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Policy Paper

Risks and Challenges of the Just Energy Transition Partnership (JETP) Indonesia

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Policy paper by CSIS Indonesia & Tenggara Strategics

Yose Rizal Damuri

Novia Xu

Riyadi Suparno

Eva Novi Karina

Stella Kusumawardhani

Bayo Andhika Putra

This Policy Paper serves as a platform for the research community to disseminate research findings and create a space for dialogue to exchange ideas.

The writing team extends their appreciation to all parties involved in completing this policy paper. The views expressed here belong to the writing team and are not intended to be associated with CSIS Indonesia.

Design and layout by Shifa Rafida Fitri.



Gedung Pakarti Centre,
Jl. Tanah Abang III No.23-27
Jakarta 10160
csis@csis.or.id
www.csis.or.id



The Jakarta Post Building,
Jl. Palmerah Barat No.142-143
Jakarta 10270
info@tenggara.id
www.tenggara.id

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List of Abbreviations

ACC	Advanced Control Center	DEN	National Energy Board
ADB	Asian Development Bank	DPR	House of Representatives
AGC	Automatic Generation Control	ENDC	Enhance Nationally Determined Contribution
APBD	Anggaran Pendapatan dan Belanja Daerah	ETM	Energy Transition Mechanism
APBN	Indonesian Local Government Budget	EV	Electric Vehicle
ASEAN	Association of Southeast Asian Nations	FOLU	Forestry and Other Land Use
Bapeten	Nuclear Energy Regulatory Agency	G7	Group of Seven
Bappenas	National Development Planning Agency	G20	Group of Twenty
BAU	Business as Usual	GDP	Gross domestic product
BGPP	Biogas power plant	GfANZ	Glasgow Financial Alliance for Net Zero
BMPP	Biomass power plant	GHG	Greenhouse gas
BPDLH	Indonesian Environmental Estate Fund	GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
BPDP-KS	Oil Palm Plantation Support Fund Management Agency	GPP	Geothermal power plant
BPEBT	New and Renewable Energy Management Agency	GW	Gigawatt
BRE	Baseload Renewable Energy	GWh	Gigawatt hour
BUR3	The 3 rd Biennial Update Report	HPP	Hydroelectric power plant
Capex	Capital expenditure	ICEL	Indonesian Center for Environmental Law
CCUS	Carbon Capture Utilization and Storage	IEA	International Energy Agency
CFPP	Coal-fired power plant	IESR	Institute for Essential Services Reform
CIPP	Comprehensive Investment and Policy Plan	ILO	International Labor Organization
CO _{2e}	Carbon dioxide equivalent	INA	Indonesian Investment Authority
COD	Commercial Operation Date	IPG	International Partners Group
CSIS	Centre for Strategic and International Studies	IPP	Independent Power Producer
CSO	Civil Society Organization	IUPTL	Electricity Supply Business License
		JET Framework	Just Energy Transition Framework
		JETP	Just Energy Transition Partnership
		JICA	Japan International Cooperation Agency

Kemenkeu	Finance Ministry	Perppu	Government Regulation In Lieu of Law
Kemenkomarves	Coordinating Ministry for Maritime Affairs and Investment	PLN	State Electricity Company
Kemlu	Foreign Ministry	PP	Government Regulation
Kemnaker	Manpower Ministry	PPA	Power Purchase Agreement
MEMR	Energy and Mineral Resources Ministry	PT SMI	PT Sarana Multi Infrastruktur
KPI	Key Performance Indicator	PV	Photovoltaics
kV	Kilovolt	Renewables	Renewable energy
LCCP	Low Carbon Scenario Compatible with Paris Agreement	RES	Renewable energy sources
LCR	Local content requirement	RMI	Rocky Mountain Institute
LTS-LCCR	Long-Term Strategy-Low Carbon and Climate Resilience	RUED	Regional Energy General Plan
MBOE	Million barrels of oil equivalent	RUEN	National Energy General Plan
MENTARI	Towards an Indonesian Low-Carbon Energy Transition	RUKN	National Electricity General Plan
MP3EI	Master Plan for the Acceleration and Expansion of Economic Development	RUPTL	Long-Term Electricity Procurement Plan
Mt CO ₂	Metric tonnes of carbon dioxide	NRE Bill	New and Renewable Energy Bill
Mt CO _{2e}	Metric tonnes of carbon dioxide equivalent	RE Bill	Renewable Energy Bill
MTOE	Millions of tonnes of oil equivalent	SOE	State-Owned Enterprise
MW	Megawatt	SPP	Solar power plant
NDC	Nationally Determined Contribution	TOE	Tonnes of oil equivalents.
NEP	National Energy Policy	TWh	Terawatt hour
NPP	Nuclear power plant	UNDC	Updated Nationally Determined Contribution
NRE	New and Renewable Energy	UNDP	United Nations Development Programme
NZE	Net Zero Emission	UNFCCC	United Nations Framework Convention on Climate Change
OCPP	Ocean current power plant	USAID	United States Agency for International Development
Permen	Ministerial Regulation	VRE	Variable Renewable Energy
Permen ESDM	Energy and Mineral Resources Ministerial Regulation	WPP	Wind power plant
Perpres	Presidential Regulation	WTEPP	Waste-to-energy power plant



EXECUTIVE SUMMARY

Indonesia and the developed countries that make up the International Partners Group (IPG), which is led by the United States and Japan, declared a joint commitment to establish the Just Energy Transition Partnership (JETP) at the 2022 Group of Twenty (G20) Summit in Bali, Indonesia. The partnership aims to accelerate the just and gradual energy transition process in Indonesia's electricity sector. Through JETP, Indonesia has committed to reducing its peak greenhouse gas (GHG) emission to 290 metric tonnes of carbon dioxide (Mt CO₂) by 2030, accelerating the share of new and renewable energy (NRE) mix out of its overall energy mix to 34% by 2030, and achieving Net Zero Emission (NZE) by 2050. To support Indonesia in achieving these targets, IPG members have pledged US\$20 billion in funding from both their public and private sectors to finance Indonesia's energy transition projects.

The success of JETP should be a priority for the acceleration of Indonesia's just energy transition. However, JETP is not immune to various risks and challenges that may hinder or even impede its success. This policy paper aims to identify these risks and challenges so that all stakeholders involved can take steps to mitigate the potential failures of JETP Indonesia. Some of the risks and challenges faced by JETP include:

Operational Environment of JETP

● PLN as the buyer and supplier of electricity in Indonesia

This condition leads to the Indonesian electricity industry structure becoming unfavorable for attracting private investors to build renewable energy (renewables) power plants. It also means support from PLN is crucial for JETP's success.

● Electricity surplus in Indonesia

Excess power supply in the Java-Bali and Sumatra grids until 2029 has caused PLN to be less enthusiastic about developing renewables in those regions. On the other hand, this condition presents a significant opportunity for early retirement of coal-fired power plants (CFPP).

- **Indonesia's energy transition priorities**

The Indonesian government and PLN's priorities for early retirement of CFPP, building transmission networks, and developing baseload renewable energy (BRE) – particularly hydro- and geothermal power – may not be supported by IPG countries that prioritize variable renewable energy (VRE) sources such as solar and wind power.

JETP Funding

- **Grant funding as too low**

The portion of grant funding for JETP, which amounts to only US\$160 million or 0.8% of the total funding needed, is seen as too small. The grant is crucial to help finance preparations for renewable energy projects, such as feasibility studies, reskilling for workers and vulnerable groups affected by the program, and various just energy transition risk mitigation programs.

- **Availability of public funding in question**

The uncertainty surrounding the availability of public funding from IPG countries has raised the pessimism of Indonesian stakeholders for JETP. Concessional loans are needed to finance less commercially attractive energy transition projects, such as the early retirement of CFPP and the development of transmission networks.

- **Commercial funding and a supportive investment climate**

However, the current investment climate for renewables in Indonesia is unfavorable due to uncompetitive electricity tariffs and prices, as well as the presence of inhibiting factors such as the onerous Local Content Requirement (LCR).

- **Funding for early retirement of CFPP not attractive to investors**

The funding for early retirement of CFPP faces difficulties in attracting investments because it still falls under the "red" category in the financial green taxonomy.

- **JETP funding a small portion of overall energy transition financing**

The committed JETP funding, initially at US\$20 billion and later increased to US\$21.7 billion, falls far short of what is needed to finance Indonesia's energy transition efforts. The total cost required to finance projects under JETP as prepared by PLN reaches US\$150 billion.

Governance of JETP

- **Low involvement and coordination among stakeholders**

The low engagement of stakeholders, both within and outside the government, in JETP's governance mechanism can pose risks to the implementation of its programs.

- **Independent JETP Secretariat**

Although it is good for JETP that its Secretariat is independent, the JETP Secretariat is not or has not been given sufficient mandate in the implementation of JETP. Currently, the Secretariat only serves as a coordinator for the technical implementation of JETP

- **Integration of ETM into JETP**

Energy Transition Mechanism (ETM) and JETP share the same goal of accelerating Indonesia's energy transition. However, both programs are managed separately under different ministries. It is only fitting for ETM to be included as part of JETP, especially for the early retirement of CFPP program.

- **Formulation of JET Framework**

Currently, there has not been a globally recognized framework for a just energy transition. The efforts to develop and implement a Just Energy Transition (JET) Framework in Indonesia can serve as an example, but they also carry the risk of failure.

Domestic politics and global uncertainties

- **Post-2024 elections**

The JETP program was initiated and formulated before the upcoming change in the Indonesian government by 2024. The continuity and success of this program will greatly depend on who will become the new president and the kind of administration that will form after the general elections.

- **Global uncertainties**

Global uncertainties, particularly those stemming from tensions between the United States and China, can disrupt the focus of decision-makers in IPG countries in their funding of JETP Indonesia.

Policy reform

The success of JETP also depends on the extent to which the Indonesian government can reform policies that align with its efforts for an accelerated and just energy transition in Indonesia. Some policy reforms needed to support the success of JETP include:

- **Legal foundation for JETP**

Currently, Presidential Regulation (Perpres) No. 112/2022 is the only legal basis for JETP. However, the regulatory hierarchy level of a Perpres may not be strong enough to ensure the realization of a just energy transition. More permanent legal instruments further up in the Indonesian legal hierarchy, such as laws, are needed to provide a robust legal foundation for JETP.

- **Utilizing NRE Bill for JETP**

The current deliberation of the New and Renewable Energy (NRE) Bill can be a good opportunity to incorporate new targets for JETP and include the JET Framework, and therefore provide a strong foundation for the JETP's operation.

- **Redrafting of RUPTL**

The 2021-2030 Long-Term Electricity Procurement Plan (RUPTL) indicates that Indonesia's energy system is still dependent on fossil fuels. In order to meet the JETP target related to increasing Indonesia's NRE out of its overall energy mix to 34% by 2030, the 2021-2030 RUPTL needs to be updated to accommodate more NRE development projects.

- **Introduction of the energy transition supply chain**

A potential issue facing the development of a renewable energy supply chain is Indonesia's potential enactment of a local content requirement (TKDN) policy. There is a high chance that IPG countries may reject investing in this area due to such a policy being perceived as a protectionist instrument for Indonesia's NRE sector.



1 IMPORTANCE OF ENERGY TRANSITION FUNDING

1.1 Electricity sector as the largest contributor to GHG emissions

The energy sector is the largest contributor to GHG emissions in Indonesia. The sector accounted for 43.38% of the country's total emissions in 2019, with power generation and distribution contributing approximately 97.22% of the energy sector emissions. Emissions from the power generation category have been rapidly increasing, with an average annual increase of 7.13% during the 2010-2019 period.¹

The main reason for the electricity sector's high GHG emissions is the dominant use of fossil fuels to power it in Indonesia, especially coal. Coal consumption dominated the energy sector with a share of 76.22% in 2019. The use of coal in the electricity sector has also increased significantly, with an average annual growth of 7.11% during the 2010-2019 period.²

This high use of fossil fuels has a negative impact on the environment and accelerates the pace of global climate change. Climate change has been recognized as a serious threat to humanity, and it can cause significant economic damage worldwide. Developing countries like Indonesia will suffer the most from such detrimental effects. However, these losses can be minimized with a commitment to reduce greenhouse gas emissions into the Earth's atmosphere.

1.2 Indonesia's climate change commitments

Indonesia has committed to addressing climate change issues, and it is reflected in the country's ratification of the 2015 Paris Agreement through Law No. 16/2016. The commitment is further reinforced with an increased Nationally Determined Contribution (NDC) that Indonesia has submitted to the United Nations Framework Convention on Climate Change (UNFCCC). As part of its commitment, Indonesia aims to reduce GHG emissions by 29% below its business as usual (BAU) levels with its own efforts and by 41% with international support.³

In terms of funding, the estimated amount required to achieve conditional NDC targets with international assistance and unconditional targets through Indonesia's own efforts from 2018 to 2030 is US\$285 billion and US\$281 billion, respectively, according to the Third Biennial Update Report (BUR3) released by the Indonesian government in 2021. However, these estimated funding needs only cover mitigation actions, which are actions that directly result in emission reductions, and do not include the costs required to create a supportive environment.⁴

¹ ESDM.go.id, "Inventarisasi Emisi GRK Bidang Energi", December 2020, <https://tinyurl.com/yc27yy4m>

² Footnote 1, hal.

³ Peraturan.go.id, "Undang-Undang Nomor 16 Tahun 2016 Tentang Pengesahan paris Agreement to UNFCCC," <https://tinyurl.com/2tcspwnz>

Indonesia has further expressed its commitment to addressing climate change issues through the 2050 Long-Term Strategy-Low Carbon and Climate Resilience (LTS-LCCR). As part of the strategy, the country aims to achieve NZE by 2060 or earlier. In the most ambitious scenario illustrated by the Low Carbon Scenario Compatible with the Paris Agreement (LCCP), GHG emissions are projected to reach a peak of 1,030 million tonnes of carbon dioxide equivalent (CO₂e) by 2030 and then decline to around 572 million tonnes of CO₂e by 2050. In this scenario, the primary energy mix by 2050 is targeted to be comprised of NRE (43%), coal (38%), natural gas (10%), and bioenergy with carbon capture, usage, and storage (CCUS) technology (8%).⁵

1.3 KEN, RUEN, and Indonesia's roadmap towards NZE 2060

1.3.1 Renewables targets based on KEN and RUEN

The Indonesian government, through the National Energy Board (DEN), has issued the National Energy Policy (KEN) as the basis for formulating the National Energy General Plan (RUEN) to be Indonesia's NRE roadmap. The formulation of KEN is regulated by Government Regulation (PP) No. 79/2014, derived from Law No. 30/2007 on Energy. KEN is developed as a guideline to provide direction for national energy governance with the dual objectives of accelerating the development of renewables while also reducing the growth rate of GHG emissions.

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The KEN has set targets for primary energy and final energy provision and utilization by 2025 and 2050. The target for primary energy provision is 400 million tonnes of oil

⁴ See footnote 3. .

⁵ Menlhk.go.id, "Indonesia Long-Term Strategy for Low Carbon and Climate Resilience 2050," 2021. <https://tinyurl.com/zt48376u>

equivalent (MTOE) by 2025 and around 1,000 MTOE by 2050, while the target for per capita primary energy utilization is about 1.4 tonnes of oil equivalent (TOE) by 2025 and 3.2 TOE by 2050. KEN also aims for the provision of electricity generation capacity to reach around 115 gigawatts (GW) by 2025 and 430 GW by 2050, as well as to achieve per capita electricity utilization of around 2,500 kilowatt hours (kWh) by 2025 and 7,000 kWh by 2050.

Regarding NRE governance policy, KEN has set targets for the renewable energy mix in relation to primary energy at 23% (92.3 MTOE) by 2025 and 31% (315.7 MTOE) by 2050. The development of renewable energy is focused on geothermal, biomass, hydro, solar, wind, nuclear, kinetic, and ocean thermal gradient energy.

The DEN has developed the RUEN's scope to reach until 2050 through Perpres No. 22/2017 in order to achieve the targets set by the KEN. The RUEN projected that the NRE power generation capacity should be around 45.2 GW by 2025 and around 167.7 GW by 2050 to meet the renewable energy mix set by KEN. The targets for the NRE power generation development by 2025 and 2050 can be seen in Table 1.

Table 1. NRE power plant development targets for 2025 and 2050

Types of NRE Power Plants	2025	2050
Geothermal	7.2 GW	17.6 GW
Hydro & Micro hydro	21 GW	45 GW
Bioenergy	5.5 GW	26 GW
Solar	6.4 GW	45 GW
Wind	1.8 GW	28 GW
Other NRE (biodiesel, ocean current, ocean wave, & ocean thermal energy)	3.1 GW	6.1 GW
Total	45 GW	167.7 GW

Source: 2021-2030 RUPTL

Realized renewable energy mix in relation to primary energy was recorded at 213.9 million barrels of oil equivalent (MBOE), or 12.2 percent, in 2022. That figure is still below the 366.4 MBOE, or 15.7 percent, target set in the RUEN.

1.3.2 Indonesia's roadmap towards NZE 2060

The Energy and Mineral Resources Ministry (MEMR) of Indonesia has formulated a roadmap towards NZE 2060 to meet the targets set by the LTS-LCCR for the energy sector, which can be divided into the following stages:⁶

- i **For the 2021-2025 period**, the focus is on issuing and implementing regulations, including laws on NRE, early retirement of CFPP, expansion of CFPP co-firing, and the conversion from diesel to gas and NRE.

- ii **For the 2026-2031 period**, there are no plans for the addition of CFPP capacity and their capacity will only come from contracted or under-construction projects. Solar panels and electric vehicles (EVs) are set to be developed at a massive scale to support the provision of 2 million four-wheeled vehicles and 13 million two-wheeled vehicles.
- iii **For the 2031-2035 period**, Indonesia will begin the first phase of its CFPP retirement and reduce the use of diesel for power generation. Solar power plants (SPPs), wind power plants (WPPs), and geothermal power plants (GPPs) are aimed to account for 57% of the share of overall renewable energy by 2035.
- iv **The 2036 – 2040 period**, will be for the second phase of CFPP retirement, including those in the subcritical and critical categories as well as some in the supercritical categories. The share of NRE is aimed to reach 66% and is to be dominated by SPP, hydroelectric power plants (HPPs), and bioenergy power plants. Additionally, conventional two-wheeled vehicle sales are targeted to be reduced.
- v **For the 2041-2045 period**, large-scale ocean current power plants (OCPs) and the first nuclear power plant (NPP) are set to begin commercial operation. The utilization of renewables is targeted to reach 93% and is to be dominated by SPPs, HPPs, and bioenergy power plants. The sales of conventional four-wheeled vehicles will also decrease. Moreover, conventional four-wheeled vehicle sales are aimed to be reduced.
- vi **The 2051-2060 period** will be the final phase of CFPP retirement, and the utilization of hydrogen to produce electricity will be massively developed. Renewables development is aimed to be dominated by SPPs, HPPs, and WPPs.

1.4 Increased NDC Commitment

In July 2022, a few months before the G20 Summit in Bali, Indonesia updated and increased its NDC commitment through the Enhanced NDC (ENDC) that included the target of reducing GHG emissions by 32% below BAU levels by 2030 through its own efforts, and 43% with international assistance.

The forestry and land use (FOLU) sector, has the highest GHG emission reduction target among Indonesia's economic sectors, which is at 17.4% with domestic efforts and 25.4% with international support. In second place is the energy sector, which has GHG emission reduction targets of 12.5% with domestic efforts and 15.5% with international assistance.⁷

⁶ ESDM.go.id, "Speaking at COP26, Energy Minister Gives Indonesia's Commitment to Net Zero Emission," November 2, 2021. <https://tinyurl.com/36v2x4tv>

Table 2. Projected GHG emission reduction target in Indonesia's ENDC

Sector	GHG Emissions in 2010 (MT CO ₂ e)	GHG Emission Rate by 2030			GHG Emission Reduction				Average Annual BAU Growth (2010-2030)	Average Annual BAU Growth (2000-2012)
		MT CO ₂ e			MT CO ₂ e		% of Total BAU			
		BAU	CM1	CM2	CM1	CM2	CM1	CM2		
Energy	453.2	1,669	1,331	1,223	358	4.46	12.5%	15.5%	6.7%	4.5%
Waste	88	296	256	253	40	43.5	1.4%	1.5%	6.3%	4%
IPPU	36	69.6	63	61	7	9	0.2%	0.3%	6.4%	0.1%
Agriculture	110.5	119.6	110	108	10	12	0.3%	0.4%	0.4%	1.3%
FOLU	64.7	714	214	-15	500	729	17.4%	25.4%	0.5%	2.7%
TOTAL	1,334	2,869	1,953	1,632	915	1.24	31.89%	43.2%	3.9%	3.2%

Notes:

CM1= Counter Measure 1, for GHG emission reduction with domestic efforts

CM2= Counter Measure 2, for GHG emission reduction with international assistance

Source: Enhanced Nationally Determined Contribution Republic of Indonesia 2022

1.5 JETP Indonesia to fund energy transition

Global climate change mitigation efforts require not only national commitments but also significant resources. The requisite financing has become one of the biggest challenges faced by developing countries such as Indonesia which heavily relies on fossil fuels, particularly coal, in its energy mix and especially for electricity generation. A substantial amount of funding is needed to transition from CFPP to NRE-based power plants in order to reduce GHG emissions from the electricity sector.

To address the issue, one of the initiatives resulting from the UNFCCC's 26th Conference of Parties (COP) in Glasgow is a funding scheme aimed at assisting developing countries in undertaking a just energy transition, known as the JETP. The initiative is carried out by the governments of the developed countries that make up the Group of Seven (G7), namely the United States, the United Kingdom, Germany, France, Italy, Japan, and Canada.

Indonesia became the second country after South Africa to announce its collaboration for JETP with the IPG, which comprises the G7, Denmark, Norway, and the European Union. The partnership was announced during the G20 Summit in Bali on Nov. 15, 2022. Through JETP, Indonesia is committed to accelerating the energy transition of its electricity sector, and the IPG countries are committed to mobilizing funding from both their public and private sectors to finance Indonesia's energy transition projects and achieve its energy transition acceleration and GHG emission reduction targets.



2 JETP INDONESIA

2.1 JETP Indonesia: Goals, targets, and funding

The main objective of the JETP's establishment is to accelerate the adoption of renewable energy sources (RES), while also gradually phasing out fossil fuel-based energy systems in a fair and just manner, in developing countries which are considered to have relatively slow energy transition progress. JETP not only focuses on strong emission reduction but also promotes sustainable development and economic growth, as well as protecting the livelihoods of communities and workers in sectors impacted by its transition.

Indonesia's participation in the JETP, which is specifically targeted at the electricity sector, has led to more ambitious GHG emission reduction commitments compared to Indonesia's targets in the ENDC. As part of its JETP participation, the Indonesian government has recorded its political commitment to meet the JETP targets, which the Indonesian government refers to as JETP plans, that include the following:

- Peak emission in the Indonesian electricity sector is targeted to reach no more than an absolute value of 290 MT CO₂ by 2030, which is lower than Indonesia's previous target of 357 MT CO₂.
- Advancing Indonesia's NZE target for the electricity sector by 10 years to be reached by 2050.
- Accelerating the development and widespread implementation of NRE so it could contribute 34% out of the total energy generated by all power plants by 2030.⁸

To support Indonesia in achieving these targets, JETP is set to mobilize US\$20 billion of funding over the next three to five years from both the public and private sectors. The IPG countries, led by the United States and Japan, have committed to raising US\$10 billion in public funding, which is aimed to be channeled through various mechanisms based on each IPG country's chosen funding scheme. In the meantime, the Glasgow Financial Alliance for Net Zero (GFANZ) will coordinate US\$10 billion of commercial funding from private financial institutions that include Bank of America, Citigroup, Deutsche Bank, HSBC,

⁸ US embassy.gov, "A Joint Statement between Government of Indonesia and International Partners Group," <https://tinyurl.com/3hjc2sbf>

Macquarie, MUFG, and Standard Chartered. The partnership with those banks will also leverage the expertise, resources, and operations of multinational development banks. Recently, public sector funding from the IPG has been increased to US\$11.7 billion, bringing the total funding for JETP projects to US\$21.7 billion.⁹

The Indonesian government is on the same structural level as the IPG on the matter of coordination mechanisms among JETP stakeholders. Coordination efforts and negotiations from the Indonesian government's side are led by the Coordinating Ministry for Maritime and Investment Affairs (Kemenkomarves). Indonesia plans to establish a decarbonization task force to oversee coordination among its ministries and agencies.

The Indonesian government and IPG have also agreed to establish the JETP Secretariat, which operates out of the MEMR office and will serve as a center for information, planning, coordination, monitoring, and evaluation of JETP projects.¹⁰

Table 3. Comparison of GHG emission reduction targets in the energy sector of Indonesia in UNDC, ENDC, LTS-LCCR, and JETP

Components	Updated NDC		Enhanced NDC		LTS-LCCR	JETP
	CM1	CM2	CM1	CM2		
Peak emission target	1,355	1,223	1,311	1,223	1,030 Mt CO ₂ e	-
NZE Target	2060		2060		2060 or earlier	2050
Electricity sector emission reduction target	11.5%	15.5%	12.5%	15.5%	572 Mt CO ₂ e	290 Mt CO ₂ by 2030
NRE portion of energy mix target	19.6% (7.4 GW)	132.74 TWh	31% by 2050	Same as CM1, with increased NRE utilization	43% by 2050	34% by 2030
Total emission reduction target for all sectors	29%	41%	31.89%	43.2%	40%	-

Notes:

CM1= Counter Measure 1, for GHG emission reduction with domestic efforts

CM2= Counter Measure 2, for GHG emission reduction with international assistance

Source: Derived from the Enhanced Nationally Determined Contribution (NDC) Republic of Indonesia 2022, Updated Nationally Determined Contribution (NDC) 2021, Joint Statement JETP Indonesia, Indonesia Long-Term Strategy for Low Carbon and Climate Resilience (LTS-LCCR) 2050 document

⁹ Katadata.co.id, "ESDM: Negara donor tambah pendanaan JETP RI menjadi US\$ 21,7 miliar," 12 Mei 2023. <https://tinyurl.com/mr2rbu25>

¹⁰ ESDM.go.id, "Sekretariat JETP Terbentuk, Siap Realisasikan Kerjasama Pendanaan Transisi Energi," February 16, 2023. <https://tinyurl.com/4udppxrn>

2.2 Tasks of JETP Secretariat

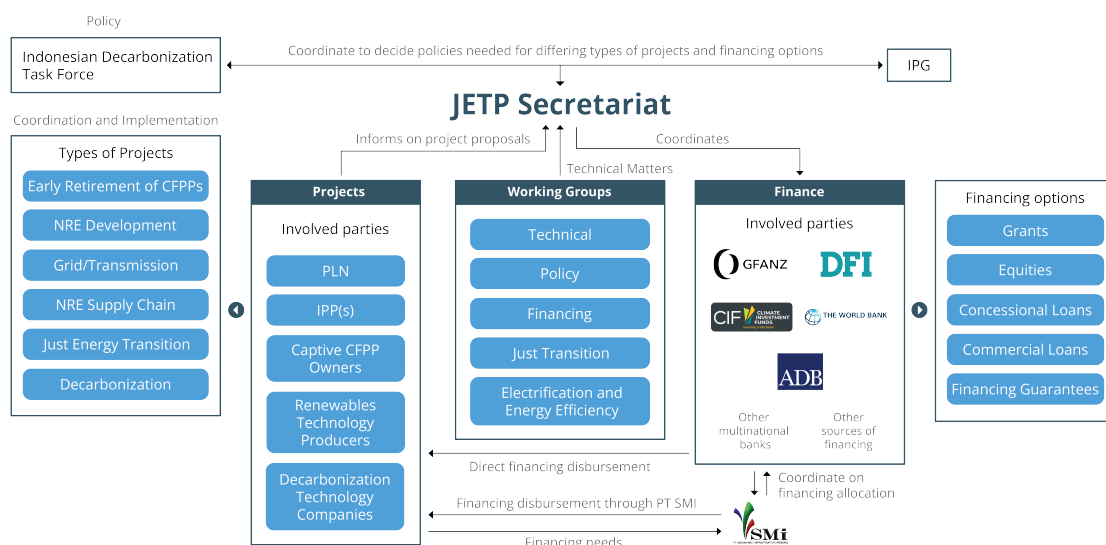
Indonesia's JETP Secretariat was officially established on Feb. 16, 2023, to facilitate the energy transition funding partnership. The JETP Secretariat, which is now already in operation out of the MEMR office, receives technical support from the Asian Development Bank (ADB) for the role of coordinating the JETP's internal and external stakeholders, as well as enacting planning and project development functions.

For the following six months after its establishment, the JETP Secretariat has been tasked with coordinating the formulation of the Comprehensive Investment and Policy Plan (CIPP) as a guide to achieve JETP targets. The CIPP will include recommendations for priority projects to accelerate the electricity sector's energy transition, public and private sector funding of those projects, policy adjustments needed to attract funding, especially private funding, for the priority projects, and upholding the just energy transition element of JETP implementation.

The JETP Secretariat functions as the field coordinator over the four working groups – which encompass the Technical, Policy, Financing, and Just Energy Transition Working Groups – in accordance with their respective areas of responsibility.

The creation of those working groups is independent of any involvement of entities that are part of the Indonesian government or IPG. After the CIPP is completed by the four working groups, the JETP Secretariat will hand it over to the Indonesian government, which would be represented by its decarbonization task force, and the IPG who will both then make final decisions regarding the CIPP.

Graph 1. Structure of the Indonesian government, IPG, and the JETP Secretariat



Source: Derived from Just Energy Transition Partnership and Working Group Setup 2023

2.3 Tasks of working groups drafting CIPP

In order to assist in the CIPP's formulation, four working groups are formed with the following tasks and functions:

a Technical Working Group

The Technical Working Group has a crucial role in strengthening and supporting the technical workflow required by the teams drafting CIPP. Their role involves formulating priority energy transition projects that will be included in the CIPP, aimed to achieve the electricity NZE targets, as well as analyzing and identifying investment needs for energy transition projects within the JETP framework. This working group is led by the International Energy Agency (IEA) and its members include the Institute for Essential Services Reform (IESR), the Rocky Mountain Institute (RMI), and the World Bank. It collaborates with PLN and the MEMR in carrying out its tasks.

The Technical Working Group's tasks encompass:

- Establishing an integrated pathway to achieve NZE targets in coordination with PLN and MEMR.
- Creating priority programs and initiatives to be included in the CIPP for achieving NZE targets, including transmission and grid development, early retirement of CFPPs, development of VRE and baseload energy sources, carbon capture, as well as other infrastructure.

- Preparing the cost estimates required for financing the proposed programs in coordination with PLN and MEMR.
- Designing the projects' implementation timeline and roadmap.

b Policy Working Group

The Policy Working Group's role is to strengthen and support the policy and regulation analysis workflow and provide policy recommendations in the CIPP to achieve JETP targets. This working group is led by the World Bank and includes members such as Mentari, the United States Agency for International Development (USAID), the ADB, and the IEA. It cooperates with the Industry Ministry of Indonesia in carrying out its tasks.

The Policy Working Group's tasks include:

- Proposing policy reforms to accelerate energy transition that encompass:
 - Low-Carbon Roadmap
 - Power Purchase Agreements
 - Supply-side incentives
 - Procurement processes
 - Development of local NRE manufacturing industries
 - NRE licensing requirements
- Providing policy and financing instrument proposals to enhance PLN's long-term financial sustainability.
- Designing project implementation plans and timeframes.

c Financing Working Group

The Financing Working Group plays a vital role in strengthening and supporting the financial analysis workflow to analyze financial and commercial risks in the formulation of investment plans for energy transition projects within the JETP framework. This working group also provides support by preparing the needed financial documents. It is led by the ADB and supported by GFANZ, the Climate Policy Initiative, KfW, and the Japan International Cooperation Agency (JICA). It cooperates with the Finance Ministry of Indonesia (Kemenkeu) and PT Sarana Multi Infrastruktur (SMI) in carrying out its tasks.

The Financing Working Group's tasks encompass:

- Setting financing priorities for the JETP Investment and Policy Plan.
- Identifying suitable sources of financing and financial instruments to support JETP projects and initiatives.
- Developing financing mechanisms for just energy transition interventions.
- Proposing reforms to address policy and legal obstacles in the banking and capital markets sectors.
- Developing strategies to leverage additional financial resources for just energy transition activities, including from domestic institutions.

d Just Transition Working Group

The Just Transition Working Group has an important role in conducting a comprehensive evaluation and strengthening the content for the workflows not covered by the technical, financing, and policy workflows, especially in terms of justice for stakeholders impacted by the JETP. This working group also facilitates stakeholder involvement in the CIPP JETP document's formulation process. It is led by the United Nations Development Programme (UNDP) and includes the ADB, the World Bank, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the International Labor Organization (ILO), and the Indonesian Center for Environmental Law (ICEL). The working group collaborates with PT SMI in carrying out its tasks.

Tasks of the Just Transition Working Group include:

- Analyzing and evaluating the current policy and legal environment related to just energy transition.
- Supporting the coordination of inter-ministerial working mechanisms established by the Indonesian government.
- Supporting the development of a national framework for just energy transition.
- Providing proposals to have just energy transition frameworks taken into consideration in financing documents.

- Formulating recommendations for the government to intervene in the development of human resources and economic opportunities.
- Providing recommendations related to the policy and/or legal frameworks for just energy transition implementation.

2.4 Priority projects proposed by Indonesia for CIPP

Currently, the CIPP's discussion and formulation process is still ongoing. However, the Indonesian government has proposed several priority activities that may differ from the priorities of the IPG countries in the process of CIPP's development. There are five types of priority projects proposed by the Indonesian government, namely:

a **Development of renewable energy-supporting transmission networks**

The proposed project involves the construction and enhancement of transmission systems, including intra- and cross-system interconnections, to support renewables projects that can be integrated into PLN's main transmission network. Additionally, the project is set to include the construction of an Advanced Control Center (ACC) to accommodate VRE development and the implementation of a Smart Grid. The government also plans to integrate electricity from renewable energy sources as captive power for PLN's network. The estimated cost for building renewables-supporting transmission networks is between US\$60 billion to US\$70 billion.

One of the priority transmission projects to be constructed is the 275 kilovolt (kV) and 500 kV transmission networks for the Sumatra-Bangka electricity system, which is aimed to connect the majority or even all power plants in Sumatra and Bangka with a total installed capacity of 6.5 GW. The Indonesian government and PLN also plan to build a backbone transmission network in Sulawesi that connects its dispersed power plants in order to enable their power to flow into natural resources "downstreaming" projects on the island.

b **Early retirement of CFPPs**

In the early stages of the JETP's launch, special attention is given towards efforts to immediately reduce coal usage in order to rapidly achieve its GHG reduction target. One of the proposed projects is the gradual phasing-out of CFPPs to achieve the JETP's GHG emission reduction target by 2030.

The Indonesian government and PLN have prepared a list of CFPPs that are ready for early retirement before 2030, including 16 CFPPs in Java and Sumatra with a total installed capacity of 5.5 GW, with said retirement expected to be financed through the JETP mechanism. The total expected cost for the early retirement of those 16 CFPPs is between US\$5 billion to US\$10 billion.

In the context of the early retirement of CFPPs, GFANZ has proposed several financing scenarios, including funding on a standalone basis, asset swaps with RES projects as a reference, and RES projects with divestments.

Table 4. Potential CFPPs for early retirement

CFPPs	Capacity (MW)	COD	Owner
Suralaya #1	400	1985	PLN
Suralaya #2	400	1986	PLN
Suralaya #5	600	1997	PLN
Suralaya #6	600	1997	PLN
Suralaya #7	600	1998	PLN
Suralaya #8	625	2011	PLN
Paiton #1	400	1993	PLN
Paiton #9	660	2012	PLN
Bukit Asam #1	65	1987	PLN
Bukit Asam #2	65	1987	PLN
Bukit Asam #3	66	1987	PLN
Ombilin #1	100	1996	PLN
Nagan Raya #1	110	2013	PLN
Labuhan Angin #1	115	2008	PLN
Labuhan Angin #2	115	2008	PLN
Cilacap #3	614	2016	IPP
Total Capacity	5,535		

Source: Presentasi PLN di Japan RE Invest Indonesia 2023

c Development of baseload renewable energy

One of the projects proposed by the government for JETP funding priority is the enhanced development of renewables power plants that can function as baseload energy sources. Baseload renewable energy (BRE) is essential for the national electricity grid since it provides an uninterrupted power supply to the transmission system. Some RES that can serve as baseload energy are HPPs and GPPs, which can generate electricity continuously and are considered suitable replacements for CFPP.

Indonesia significantly emphasizes BRE development due to its vast hydropower and geothermal potentials, which are estimated at 75.09 GW and 23.96 GW respectively. The hydropower potential is mainly located in Papua, with a largely untapped capacity of 22.37 GW, followed by Kalimantan with 16.84 GW and Sulawesi with 6.34 GW.

The installed capacity of Indonesia's HPPs reached 5.66 GW as of 2021, the largest contribution for renewables. On the other hand, the largest geothermal potential is found in Sumatra and Java, with Indonesia's installed GPPs capacity reaching 2.52 GW as of 2021. This means that there is still a significant untapped potential for both hydropower and geothermal energy, but projects to harness them require substantial investment.¹¹

The addition of renewables power plant capacity is planned to reach 13.7 GW by 2030. Meanwhile, the realization of BRE potential is targeted to reach 15-40 GW by 2037. To carry out this project, the required capital expenditure (capex) is estimated to be around US\$85-100 billion.

Table 5. Capacity of baseload power plants

Power Plants	Projects	Total Capacity (MW)	Potentially JETP-Funded Projects	Total Capacity (MW)
HPPs	15	1,925	36	2,727.3
GPPs	19	972.2	64	2,201
Mini-Hydro Power Plants	89	588.15	132	463.31
Biomass Power Plants (BMPP)	6	41.7	3	30
Waste-to-Energy Power Plants (WTEPP)	3	40.5	10	228
Biogas Power Plants (BGPP)	3	7	4	11
Baseload Power Plants	-	-	19	970

Source: Derived from the 2021-2023 RUPTL document

d Development of variable renewable energy

In addition to BRE, the Indonesian government has initiated efforts develop variable renewable energy (VRE), which is also known as intermittent energy due to its fluctuating electricity generation. The proposed projects for VRE include the development of SPPs and WPPs.

Indonesia's potential SPP capacity is estimated at 3,294 GW, the largest among its RES, while the country's potential WPP capacity reaches around 155 GW. However, the installed capacities for solar and wind power are still very small, lower 314.8 MW for solar power and 154.3 MW for wind.¹² The low installed VRE capacities are attributed to the intermittent nature of their electricity supply, which is an aspect disliked by PLN. The addition of VRE capacity is targeted to reach 5.3-6.2 GW by 2030, and the realization of VRE potential is targeted to reach 30-50 GW by 2037. The estimated capex required for VRE enhancement projects is around US\$60-80 billion.

¹¹ Reinvest.id, BPS.go.id, "Kapasitas Terpasang PLN menurut Jenis Pembangkit Listrik (MW)." <https://tinyurl.com/bddav4dp>

¹² Reinvest.id, BPS.go.id, "Kapasitas Terpasang PLN menurut Jenis Pembangkit Listrik (MW)." <https://tinyurl.com/bddav4dp>

Table 6. VRE development

Power Plants	Ongoing Projects	Total Capacity (MW)	Potentially JETP-Funded Projects	Total Capacity (MW)
SPPs	15	1,925	36	2,727.3
SPPs + Batteries	19	972.2	64	2,201
WPPs	89	588.15	132	463.31
Pumped-Storage Hydroelectricity	6	41.7	3	30

Source: Derived from the 2021-2023 RUPTL document

e Electrification and renewable energy supply chain industry

Projects aimed at increasing electricity utilization and the development of related industries, such as the domestic manufacture of photovoltaic (PV) or solar panels and the electric vehicle (EV) industry, have been proposed as recipients of funding support through the JETP. The estimated capex required for electrification projects and the development of NRE supply chain industries is around US\$30-50 billion.



3 RISKS AND CHALLENGES OF JETP

The success of JETP ought to be a priority for accelerating Indonesia's just energy transition. The success of JETP would be a breath of fresh air and a tangible example of support from developed countries for emerging countries in international cooperation on climate management.

However, JETP is inseparable from risks that can reduce or even hinder its success regardless of the high support that has been provided by the government of Indonesia, the governments of developed countries through IPG, and other international bodies. The various risks faced by JETP are a concern of all parties involved. By knowing the information about the following risks, the parties can take steps to reduce the risks and minimize the potential for failure of JETP Indonesia.

3.1 Operating Environment of JETP

On a technical level, the implementation of JETP Indonesia faces several risks and challenges related to the context or operating environment. The environmental context includes the surplus electricity situation in the Java-Bali and Sumatra-Bangka grids, the monopoly and monopsony of state-owned electricity company PT PLN over Indonesia's electricity sector, and the energy transition priorities of the Indonesian government/PLN, which may not necessarily align with the priorities of the IPG countries.

The electricity surplus in the Jawa-Bali and Sumatra-Bangka grid, which are still dominated by coal-fired power plants (CFPP), opens an opportunity for early retirement schemes. However, as will be explained in the funding risk and challenges segment, funding for CFPP early retirement schemes is not easily obtained. In that respect, the monopoly and monopsony of PLN towards Indonesia's electrical industry heavily affect Indonesia's energy transition along with the investment climate of renewable energy.

3.1.1 PLN as the sole buyer and seller of electricity in Indonesia

In 1992, through Presidential Decree No. 37/1992, the concept of independent power producers was introduced. The growth of electricity demand that grew rapidly forced the government to open the market for private parties to participate in the electricity generation business.

After the monetary crisis of 1997-1998, private participation was supported further by Law No.20/2002 on Electricity, which separated the electricity industry into the competitive and non-competitive segments and unbundled the sector into generation, transmission, distribution and selling sectors of electricity, which meant that PLN no longer had complete

monopoly over the electric supply business. However, this new regulation was rejected because it was seen as liberating the market and removing the authority of the state over a vital commodity for the quality of life of everyone, eventually leading to the Constitutional Court to overturn the law in 2004, thus reinstating Law No. 15/1985 on Electricity.

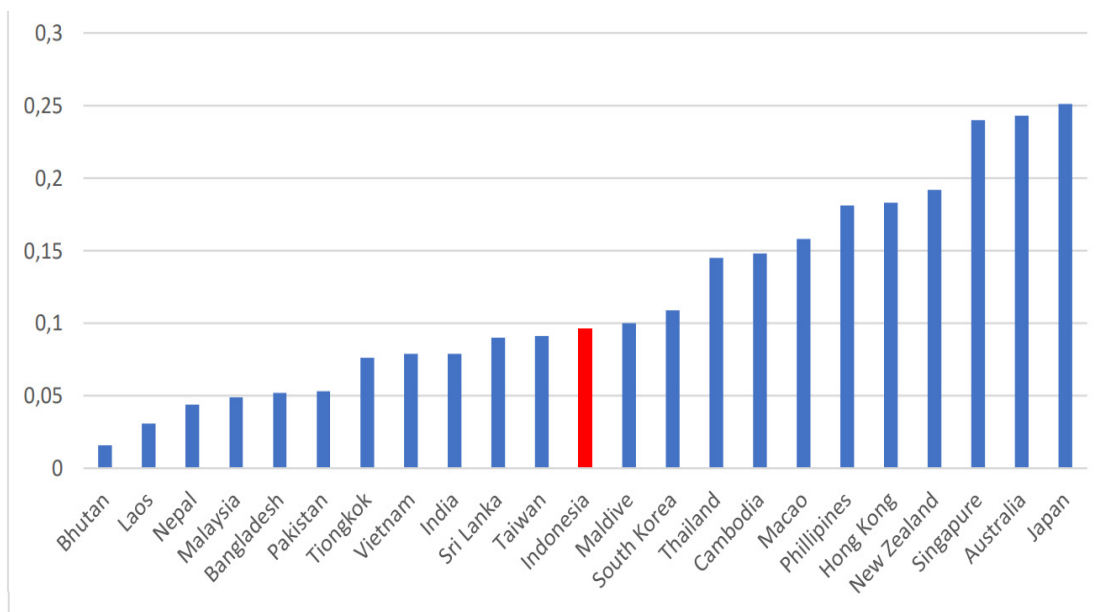
Efforts to reform the structure of the electricity industry in Indonesia were once again carried out with the enactment of Law No. 30/2009 on Electricity. The concept of unbundling was reintroduced through Article 10 Paragraph 1, and the role of the private sector was encouraged again through Article 10 Paragraph 2, and Article 11 Paragraph 1, which states that "the provision of electricity for the public interest as referred to in Article 10 paragraph (1) shall be carried out by state-owned enterprises, regional-owned enterprises, private enterprises, cooperatives, and community-based enterprises engaged in the provision of electricity," although State-Owned Enterprises (SOEs), in this case, PLN, are given priority. Due to public accusations of the removal of state authority again, the Constitutional Court revoked Article 10 Paragraph 2 and Article 11 Paragraph 1 of this Electricity Law in 2016. However, these two provisions were reinstated yet again in Government Regulation in Lieu of Law (Perppu) No. 2/2022 concerning Job Creation.

Although, by law, private sector participation opportunities are widely open, private enterprises face difficulties in operating each type of electricity supply business due to licensing issues in the form of an Electricity Supply Business License (IUPTL). Energy and Mineral Resources Ministerial (ESDM) Regulation No. 28/ 2012 on the Procedures to Apply for Electricity Supply Business Areas for Public Interest requires that the area must not yet be covered by an existing business. Meanwhile, many areas have already been covered by PLN.

Therefore, based on Article 6 of Energy and Mineral Resources Ministerial Regulation Number 35 2013 concerning the Procedures for Licensing in the Electricity Business, if PLN is operating in the business areas, the Electricity Supply Business License (IUPTL) for new power generation can still be granted if there is an agreement for the sale and purchase of electricity with PLN, while the IUPTL for transmission and distribution is granted if there is an agreement for the lease of electricity network with PLN. Cooperation with PLN in the form of Power Purchase Agreements (PPA) for the sale and purchase of electricity has been commonly conducted, either through tender processes or direct appointments. However, obtaining IUPTL for transmission and distribution within PLN's business areas is very challenging. For these areas outside PLN's business areas, IUPTL for distribution, sales, or integrated electricity supply is granted only after the business area obtains approval from the Energy and Mineral Resources Ministry.

Even though power purchase agreements (PPA) with PLN are common, often the prices obtained by investors are not attractive because PLN is the sole buyer of electricity, giving PLN significant bargaining power while investors are in a weak position. Although this "rule of the game" leads to practices of network and electricity sales monopoly and electricity purchase monopsony by PLN, it is not considered a violation of Law No. 5/1999 concerning the prohibition of Monopolistic Practices and Unfair Business Competition. This is due to Article 50(a), which provides an exception to the provisions of the law for actions and/or agreements aimed at implementing regulations, in this case, related to the state's obligation to fulfill the needs of the public, and Article 51, which states, "Monopolies and/or concentration of activities related to the production and/or marketing of goods and/or services that control the needs of the public and important branches of production for the state are regulated by law and carried out by state-owned enterprises and/or institutions established or appointed by the Government." With residential electricity prices paid by the public being relatively low in Indonesia compared to other countries, PLN's monopoly is seen as fulfilling the needs of the public and does not violate competition law.

Graph 2. Household electricity prices (Desember 2022)



Source: GlobalPetrolPrices.com¹³

¹³ Globalpetrolprices.com. "Electricity Prices", 2023. <https://tinyurl.com/3j5p84cy>

Because PLN is responsible for maintaining affordable electricity prices for consumers, this puts pressure on PLN's finances to build or maintain facilities to improve its services. This also impacts the technology options available to PLN, where they opt for projects with low capital expenditure even if it leads to higher operational expenditure, so long as it can smooth out their expenses over time. For example, when developing transmission infrastructure, if they cannot secure cheap financing, PLN will use the existing transmission they have, limiting the options for renewable energy power generation to generation sources capable of providing baseload energy.

PLN, as the sole entity authorized to distribute electricity in Indonesia, plays a key role in ensuring the realization of projects prioritized in the JETP. Potential issues may arise if there are differences in priorities between PLN and what has been agreed upon by the Indonesian government with IPG. Differences in priorities regarding the types of renewable energy that should be developed in Indonesia between PLN and IPG can develop into an issue.

On one hand, the IPG strongly advocates for the development of renewables sources in Indonesia to focus more on variable renewable energy sources (RES) such as SPPs and WPPs. On the other hand, PLN tends to avoid the development of variable RES because intermittent energy requires support from a smart grid. However, PLN's transmission infrastructure which is equipped with smart grid technology is still quite limited. Indonesia has the largest potential for renewable energy, with solar energy alone estimated to be equivalent to 3.294 GW, but its utilization so far is only 314.8 MW.

To accelerate the integration of renewable energy into Indonesia's energy mix by 34% before 2030, private sector involvement is crucial. Unfortunately, the investment climate for the development of renewable energy sources in Indonesia is considered unfavorable for investors due to PLN's implementation of maximum electricity tariff limits. Without adjustments in the PPA related to the electricity purchase price conducted by PLN, the government's efforts to increase private sector participation in building renewable energy plants in Indonesia will always face obstacles.

Another issue is related to PLN's rejection of the power wheeling scheme planned by the government in the New and Renewable Energy (NRE) Bill. Through this scheme, the transfer of electrical energy from renewable energy sources developed by independent power producers can be directly delivered to customers who use it, while still utilizing PLN's transmission network. Moreover, the projections to achieve the target of renewable energy in Indonesia's energy mix is based on power wheeling as a crucial instrument to boost investments in the renewable energy sector.

There are many steps to achieve the JETP target, which ultimately must involve PLN as the executor. PLN's willingness to fully support the investment plans and policies being formulated in the Comprehensive Investment and Policy Plan (CIPP) becomes a critical factor. Therefore, involving PLN in the policy formulation process is part of ensuring PLN's commitment to support the strategic implementation of JETP.

3.1.2 Electricity surplus in Java-Bali, Sumatra-Bangka grid

The electricity surplus in the Java-Bali grid, which serves as the backbone of Indonesia's economy, has increased significantly since COVID-19. According to PLN, the reserve margin for the Java-Bali grid, which ideally should be at 30%, sharply increased to 40% in 2020, then slightly decreased to 37% in 2021, and further surged to 56% in 2022 due to the addition of several new coal-fired power plants to the Jawa-Bali network while demand had not fully recovered yet.¹⁴ The reserve margin also rose sharply in the Sumatra-Bangka grid, reaching 41.2% in 2022, and is projected to rise further to 48.4% in 2023. This oversupply issue is a result of past electricity policies that designed power plant developments in Indonesia based on economic growth projections that turned out to be much higher than the actual figures, exacerbated by the COVID-19 pandemic, leading to a decline in electricity demand.

To meet the electricity supply needs, PLN formulated RUPTL based on the estimated electricity demand for at least the next 10 years. PLN formulated these estimates by considering that electricity demand in an area is driven by three main factors: economic growth, electrification programs, and the shift of electricity from self-suppliers (captive power) to the PLN network. Economic growth increases the income of the population, which subsequently leads to an increased demand for electricity. Moreover, the electricity

¹⁴ CNBCIndonesia, "Bos PLN Blak-blakan Alasan di Balik *Oversupply* Listrik RI," 8 Februari 2023. <https://tinyurl.com/ynj8p2zx>

supply also contributes to economic growth as one of the input variables.

In the Master Plan for the Acceleration and Expansion of Indonesia's Economic Development (MP3EI), Indonesia's economy is projected to grow at an average rate of 6.8% per year during the 2015-2024 period. With this projected economic growth, electricity sales in 2024 are estimated to reach 464 Terawatt-hours (TWh), with an average annual growth rate of 8.7% during the 2015-2024 period and peak load reaching 74.5 gigawatts (GW). Therefore, a new power plant development program of 70.4 GW was established for the 2015-2024 period, giving rise to the 35,000 MW development plans for the 2015-2019 period.

**Table 7. Assumption on the growth of Indonesia's economy, RUPTL
2015-2024**

Region	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Indonesia	6,1%	6,4%	6,8%	7,0%	7,1%	7,0%	7,0%	7,0%	7,0%	7,0%
Java Bali	6,2%	6,5%	6,9%	7,1%	7,3%	7,1%	7,1%	7,1%	7,1%	7,1%
Sumatra and East Indonesia	5,9%	6,2%	6,6%	6,8%	6,9%	6,8%	6,8%	6,8%	6,8%	6,8%

Source: RUPTL 2015-2024

Table 8. Realized electricity sales in Indonesia (GWh)

Breakdown	2015	2016	2017	2018	2019	2020**
Total	200.600	213.455	221.066	232.433	243.058	241.140
Growth	2,13%	6,41%	3,57%	5,14%	4,57%	-0,79%

Source: RUPTL 2021-2030

Graph 3. Realized economic growth of Indonesia



Source: Berita Resmi Statistik BPS (2023)

The oversupply of electricity can also be seen from PLN's reserve margin, especially in the Java-Bali grid system. In the Java-Bali system, the criterion of Loss of Load Probability (LOLP) < 0.274%, which is equivalent to the probability of 1 day in a year where the peak load cannot be met by the existing capacity of the power generation system, requires a reserve margin of 25-30%.¹⁵ Meanwhile, for the Eastern Indonesia System, due to the fewer number of power generation units and relatively higher economic growth compared to Java-Bali, the reserve margin is set at 40%. PLN's established reserve margin is relatively high compared to equivalent countries.

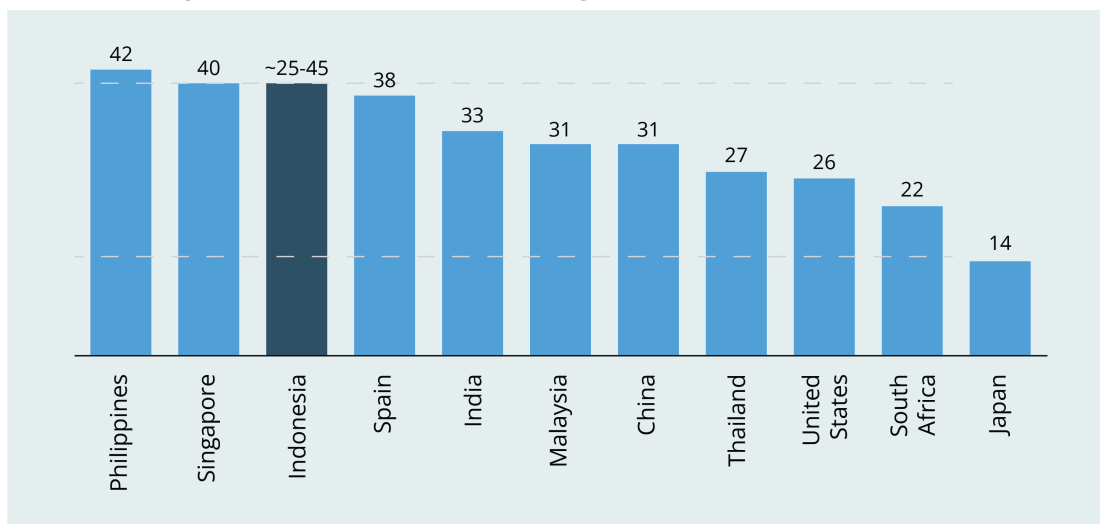
The Java-Bali grid's reserve margin in 2019 was already quite optimal at 32%, although there were a few regions with either high or low reserve margins. However, during the COVID-19 pandemic in 2020, there was a significant decrease in electricity demand, and the Java-Bali grid's reserve margin increased to 40% in 2020, then decreased to 37% in 2022, but rose again to 56% after 2022 ended.

Following the input from several coal-fired power plants, the electricity purchasing contract model of "take or pay" with private power producers, PLN stipulates payments to be made to Independent Power Producers (IPPs) who own coal-fired power plants that have started operating or reached the Commercial Operating Date (COD). Because of this, PLN is estimated to spend Rp 3 trillion per 1 GW of electricity to IPPs, even if the electricity is not used.

According to the Electricity Procurement Plan (RUPTL) for 2021-2030, the reserve margin in the Java-Bali system is projected to start declining in 2024, but it will remain above 40% until 2029. Meanwhile, the reserve margin in the Sumatra-Bangka system will fluctuate above 40% until 2029.

¹⁵ *Reserve margin* (RM) didefinisikan sebagai kapasitas pembangkit (G) dibagi beban puncak (D) sesuai persamaan $RM = (G/D-1) \times 100\%$

Graph 4. Benchmark reserve margin from other countries (in %)



Source: RUPTL 2021-2030

Table 9. Reserve margin Java-Bali system 2019-2020

Reserve Margin	Jakarta -Banten	West Java	Central Java	East Java	Bali	Java-Bali
2019	3%	33%	58%	55%	-3%	32%
2020	11%	34%	60%	58%	-5%	40%

Source: RUPTL 2021-2030

Table 10. Reserve margin sistem Jawa-Bali dan Sumatra-Bangka 2022-2030

System	Reserve Margin	2022	2023	2024	2025	2026	2027	2028	2029	2030
Java-Bali	MW	16.627	14.834	13.757	15.895	16.732	15.503	15.431	15.035	14.483
	%	56,7	48,6	43,3	48,1	48,9	43,7	42,1	39,6	36,8
Sumatra-Bangka	MW	2.927	3.790	3.634	4.716	4.771	4.861	4.789	4.877	4.561
	%	41,2	48,4	43,1	52,2	50,0	48,3	45,5	44,3	39,1

Source: RUPTL 2021-2030

Considering the oversupply conditions in the Java-Bali and Sumatra regions until 2029, it is reasonable for PLN not to be interested in developing renewable energy in these areas. It is understandable if PLN directs the development of renewable energy to regions outside Java-Bali and Sumatra. However, investors still target Java and Sumatra because these areas are sources of Indonesia's growth and contribute 58.6% and 21.5% respectively to Indonesia's gross domestic product (GDP).

The oversupply conditions in Java-Bali and Sumatra-Bangka also provide a significant opportunity for energy transition in Indonesia, offering an opportunity to launch projects for the early retirement of coal-fired power plants. As explained in the above government's energy transition priorities, Indonesia has prepared a total of 16 coal-fired power plants in Java and Sumatra, with an installed capacity of 5.5 GW to be retired before 2030. The financing required for the early retirement of these 16 power plants is estimated to be at least US\$4.2 billion. However, as elaborated under financing risks, advanced countries under IPG and financial institutions under GFANZ face difficulties in raising funds to finance the early retirement of coal power plants because financing for coal power plants, including early retirement, falls under the "red" category in the green finance taxonomy.

3.1.3 Indonesia's energy transition priorities

As explained in Chapter 2 regarding JETP, the Indonesian government has developed a priority energy transition program, which includes transmission development, baseload renewable energy development, intermittent/variable renewable energy development, and promoting the growth of renewable energy supply chains such as solar panel manufacturing and electric vehicles. However, it is possible that the governments of advanced countries within the IPG may not agree with Indonesia's government priorities due to the interests of each advanced country regarding Indonesia's JETP.

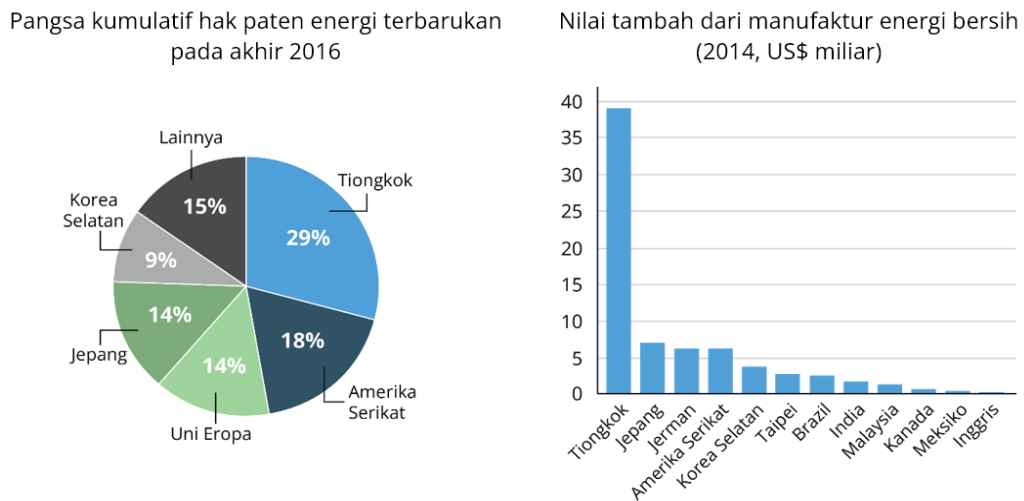
The reason for PLN's energy transition priority sequence is because the current state of PLN's power generation cannot support the development of intermittent renewable energy. Currently, some of PLN's power systems are not ready to accept renewable energy due to the oversupply conditions in the Java-Bali system and the Sumatra-Bangka system.

Furthermore, the introduction of intermittent renewable power sources such as solar and wind requires PLN to prepare power plants that can serve as baseload and peaker units to support the grid when variable energy sources are not generating electricity. This increases PLN's operational costs and necessitates additional investments, such as building an Automatic Generation Control (AGC) system, precise Forecasting Generation, Automatic Dispatch System, SCADA system upgrades, and more. PLN and the Indonesian government have placed the development of a smart grid as a top priority to support renewable energy, followed by the construction of baseload renewable energy sources, specifically hydroelectric power plants (HPP) and geothermal power plants (GPP), which can provide continuous electricity generation. However, building HPP and GPP requires significant upfront investment and a longer time to reach operational status and produce electricity. According to PLN's calculations, HPP and GPP projects require 6 to 7 years from the start of construction to commissioning, compared to just two years for equivalent-capacity coal-fired power plants (CFPP). Additionally, HPP and GPP involve much higher capital expenditure (capex) investments. It is possible that the countries within the IPG might be reluctant to invest in baseload renewable power plants due to their high costs and environmental concerns, especially for hydropower plants.

On the other hand, from the perspective of IPG countries, they need markets for manufacturing the renewable energy technologies they possess, especially solar power plants (SPP) and wind power plants (WPP), both of which are intermittent energy sources. In terms of the number of renewable energy technology patents, the United States and Japan are only slightly behind China. In 2016, China held the most renewable energy patents in the world, accounting for 29% of all patents, while the United States ranked second with 18%, and Japan ranked fourth with 14%.

However, in terms of added value obtained through clean energy manufacturing capabilities, calculated from components like wind turbine parts, crystalline silicon PV modules, LED packages, and lithium-ion battery cells, China is able to achieve nearly US\$40 billion in added value, while the United States and Japan lag far behind, obtaining only slightly over US\$5 billion.

Graph 5. Patent ownership and conversion of added value for manufacturing renewable energy



Source: IRENA (2019)

Therefore, the United States and Japan require a market for the SPP and WPP technologies they possess so that they can gain added value from manufacturing these technologies. If WPP and SPP are to be developed in Indonesia, PLN will need to invest in building a transmission system that supports both of these intermittent renewable energy sources. However, so far, there hasn't been any visible interest from the IPG to assist in financing transmission infrastructure projects. Unlike power generation where energy is sold to PLN to produce electricity, the business model for transmission systems still raises questions about its profitability. Thus, without funding assistance for transmission system development, there's a disparity in the technologies PLN expects to use for energy transition and the technologies that the IPG aims to offer through this JETP collaboration.

3.2 JETP funding

As a partnership aimed at supporting financing in energy transition, JETP faces potential risks related to obstacles in raising promised funds and smoothly disbursing them. These risks arise because JETP's funding involves participation from both the public and private sectors in various countries, leading to various hurdles originating from different parties, as well as risks associated with politicization. Therefore, the objective of this segment is to outline various challenges that could potentially complicate the provision and disbursement of JETP funds.

3.2.1 Grant funding as too low

Since the announcement of the JETP funding structure, various potential issues have started to be identified. JETP funding is divided into three categories: grant funding, concessional loans, and commercial loans. Grant funding is primarily required to provide technical support to the Indonesian government, initiate non-profit generating pilot projects, and more importantly, finance training and other efforts to mitigate the impacts of energy transition on stakeholders affected in the field, such as workers in coal-fired power plants and mines, ensuring a just energy transition.

Based on the latest information provided by the JETP Secretariat Communications Director, Adhityani Putri, on July 5, 2023, the grant funding within the JETP amounts to only US\$160 million out of the total of US\$21.7 billion, which is merely 0.8%. Despite noting that negotiations are ongoing, the distribution and proportion of funding have already prompted criticism from the Indonesian side.¹⁶

The proportion of grant funds that does not reach 1% of the total funding of the JETP is too small to assist the Indonesian government in initiating and promoting Indonesian energy transition programs effectively. What is even more concerning is that this already small grant portion involves pre-existing energy transition funding programs.¹⁷ Thus, the new funds originating from the JETP in this grant scheme are much smaller than what has been reported in the media. The Indonesian government hopes that the funding for IPG grants can be increased to reach 4%, similar to what has been provided to South Africa in the JETP scheme.

¹⁶ Tempo.co, "Dana Hibah JETP Cuma US\$ 160 juta dari US\$ 20 miliar, Ekonom: Mencederai Komitmen Negara Maju", July 6, 2023. <https://tinyurl.com/3cmmd6tn>

3.2.2 Availability of public funding in question

One of the main goals of the JETP is to seek funding for developing energy transition projects that are typically less attractive to conventional investors. However, lessons from the JETP in South Africa show that the accessibility of JETP funding from the public sector is still low. Projects with significant value for energy transition purposes face difficulties in obtaining funding priority from the JETP. Grant financing is clearly needed for fundamental yet commercially unattractive energy transition projects such as the early retirement of coal-fired power plants and transmission development. Projects like these are not capable of absorbing even concessional loans, this is especially true for early retirement of power plants who can hardly attract any commercial loans at all. Energy transition projects like these often require high costs with long investment returns. Like most green projects, they take a relatively long time to become profitable.

The main barrier to JETP's public funding provision is the priority of financial assistance or concessional funding provision in each developed country participating in the JETP. The provision of foreign financial assistance, for example from the United States, requires approval from the House of Representatives and Congress, each with their own priorities. For U.S. politicians, Indonesia might not be a priority for assistance in energy transition. Other advanced countries within the IPG have different interests and priorities in providing cheap funds for foreign aid, and this certainly poses a challenge in providing funds in accordance with JETP commitments.

Moreover, it is possible that the funds promised in the JETP program by these developed countries are not entirely new funds, but rather mostly funds that they have allocated all along.

Another risk of public funding is the absence of a single institution that can channel all JETP funding. Each developed country has its own distribution mechanism that is then channeled through different development banks such as KFW, AFD, World Bank, and ADB. The proposal to establish a single institution to act as the sole manager of JETP funds is also difficult to realize. Such consolidation would bring about excessive systemic risk. Moreover, each IPG member country is reluctant to entrust its funding to a single financial institution. Each development bank has its own requirements and processes for channeling funds, so there is no standardized process in place. As a result, the time needed to obtain approval for JETP projects could be longer than the time needed to approve non-JETP projects.

3.2.3 Commercial funding and a supportive investment climate

Energy transition projects under the JETP scheme involve numerous renewable energy development projects that offer favorable returns. Projects of this nature can be offered to secure commercial financing from banks participating in the Indonesian JETP, which are under the coordination of GFANZ: Bank of America, Citi, Deutsche Bank, HSBC, Macquarie, MUFG, and Standard Chartered.

To attract these international banks to enter and invest in energy transition projects, a supportive investment climate is required, particularly in the energy sector, specifically in electricity generation. This undoubtedly necessitates policy and regulatory reforms to make the renewable energy sector attractive for investment. Investors in renewable energy often complain about non-competitive renewable energy tariffs or prices that hinder the development of the renewable energy industry, as well as challenges from local content requirements (LCR). Additionally, reforms are needed in renewable energy licensing, procurement of goods and services, and more. (Refer to the Policy Risks in section 3.2)

Furthermore, international banks often view Indonesia as a region with certain investment risks, leading them to frequently require government guarantees before investing. Meanwhile, the Finance Ministry has stated that the government does not want the JETP to add burdens to the state budget. As a result, although the JETP can mobilize new funding, it might not gain approval from the Finance Ministry if the funding takes the form of loans requiring government guarantees.

To attract financing from these international commercial banks, these energy transition projects must promise adequate returns and provide assurance that the projects will proceed as planned. Therefore, preparing good projects that promise high returns and structuring them into feasible and bankable projects presents its own challenges.

3.2.4 Financing for early retirement of CFPPs unattractive to investors

When launched, one of the priorities of the JETP was to promote the early retirement of coal-fired power plants (CFPP) as it could swiftly reduce GHG emissions. The issue lies in securing funding for the early retirement of coal-fired power plants, as the financing for CFPPs, including early retirement, falls under the "red" category in the green banking finance taxonomy. Even though the purpose of these projects is the early retirement of CFPPs, many global investors are reluctant to add fossil fuel-based assets to their portfolios due to the negative impact on their image, especially concerning Environmental, Social, and Governance (ESG) assessments. With the increasing global scrutiny on 'greenwashing', investments in any projects involving coal, including cessation efforts, cannot be deemed environmentally friendly investments by investors focusing on ESG.

Before the establishment of the Indonesian JETP, the Indonesian government had attempted to gather funding for the early retirement of coal-fired power plants through blended finance mechanisms using the Energy Transition Mechanism (ETM), launched by the Indonesian government and supported by the Asian Development Bank. According to PT Sarana Multi Infrastruktur (SMI)¹⁸, the country platform manager for the ETM, financing for the early retirement of coal is still hard to obtain from commercial financing due to green taxonomy issues.

The institutions currently being explored to participate in financing several early retirement projects under the ETM include the Indonesian Investment Authority (INA) Sovereign Wealth Fund, philanthropic institutions, climate financing institutions, and the Indonesian government in the form of guarantees. Currently, the financing of coal-fired power plant (CFPP) early retirement through the ETM mechanism is still in its early stages, and no CFPP early retirement projects have fully commenced yet. If the funding for CFPP early retirement through the ETM mechanism proves successful, it could be adopted as a model for funding CFPP early retirement by the JETP.

Since one of the main obstacles to funding CFPP early retirement is the green banking taxonomy, the Indonesian government is advocating for changes in the green taxonomy for CFPP early retirement. Indonesia, currently serving as the chair of the Association of Southeast Asian Nations (ASEAN), has successfully convinced ASEAN member states to change the investment taxonomy for CFPP early retirement. In the ASEAN Taxonomy for Sustainable Finance version 2.0 released in March 2023, CFPP early retirement activities can be classified as 'green' or 'yellow' activities. For CFPP early retirement completed before

¹⁸ Presentation PT SMI di Japan RE Invest Indonesia 2023

the year 2040, this activity can be classified as 'green', while those completed after that are categorized as 'yellow'. This second version of the ASEAN taxonomy is expected to better accommodate energy transition financing. Nevertheless, this sudden change has raised suspicions from many climate finance experts that what is known as 'greenwashing' has occurred, where political considerations override science-based reasons.¹⁹

Not limited to private investors moving away from fossil energy investments, the public sector is also distancing itself from the fossil sector. Many citizens in advanced countries do not allow their governments to use public funds to finance fossil energy development, including the retirement of coal-fired power plants. Thus, it will be a challenge for Indonesia to secure funding for CFPP early retirement through the JETP scheme.

3.2.5 JETP funding a small portion of energy transition financing

When initially launched, the JETP sounded impressive. However, the budget amount of US\$21.7 billion falls far short of being sufficient to fund Indonesia's decarbonization efforts. For the electricity sector alone, PLN has repeatedly stated that the funding required to achieve the NZE target by 2060 is estimated to be at least US\$500 billion²⁰, far exceeding the funding capacity of the national budget. In fact, of the projects outlined by PLN for the JETP, the total cost needed to finance the projects under the JETP amounts to US\$150 billion.

If, with this amount of funding, the JETP cannot fulfill all its commitments within the promised timeframe, there is a possibility that the Indonesian government or PLN will approach investors outside of the JETP to help finance priority projects. This is especially true for projects avoided by the advanced countries participating in the JETP, such as early retirement of CFPP, transmission, and renewable energy for baseload power.

¹⁹ IEEFA.org, "Indonesia dances around taxonomies to mobilize capital for its coal phaseout programs," April 18, 2023. <https://tinyurl.com/yv967uwp>

²⁰ Dunia Energi, "Kejar Target Net Zero Emission Tahun 2060, PLN Butuh US\$500 Miliar", November 3, 2021. <https://tinyurl.com/4s8xrkud>

3.3 Governance of JETP Indonesia

As a cross-country partnership involving various stakeholders, ensuring good governance of JETP is one of the key success factors for energy transition in Indonesia. Unfortunately, uncertainties regarding the governance mechanisms within and outside this partnership expose JETP to several potential issues. This section is aimed at discussing some problems that could arise due to the low level of engagement processes among various stakeholders both within and outside the government, the lack of coordination among stakeholders, and the independent status of the JETP Secretariat without authority.

3.3.1 Low involvement of stakeholders

Due to the broad scope of JETP's work that covers various sectors and the many parties that will be impacted by the energy transition process in Indonesia, it is crucial to identify stakeholders who need to be involved in the dialogue and coordination related to the plans and implementation of JETP in Indonesia.

Even within the government itself, attention to the JETP remains centered in only a few ministries/agencies such as the Coordinating Ministry for Maritime Affairs and Investment (Kemenkomarves), the Energy and Mineral Resources Ministry (MEMR), Finance Ministry, and the State-Owned Electricity Company (PLN). While several other ministries/agencies play essential roles in the success of JETP's implementation, their involvement has not been optimal.

As a partnership involving inter-country relations, it is unusual for negotiations between Indonesia and donor countries to completely exclude the Foreign Affairs Ministry (Kemlu). Negotiations in cross-country partnerships like JETP often involve various global political and economic considerations that the Foreign Affairs Ministry could recommend to ensure Indonesia's negotiation strategy with the IPG proceeds smoothly.

Furthermore, the Manpower Ministry (Kemnaker) has also not been extensively engaged in the formulation and planning processes of JETP, especially regarding the implementation of a fair energy transition framework. To ensure that the just transition framework can be implemented and accepted by the affected workers, the involvement of Kemnaker is required to synchronize various upskilling training programs that are institutionally supported and aligned with the programs prepared under the Omnibus Law on Job Creation.

The National Development Planning Agency (Bappenas), responsible for national development plans, has not been actively involved in JETP agendas. However, if the various projects recommended in the Indonesia Comprehensive Investment and Policy Plan (CIPP) are implemented, they will impact national strategic policies related to development planning. Bappenas needs to be engaged to assist in coordinating and synergizing activities across the coordinating ministries.

Furthermore, the central government also needs to optimize the involvement of local governments and civil society organizations (CSOs). Involvement of stakeholders at the local level is crucial for garnering public acceptance of the JETP and ensuring efforts for protection and mitigation of economic and social impacts from early retirement of coal-fired power plants (CFPP) are carried out according to the actual needs of the region and accurately targeted.

The low engagement of stakeholders, both within and outside the government, in the JETP governance mechanism puts various prioritized agendas in the CIPP at risk of not being approved by the IPG.

3.3.2 Lack of coordination among stakeholders

An effective, accountable, and transparent coordination mechanism and governance structure among stakeholders, both government and non-government, are key to ensuring a just energy transition process. To promote synergy among government institutions, the government has planned to establish a decarbonization task force responsible for coordinating various ministries/agencies involved in decarbonization efforts, including those related to the JETP.

This decarbonization task force is also expected to be an institution that can accommodate stakeholders outside of the government, considering the participation and contributions of all actors, as the inclusion of civil society organizations (CSOs), donors, and investors, are highly necessary. This task force will also serve as the point of contact for all partners willing to support just energy transition policies.

Furthermore, to avoid overlap or duplication of programs and to optimize synergy among various initiatives such as the ETM Country Platform, mapping will also be carried out through the creation of a database containing information about all partners and their activity plans in supporting just energy transition policies.

To ensure expanded support from donors and investors for just energy transition policies, the institutional body established needs to be prepared with a clear communication plan. This plan should outline specific activities addressing various socioeconomic and environmental components, implementation schedules, funding or capacity gaps, and the type of support needed from partners.

3.3.3 Independent JETP Secretariat

The JETP is expected to be managed by an independent entity separate from any government to maintain the institutional neutrality and accountability of this partnership. Therefore, the JETP Secretariat only involves Indonesian professionals who are not affiliated with government institutions. Additionally, several international organizations are also involved in the JETP Secretariat to provide technical assistance in the preparation of the CIPP, including the IEA, World Bank, ADB, and UNDP.

Although an independent secretariat has been established for the JETP, staffed by individuals not part of the state apparatus, the authority of the JETP Secretariat is very limited. It only has a mandate to carry out coordination functions between the Indonesian government and the IPG, or as a technical implementation coordinator. This means the authority to decide whether the CIPP can be accepted remains with the decisions of the Indonesian government and the IPG. The JETP Secretariat lacks policy instruments to optimally run the JETP and is greatly constrained by the political interests within the Indonesian government. The Secretariat also cannot influence decisions made by IPG member states. The independence of the JETP Secretariat comes with the consequence of lacking enforcement power.

Furthermore, the primary key performance indicators (KPIs) of the JETP Secretariat also need attention. Are the KPIs of the Secretariat limited to producing reports and the targeted completion of the CIPP by August 16, 2023? What about the performance of the JETP Secretariat after that?

Going beyond the mere KPIs of the JETP Secretariat involves reviewing the success indicators of the JETP itself. What defines a successful JETP? The presence of clear success indicators provides objective and measurable expectations for both the Indonesian government and the IPG, as well as broader stakeholders.

Next, what about the expected process of monitoring and evaluation for JETP activities? Which institution is authorized to carry out these functions? The existence of monitoring and evaluation functions is crucial to ensure the achievement of goals set by the JETP's investment and policy plans.

Will all the aspects mentioned above be presented in the upcoming CIPP? As of July, a month before the CIPP launch, there is no definitive information about what details will be included in the CIPP, apart from the investment plans that will be incorporated into it.

3.3.4 Integration of ETM into JETP

In addition to the JETP, the Indonesian government also collaborates with the Asian Development Bank (ADB) to launch the Energy Transition Mechanism (ETM) platform. To support the effectiveness of the ETM, the government has established a Country Platform as a framework to mobilize the necessary commercial and non-commercial funding. For the ETM Platform, the Indonesian government has secured a funding commitment of around US\$4 billion for early retirement of coal-fired power plants, coordinated by Indonesia's Sarana Multi Infrastruktur (SMI) as the ETM Country Platform Manager. Indonesia SMI has also been designated to assist in fund management within the JETP.

Both the JETP and ETM are aimed at accelerating Indonesia's energy transition from fossil fuels, especially coal, to renewable energy to achieve NZE. Despite sharing the same goal, these two programs have different funding schemes. If not well-coordinated and measured, these programs could potentially result in overlapping funding for energy transition projects in Indonesia. As of now, it is not clear how the coordination mechanism between the two programs will be established to avoid conflicts.

Monitoring and evaluation mechanisms within each funding scheme are also crucial to ensure that funding targets are clearly identified, do not overlap, and can be measured for progress. Unclear monitoring mechanisms in both funding schemes will result in low accountability in fund management. This is especially significant considering that a large portion of this funding consists of foreign loans, which pose a significant risk of burdening the national budget in the future.

Furthermore, it is essential to have a clear division of roles so that these two programs can complement each other. Although both the JETP and ETM schemes are aimed at accelerating Indonesia's energy transition, the funding approach of the JETP is more based on programs and clear targets. On the other hand, the focus of the ETM is primarily on the early retirement of coal-fired power plants, which no longer require policy reform. To complement each other, the ETM mechanism can be used as a way to finance the early retirement of coal-fired power plants within the framework of the JETP, which still struggles to secure funding commitments.

3.4 Just Energy Transition (JET) framework

The aspect of just is a new element in global energy transition programs, including in Indonesia. Until now, there hasn't been a comprehensive global framework for a just transition. Efforts to develop the Just Transition Pathways Work Program were discussed by UNFCCC member countries during COP 27 in Sharm el-Sheikh, Egypt in November 2022. The First Global Dialogue, aimed at conveying views and sharing experiences about opportunities, best practices, challenges, and action solutions, was only held on June 3-5, 2023. So far, efforts to implement just energy transitions in various countries are still partial and experimental. Therefore, the endeavor to formulate and implement a framework for just energy transition in Indonesia is a complex issue and is susceptible to failure due to the lack of a comprehensive reference framework.

Nevertheless, the Just Transition Working Group led by UNDP is currently developing the Just Energy Transition (JET) Framework. This step is based on the understanding that the shift from fossil fuel-based energy systems to renewable energy systems creates shocks that present unfair risks and opportunities for stakeholders in the energy sector, especially workers, local communities, and vulnerable groups affected. This framework is necessary to provide guidance and ensure that the process and outcomes of energy transition in Indonesia adhere to the principles of just. Hence, risks and opportunities can be distributed fairly, considering the capacities of impacted stakeholders.

Based on statements from involved parties, the JET Framework is built on two main principles: "no one left behind" and sustainability and resilience. In this regard, the JET Framework is designed to go beyond socio-environmental safeguards by strengthening the resilience capacity of stakeholders with varying vulnerabilities.

Therefore, the JET Framework encompasses two main aspects: safeguarding actions, which aim to identify and avoid social, economic, and environmental impact risks, and risk mitigation and opportunity utilization actions, which aim to address risks and maximize opportunities while ensuring distribution based on the capacities of impacted stakeholders. This will be implemented at the national level, program/area level of energy transition investment, and project level.

Conceptually, the JET Framework presents an ideal design by integrating three dimensions of justice: recognition, procedural, and distributive.²¹

However, it is important to highlight technical aspects that could potentially pose challenges in implementation. One such challenge is related to the availability of reliable databases that include data on informal workers, who dominate Indonesia's economy.

The JET Framework is designed to have a scope and dimensions that are not limited to impacted workers, but also extend to local communities and vulnerable groups, so that the "no one left behind" principle can be realized.

For this purpose, the availability of reliable and accessible data becomes a prerequisite for efforts to implement just energy transition policies. However, data synchronization among ministries/agencies remains a root issue that has not been comprehensively addressed at the central government level. The successful implementation of just energy transition policies is challenging without accurate and interconnected data. Unfortunately, there is currently no institution that can provide accurate information about the number of workers who will be affected by the energy transition, the number of companies along the value chain of the coal-based energy sector, as well as local communities and vulnerable groups impacted by various renewable energy development projects in the regions.

Various organizations that record the number of workers in the coal-based industry report varying figures. Additionally, because some institutions rely on voluntary reporting by companies, the credibility of these statistics is questioned. Furthermore, efforts to access data are not an easy process due to the challenging application process and lengthy completion time.

²¹ Menlhk.go.id, "Transisi Berkeadilan (Just Transition), Indonesia Dorong Program Kerja yang Inklusif", June 21, 2023. <https://tinyurl.com/24scw2rz>

Another aspect that should not be overlooked is the presence of informal workers who are also susceptible to energy transition impacts. In February 2023, informal workers accounted for the majority of the workforce in Indonesia at 83.34 million or 60.12%. Despite their significant numbers in Indonesia's economy, there is no institution specifically handling or representing informal workers. In the coal industry, while workers employed by large mining operations are formal, informality often occurs in small mining operations, particularly mines without formal mining rights. A just transition also needs to acknowledge the diversity of work conditions and employment statuses involving informal workers. Coordination among government agencies is required to include informal workers in fair energy transition policies, ensuring they are not excluded from capacity-building and skill-enhancement programs that enable them to leverage energy transition opportunities in Indonesia.

Therefore, the provision of a reliable and accessible database, especially for documenting all impacted stakeholders, including formal and informal workers, vulnerable groups, and local communities, is essential. Additionally, mapping and identifying documented information about new economic activities, alternative sources of income, and pathways of support for both communities and workers during the transition period are necessary. To accomplish this, technical assistance and capacity enhancement from all key stakeholders, both within and outside the government, are required at both the national and local levels.

3.5 Domestic politics and global uncertainties

The implementation and success of the JETP program are not only influenced by technical aspects such as the operational scope of the JETP, funding, governance, and the establishment of a framework for justice but also by domestic political conditions and global uncertainties. The JETP begins just one year before the 2024 election, which means it is highly susceptible to policy changes from the new government that will be formed after the election. Additionally, global uncertainties, especially due to the rivalry between the United States and China, could impact the operations and success of the JETP.

3.5.1 Post 2024 elections

One potential issue that needs to be considered is related to the change of president and government post the 2024 Election. If there are changes in the government after the 2024 Election, there is a likelihood of a realignment of commitments to achieve a just energy transition in Indonesia. Therefore, it is important to think about how efforts can be made to create political support and social pressure to ensure that the framework for a just energy transition policy can be realized.

Currently, initiatives for a just energy transition policy still utilize a top-down approach, originating from the government. Efforts to build political support from stakeholders within the government still need to be continued, especially involving various ministries and agencies beyond the Energy and Mineral Resources Ministry, the Coordinating Ministry for Maritime Affairs and Investment, PLN, and the Finance Ministry.

3.5.2 Global uncertainty

As a form of international cooperation, JETP cannot escape the threat of global uncertainty, especially amidst the geopolitical rivalry faced by the participating IPG countries. The intensifying competition between the United States and China is feared to exacerbate global inflation up to 5%²², which in turn could shift the priorities of each IPG country in allocating their national budgets for JETP funding.

Furthermore, the ongoing geopolitical tensions between China and Japan in the East China Sea also add vulnerability to the JETP Partnership. If these tensions escalate into open conflict, it is likely that Japan and the United States (US) would prioritize deploying resources and allocating funding to address security threats and alliances over JETP funding. These various geopolitical tensions can disrupt decision-makers' focus from energy transition to other geopolitical issues, worsening the imbalance between developed and developing countries in decarbonization efforts. Such disruption can harm the JETP partnership, which heavily depends on funding from developed countries.

Moreover, IPG does not encompass all developed countries partnering with Indonesia. China, as a strategic partner for Indonesia, is not involved in JETP or ETM, despite being one of the highest investors in Indonesia after Singapore in 2022. Meanwhile, Japan and the US rank 4th and 6th, respectively, in terms of the largest investment realization in Indonesia in 2022. Indonesia needs to find a balance between international cooperation increasingly bound by geopolitical issues and positioning JETP amidst the rivalry of developed countries. Instead of relying solely on IPG countries, Indonesia can also explore the potential to establish energy transition partnerships with other strategic partner countries such as China.

²² Climate Strategies. "Menggabungkan strategi transisi yang adil ke dalam NDC dan respon Covid-19 negara-negara Berkembang", 2021.



4 POLICY REFORM

Policy reform is considered crucial in ensuring the success of JETP. This is because the investments required for energy transition, whether for early retirement of coal-fired power plants, network system development, or accelerated renewable energy development, are substantial and high-risk. Hence, governmental support is necessary to provide incentives in the form of legal certainty and a favorable investment climate that can attract investments and ensure market stability for this energy transition.

The process of transitioning from fossil fuel sources to renewable energy involves a high level of uncertainty and investment risk due to the capital-intensive nature of the energy sector investments. Stages such as the early retirement of coal-fired power plants, for instance, require funding to execute the proper shutdown of power generation operations, including asset re-evaluation costs and handling of contaminated hazardous materials at the site, while ensuring equivalent returns on investment for plant owners.

Similarly, the gradual development of renewable energy requires costs and time to build new infrastructure, upgrade existing power grids to be compatible, and provide reliable energy storage systems. Upfront costs are also necessary to establish new transmissions and enhance or upgrade existing ones to support variable renewable energy sources.

Based on discussions with various stakeholders involved in JETP, there are several concerns related to the policies needed to support the success of JETP. Some of these concerns include the following:

4.1 Legal foundation for JETP

One potential challenge in implementing JETP is the absence of a robust legal framework to underpin fair energy transition policies in Indonesia. Currently, the legal basis for the JETP partnership rests solely on Presidential Regulation (Perpres) No. 112/2022 regarding the Acceleration of Renewable Energy Development for Electricity Procurement Plans (RUPTL).

This regulation governs Indonesia's energy transition efforts through the formulation of RUPTLs, which promote the development of renewable energy power plants with improved pricing structures for PLN purchases and the creation of a roadmap for phasing out the operational period of coal-fired power plants (CFPP). However, various policy aspects within

the JETP partnership remain unaddressed by Perpres No. 112/2022, such as local content requirements (LCR), procurement procedures, licensing prerequisites for renewable energy power plants, as well as the equitable energy transition aspects for affected communities and workers.

Even within Perpres No. 112/2022, the construction of new CFPPs is allowed under specific conditions. For instance, CFPP projects that are already included in the RUPTL 2021-2030 include integrated CFPPs with national strategic industries, CFPPs committed to reducing greenhouse gas emissions by at least 35% within ten years of operation through technologies like Carbon Capture Utilization and Storage (CCUS), Carbon Offset, and/or a blend of renewable energy sources. This stance contradicts the clear stance of the JETP scheme, which does not endorse new CFPP construction or policies favoring the extension of fossil fuel usage.

Policy reform is increasingly necessary to address concerns of advanced IPG countries, which suspect Indonesian government policies could prolong the use of fossil fuels, such as by incorporating CCUS components.

Furthermore, the authority of Perpres is not sufficiently robust to ensure the realization of fair energy transition policies. Presidential regulations that reflect the current president's vision are more susceptible to change when a new administration assumes power, particularly if the next elected president does not share the same vision as the current one.

To guarantee the implementation of equitable energy transition policies in Indonesia, higher-level and more enduring legislative measures, such as laws, are required. These laws can provide a strong legal foundation and robust institutional support for the establishment of just energy transition policies in Indonesia.

These laws can also lead to the formulation of derivative regulations that clarify the authorities of each ministry/agency in implementing just energy transition policies. Furthermore, these regulations should specify the institutional bodies empowered to lead and enforce the formulated just energy transition policies.

4.2 Utilization of the NRE bill for JETP

The Government and the House of Representatives (DPR) are currently discussing the New and Renewable Energy (NRE) Bill. The deliberation of this bill could serve as a favorable opportunity to incorporate new renewable energy development targets as requested by JETP, as well as to include the Just Transition Energy Framework, thus providing a strong foundation for the operation of JETP.

However, aligning the NRE Bill with the JETP program requires significant effort, as the NRE Bill still presents several issues that need to be re-evaluated. These issues include:

4.2.1 Coal DMO in the energy transition

The NRE Bill includes an article concerning the domestic market obligation (DMO) for coal in the energy transition from fossil energy sources to new and renewable energy sources. This bill intends to increase the DMO portion from 25% to 30% while maintaining the DMO price at US\$70 per tonne to uphold the electricity selling price of 6 cents per kilowatt hour (kWh) or equivalent to Rp 915 per kWh.

The inclusion of the DMO article in the NRE Bill has become a controversy, and many parties believe that this DMO provision does not need to be included in the NRE Bill. Coal miners object to the increase of the DMO percentage to 30%. Meanwhile, renewable energy actors object to the inclusion of coal-related provisions in the NRE Bill. The regulation regarding DMO has been governed by the Minister of Energy and Mineral Resources' Decree, and there is no urgency to include the DMO provision in the NRE Bill.

4.2.2 Fossil-based new energy

The NRE Bill, as the name suggests, not only regulates renewable energy but also new energy sources, such as nuclear, hydrogen, and new coal-based energy sources like coal methane gas, coal liquefaction, and coal gasification. In fact, this bill seems to emphasize the development of new energy sources, particularly nuclear, rather than renewable energy.

The NRE Bill pays special attention to the development of nuclear energy, adding aspects that have not been covered by Nuclear Energy Law No. 10/1997. For instance, it establishes the Nuclear Energy Council, responsible for designing, formulating, establishing, and managing the implementation of the national nuclear energy program. This body does not negate the

Nuclear Energy Regulatory Agency (Bapeten), which has already been established based on the Nuclear Energy Law. The bill also assigns State-Owned Enterprises to construct and operate nuclear power plants (NPPs).

The inclusion of provisions related to nuclear energy indicates that the government is seriously considering the construction of NPPs in Indonesia. However, the development of NPPs always invites controversy. There are always pros and cons regarding NPP construction.

In addition to nuclear, another controversial form of new energy is the development of new energy based on coal, such as coalbed methane, liquefied coal, and gasified coal. The inclusion of provisions regarding coal-based new energy aims to strengthen the coal downstream policy promoted by the government. However, once again, the development of coal-based energy within the bill regulating renewable energy does not align with the spirit of transitioning from fossil fuels to renewable energy.

Therefore, many parties, especially renewable energy practitioners and activists, object to blending new energy with renewable energy. Blending new energy with renewable energy ultimately undermines the emphasis on renewable energy. It is recommended to separate new energy and renewable energy into two distinct bills. Consequently, the Renewable Energy (RE) Bill would be better positioned to provide a strong foundation for renewable energy investment to accelerate the energy transition as desired by the JETP program.

4.2.3 NRE fund without a management agency

The NRE Bill mandates the central and regional governments to establish a new and renewable energy fund to develop infrastructure and provide incentives, and even subsidies for new and renewable energy, in order to achieve the energy transition policy targets while considering the capacity of the State Budget (APBN), Regional Budget (APBD), transition period, and the roadmap for the development of new and renewable energy. Apart from APBN and APBD, funding sources for new and renewable energy can come from non-renewable energy export levies, carbon trading funds, renewable energy certificate funds, and other sources. This renewable energy fund is managed by the Energy and Mineral Resources Ministry (ESDM).

The clause on the accumulation of the new and renewable energy fund is a positive aspect brought by the NRE Bill. However, this fund accumulation is not followed by the establishment of an institution, an entity granted the authority not only to manage the fund

but also to design, formulate, establish, and oversee the implementation of renewable energy development for the purpose of energy transition. The Indonesian Renewable Energy Society (METI) has suggested the formation of a Renewable Energy Management Agency to lead all efforts in a just energy transition. To enhance effectiveness, it's recommended that this Renewable Energy Management Agency be combined with two other management bodies that oversee substantial funds, namely the Oil Palm Plantation Fund Management Agency (BPDP-KS) and the Environmental Fund Management Agency (BPDLH).

4.3 Revision of KEN and RUEN

Currently, the government is in the process of discussing the update of the substance of the National Energy Policy (KEN). The revision of KEN is necessary to align the national energy policy with the government's efforts to undertake an energy transition in the electricity sector under the JETP scheme. In the KEN, the government targets a Renewable Energy (RE) blend in the Primary energy supply of 23% by 2025 and aims to increase it to 31% by 2050. However, this KEN determination is no longer relevant to meet the JETP commitment, which aims for Indonesia's RE blend to reach 34% by 2030.

Under the current applicable RUEN, electricity capacity calculations are still based on outdated KEN targets and have not yet adopted the energy transition vision. According to the RUEN, the targeted RE blend of 23% by 2025 would increase the installed capacity of RE power plants to 45.2 GW, composed of 29.9 GW from hydroelectric power plants (HPP), 7.2 GW from geothermal power plants (GPP), 6.5 GW from solar power plants (SPP), 5.5 GW from bioenergy, and 1.8 GW from wind power plants (WPP). Meanwhile, achieving a RE blend of 31% would aim to achieve a capacity fulfillment of RE power plants of 167 GW by 2050, with a composition of 45 GW from solar power plants (SPP), 38 GW from hydroelectric power plants (HPP), 28 GW from wind power plants (WPP), 26 GW from bioenergy, and 17.5 GW from geothermal power plants (GPP).

In order to align with the more ambitious target of achieving a RE blend of 34% by 2030 in the JETP, the National Energy Policy (RUEN) needs to be revised by reevaluating the current macroeconomic conditions to build projections for the RE supply blend and model the development targets for RE power plants, particularly in the years 2030 and 2050.

The revision of RUEN to accommodate this energy transition vision is crucial, as it will serve as a reference for all national energy-related plans, such as the National Electricity General Plan (RUKN) and the Electricity Procurement Plan (RUPTL). It also provides guidance for regional governments to develop local RE potential and project their development projections within the Regional Energy General Plan (RUED).

Meanwhile, for the National CPE, the government can prioritize the use of crude oil, oil fuels, and LPG gas that can support the country's energy needs for up to 30 days in case of an energy crisis.

4.4 Redrafting of the RUPTL

One of the government policy instruments that need adjustment due to the JETP is the 2021-2030 Electricity Procurement Plan (RUPTL), which is claimed to be the "greenest" RUPTL as it includes a share of Renewable Energy (RE) power plant capacity of 51.5% or 20,923 MW by 2030. However, the 2021-2030 RUPTL still indicates a reliance on fossil energy in Indonesia's energy system, with coal contributing 59.4% of the energy mix, and gas at 16%. Meanwhile, the portion of RE electricity in the mix remains relatively small, accounting for only 24.8%. This means that from 2025 to 2030, the increase in RE electricity mix is only around 1.8%.

To achieve the JETP target of increasing the RE electricity mix to 34% by 2030, the 2021-2030 RUPTL needs to be further revised to accommodate more RE development projects.

Table 11. Electricity energy mix, 2021-2030

Energy source	2021		2030	
	GWh	%	GWh	%
Coal	194.558	67%	264.260	59%
Gas	48.154	17%	68.724	16%
Geothermal	16.954	6%	36.485	8%
Hydro	16.867	6%	42.616	10%
Oil	10.222	4%	1.798	0.4%
Other RE	2.766	1%	27.353	6%
Total	289,521		441.236	

Source: RUPTL 2021-2028

One important aspect that needs to be accommodated in the new RUPTL is PLN's plan to build new grid networks, especially in Sumatra and Sulawesi. The development of transmission in these two regions is crucial to connect various isolated systems, forming a backbone transmission to distribute a large amount of energy to distant load centers and to interconnect different systems into a larger network.

The transmission network development projects will also be followed by the construction of an Advanced Control Center (ACC) to accommodate the variable renewable energy (VRE) development and the implementation of a Smart Grid. Furthermore, the government plans to integrate electricity from renewable energy generators for captive power use into the PLN grid.

One of the priority transmission projects to be built is the 275 kV and 500 kV backbone transmission network for the Sumatra-Bangka power system, connecting the majority or all power generators in Sumatra and Bangka with a total installed capacity of 6.5 GW. The government and PLN also plan to build a backbone transmission network in Sulawesi to connect power generators scattered in many locations, allowing them to be directed toward downstream projects on the island.

Table 12. Added electricity capacity 2021-2030

Electricity sales Growth		Added transmission networks	
2021-2025	5.2%	2021-2025	34.5 thousand km
2021-2030	4.9%	2021-2030	47.7 thousand km

Added generator capacity		Added distribution networks	
2021-2025	26.9 GW	2021-2025	209.4 thousand km
2021-2030	40.6 GW	2021-2030	456.5 thousand km

Number of customers		Added substation	
2021-2025	12.1 million	2021-2025	45.5 thousand MVA
2021-2030	24.4 million	2021-2030	76.7 thousand MVA

Source: RUPTL 2021-2028

4.5 Introduction of energy transition supply chain

In addition to the 4 (four) investment areas involving the development of transmission networks, early retirement of CFPPs, acceleration of renewable energy baseload, and acceleration of variable renewable energy, the Indonesian government also advocates a fifth investment area that emphasizes the development of the renewable energy supply chain. This fifth investment area aims to activate local infrastructure and industries related to energy transition, particularly the establishment of manufacturing industries to support renewable energy development.

Potential issues may arise from industrial policies within this fifth investment area, as Indonesia tends to implement a Domestic Component Level (LCR) policy, which is suspected to be a basis for protectionism in the energy transition manufacturing sector. A study on LCR conducted by CSIS (2023) indicates a negative correlation between LCR policies and Indonesia's economic productivity. Furthermore, Indonesia's LCR policy is seen as lacking a clear direction and mature consideration of industrial comparative advantages.

There is a potential that the IPG may reject Indonesia's proposal regarding the introduction of the fifth area of the JETP due to the misalignment between Indonesia's industrial policies and JETP principles. Indonesia's LCR policy also lacks clear implementation planning, which could disrupt investor decisions and business actors in transitioning to renewable energy.

Supply chain-related policies are also seen as an answer to the need for energy sovereignty and resilience in Indonesia. However, energy resilience needs to be understood in a broader sense, encompassing not only domestic availability but also affordable prices. Therefore, caution is needed with policies such as LCR that restrict imports, which might not support achieving affordable electricity market prices.



5 CLOSING NOTES

The JETP Indonesia holds the potential for both success and failure. Success in achieving the JETP targets or failing altogether depends on the commitment of the Indonesian government and the advanced economies within the IPG alliance. High commitment from both sides is essential to make JETP a success, exemplifying genuine international climate cooperation where developed nations assist developing ones. This commitment is crucial given the real risks and challenges that confront JETP, encompassing challenging operating environment, diverse financing risks, formulation of the just energy partnership (JETP) framework, and most importantly, the willingness or reluctance of the Indonesian government to enact necessary policy reforms.

The operating environment of JETP is quite challenging, where electricity purchase, distribution, and sales are controlled by a single entity, PT PLN. As the monopolistic and monopsonist player in the power sector, PLN's stance and attitude toward JETP will determine its success. Unlike JETP in South Africa, which operates amid a power supply deficit, JETP Indonesia operates in the context of an electricity surplus, especially in its Java and Sumatra grids. This surplus presents both challenges and opportunities. It is a challenge because PLN avoids renewable energy investments in Java and Sumatra. Instead, PLN directs these investments to regions outside these areas. Simultaneously, the surplus offers an opportunity for the early retirement of coal-fired power plants (CFPPs). However, securing funding for such retirements is not straightforward. IPG countries, initially enthusiastic about CFPP retirements, have recently become less so due to coal investments falling under the "red" category in green finance taxonomy.

Before JETP existed, Indonesia had already initiated CFPP early retirements through the Energy Transition Mechanism (ETM), supported by the Asian Development Bank. Some CFPPs, including Cirebon 1 and Pelabuhan Ratu, are under an early retirement piloting by PT Sarana Multi Infrastruktur (SMI) as the ETM country platform manager. If successful, the ETM mechanism could become part of JETP, creating a model for financing CFPP early retirements. Thus, two distinct platforms with a shared goal of accelerating energy transition could be merged.

Early retirement of CFPPs is one of the Indonesian government's priority energy transition projects, alongside the development of transmission network, especially in Sumatra and Sulawesi, and the construction of more baseload renewable energy power plants. However, these priorities might not align with the interests of IPG countries, specifically their focus

on selling variable renewable energy products. PLN, meanwhile, is not overly enthusiastic about variable renewable energy due to its intermittent nature. These divergent interests could potentially impact JETP's implementation, necessitating commitment from both sides to find a middle ground for its success.

To facilitate coordination, an independent JETP Secretariat has been established by both parties. The Secretariat's task is to coordinate the development of the Comprehensive Investment and Policy Plan (CIPP) for JETP, led by four working groups under the guidance of multilateral institutions IEA, World Bank, ADB, and UNDP. Once the CIPP is completed, it will be submitted to the Indonesian government and IPG for approval. Afterward, the role of the JETP Secretariat remains unclear. Will it be empowered to oversee CIPP implementation, ensuring the JETP program's execution, or solely engage in coordination works? This decision lies with the Indonesian government and IPG.

Once both parties agree on the CIPP, the next challenge would be on the Indonesian side to adopt the policy reform outlined in the CIPP. It remains to be seen if the Indonesian government would implement JETP within the existing policy framework or to undertake a policy transformation to drive a broader energy transition. The government's policy reform is crucial, especially to attract private funding for its energy transition.

Indeed, there are still uncertainties regarding the funding commitment from the IPG, especially concerning grant funds and concessional loans. However, this must not diminish Indonesia's enthusiasm for JETP as JETP has provided an opportunity for Indonesia to collectively design and implement an equitable energy transition program. If the promised funding falls short, Indonesia could still offer the same projects to countries outside JETP. In the end, Indonesia's interest is to implement its just energy transition to achieve its commitment of NZE 2060, and NZE 2050 for the power sector.



CENTRE FOR
STRATEGIC AND
INTERNATIONAL
STUDIES

Gedung Pakarti Centre,
Jl. Tanah Abang III No.23-27
Jakarta 10160
csis@csis.or.id
www.csis.or.id



The Jakarta Post Building,
Jl. Palmerah Barat No.142-143
Jakarta 10270
info@tenggara.id
www.tenggara.id