



# Indonesia's Financing and Technology Needs for Reaching NZE in 2060 or sooner

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Presented at:

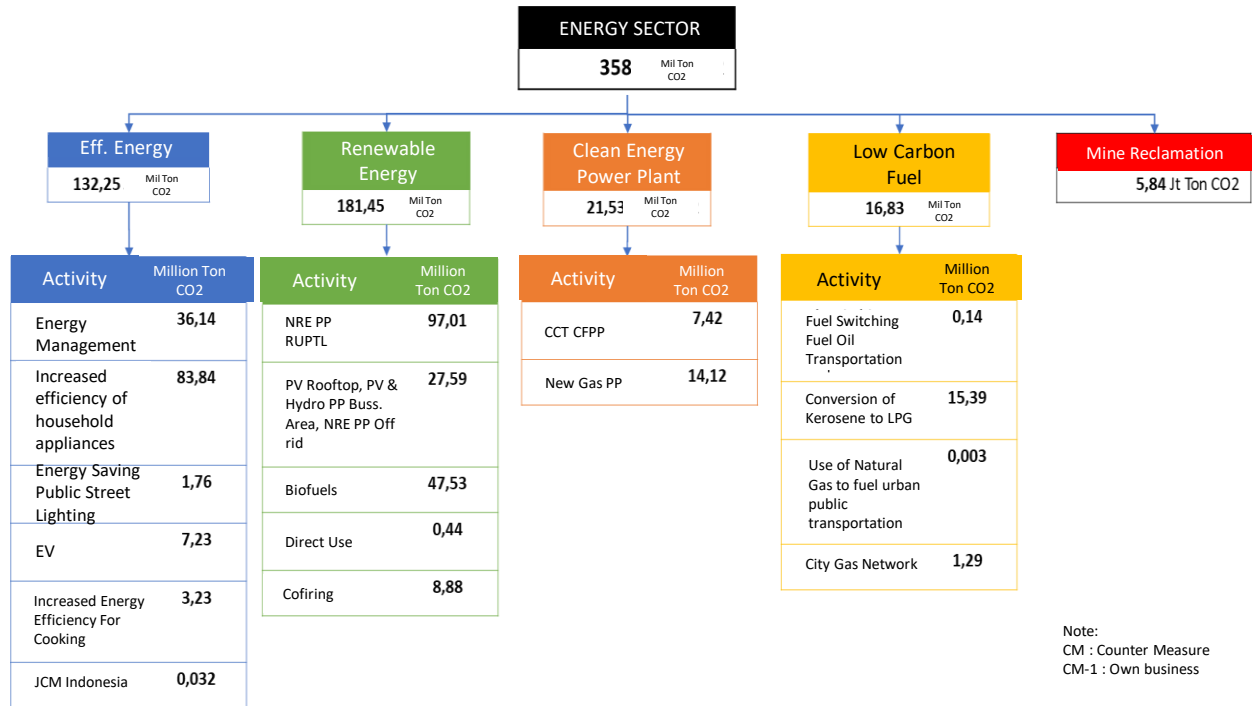
ASEAN Sustainable Finance for Clean Energy Workshop

17<sup>th</sup> October, 2023

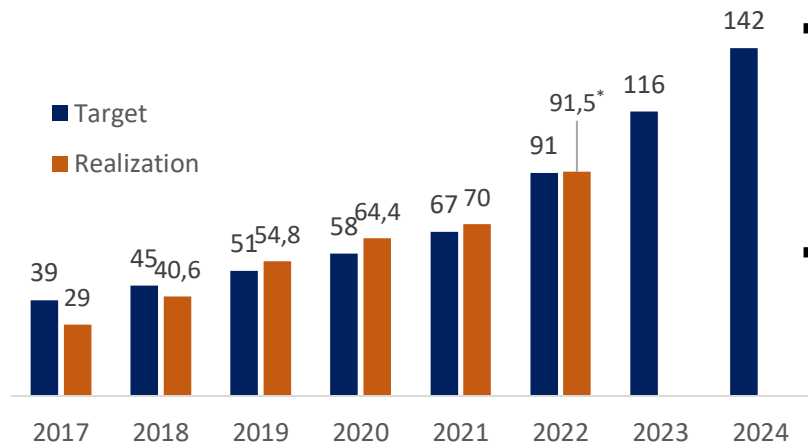
# GOVERNMENT COMMITMENT TO REDUCING GHG EMISSIONS

## Indonesia's Enhance NDC

No	Sector	2010 GHG Emission (Million Ton CO <sub>2</sub> e)	GHG Emission by 2030			Reduction	
			BaU	CM1	CM2	CM1	CM2
1.	Energy	453.2	1,669	1,311	1,223	358	446
2.	Waste	88	296	256	253	40	45.3
3.	IPPU	36	70	63	61	7	9
4.	Agriculture	111	120	110	108	10	12
5.	FOLU	647	714	217	-15	500	729
<b>TOTAL</b>		<b>1,334</b>	<b>2,869</b>	<b>1,953</b>	<b>1,632</b>	<b>915</b>	<b>1,240</b>

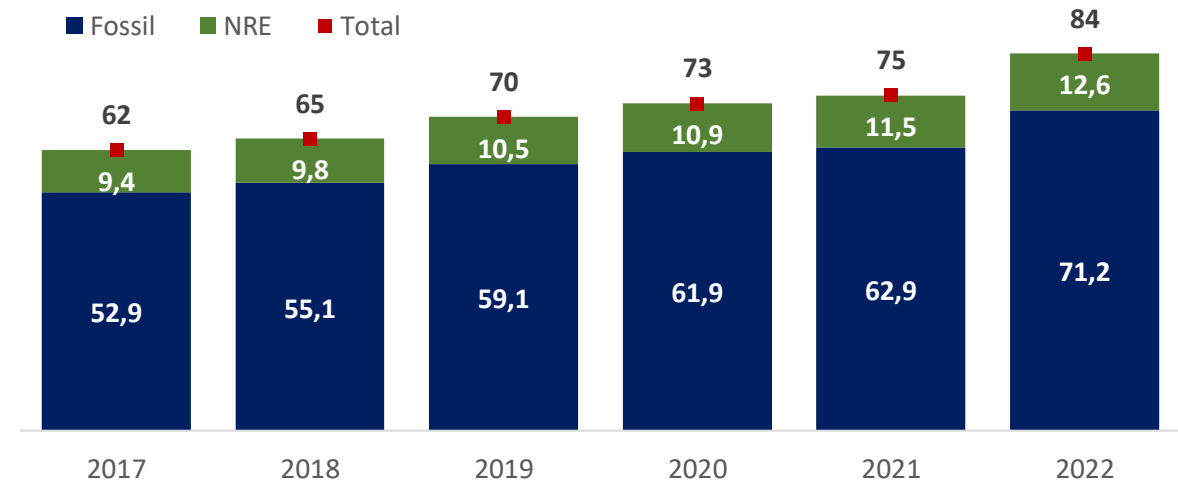


Note:  
CM : Counter Measure  
CM-1 : Own business



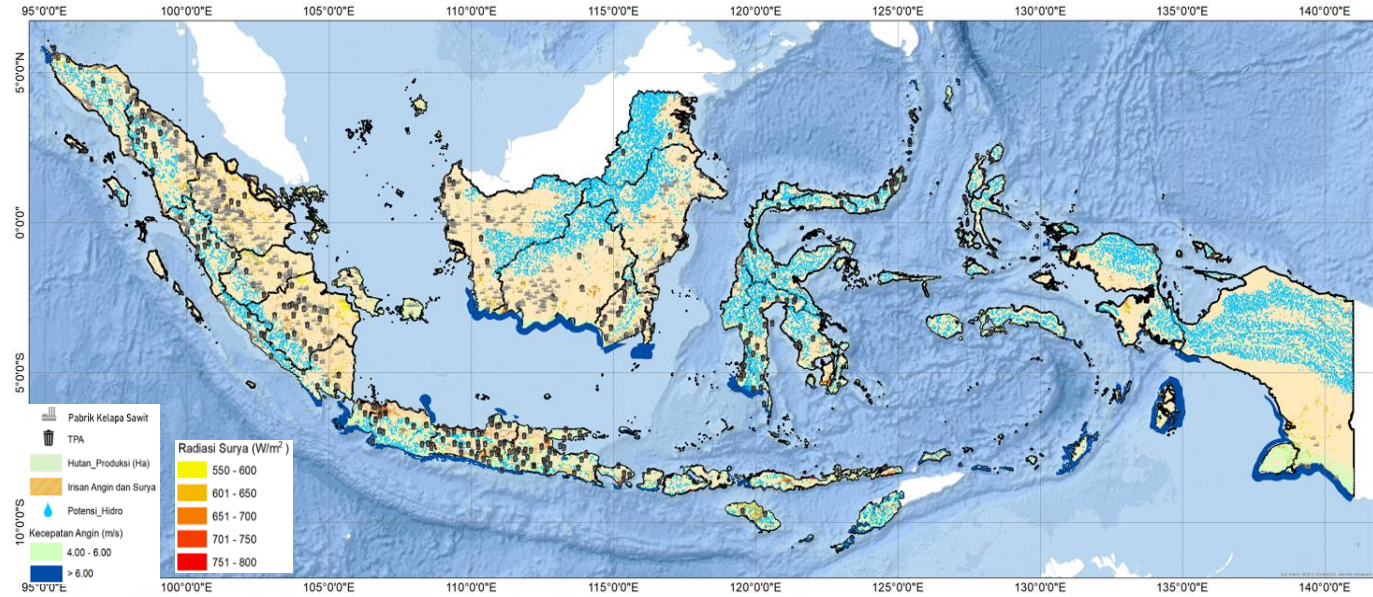
- By 2022, the energy sector will be able to reduce GHG emissions by 91.5 million tonnes of CO<sub>2</sub>e.
- Energy efficiency contributed for 22% of the realization or equal to 20.5 million tonnes of CO<sub>2</sub>e

### Power Plant Installed Capacity 2022 | GW









# INDONESIA RENEWABLE ENERGY SOURCES

Indonesia has large, widespread and diverse NRE potential to support national energy security and achieve NRE mix targets



“ 0.3% of the total potential has been utilized so that the opportunity for developing EBT is very open, especially supported by environmental issues, climate change and increasing electricity consumption per capita. ”

		POTENCY (GW)	UTILIZATION (MW)
	<b>SOLAR</b>   Solar is spread throughout Indonesia, especially in NTT, West Kalimantan and Riau, which has higher radiation	<b>3.294</b>	<b>323</b>
	<b>HYDRO</b>   Hydro is spread throughout Indonesia, especially in North Kalimantan, NAD, West Sumatra, North Sumatra and Papua	<b>95</b>	<b>6.738</b>
	<b>BIOENERGY</b>   spread throughout Indonesia in the form of main products, forestry/plantation land waste, industrial waste. Types of potential include biofuel, biomass and biogas.	<b>57</b>	<b>3.118</b>
	<b>WIND (&gt;6 m/s)</b>   especially found in NTT, South Kalimantan, West Java, South Sulawesi, Aceh, and Papua	<b>155</b>	<b>154</b>
	<b>GEO THERMAL</b>   spread across the ring of fire area, including Sumatra, Java, Bali, Nusa Tenggara, Sulawesi and Maluku	<b>23</b>	<b>2.373</b>
	<b>OCEAN</b>   spread throughout Indonesia, especially DI Yogyakarta, NTT, NTB and Bali	<b>63</b>	<b>0</b>

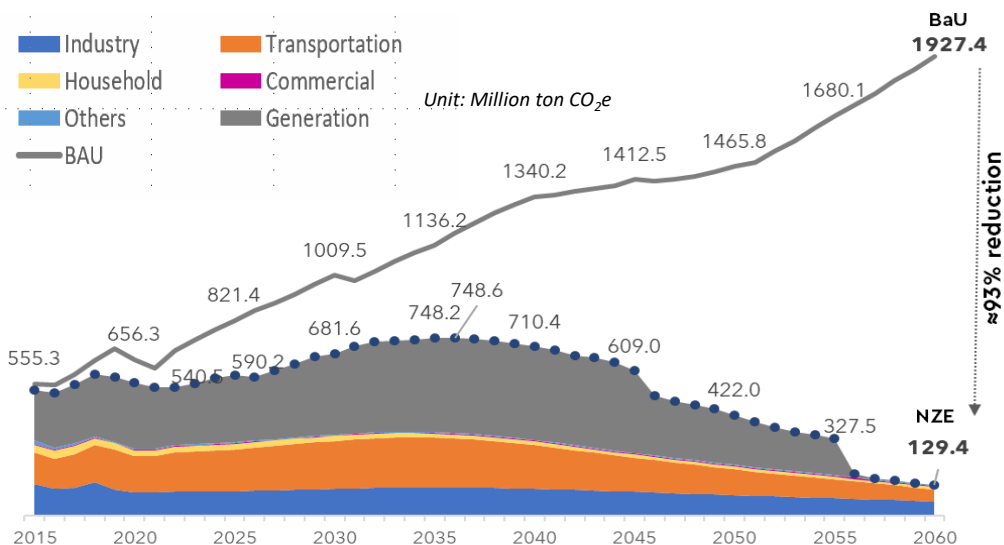
**TOTAL** **3.687** **12.737\***

catatan: \*) utilization as Juni 2023  
 \*\*) nuclear potency: Uranium 89,483 tonnes - Thorium 143,234 tonnes

# INDONESIA'S ENERGY SECTOR ROADMAP TOWARDS NET ZERO EMISSION 2060

COP 26, 2 NOVEMBER 2021

- Indonesia will be able to **contribute faster to the global Net-Zero Emissions.**
- The MEMR along with other stakeholders created the **Energy Sector Roadmap towards Indonesia NZE 2060.**



## NZE Strategies

- 1 Electrification** (EV, induction stove, electrifying agriculture, etc)
- 2 NRE Development** (offgrid, ongrid, biofuel)
- 3 CFPP Moratorium & early retirement** of existing CFPPs
- 4 New energy sources** (hydrogen and ammonia)
- 5 CCS/CCUS**
- 6 Energy efficiency application**

## Energy Sector Roadmap for NZE 2060 or sooner

### Supply:

NRE Development based on RUPTL 2021-2030, cofiring on CFPP

### Demand:

Induction stove, gas network, DME, B35 mandatory, EV.

2021-2025

2026-2030

### Supply:

NRE Development based on RUPTL 2021-2030, pump storage starts by 2025

### Demand:

Induction stove, gas network, B40 mandatory, EV, energy management.

### Supply:

Green Hydrogen utilization begin in 2031 for transportation sector, BESS in 2034

### Demand:

Induction stove, gas network, B40 mandatory, EV, energy management, & hydrogen for transportation sector

2031-2035

2036-2040

### Supply:

Nuclear PP starting 2039, massive Solar PV development, along with onshore and offshore wind PP.

### Demand:

Induction stove, gas network, B40 mandatory, EV, and CCS for cement and steel industry

### Supply:

Green Hydrogen utilization begin to substitute natural gas, NRE dominate the energy mix

### Demand:

Induction stove, gas network, B40 mandatory, EV, & hydrogen for industry.

2041-2050

2051-2060

### Supply:

All electricity are generated by NRE PP. Remaining GHG emission level: 129 million tons CO2.

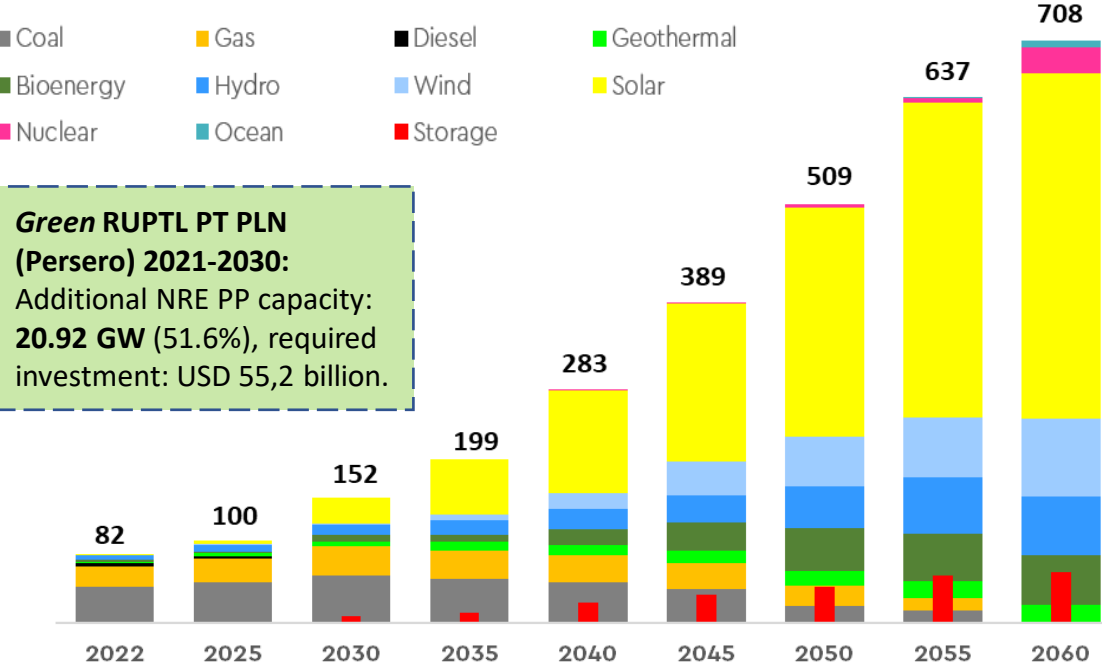
### Demand:

Induction stove, gas network, EV, and CCS for industry

# NZE ROADMAP

## NZE Power Plant Development Roadmap

**NRE PP Installed Capacity in 2060: 708 GW**  
 Solar 421 GW, Wind 94 GW, Hydro 72 GW, Bioenergy 60 GW, Nuclear 31 GW, Geothermal 22 GW, Ocean Energy 8 GW.  
**60,2 GW Storage: Pumped Storage 4.2 GW, BESS 56 GW.**

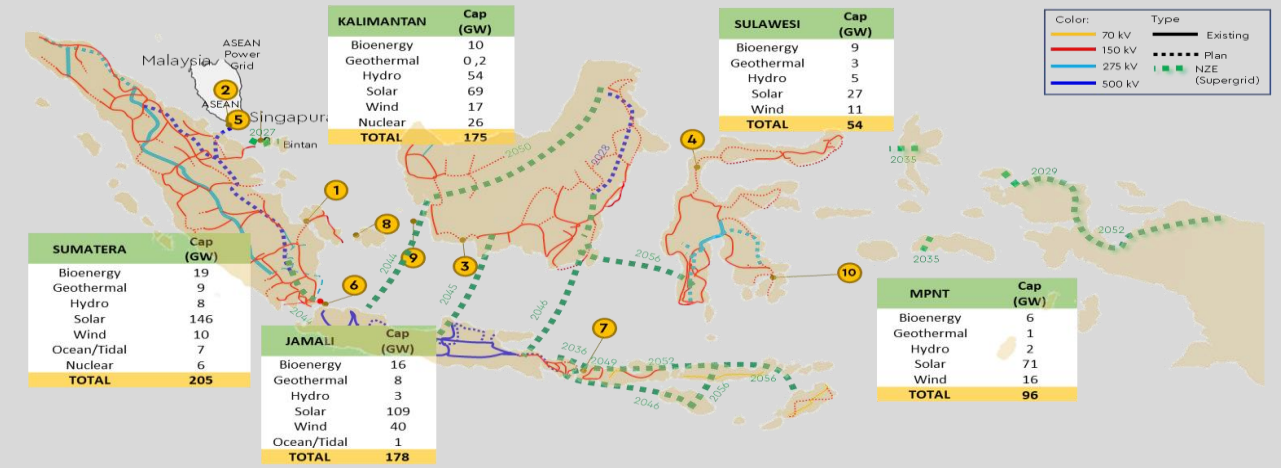


**Green RUPTL PT PLN (Persero) 2021-2030:**  
 Additional NRE PP capacity: **20.92 GW (51.6%)**, required investment: USD 55,2 billion.

- National power generation will be mainly sourced by VRE while optimizing other RE resources to help maintaining system stability.
- Pump storage enters the system in 2025, Battery Energy Storage System (BESS) to be massively utilized in 2031.

**No additional CFPP will be developed after 2030 and the last CFPPs will be terminated in 2058.**

## Super Grid and Equalization of Renewable Energy Resources



To optimize Indonesia's condition as an **archipelagic nation** with widely distributed renewable energy resources across the country, a modern and nationally integrated smart grid network is required. **There will be no energy transition without building a robust and reliable domestic transmission infrastructure.**

# NZE REQUIRES HUGE FUNDING

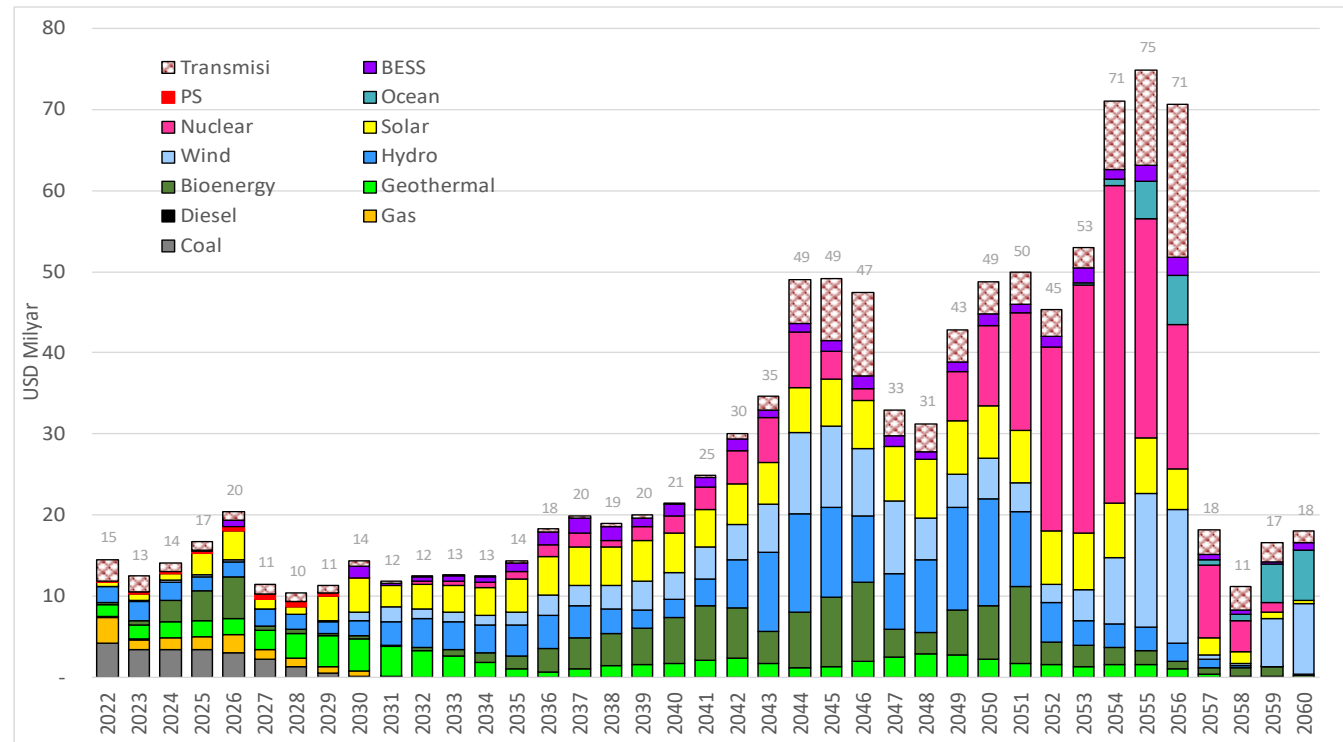
## NZE 2060 Funding Requirement for Energy Sector

The huge investment of NRE development to realize Indonesia NZE 2060 requires substantial support from stakeholders, including private sectors & international parties.

POWER PLANTS/ STORAGE	INVESTMENT REQUIREMENT (MIO USD)	CAPACITY @ 2060 (GW)
HYDRO	168,568	72
NUCLEAR	216,210	31
SOLAR	159,879	421
WIND	156,393	94
GEOTHERMAL	71,270	22
OCEAN/TIDAL	24,205	8
BIOENERGY	122,347	60
COAL	21,693	-*
GAS	13,614	-*
OIL	207	-*
<b>Storage</b>		
BESS	37,218	56
PUMP STORAGE	2,989	4
<b>TOTAL</b>	<b>994,593</b>	<b>768</b>

### NZE Investment Need

- Generation: USD 994.6 billion.
- Transmission: USD 113.4 billion.
- Total: 1,108 Billion USD or 28.5 Billion USD/year.



# Indonesia Challenges in Financing

## Indonesia NZE Challenges in Financing

1. Limited Public Funding  
Government of Indonesia has budget constraints in financing for Net Zero Emission (NZE)
2. Limited financial institution experience and knowledge.  
Financial institutions in Indonesia have limited experience and knowledge to assess renewable energy projects adequately.
3. Perceptions regarding risks and how opportunities are viewed.  
Risks are often perceived as too significant, and there is a lack of confidence in project feasibility, with limited efforts made to mitigate these risks.
4. Available funding conditions.  
The demand for financing often does not align with the available supply.
5. Limited funding sources. The lack of domestic non-recourse financing for renewable energy projects has raised financing costs.
6. Lack of incentives.  
There are no compelling incentives for financial institutions to create a "green portfolio."
7. High bank interest rates.  
The cost of capital for renewable energy projects can be high, particularly due to elevated interest rates, rendering renewable energy projects less financially appealing.

Foreign assistance is needed to address these challenges and support the Net Zero Emission (NZE) initiatives in Indonesia.

# SUPPORTS TO FACILITATE THE INVESTMENT

## Indonesia NRE Investment Incentives and Facilities

### Fiscal Incentive

- 1 Tax Holiday
- 2 Land and Building Tax exemption
- 3 Tax Allowance
- 4 Import Duty Facilities

### Non Fiscal Incentive

- 1 Biofuel incentive through BPDPKS





# CLIMATE CHANGES FINANCE

## Blended Financing

- ❑ **SDG Indonesia One**
  - Initiated by the Ministry of Finance through PT. SMI
  - An integrated platform to support SDG related projects aimed at raising funds from investors, donors & benefactors
  - 4 pillars: Development Facilities, De-Risking Facilities, Financing Facilities, & Equity Fund
- ❑ **Indonesia Climate Change Trust Fund**
  - Based on Minister of National Development Planning/Bappenas Decree No 111/2018
  - Facilitate the acquisition of funds from donors namely ADB, European Investment Bank, World Bank, European Investment Bank (grants / loans)



## National Non-Public Financing

- ❑ **Sustainable Finance by Banking and other financial services**
  - OJK requires banks to provide a certain percentage of their credit portfolio to fund green projects, namely Renewable Energy projects
  - Several banks have financed EBT projects such as BRI, BNI, Mandiri
- ❑ **Public Private Partnership**
  - A long-term contract between a private party and a government entity, to provide public assets or services Government Support:
  - Project Development Facility (PDF), Viability Gap Fund (VGF), infrastructure guarantee, & payment availability



## International Public Financing

- There are several climate change financing that can be accessed to fund EBT projects such as the Global Climate Fund, Global Environmental Facility, Join Credit Mechanism, and Energy Transition Mechanism.
- Each financing has its own distribution method, such as the Green Climate Fund which is channelled through PT SMI in Indonesia while the scale of the project is the main consideration.
- Example of NRE PP with JCM collaboration: Jakabaring Solar PV 2 MW



## International non-Public Financing

- International Non-public financing can take the form of financing by international banks such as Standard Chartered Bank which is financing the Cirata floating solar PV project Apart from banks and international financial institutions,
- international non-public financing can also take the form of philanthropy as carried out by the Bill & Miranda Gates Foundation and the Ford Foundation.



# JUST ENERGY TRANSITION PARTNERSHIP (JETP)

CHAIR CO-CHAIR



President Joko Widodo, along with President of the United States Joe Biden and leaders of International Partners Group (IPG) countries, launched the international JETP agreement during the G20 Summit in Bali in 2022.



Supporting the ambitious and equitable energy transition in Indonesia's electricity sector to keep global temperature rise below 1.5°C

**FUNDING**  
**20 Billion USD**

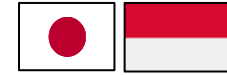
## TARGET

- The peak emissions in the electricity sector are expected to occur in 2030, earlier than the initial projections.
- The maximum emissions from the electricity sector will be 290 million tons of CO2 in 2030, lower than the baseline of 357 million tons of CO2.
- Setting a target to achieve net-zero emissions in the electricity sector by 2050, 10 years earlier than the initial projections.
- Accelerating the use of renewable energy so that by 2030, it is expected that at least 34% of electricity generation will come from renewable energy sources.



Currently the JETP Secretariat is finalizing the Comprehensive Investment & Policy Plan that has been prepared

# ASIA ZERO EMISSIONS COMMUNITY (AZEC)



President Joko Widodo, along with Prime Minister Fumio Kishida of Japan, announced the Joint Indonesia and Japan initiative to establish the Asia Zero Emission Community (AZEC) during the G20 Summit in Bali in 2022.

**FUNDING**  
**500 Million USD**

## KEY POINTS

- Supply security, affordability, and community-centered efforts are key in the energy transition process to achieve carbon neutrality/net zero emissions goals without compromising economic development.
- Japan has expressed its readiness to assist Indonesia by mobilizing resources and funding from Japanese public institutions in collaboration with Indonesia to support the energy transition process in Indonesia, as part of the AZEC cooperation framework.
- Japan and Indonesia invite other Asian countries to join this initiative.



Participants: Indonesia, Japan, Australia, Brunei, Cambodia, Laos, Malaysia, the Philippines, Singapore, Thailand, Vietnam

# Thank you

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