company, and other regulatory and market mechanisms to enhance the oversight and efficiency of the sector.⁷⁹

4. **Working toward the greening of Indonesia's energy system and accelerating action on climate change.** Over the past two decades, WBG has increased its support for the development of sustainable energy in Indonesia. The importance of this priority was reflected in the Country Partnership Framework (CPF) for Indonesia for FY2016 to 2021, which had the goal of increasing sustainable energy production as one of its six areas of engagement with the Indonesian government. The latest CPF covering FY2021 to 2025 builds on this area of engagement, highlighting that improving energy infrastructure, through transitioning to low-carbon energy and attaining universal access to electricity, will be a key enabler of Indonesia's long-term economic growth.

5. Geothermal power is a subsector that WBG has had a particular focus on, given the significant gap between Indonesia's geothermal potential, the largest of any country in the world, and the development of these resources.⁸⁰ In 2011, the World Bank supported the Geothermal Clean Energy Investment Project, which financed the construction of the Steamfield Above-Ground System (SAGS) and the Ulubelu and Lahendong (Tompasso) geothermal fields. WBG continues to support the scale up of investment in geothermal energy development and is currently contributing to two first-of-its-kind geothermal programs.

⁷⁶ World Bank. World Bank Group Timeline. <https://timeline.worldbank.org/event/2241>.

⁷⁷ World Bank. Power Project. <https://projects.worldbank.org/en/projects-operations/project-detail/P003825>.

⁷⁸ World Bank. Rural Electrification Project. <https://projects.worldbank.org/en/projects-operations/project-detail/P003979>.

⁷⁹ World Bank. Sumatera and Kalimantan Power Project. <https://projects.worldbank.org/en/projects-operations/project-detail/P003910>

⁸⁰ With about 27,000 MW of geothermal power potential, Indonesia has roughly 40% of the world's geothermal potential, the largest of any country in the world.

First, the Geothermal Energy Upstream Development Project (GEUDP) which supports government-sponsored exploration drilling, to enable the development of 65 MW of geothermal energy across Indonesia. Second, the Geothermal Resource Risk Mitigation (GREM) Project which supports the deployment of an innovative risk-sharing mechanism to facilitate exploration drilling by developers in up to 17 geothermal greenfield sites. GREM is expected to enable the development of 1,000 MW of geothermal energy and estimated GHG emission reduction of 187 million MtCO₂e by 2029. The two projects have been widely referenced as strategic government initiatives in the geothermal sector.

6. WBG, alongside the Asian Infrastructure Development Bank (AIIB), is also financing Indonesia's first highly complex pumped storage hydropower project (the Upper Cisokan). The project will be the first of other pumped storage schemes that can be developed, especially on Java-Bali, that can support the integration of variable renewable energy and ultimately reduce over-reliance on coal.

7. To reach the universal electricity access goal, Indonesia has been working with WBG on preparing a least-cost electrification project, which seeks to electrify Indonesia's Eastern Islands while displacing fossil fuels with solar and hybrid as part of the least-cost generation and improving grid reliability. At the same time, WBG has been supporting PLN on accessing commercial financing for "green" projects. Also under preparation are the two projects proposed under this IP: an Energy Transition Program-for-Results and a Just Transition and Coal Repurposing project.

8. Over this time, the IFC has also been engaging with private sectors in the energy space in Indonesia both in investment and advisory sides with focus on the development of Renewable Energy. Selected IFC's investments in the energy sector include hydro power and gas IPP. In 2014, IFC provided a US\$280 million loan facility with tenors of 13- and 15-year and acquired a minority stake in Asahan 1, a 180MW run-of-river hydro plant in North Sumatra. In 2020, IFC refinanced the Asahan-1 facility and provided US\$230 million debt facility for Asahan-1, mobilized institutional investors to have direct exposure to de-risked Infrastructure assets for the first time and also extended the tenor of the loan facility to 17 years and improved the pricing. In addition, in 2018, IFC provided US\$50 million long-term project finance for up to 20 years to Riau Gas IPP owned by Medco Power and Ratchaburi. IFC will continue to support the private sector on RE projects such as wind power and battery storage, floating solar project, hydro power plant, and waste-to-energy projects. IFC has also been advising the first Waste-to-Energy PPP project in Indonesia.

9. **Ongoing technical assistance to support energy sector reforms.** The Government of Indonesia is currently developing a roadmap to Net Zero by 2060, to be unveiled at COP27 and at the G20 Summit in November 2022. Government entities are contributing sector-specific inputs to the roadmap, including MEMR, who with WBG support is developing a Power Sector Action Plan of reforms. Many of the recommendations under the Action Plan are informed by two analytical works prepared by the World Bank over the last 12 months: 1) a White Paper on energy sector reform, and 2) the Indonesia Climate Change for Development Report. This analysis in turn was underpinned years of dialogue and engagement on PLN's financial sustainability, including review of their revenue model, tariff structure and corporate financial strategy. The key recommendations from all of these works will underpin WBG operations going forward, as part of a comprehensive energy sector reform program covering pricing, planning, and regulatory improvements that will help Indonesia accelerate energy transition and private investments and put PLN on a more sustainable financial footing.

WB Major Energy Sector Investment Projects since 2010

Investment Project Name	Period	Commitment Amount (US\$m)
Development of Pumped Storage Hydropower in Java-Bali System Project	September 2021 - Present	610
Indonesia Geothermal Resource Risk Mitigation Project	September 2019 -	325

(GREM)	Present	
Geothermal Energy Upstream Development	February 2017 - Present	50
Power Distribution Development Program-for-Results	April 2016 - April 2020	920
Indonesia Energy Sector Development Policy Loan	December 2015 - July 2016	500
Indonesia Second Power Transmission Development Project	July 2013 - December 2019	138
Geothermal Clean Energy Investment Project	July 2011 - December 2018	175
Pumped Storage Technical Assistance Project	May 2011 - December 2021	620
Indonesia Power Transition Development Project	July 2010 - October 2019	225
Indonesia Climate Change Development Policy Project	May 2010 - December 2010	200

APPENDIX 10: Project Concept – PLN Early Retirement Program

Problem Statement

In its most recently approved Electricity Power Supply Business Plan (RUPTL), 2021–2030, Perusahaan Listrik Negara (State Electricity Corporation, PLN) plans to add 20.9 GW of renewable energy capacity of which 56% should be developed by independent power producers (IPP). PLN estimates that this would contribute to avoiding 336 million tons carbon dioxide equivalent (MtCO_{2e}). The accelerated development of renewable energy will facilitate reducing the electricity supply from coal, for example through early retirement of coal-fired power plants (CFPPs) which would further contribute to avoiding CO_{2e} emissions of potentially 900 MtCO_{2e} as per PLN estimates. The plan also includes the conversion of diesel power plants, spread across 2,130 locations, through renewable energy hybrid systems further contributing to avoiding 10 MtCO_{2e}.

The plan is faced with two challenges. First, overcapacity and high reserve margins on Java-Bali, which is the major load center which is expected to last till about 2030, means that operational CFPPs will continue to be the main stay, threatening the success of this planned expansion of renewables. The first set of CFPP retirements in PLN's schedule of retirements do not begin until 2030. Second, the financing needed to expand renewable energy capacity is estimated at over \$5 billion per year, and PLN does not generate sufficient cash flow to fund significant investments. The utility is largely dependent on borrowing to fund investments.

Proposed Transformation

The Asian Development Bank (ADB) is preparing a results-based lending (RBL) program to support PLN in accelerating Indonesia's clean energy transition. The overall objective of the RBL program is to help PLN accelerate the development of renewable energy as an alternative source of electricity supply to reduce electricity supply from CFPPs. The first phase of this RBL program will focus on activities and expenditures on (i) increasing the share of electricity supply from renewable energy sources (i.e., main driver being a combination of the termination of operations and retirement of ~1-2 GW of CFPP before 2030, cancellation of PPAs for planned CFPP developments and lower utilization of its overall CFPP fleet), (ii) expanding the transmission grid infrastructure, and (iii) strengthening PLN institutional capacity to manage a just energy transition including how to integrate just transition into internal policies and procedures. PLN has already shortlisted 9 candidate CFPPs in Java-Bali grid slotted for retirement by 2030. These 9 plants were included in ADB's socioeconomic impact analysis, and the results will be used to support PLN on just transition. The RBL is also an opportunity to promote broader institutional change throughout PLN, support activities such as workforce and skills planning⁸¹ and integration of just transition into ESG, paving the way for further accelerated retirements in the coming decade. Satisfactory performance on this and indicators will form the basis for periodic loan disbursements.

Implementation Readiness

The proposed activities are backed by strong political will and commitment. Commitments have been made in Indonesia's National Energy Policy to expand the use of renewable energy to meet 23% of primary energy supply by 2025 and 31% by 2050. In its RUPTL, 2021–2030, PLN plans to increase renewable energy generation from 12.7% of total generation in 2021 to 24.8% by 2030. The RBL program is currently being prepared by ADB with approval of the RBL program by ADB's Board of Directors targeted for Q3 2023. ADB and PLN have previously implemented four RBLs satisfactorily, so the modality is well understood.

Rationale for ACT Cofinancing

Concessional funds from the CIF-ACT program would complement financing from ADB and other development partners to assist PLN to increase the share of renewable energy generation and incentivize the accelerated retirement of CFPPs to before 2030. With the ability of the government and capability of

⁸¹ A specific indicator may be tied to incentivizing PLN to partner with local universities for energy transition education for PLN staff, linked to Component 2.3, Reskilling for RE or PRIME STeP.

domestic and international financing institutions to lend to PLN limited, assistance from major development partners has become all the more important in securing a healthy economic recovery and the continued development of clean and efficient energy.

ADB's RBL modality is the most appropriate sovereign lending modality. Defining financing objectives in terms of not only inputs, but also in terms of delivering targeted and measurable results, as required by the RBL modality, will incentivize PLN to focus its activities on delivering financially, environmentally, and socially beneficial impacts, not just building more infrastructure. Concessional funds from CIF-ACT will contribute to incentivizing PLN to achieve its delivery commitments to accelerate its transition to renewable clean electricity supply both, PLN-owned capacity and power purchase from IPPs. It will contribute to a change in mindsets, elevating the importance and priority attached to renewable energy within PLN. It complements ADB's Energy Transition Mechanism which focuses on a variety of transaction options to retire IPP and public utility owned CFPPs early and replace them with clean, renewable energy sources.

Results Indicators (to be finalized)

Result	Indicator	Baseline ^a	Target ^a	Data Source & Means of verification
Policies	Number of policies, regulations, codes, or standards that have been amended or adopted (#)	n/a	[2]	MDB Public disclosures; Implementing Agency reporting
Readiness	Coal transition strategies finalized (#)	n/a	[1]	MDB and Government Public disclosures
Reduce GHG emissions	GHG emissions reduced or avoided (mt CO ₂ eq) – direct/indirect	n/a	[20]	MDB results reporting
Mobilized cofinancing	Volume of cofinancing leveraged	n/a	[1,742]	MDB Public disclosures
Plant decommissioning	Capacity of existing coal power generation assets accelerated for retirement (MW)	n/a	[1,000]	MDB results reporting
Coal abatement	Amount of coal diverted (million tons)	n/a	[11]	MDB results reporting

Note: Baseline and targets are currently being developed.

Financing Plan

Source	Amount (US \$ million)
ADB	530
Other development partners (KfW, AFD) ^a	600
CIF ^b	50
PLN	612
Total	1,792

Note: ^a Financing amount to be confirmed/adjusted based on PLN concurrence. ^b CIF amount to be confirmed.

RBL Program Preparation Timetable

Milestones	Expected Completion Date
ADB Fact-finding	1 st quarter 2023
ADB Management review meeting	2 nd quarter 2023
Loan negotiations	3 rd quarter 2023
ADB Board consideration	4 th quarter 2023
Loan signing	4 th quarter 2023

Source: Asian Development Bank estimates.

APPENDIX 11: Project Concept – PT SMI Early Retirement Program

Problem Statement

The Government of Indonesia (GOI) has identified a just and affordable transition from coal-to-clean energy as a national priority and has included energy transition driven by a sustainable financing mechanism as a key priority for its Presidency of the G20 in 2022. Indonesia has committed, through the Paris Agreement, to reduce its GHG emissions by 31.89% (or by 43.2% with international financial support) by 2030.⁸²

In 2019, electricity generation accounted for 43% of energy sector emissions or 15% of Indonesia's total greenhouse gas emissions. Around 67% of Indonesia's electricity comes from coal, and in spite of abundant resources, the contribution of solar and wind to the energy mix has remained minimal. The electricity sector therefore has a key role in helping the country reduce its greenhouse gas emissions through accelerated Coal-Fired Power Plants (CFPPs) retirement and increasing the share of renewable energy, in line with the government's commitments in Presidential Regulation 112/2022 and its energy transition roadmap.

Summary of Intervention

The Ministry of Finance (MOF) assigned the SDG Indonesia One platform managed by PT Sarana Multi Infrastruktur (PT SMI) as the ETM Country Platform (ETMCP) secretariat and manager. Established in 2009 to catalyze Indonesia's infrastructure development, PT SMI is a state-owned enterprise overseen by the MoF. PT SMI has extensive experience in lending to commercial and public infrastructure projects and has expertise in project development, structuring, financing, risk management, and safeguards which support its infrastructure lending transactions.

The ETMCP will play a critical role in coordinating various energy transition activities and channel fiscal support where needed. It has been tasked with deploying a range of traditional and innovative financing instruments such as debt (loans), equity, guarantees, bonds, and carbon finance.

ADB is looking to support the ETMCP through a financial intermediation loan (FIL) from ADB to MOF which will be re-lent to PT SMI as ETMCP Manager to support underlying early retirement subprojects. As ETMCP Manager, PT SMI has a good track record in project development, structuring, and financing across multiple sectors. PT SMI's international credit rating is BBB/Stable and domestic credit rating is AAA/Stable (Fitch) as of April 2022. PT SMI reported total assets of IDR74.8 trillion (2021) and issued the first green bond in Indonesia in 2018. PT SMI is currently the first GCF Accredited Entity in Indonesia as a DAE (Direct Accredited Entity). In February 2022, ADB approved a \$150 million financial intermediation loan for the SDG Indonesia One Green Finance Facility (SIO-GFF), with PT SMI as the implementing agency.

ADB proposes a financial intermediation loan with two components:

(1) Accelerating Coal Retirement Facility (ACRF): This facility will provide local currency (IDR) cofinancing to support the accelerated retirement of PLN-owned CFPPs. ADB FI Loan and other funding raised from commercial lenders will be blended with Government Investment Fund (OIP) contribution into the facility. PT SMI is also considering a trust fund model for the facility. The facility will complement the SIO-GFF renewable energy facility. The ACRF will be deployed into potential ETMCP schemes, including the Spin-off model: PT SMI would use ACRF funds provide an investment loan to the investor/SPV to shorten the operational lifetime of the plants.

- *Spin off model candidate projects:* In 2022 GOI has announced two CFPPs for spin-off and early retirement: Pelabuhan Ratu CFPP (3 x 350MW) and Pacitan CFPP (2 x 315MW), including through signing of Principal Framework Agreement with PT Bukit Asam for spinning off the former coal

⁸² Indonesia's Paris Agreement commitments. United Nations Framework Convention on Climate Change. 2016. [Indonesia's Enhanced NDC](#). 2022.

plant. The spin-off transaction aims to shorten the plant's operational lifetime from 24 years to 15 years. As of Q1 2023, PT SMI has submitted the application for Government Investment Fund (OIP) for disbursement in GOI Fiscal Year 2024 in support of GOI spin-off transactions. PT SMI plans to enter the Pelabuhan Ratu spin-off transaction through the ETM Country Platform facility by providing debt financing as well as acting as an equity partner alongside Indonesia Investment Authority.

(2) Grant component: US\$1 million is to be deployed ahead of the ACRF to support the establishment and pilot application of PT SMI Just Transition Implementation Guidelines, and capacity building roadmap to implement the aforementioned facility.

Implementation Readiness

Ministry of Finance Decree No. 275/KMK.010/2022 underscores PT SMI's adequate capacity as ETMCP Manager, given its role as the implementing agency for SIO-GFF. The Ministry of Finance decree and the upcoming ministerial regulation provide PT SMI operational legal basis as the ETMCP secretariat and manager. As a platform that channels GOI fiscal support, the ETMCP will be able to tap into the Government Investment Scheme (OIP) and Government Guarantee to deliver the ETM transactions.

Rationale for ACT Cofinancing

Concessional funds from CIF-ACT would complement financing from ADB to assist PT SMI as it builds capacity to fulfill its central role as the ETMCP Manager in accelerating Indonesia's clean energy transition. Concessional funds from CIF-ACT will also contribute to expanding PT SMI's lending capacity in local currency to support accelerating coal transition.

Financing Plan (Indicative)

Source	Amount (US \$ million)
ADB ^a	102
CIF	99
Other / Private	150
Government of Indonesia	500
Total	851

Note: ^a ADB amount to be confirmed/adjusted based on PTSMI concurrence.

Results Indicators (to be finalized)

Result	Indicator	Baseline ^a	Target ^a	Data Source & Means of verification
Policies	Number of policies, regulations, codes, or standards that have been amended or adopted (#)	n/a	[2]	MDB Public disclosures; Implementing Agency reporting
Readiness	Coal transition strategies finalized (#)	n/a	[1]	MDB and Government Public disclosures
Reduce GHG emissions	GHG emissions reduced or avoided (mt CO ₂ eq) – direct/indirect	n/a	[25]	MDB results reporting
Mobilized cofinancing	Volume of cofinancing leveraged	n/a	[752]	MDB Public disclosures
Plant decommissioning	Capacity of existing coal power generation assets accelerated for retirement (MW)	n/a	[1,680]	MDB results reporting
Coal abatement	Amount of coal diverted (million tons)	n/a	[18]	MDB results reporting

Note: Baseline and targets are currently being developed.

FI Loan Preparation Timetable (Indicative)

Milestones	Expected Completion Date
ADB Fact-finding	December 2023
ADB Management review meeting	2 nd quarter 2024
Loan negotiations	3 rd quarter 2024
ADB Board consideration	4 th quarter 2024
Loan signing	1 st quarter 2025

Source: Asian Development Bank estimates from INO ICPM 2023-2025.

APPENDIX 12: Program Concept – IPP CFPP Early Retirement Program

Problem Statement - Supporting energy transition of Indonesia. The installed electricity generation capacity of Indonesia as of 2020 was 63GW, 62% of which came from coal-fired power plants (CFPPs) and 6% of which came from renewable energy sources. The Government of Indonesia (GOI) aims to phase out CFPPs to lower greenhouse gas emissions by 43.2% by 2030 (conditional upon international support) and to achieve carbon neutrality by 2060. Shortening the life of CFPPs will not only support the GOI on these goals but also opens the door for further investments in cost-effective renewables to meet the country's electric power demand, lowering overall energy generation costs in the long run.⁸³

Proposed Transformation. *Developing a pipeline of IPP CFPP early retirement opportunities through a pilot transaction under ADB Energy Transition Mechanism (ETM).* A key goal of the first project under ADB's ETM framework and CIF-ACT IP IPP CFPP early retirement program is to provide a “proof of concept” among the IPP asset class of CFPPs. Structuring a successful financing will be the first step to establishing a viable early retirement financing model for IPP CFPP assets, not only in Asia but also in other regions of the world. As the pipeline of IPP CFPPs open to early retirement grows, CIF-ACT funds support replication and the broader expansion of ETM as one of the largest carbon reduction programs in the world. Working with the governments in ETM's 3 pilot countries, Indonesia, the Philippines and Viet Nam, ADB and the governments are aiming to retire 50% of CFPPs in the countries, which is approximately 30GW, over the next 10-15 years would reduce CO₂ emissions by 200 million tons annually.

Implementation Readiness. ADB is in detailed discussions with the project stakeholders, as well as the IPP counterparties in PLN. The qualified IPPs are identified as strategic projects within ADB's Indonesia pipeline, and the first project has obtained preliminary concept approval. The opportunity is receiving the highest level of consideration from within ADB, as well as across affiliated parties in PLN, MEMR and MoF. Just Transition plans, particularly to safeguard the job security of the employees of the Project, will also be developed and the associated costs will be reflected in the revised model during due diligence.

Rationale for ACT Cofinancing. Concessional funds from the CIF-ACT program would complement debt financing from ADB to maximize the reduction in the Power Purchase Agreement (PPA) tenor and remaining operating life of the CFPPs. Without access to the CIF's toolbox of flexible cost and risk-bearing instruments, it would be impossible to adequately account for the loss of revenue from shorter PPA terms. Furthermore, until an IPP demonstrates a reliable collaboration with PLN and other GOI counterparties through the successful financing, other IPPs are unlikely to consider early retirement in the near term.

Results Indicators (to be finalized)

Result	Indicator	Baseline ^a	Target ^a	Data Source & Means of verification
Reduce GHG emissions	GHG emissions reduced or avoided (mt CO ₂ eq) – direct/indirect	n/a	[20]	MDB results reporting
Mobilized cofinancing	Volume of CIF cofinancing leveraged	n/a	[700]	MDB Public disclosures
Plant decommissioning	Capacity of existing coal power generation assets accelerated for retirement (MW)	n/a	[1000]	MDB results reporting
Coal abatement	Amount of coal diverted (million tons)	n/a	[11]	MDB results reporting

Note: Baseline and targets are currently being developed.

⁸³ ADB. 2022. *Establishment of the Energy Transition Mechanism Partnership Trust Fund under the Clean Energy Financing Partnership Facility*. Manila.

Financing Plan for Program

Source	Amount (US \$ million)
ADB ^a	400
CIF-ACT	100
Commercial Cofinancing ^b	300
Total	800

Note: ^aFinancing amount to be confirmed. ^bTo be confirmed at a later stage, based on market sounding.

Program Preparation Timetable

Milestones	Expected Completion Date
MOU signing for Project 1	November 2022
Mandate and Due Diligence for Project 1	1 st quarter 2023
CIF Trust Fund Committee Consideration of Proposed Program	2 nd quarter 2023
Project 1 loan negotiations & final investment committee consideration	3 rd quarter 2023
ADB Board consideration for Project 1	4 th quarter 2023
Loan signing for Project 1	4 th quarter 2023
Processing for future projects under program	TBD

Source: Asian Development Bank estimates.

APPENDIX 13: Indonesia Coal Repurposing and Just Transition Program (Phase 1 & 2)

Problem Statement.

Excess coal generation capacity is constraining Indonesia's decarbonization efforts. The installed capacity of coal-fired power plants (CFPP) has almost tripled in a decade from 13GW in 2010 to 37GW in 2020 and additional coal plants (around 13.8GW) are under development. The capacity margin in Indonesia, particularly in the Java-Bali system, is around 57% in 2022, about three to four times higher than international benchmarks.

The overhang of excess coal power assets reduces space for investments in renewable energy and energy efficiency, creating the risk of stranded assets and financial losses for the electricity utility PLN. The relative inflexibility of coal assets – particularly the limited ramping capacity of the existing CFPPs - makes integration of variable renewable energy (VRE) challenging, exacerbating PLN's planning towards expansion of traditional renewable energy such as hydro and geothermal, rather than lower-cost VRE options such as Solar Photovoltaics (PV). However, the Government of Indonesia is taking steps to address these challenges under this Investment Plan, including through the proposed early retirement of CFPPs.

As part of this effort, there will be need to invest in replacement VRE generation, particularly in areas of the country that don't already have surplus generation capacity. Various approaches, including repurposing of coal assets needs to be considered to ensure that the power sector can respond efficiently and effectively to fill in the needed renewable power generation. Given the intermittent nature of renewable energy, it will also be increasingly important to ensure that grid stability can be maintained and there is dispatchable power that could be called upon, as needed.

The shift away from coal-fired power as set out in this Investment Plan will have implications for coal demand and the outlook for the coal mining industry in Indonesia, with adverse economic and social impacts expected for workers and coal dependent communities. The projected fall in global demand for coal will be even more significant; countries responsible for over 85 percent of Indonesia's coal exports by value have Net Zero Emissions (NZE) pledges. The IEA projects that Indonesian coal exports will decline—from 435 Mt in 2021—to 228 Mt in 2050, about one-half of the volume of exports in 2021.

Among the expected adverse economic and social impacts, coal-dependent communities will experience tax and non-tax revenue loss, job loss, decline of livelihoods that rely on coal value chains, skills mismatch, land loss, energy and food insecurity, and reduced access to essential services and infrastructure currently centered on coal production. Communities can also experience loss of identity, erosion of trust, and outmigration as a new social and economic organization takes shape.

While Indonesia's full transition to a low-carbon economy will be a long-term endeavor, a critical first step is to engage with coal-dependent communities before the adverse impacts set in, and to build trust and local capacity to drive development toward economic diversification. For the transition to be just and sustainable, an engagement across a diversity of stakeholders including enterprises, workers, and communities must start early; expand opportunities for the directly and indirectly affected groups; and strengthen local institutions to become better equipped to deal with the social and economic pressures that the transition will bring.

Proposed Transformation

Dismantling, remediating and repurposing of closed CFPPs would enable the reuse of the existing power transmission infrastructure to support increased low-carbon generation capacity and pilot of new and emerging technologies to improve the system's flexibility to integrate VRE generation. The second activity supporting local economic development initiatives will enable the coal transition to be sustainable; expand opportunities for the directly and indirectly affected groups; and strengthen local institutions to become better equipped to deal with the social and economic pressures that the transition will bring. As part of this

activity, there will also be scope for the repurposing of disused mine sites which has already been closed, to generate additional opportunities for works in the region.

Program Development Objective. The objective is to support pilot demonstration projects under the energy transition, including i) repurposing CFPPs in Indonesia, and ii) creating economic opportunities for workers and communities during the transition process, including through the repurposing of disused mine sites. The program will target “first-mover” interventions which, once the concept is proven, can be scaled up across the country. It will be implemented in phases and through multiple projects, as indicated below (see Table 1 for indicative Program cost estimates and financing plan):

Activity 1: Repurposing CFPP sites. While PLN has not yet reached a final decision on the specific assets which will first be dismantled and repurposed, it has developed a list of seven power plants located in *Suralaya, Paiton, Bukit Asam, Ombilin, Labuhan Angin, Nagan Raya, and Adipala*, with a total capacity of about 5.6GW, for possible early retirement and closure before 2030. World Bank is undertaking electrical and planning studies on these CFPPs to assess the repurposing options. Once the assets have been identified and closed by PLN, the program will support:

- (i) **Dismantling and Remediating CFPPs units closed by PLN** through removal of materials, structural demolition, environmental remediation, and restoration. Out of the list of 7 plants listed above, the CFPPs with the earliest retirement dates are *Suralaya* and *Paiton*.

Suralaya CFPP is in Cilegon, Banten in Indonesia. The plant has a maximum generating capacity of 4,025 MW across eight generating units. The power plant was built in four phases, with the completion of the first unit in 1984 (400MW) and the eighth unit (660MW) in 2011. *Suralaya 1* and *2* generating units currently have relatively high-Capacity Factor (CF) and Equivalent Availability Factor (EAF) and low cost of generation. However, the CF is expected to decline significantly once the adjacent 2GW *Jawa 9* and *10* independent power producers (IPP) units come online by 2024, World Bank analysis indicates that early retirement and decommissioning of the oldest generating units (*Suralaya 1* and *2*) is expected to be viable post 2024, helping avoid operations and maintenance costs and enabling greater use of VRE generation and more efficient CFPPs.

Paiton CFPP is located 35 km to the east of the town of Probolinggo in East Java in Indonesia. The plant has a maximum generating capacity of 4,710MW across nine generating units. The first unit (400MW) was completed in 1993 and the ninth unit (660MW) in 2012. As with *Suralaya*, *Paiton 1* unit has relatively high EAF, CF and low cost of generation. However, the CF is estimated to decline to 15% in 2023 following the commissioning of a nearby 1000 MW IPP unit and it would then be economically beneficial to allow *Paiton 1* to be retired and repurposed. Box 1 presents the initial findings of the electrical and planning studies undertaken by World Bank to assess the technical and economic impacts of decommissioning on the Java-Bali grid.

- (ii) **Repurposing of closed coal plant assets** into renewable energy options such as solar PV and Biomass and network flexibility solutions as Battery Energy Storage Systems (BESS) and Synchronous Condensers (SYNCON). In the first phase, PLN is expected to only consider the repurposing of 1 or 2 generating units at the *Suralaya* and *Paiton* power plants, which will limit the space that will be available for development of solar and wind generation capacity through repurposing. However, it could still be feasible to repurpose these unit to run on biomass and network flexibility options such as BESS and SYNCON. Initial analysis undertaken by the World Bank indicates that *Suralaya* units 1 and 2 could be repurposed into a flexibility center comprising of BESS and SYNCON with significant benefits to the grid and PLN; the *Paiton1* generating unit could be reconverted to run on biomass after determining the technical and economic viability of reconversion.

Assessing impacts of retiring & decommissioning selected CFPP units in the Java-Bali system

The implications of retiring and decommissioning 1.8GW of PLN CFPP units (Suralaya 1 (400MW), Suralaya 2 (400MW), Adipala (600MW), Paiton 1 (400MW)) on system cost, reserve margin, operating reserve performance, voltage stability of the grid were assessed through generation planning, power flow and system stability studies, undertaken using Plexos and DigSilent software. The studies assessed the impacts of retiring and decommissioning the plants individually as well as collectively, with the following key findings:

Retirement of the four units - Surayala 1 (400 MW), Suralaya 2 (400MW), Paiton 1 (400 MW) and Adipala (600MW) can reduce (undiscounted) system costs by more than \$600 million over 2025-2030. Grid stability would continue to be maintained following the retirement and decommissioning of these four units - spinning reserve, voltage levels and frequency excursion are all comfortably within technical limits in the power flow and system stability studies CFPP sites can be repurposed to add renewable (including biomass, solar PV etc.), storage such as BESS and possibly dynamic reactive power devices such as SYNCON.

The reserve margin would stay above 30% or above until 2030 when it would dip marginally below this level. Overall, retirement and repurposing would result in economic gains without compromising system adequacy, security, or stability.

Source: Institute of Technology Bandung Analysis for the World Bank

Activity 2: Just Transition and Local Economic Development. This program will support activities to mitigate the social, economic, and environmental risks and impacts associated with decommissioning and repurposing of CFPPs (including upstream impacts from the closure of coal mines) while enhancing the opportunities of this transition. This will be achieved through: (a) local development planning and infrastructure to fill critical service gaps and create enabling conditions for economic diversification; (b) skills, livelihoods, and entrepreneurship activities to equip local workers, communities, and businesses to thrive in a diversified economy; and (c) community outreach and citizen engagement activities to promote stakeholder dialogue, social risk management, and citizen oversight on the transition process. While this will be linked to interventions in activity 1, the purpose is to demonstrate just transition interventions which can eventually be deployed at a larger scale. This will be a cross-sectoral initiative which will include energy and extractives, social protection, education, financial support for small and medium enterprises, along with a gender component, which will be developed with the support of WOLCOT for the preparatory phase.

- (i) **Local Development Planning and Infrastructure Development.** This component will finance investments in enabling local infrastructure at the village- and district-level to fill key service gaps as a result of the energy transition, and promote economic diversification. Activities could include: (a) fiscal support and technical assistance to facilitate inclusive economic development planning at village and district level for locally owned spatial plans around coal assets; (b) technical assistance to assess and support the feasibility of locally-identified infrastructure investments based on economic and ecological criteria; and (c) direct fiscal transfers and technical support to eligible villages and districts to implement infrastructure schemes (including possible repurposing of land from closed coal mines).
- (ii) **Investments in Sustainable Livelihoods, Skills, and Entrepreneurship.** This component will finance investments in sustainable livelihoods and post-coal employment and entrepreneurial skills of communities located around coal sites. Activities could include: (a) financial and technical assistance for identification and adoption of community-based livelihoods in low-emission activities; (b) training programs for workers in coal-related value chains to adopt employable skills in a low-carbon economy; and (c) business development and entrepreneurship ecosystem services for local enterprise development beyond the coal value chain.

- (iii) **Community Outreach and Stakeholder Engagement:** This component will finance the development and implementation of a community outreach plan and a stakeholder engagement platform. The latter will include coal and power companies, national and subnational governments, local communities, women’s coalitions and groups, and nongovernmental organizations. The project could create a two-way communication and engagement platform for stakeholders to set expectations, develop a common understanding of short-term costs and long-term benefits of transition, agree on the required mitigation and adaptation actions, and ensure that local communities have access to information and resources they need to participate in local development planning and decision-making in an effective manner. The initiative could also invest in the capacity of communities to perform citizen-led oversight on the local planning and implementation, with a view to ensuring compliance, fairness, and process legitimacy.

Indicative Cost Estimates and Financing Plan (in US\$ million)

Project	Estimated Cost	Financing Plan		
		IBRD	CIF ACT	PLN/GOI
1. Repurposing	900	620	130	150
CFPP Decommissioning	50	20	10	20
Ancillary Services	70	40	10	20
Battery Storage	300	230	30	40
Renewable Energy	480	330	80	70
2. Just Transition and Local Economic Development	200	128	62	10
Total	1100	748	192	160

Implementation Readiness.

CFPP Repurposing. Progress is contingent on timely PLN and government decision on the CFPP units to be dismantled and repurposed under the CIF ACT program. The proposed dismantling and repurposing of CFPPs has been discussed with stakeholders including PLN, MOF, MEMR, CMMI and MSOE. The World Bank is screening the list of 7 plants provided by PLN as candidates for early retirement by 2030 and is carrying out planning and technical studies to inform PLN and Government decision on decommissioning and repurposing. The screening consists of site visits and planning and electrical studies to assess opportunities for investments for productive uses including renewable energy generation, energy storage, and ancillary services.

Just Transition and Local Economic Development. The proposed initiatives on just transition and local economic development were discussed with PLN, MOEMR, MOEF, MOV and Bappenas in December 2022. Indonesia has a decentralized fiscal transfer system to deliver basic services and infrastructure at scale. The program will work within the existing fiscal transfer and local planning systems by providing top-up funding to local governments. These earmarked funds will be supplemented with focused assistance to reorient local development planning and implementation toward forward-looking economic diversification and transition planning. In addition, the repurposing of land from closed coal mines has been discussed with PERHAPI, the association of coal mining companies and PT Bukit Assam, the largest state-owned coal mining company. The program will consider public private partnerships to develop renewable energy and economic regeneration activities in post mined areas.

Rationale for ACT financing. ACT financing, along with IBRD co-financing, will support Indonesia to catalyze and build momentum on the implementation of its program to accelerate transition from coal. The CFPPs selected under this program, will be the first to dismantled and repurposed as part of Indonesia’s plan to phase out coal by the 2040’s. CIF ACT financing will help (i) the government, PLN and other agencies gather knowledge and experience to accelerate the dismantling, remediation and repurposing of closed coal plants; (ii) build expertise Indonesia in technologies such as energy storage, synchronous condensers, biomass and other low-carbon technologies; (iii) overcome first-mover cost and, build

confidence among local stakeholders and communities and (iv) mitigate the adverse social and economic impacts of the coal transition in Indonesia.

Results Indicators (to be finalized)

Result	Indicator	Baseline ^a	Target ^a	Data Source & Means of verification
Income security for employees in subset industries	Number and percentage of employees of retired coal plants/mines that have access to sustained income	n/a	[900, 90%]	MDB results reporting
Social Plans and Economic Regeneration Packages	Number of direct beneficiaries of implemented social plans and economic regeneration activities (#)	n/a	[2,000]	MDB results reporting
Mobilized co-financing	Volume of CIF co-financing leveraged	n/a	[908]	MDB Public disclosures
Coal abatement	Amount of coal diverted (MT)	n/a	[TBD]	MDB results reporting
Mine closure	Mine area reclaimed and reforested/restored (Ha)	n/a	[150]	MDB results reporting
Cleaner energy sources	Installed capacity of renewable energy	n/a	[100]	MDB Public disclosures

Note: Baseline and targets are currently under development.

Financing Plan

Source	Amount (US \$ million)
CIT ACT Loan	182
CIF-ACT Grant	10
IBRD Financing	750
Government	160
Total	1100

Program preparation timetable

Milestones	Program
Concept approved by WB	September 2023
Program scope agreed with government/ PLN	June 2024
Board approval by World Bank	December 2024*
Program effectiveness	March 2025

*There will be several phases to be approved by the World Bank's Board, with the first project under the program estimated to be approved around December 2024

APPENDIX 14: Project Concept - RE Repowering Program (On-grid and Off-grid)

Problem Statement

Currently, Indonesia has an installed power generation capacity of 74 GW, ie. “on-grid” generation. As required by the RE PR, a roadmap for accelerated retirement of Coal-Fired Power Plant (“CFPP”) assets will be developed by the GOI, with initial analysis shared in Appendix 2. The sample assessment identifies a total of 650MW candidate CFPPs in Sumatra, and 13.3GW in Java-Bali. While currently there is a healthy reserve margin in these two grids, in order to facilitate the smooth retirement of CFPP’s identified by PLN and still meet the growing energy demands of the future, there need to be plans in place to replace this generation capacity.

A further 17 GW are generated and consumed “on site,” bypassing the national grid - so-called captive power. Nickel and aluminum smelters are the examples of the sectors which consume significant amounts of power from coal-based captive generation. Further, captive generation for industrial parks is expected to increase by at least another 11 GW, providing the needed power supply to the country’s fast-growing mineral processing industry, including for the production of nickel that is a key element in electric vehicle batteries. It is crucial that Indonesia continues with a strategy that maximizes the use of captive renewable energy (RE) generation (as alternative to captive coal power generation).

Proposed Intervention

Proposal 1:

1A: A geographically targeted approach to RE development:

IFC will conduct a targeted approach for the development of renewable energy power. Based on prior research conducted on suitable coal early retirement, the regions of Sumatera and Jawa-Bali would have the most number of suitable candidates, especially the regions of Banten and Sumsel.

As such, the IFC team is concentrating their efforts on two floating solar projects in West Sumatra and West Java, a WtE project in West Java, as well as a hydro project in North Sumatra. These projects will be prioritized for development support as they are planned to connect to grids which have suitable candidates for coal closure.

IFC is also currently conducting a hydropower mapping study that will be used together with private sector partners to identify suitable hydropower development locations, taking into account potential coal closures and target these areas as priority locations.

1B: Supporting captive power with green generation sources:

IFC is also engaged with key industry players to explore options of captive RE power and is keen to support the private sector to develop the captive RE power to replace captive CFPP. The development of a captive RE power plant would not need to go through public tender process.

IFC are in discussions with developers that serve commercial and industrial consumers (e.g., manufacturing, processing, chemicals, etc.) in Indonesia’s industrial parks. Proposed technologies could include not only large solar and battery installations, but potentially even hydropower developments as well. The developers that would normally serve the commercial and industrial customer base are also traditionally reliant on fossil fuels, thus deploying ACT funds to support RE or hydropower projects would enable these developers to gradually phase out their traditional thermal businesses and transition into RE.

IFC is also supporting green hydrogen development to provide stable, renewable power to off-grid customers. IFC team is in discussion with a green hydrogen technology provider which has a proven

technology suitable for islanded grids. However, there is a learning curve for these companies to enter a new market like Indonesia, and ACT funds would enable these entrants to overcome the initial entry barriers before it can become mainstream in the country.

Proposal 2: Supporting sustainability-linked loan to private energy companies. Sustainability-linked finance is designed to incentivize the borrower's achievement of environmental, social, or governance targets through pricing incentives. In this context, IFC is in early-stage discussions with several private sector clients, owners of large-scale captive and grid-connected CFPPs, to assist them in developing decarbonization or sustainability strategy which will help them gradually phase out CFPP and replace with RE power. One of the innovative approaches that is being pursued is sustainability-linked loan to private energy companies.

For discussions with these private sector clients which have fossil-fuel exposure, IFC will be able to support their decarbonization efforts as long as the initiatives are Paris-Aligned. The PA assessment will look at how the project makes sense from an economic, legal and technical perspective; and how from all these perspectives it will help their coal plant(s) retire eventually. This will enable IFC to determine the corporate-level decarbonization plan and commitment, and also provide certainty and line-of-sight toward a tangible result.

Activities covered under this Proposal can vary depending on the project, but they generally include: (i) identifying corporate- or project-level metrics that are material to the borrower's business strategy; (ii) benchmarking proposed targets for each metric against the borrower's historical performance and industry peers to ensure ambitiousness; (iii) defining relevant reporting methodologies and external verification mechanisms for target compliance; (iv) structuring financial incentives that are commensurate with the target's ambition, drafting sustainability-linked financing frameworks whenever needed, and incorporating legal language in the documentation; and (v) assisting in the SPO of the sustainability-linked financing framework, if required.

As the largest development finance institution focused solely on supporting private sector, IFC is well positioned to support the scale-up of sustainability-linked financing in emerging markets. Driven by increasing private sector demand, and in support of the 2030 Agenda of its client countries, IFC has rolled out a comprehensive offering for sustainability-linked financing.

Implementation Readiness

IFC is in early-stage discussions with several private sector clients (including the ones mentioned above) to assist in retiring coal generation and replacing with RE. For that company mentioned above, IFC is considering supporting the early project developments of renewable energy, hydropower and hydrogen projects on assessments such as E&S and technical feasibility analysis to improve the bankability of the project.

Rationale for ACT Cofinancing

With the expected transition away from large quantities of baseload power from coal, Indonesia will need to close the gap between energy supply and demand. This will unavoidably include the need to attract large investment to transform the economy to a new green future; most of this investment volume will have to come from private sector. No sizable or sustainable coal transition process can be designed without rapid growth of investment in the replacement firm power generation infrastructure. The sector requires further strengthening in order to reduce the reliance on national government guarantee and, more significantly, the sector requires definitive and careful support to stimulate the growth of the firm load RE power generation. This creates a case for the CIF-ACT support to private sector activities to demonstrate areas for further investment and together to catalyze new economic opportunities. Once the precedents are set, established models and approaches can be scaled up.

Results Indicators (to be finalized)

Result	Indicator	Baseline	Target ^a	Data Source & Means of verification
Reduce GHG emissions	GHG emissions reduced or avoided (mt CO ₂ eq) – direct/indirect	n/a	[TBD]	MDB results reporting
Mobilized cofinancing	Volume of CIF cofinancing leveraged	n/a	[200]	MDB Public disclosures
Cleaner energy sources	Installed capacity of renewable energy	n/a	[200]	MDB Public disclosures

Note: Baseline and targets are currently being developed.

^a GHG emission reductions associated with individual subprojects will be collected and aggregated at this Program level. However, as the proposed dispatchable RE projects aim at creating conditions enabling the ramp up of the CFPP retirement process, the system-wide effect of the associated GHG emission reductions will be realized and accounted for through the CFPP retirement. In other words, supply of dispatchable RE power into the grid will allow reduction of supply of power from CFPPs, enabling their retirement, leading to associated GHG emission reduction. Therefore, to avoid double counting, the GHG emission reductions will be reported only for direct CFPP retirement projects under this IP.

Financing Plan (Indicative)

Source	Amount (US \$ million)
IFC	140
CIF	50
Private Sector	200
Total	390

Program Preparation Timetable

Milestones	Expected Completion Date
Project Preparation	2 nd quarter 2024
CIF Trust Fund Committee Consideration of Proposed Program	2 nd quarter 2024
Project 1 loan negotiations & final investment committee consideration	3 rd quarter 2024
Processing for future projects under program	TBD

APPENDIX 15: Project Concept: Reskilling for RE – PRIME STeP: Supporting Research & Development and Application of Viable Renewal Energy in Indonesia

Problem Statement. To achieve its commitments to United Nations Framework Convention on Climate Change and Paris Agreement, Indonesia needs to scale up its knowledge base on renewable energy by building its capacity and capability to conduct research & development (R&D) and downstream R&D outputs in collaboration with the private sector. ADB has approved a project (Promoting research and innovation through modern and efficient science and technology park – PRIME STeP) in Indonesia on R&D and innovation, key bottlenecks to productivity and growth. Prior to the coronavirus disease (COVID-19) pandemic, the main factor constraining growth had been a low productivity growth, partly attributed to (i) limited technology sophistication in Indonesian industries (use of advanced operations and technologies with extensive research and development (R&D) in production and industry processes), and (ii) lack of absorptive capacity for technology and innovation across Indonesia's workforce.

Proposed Transformation. Under the project, ADB will support four top-ranked universities (University of Indonesia, Gadjah Mada University, IPB University, and Institute of Technology Bandung) by financing advance R&D facilities, establishing a Center of Excellence for the clean energy transition, provide grants for applied research and startup incubation, and strengthening researchers capacity through post doctorate programs. Several proposed R&D and innovation topics under the project are related to renewal energy development and applications.

Subproject 1: Energy Storage System Batteries. One of the key technologies to realize carbon-neutral future is alternative energy storage system through development of batteries. The battery market is expected to expand the market for on-board batteries with the rapid expansion of the electrical vehicle (EV) markets. This project aims to develop either of the followings: (1) suitable high-energy density secondary battery for battery industry in Indonesia including Ni-rich cathode, Li-rich cathode, and metal-air battery; (2) high-power battery (LNMO cathode); (3) all solid-state battery cell (polymer-based electrolyte and inorganic solid electrolyte); and (4) anode-free battery using current collector modification. The related outputs will be: (1) High-energy density and/or solid-state battery prototypes; (2) Effective technology research studies in Indonesia through patent and reputable scientific journals; (3) Doctoral and Master students involved in development of battery material, including attending training courses; and (4) Ready for production high-energy density and/or solid-state energy storage system batteries. Training curriculum will be informed by the research and corresponding training curriculum related to energy storage value chain. 250 teachers from Technical Vocational Education and Training institutions will be trained under the new curriculum. 500 fossil-fuel industry workers (e.g., PLN staff) as part of life-long learning program will also be trained as part of just transition to support workers transition into clean energy sector. A roadmap for detailing the economic value chain of the energy storage technology will be developed and corresponding demand of skilled workforce and training capacity will be mapped accordingly. To motivate local solutions by youth of Indonesia to develop innovative solutions in accelerating the adoption and adaptation of clean energy solutions, promising students' startup companies will also be supported.

Subproject 2: Development of High-Performance Solar Cell based on Emerging PV Technology. Solar energy is one of Indonesia's key strategies to move away from fossil fuels and rely more on renewable energy. Indonesia has the potential to generate 207 gigawatts (GW) of solar power, but only around 0.09 GW or less than 0.1 percent has been tapped. The slow growth is a combination of several inhibiting factors: lack of consistent and supportive policies, the absence of attractive tariff and incentives, as well as concerns on-grid readiness. The National Energy Policy (KEN) aims to increase solar power generation to 6.5 GW in 2025 and 45 GW in 2050. This proposal aims to develop high performance solar cell based on emerging PV technologies. The project will be carried out in several phases, which include designing and modeling of PV, architecture development of perovskite and perovskite-silicon tandem foil PV, prototyping, testing, scaling up, and developing and implementing of training courses. The proposed output will be a high-performance pilot scale industrial module prototype with ready technology and methodologies for future up-scaling. Training curriculum will be informed by the research and corresponding training curriculum related

to solar cell development and PV system value chain will be developed. 250 teachers from Technical Vocational Education and Training institutions will be trained under the new curriculum. 500 fossil-fuel industry workers (e.g., PLN staff) as part of life-long learning program will also be trained as part of just transition and to support the workers into clean energy sector. To motivate local solutions by youth of Indonesia to develop innovative solutions in accelerating the adoption and adaptation of clean energy solutions, promising students' startup companies will also be supported.

Implementation Readiness

The proposals will be aligned with the implementation of the PRIME STeP Project, which support the government's strategy to downstream R&D and improve the success rate of startup incubation of four science and technology parks (STPs) in four top-ranked project universities. This is aligned with the government's National Medium-Term Development Plan (RPJMN) 2020–2024. PRIME STeP project was approved on 8 December 2022 and became effective on 23 January 2023.

Rationale for ACT Cofinancing

Concessional CIF-ACT funding would assist Indonesia to pave the way for the transition to green energy by covering the cost of human capital development particularly in workforce transition and training for future workforce competence to work in the clean energy sector. Specifically, CIF-ACT grant funds would likely support an ADB technical assistance for establishment costs of the PRIME STeP Applied Research Program (e.g. training curriculum and training roll out, workforce training roadmap development, seed funding for start-up incubator), that intends to foster an innovation mindset in the energy sector, creating a space for renewable energy technology development and application in the Indonesian context.

Results Indicators

Result	Indicator	Baseline ^a	Target ^a	Data Source & Means of verification
Pilot production facility for at least one identified advance energy storage system established and operational	Production of energy storage products	0	1	Production of energy storage products
Training courses (online and off-line) to impart skillsets to develop talent in manufacturing or production facilities for energy storage system developed and implemented in at least one higher education institution (university or polytechnic)	Students' enrollment on training course on energy storage technology production in higher education institution (with gender disaggregation)	0	750	Enrollment records
High performance solar cell production facility based on emerging PV technologies established and operational	Production of advance PV cell	0	1	Third party laboratory test on product performance
Training courses (online and off-line) to impart skillsets to develop talent in manufacturing or production facilities for emerging PV technologies developed and implemented in at least one higher education institution (university or polytechnic)	Students' enrollment on training courses on PV technologies in higher education institution (with gender disaggregation)	0	750	Enrollment records

Note: Baseline and targets are currently being refined.

Financing Plan (Indicative)

Source	Amount (US \$ million)
ADB	138
CIF grant	9
Government	21
Total	168

Grant preparation timetable

Key Milestones	Timeline
Prime STeP loan signing	December 2023
CIF-ACT Trust Fund Committee consideration of grant application	2 nd quarter 2023
ADB Board consideration of additional financing	3 rd quarter 2023