KEMENTERIAN ENERGI DAN SUMBER DAYA MINERAL
REPUBLIK INDONESIA

G20 INDONESIA 2022

Clean Energy Transitions in Emerging Economies
Closing workshop

Jakarta, September 14, 2022

G20 PRECIDENCY OF INDONESIA

77%

World Energy Consumption

G20 Countries contribute 77% of Global Energy Demand

G20 INDONESIA 2022

Recover Together, Recover Stronger

81%

Carbon Emission from energy sector

80%

World GDP

75%

World Trading

Priority Issues:

1. Global Health Architecture;
2. Digital Transformation;
3. **Sustainable energy transition**

ETWG FRAMEWORK - G20 PRESIDENCY 2022
Indonesia's Road Map inside Communique

Energy Transition Main Theme

"Energy Transitions towards Sustainable Recovery and Productivity: Strengthen Global Cleaner Energy Systems and Just Transitions, by:

Securing Energy Accessibility

Pursuing the progress of accessibility ("leaving no one behind") towards affordable, reliable, sustainable and modern energy for all, in specific for clean cooking & electrification.

Thematic Regional Issues: Energy access & transitions in archipelagic states

Smart & Clean Energy Technologies Scaling Up

Rapidly scaling up widest variety of technologies; while anticipating future energy transitions challenges inc. people-centred energy transitions, growing demand for energy storage, low-emission energy systems, clean industrial development, transfer-of-technology, renewables integration, and energy efficiency.

Advancing Energy Financing

Ensuring green financing ecosystem in energy transitions through exploring best practices, assessing growing challenges, and mitigating financing disparity

DELIVERABLES

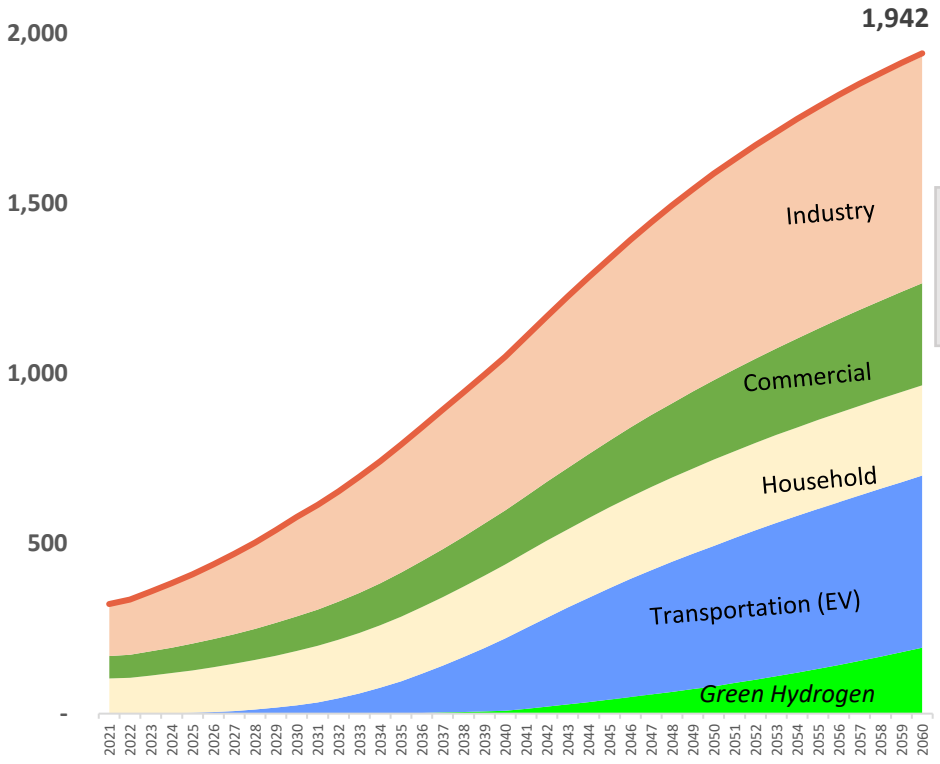
Energy Transitions Ministerial Communique

Lighthouse Deliverable: Achieving global deal to accelerate energy transitions

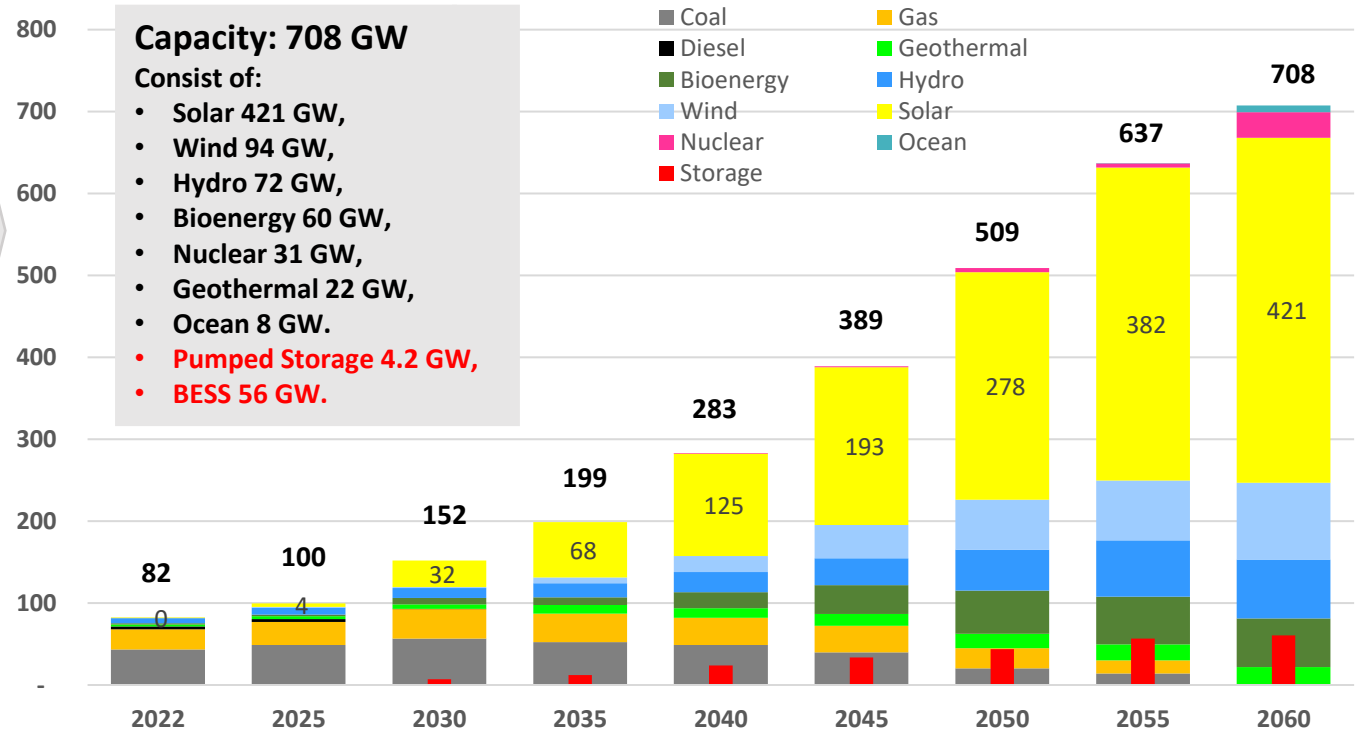
Express bold commitment to achieve global target on energy access, escalate viable clean technologies, and intensify energy transitions' financing

INDONESIA ELECTRICITY SUPPLY PLAN FROM 2022 TO 2060

Electricity Demand by Sector | TWh



Power Plant Capacity | GW

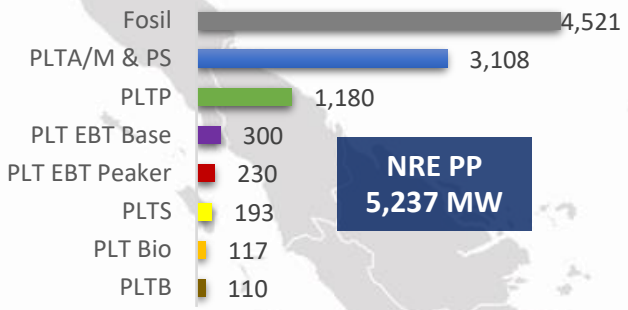


Electricity Demand in 2060 will reach 1,942 TWh, dominated by industry and transportation sector. All electricity demand around 708 GW supplied by 96% renewable energy-based power plant and 4% of Nuclear. The total capacity of various renewable energy is 77% of total renewable energy capacity equipped by storage technology such as Hydro pumped storage and BESS.

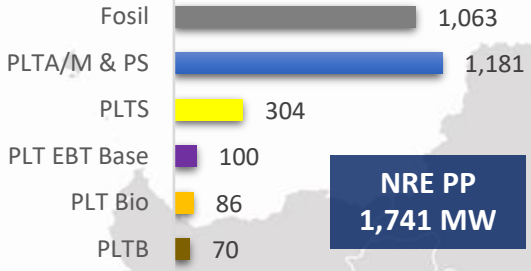
RENEWABLE ENERGY DEVELOPMENT PLAN 2021-2030 - *GREEN RUPTL*

- NRE additional capacity is targeted to reach 20,9 GW (51,6% of the power plant in RUPTL 2021-2030.
- NRE development has been carried out in accordance with the systems' electricity balance.

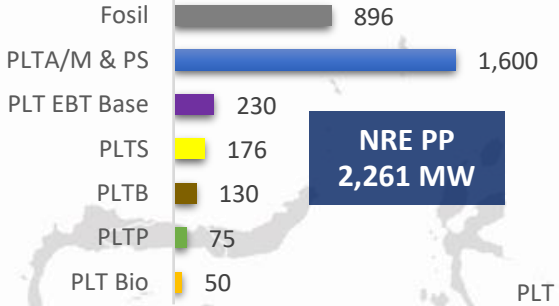
SUMATERA



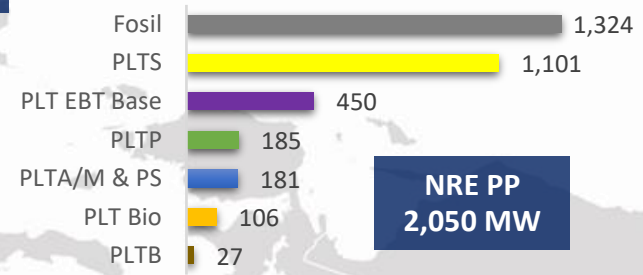
KALIMANTAN



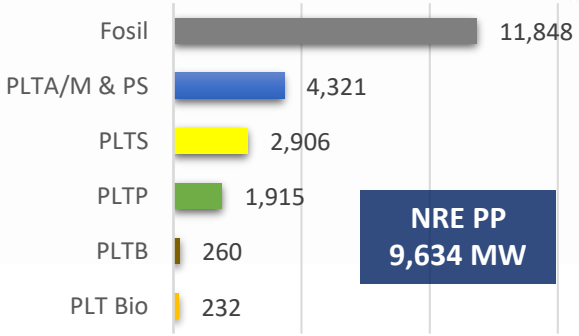
SULAWESI



MALUKU PAPUA NUSA TENGGARA



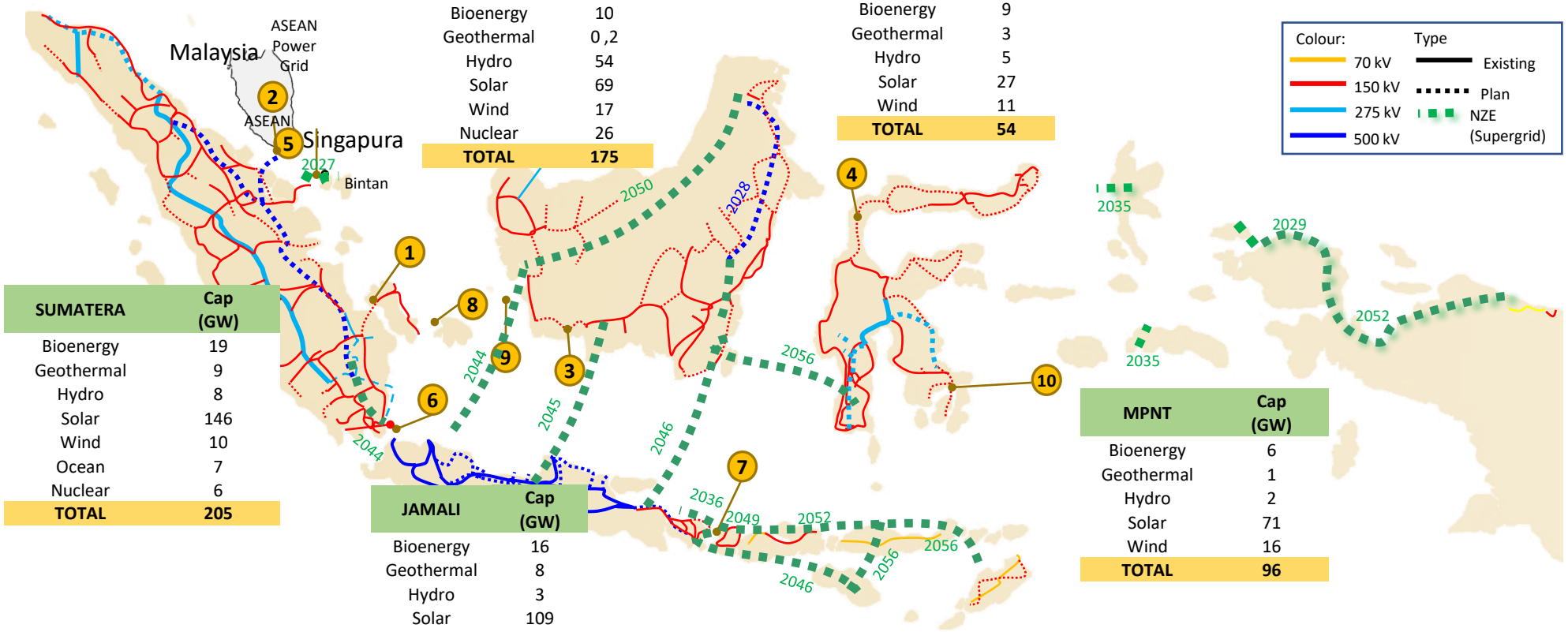
JAWA MADURA BALI



No	PP	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
1	Geothermal (PLTP)	136	108	190	141	870	290	123	450	240	808	3,355
2	Large Hydro (PLTA)	400	53	132	87	2,478	327	456	1,611	1,778	1,950	9,272
3	Mini Hydro (PLTM)	144	154	277	289	189	43	-	2	13	6	1,118
4	Solar PV (PLTS)	60	287	1,308	624	1,631	127	148	165	172	157	4,680
5	Wind Turbine (PLTB)	-	2	33	337	155	70	-	-	-	-	597
6	Bioenergy (PLT Bio)	12	43	88	191	221	20	-	15	-	-	590
7	NRE PP - Base	-	-	-	-	-	100	265	215	280	150	1,010
8	NRE PP - Peaker	-	-	-	-	-	-	-	-	-	300	300
Total		752	648	2,028	1,670	5,544	978	991	2,458	2,484	3,370	20,923

SUPER GRID AND RENEWABLE ENERGY SHARING RESOURCES

Super grid is a key factor to achieve Zero Emission in the power generation sector



KALIMANTAN	Cap (GW)
Bioenergy	10
Geothermal	0 ,2
Hydro	54
Solar	69
Wind	17
Nuclear	26
TOTAL	**175**

SULAWESI	Cap (GW)
Bioenergy	9
Geothermal	3
Hydro	5
Solar	27
Wind	11
TOTAL	**54**

SUMATERA	Cap (GW)
Bioenergy	19
Geothermal	9
Hydro	8
Solar	146
Wind	10
Ocean	7
Nuclear	6
TOTAL	**205**

JAMALI	Cap (GW)
Bioenergy	16
Geothermal	8
Hydro	3
Solar	109
Wind	40
Ocean	1
TOTAL	**178**

MPNT	Cap (GW)
Bioenergy	6
Geothermal	1
Hydro	2
Solar	71
Wind	16
TOTAL	**96**

National	Cap @ 2060 (GW)
Bioenergy	60
Geothermal	22
Hydro	72
Solar	421
Wind	94
Ocean	8
Nuclear	31
TOTAL	**708**

Interconection investment will decrease if REBID is implemented

A. Already included in the RUPTL project list:

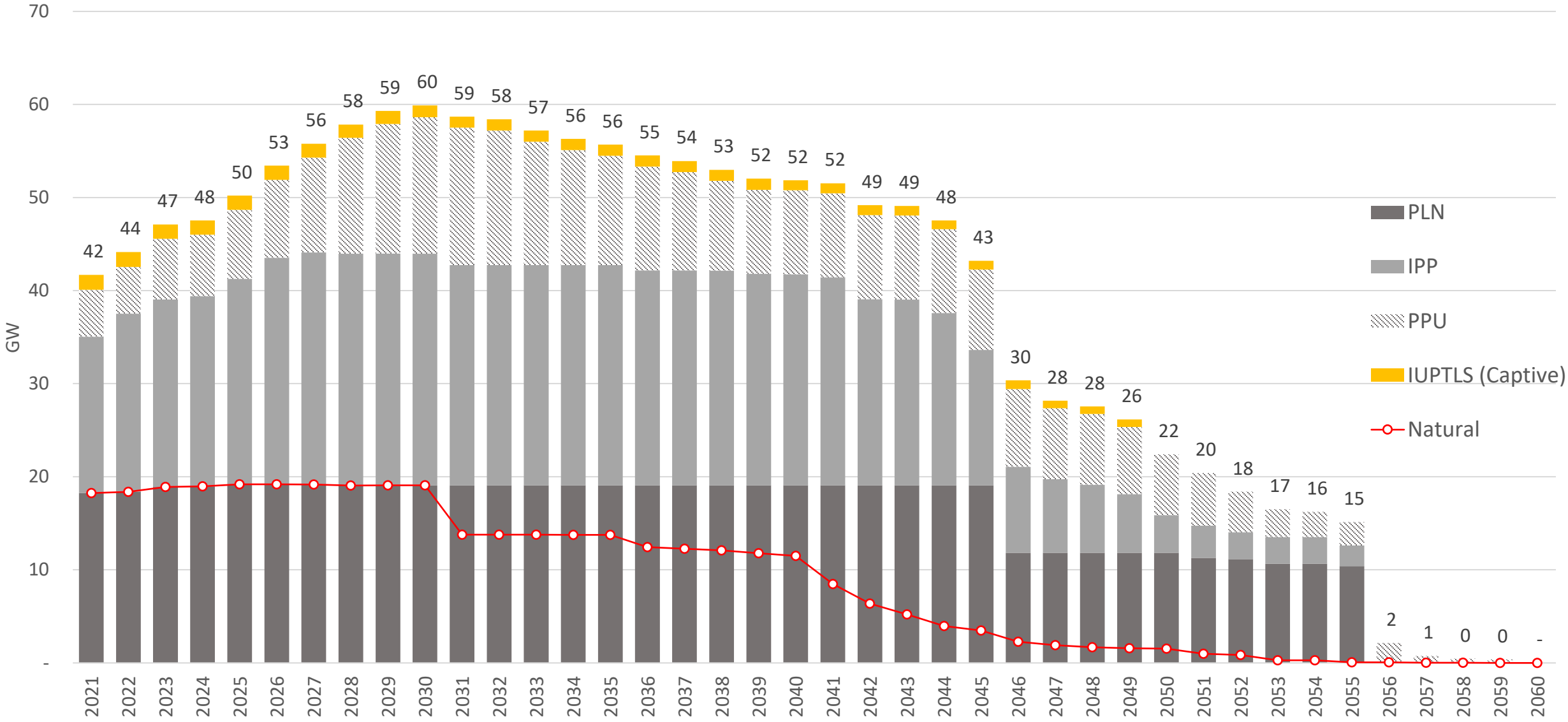
1. 150 kV Sumatera-Bangka Interconnection (2022);
2. 500 kV Sumatera-Malaysia Interconnection (2030), supporting cooperation framework of ASEAN Power Grid;
3. 150 kV Kalimantan Interconnection (2023);
4. 150 kV Sulbagut-Sulbagsel Interconnection (Tambu-Bangkir COD 2024).

B. Still in narrative and need further study:

5. Sumatera-Singapura Interconnection (included Sumatera-Bintan Interconnection), supporting ASEAN Power Grid;
6. 500 kV Sumatera-Jawa Interconnection;
7. 150 kV Bali-Lombok Interconnection (require further study to support Jawa-Nusa Tenggara Interconnection Plan);
8. 150 kV Bangka-Belitung Interconnection (require further study for Sumatera-Kalimantan Interconnection);
9. Belitung-Kalimantan Interconnection (require further study as a part of Supergrid Nusantara Program);
10. 150 kV Baubau-Sulbagsel Interconnection (require further study for Bau-Bau Sumbagsel Interconnection System Reliability).

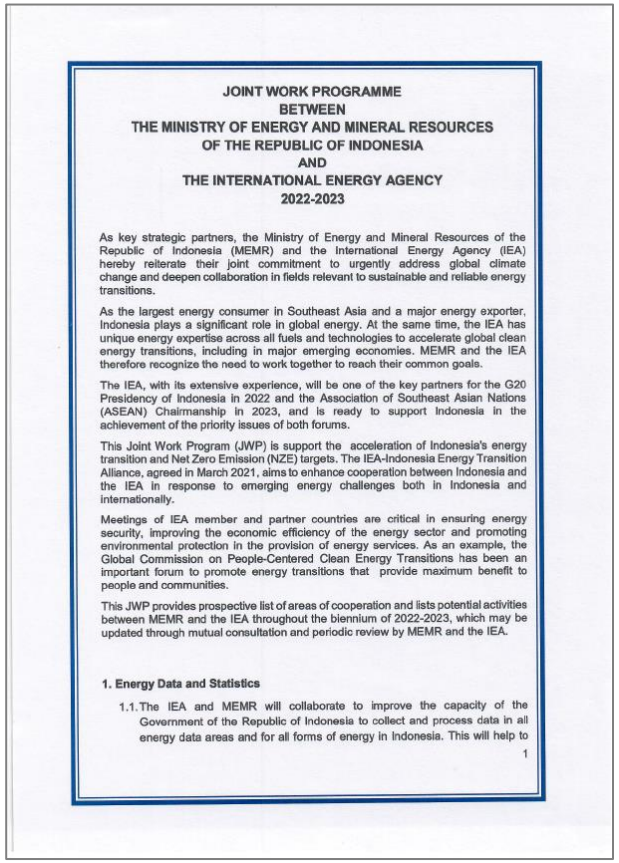
COAL FIRED POWER PLANT RETIREMENT SCENARIO

Retirement of PLN's takes into account asset revaluation with an extension of the lifetime of the generator by 30-40 years since 2016



IEA – MEMR Joint Working Program (JWP)

Joint Working Program between IEA & Ministry of Energy and Mineral Resources of Indonesia is updated every year to ensure urgent issues are addressed properly.



JOINT WORK PROGRAMME
BETWEEN
THE MINISTRY OF ENERGY AND MINERAL RESOURCES
OF THE REPUBLIC OF INDONESIA
AND
THE INTERNATIONAL ENERGY AGENCY
2022-2023

As key strategic partners, the Ministry of Energy and Mineral Resources of the Republic of Indonesia (MEMR) and the International Energy Agency (IEA) hereby reiterate their joint commitment to urgently address global climate change and deepen collaboration in fields relevant to sustainable and reliable energy transitions.

As the largest energy consumer in Southeast Asia and a major energy exporter, Indonesia plays a significant role in global energy. At the same time, the IEA has unique energy expertise across all fuels and technologies to accelerate global clean energy transitions, including in major emerging economies. MEMR and the IEA therefore recognize the need to work together to reach their common goals.

The IEA, with its extensive experience, will be one of the key partners for the G20 Presidency of Indonesia in 2022 and the Association of Southeast Asian Nations (ASEAN) Chairmanship in 2023, and is ready to support Indonesia in the achievement of the priority issues of both forums.

This Joint Work Program (JWP) is support the acceleration of Indonesia's energy transition and Net Zero Emission (NZE) targets. The IEA-Indonesia Energy Transition Alliance, agreed in March 2021, aims to enhance cooperation between Indonesia and the IEA in response to emerging energy challenges both in Indonesia and internationally.

Meetings of IEA member and partner countries are critical in ensuring energy security, improving the economic efficiency of the energy sector and promoting environmental protection in the provision of energy services. As an example, the Global Commission on People-Centered Clean Energy Transitions has been an important forum to promote energy transitions that provide maximum benefit to people and communities.

This JWP provides prospective list of areas of cooperation and lists potential activities between MEMR and the IEA throughout the biennium of 2022-2023, which may be updated through mutual consultation and periodic review by MEMR and the IEA.

1. Energy Data and Statistics

1.1. The IEA and MEMR will collaborate to improve the capacity of the Government of the Republic of Indonesia to collect and process data in all energy data areas and for all forms of energy in Indonesia. This will help to

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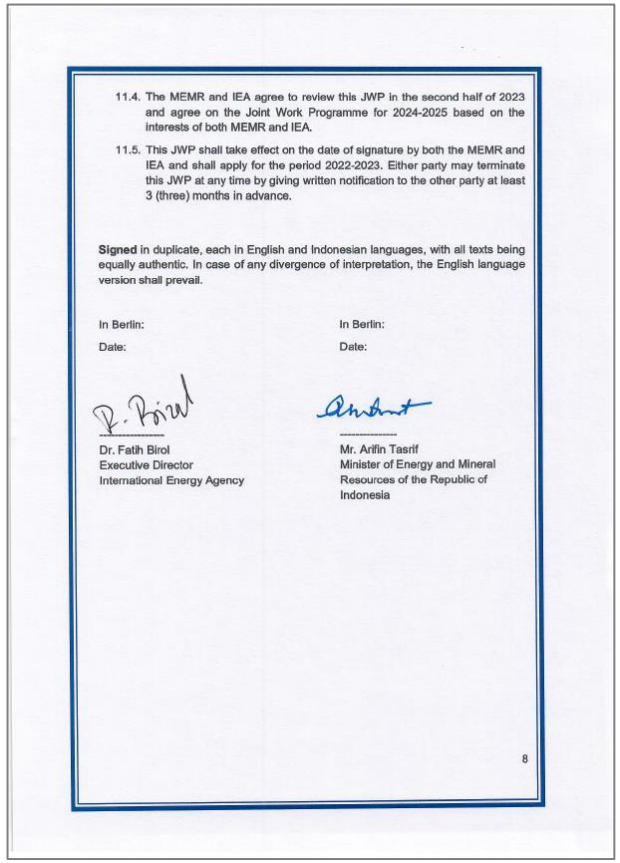

11.4. The MEMR and IEA agree to review this JWP in the second half of 2023 and agree on the Joint Work Programme for 2024-2025 based on the interests of both MEMR and IEA.

11.5. This JWP shall take effect on the date of signature by both the MEMR and IEA and shall apply for the period 2022-2023. Either party may terminate this JWP at any time by giving written notification to the other party at least 3 (three) months in advance.

Signed in duplicate, each in English and Indonesian languages, with all texts being equally authentic. In case of any divergence of interpretation, the English language version shall prevail.

In Berlin:
Date:

Dr. Fatih Birol
Executive Director
International Energy Agency

In Berlin:
Date:

Mr. Arifin Tasrif
Minister of Energy and Mineral Resources of the Republic of Indonesia

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Signed by **IEA Executive Director** and **Minister of Energy and Mineral Resources of Indonesia,** this document reiterated commitment to address global climate change and to collaborate in sustainable and reliable energy transition from both parties.

JWP COOPERATION AREAS

- Energy Data and Statistics
- Energy Security, Emergency Response, and Policies
- Power Sector Enhancement
- Bioenergy
- Energy Efficiency
- Clean Energy and Technology
- Energy Policy Evaluation Framework
- Global Energy Leadership

JWP ACTIVITIES

1. High-Level Visits
2. Participation in IEA structures and Key Publications
3. Final Provisions

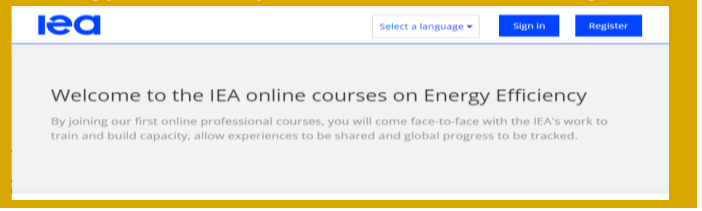
IEA Various Supports in Indonesia Energy Transition 2018 - 2022

2018

- Energy Efficiency Data Collection
- Clean Energy Investment and Financing Training
- Energy Efficiency Training
- IEA Ministerial Meeting
- Launched Forecast Coal to 2023 by The Minister of Energy and Mineral Resources
- Consolidated Database in Energy

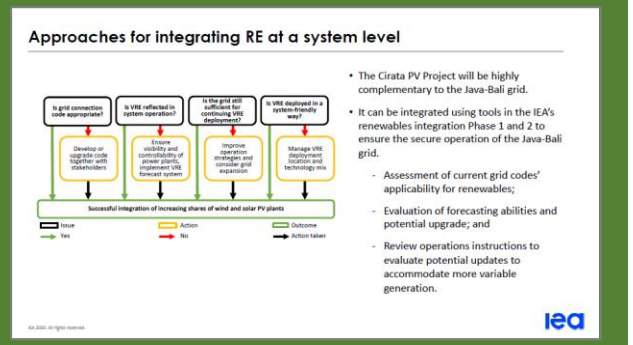
2019

- Evaluation of Energy Management Online Reporting platform
- Consolidated Database in Energy
- IEA Technology Collaboration Programs
- IEA Business Meeting
- Energy Efficiency Online Course Development



2020

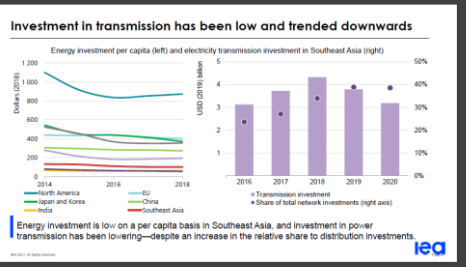
- Renewable Energy Integration Study for Cirata Hydro Powerplant



- Development of SINERGI Website
- LPG to Electric Cooking Transition

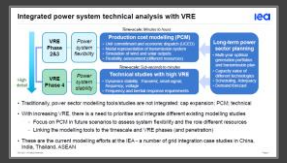
2021

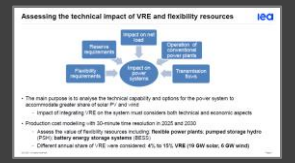
- Attracting Private Investment in Transmission



- Indonesia AC Market Survey
- IEA Analysis to Wheeling Methodology Indonesia
- Organized Webinar on Smart Grid

- Organized Webinar on VRE



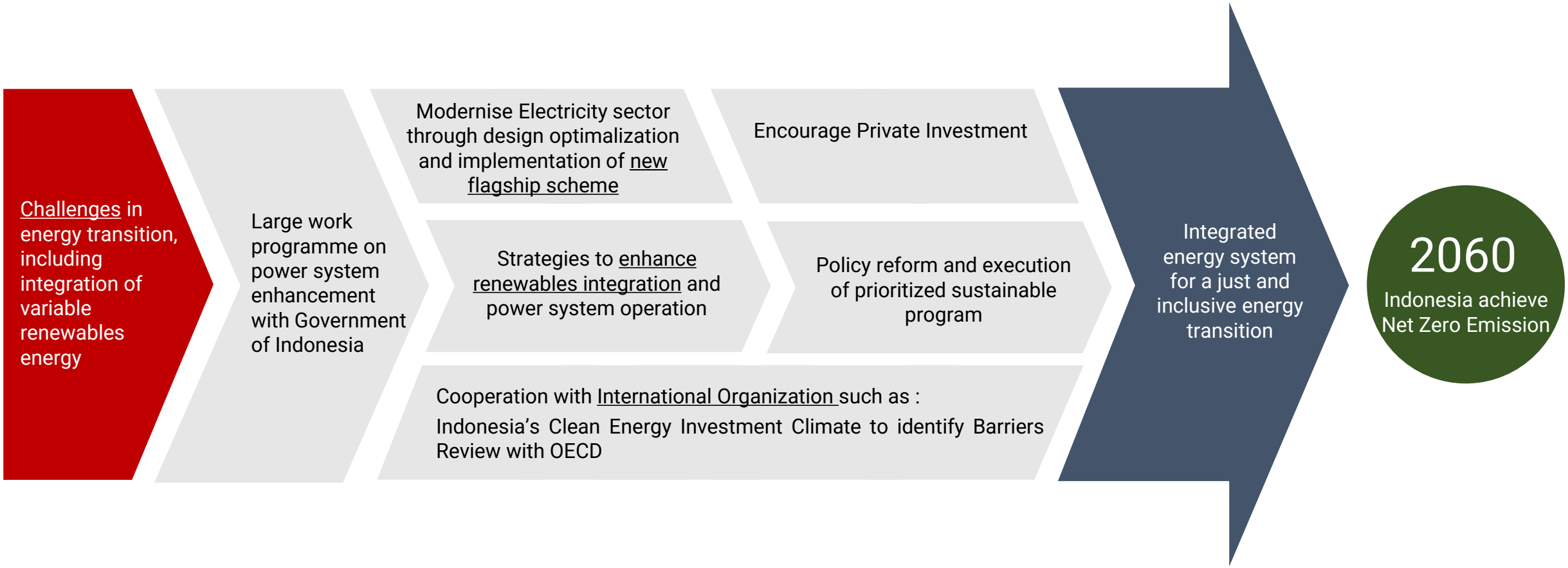


2022 - Onward

- Development of Roadmap to Net Zero Emission in Indonesia
- Enhancing Indonesia's Power System Report
- EV Conversion Report
- ETS for Electric Steam Power Plant (PLTU)
- Development of Policy Package and Energy Efficiency Benchmarking in Textile Industry (on progress)
- Development of Energy Efficiency Indicators and Benchmarking in Pulp Paper Industry (on progress)
- Development of Fuel Economy Standards for Trucks in Indonesia (on progress)
- ETS for Industrial Sector in terms of Energy Sector (on progress)

IEA Framework in Achieving Net Zero Emission for Indonesia

International cooperation supports are essential factors for Indonesia in achieving Net Zero Emission by 2060



According to IEA Roadmap, many of the ingredients for reaching net zero emissions and advanced economy status are the same : INNOVATION, KNOWLEDGE, TECHNOLOGY, AND ECONOMIC DIVERSIFICATION

IEA for Indonesia in 2022

In 2022, IEA participates in shaping the energy transition in Indonesia through road map development, report provision, and other forms of support.

Development of Roadmap to Net Zero Emission in Indonesia

- The document provided outline on how Indonesia can achieve net zero emissions, the role energy sector can play, and the needed actions and investments.
- It is based on understanding and analysis of national, regional, and global situations.

Enhancing Indonesia's Power System Report

- The study focused on two systems where 80% of the demand is located and assesses their performance across a number of scenario.
- It identified the potential and the barrier for renewable energy development in Indonesia and provided recommendation accordingly.

IEA on-going supports for Indonesia Government include G20 Presidency execution and ASEAN Chairmanship preparation.

IEA role in G20

- 6th April G20 Side event
- 20th April G20 Side Event
- Bali G20 Roadmap and Updated Stocktake
- Report Launching: An Energy Sector Roadmap to Net Zero Emissions in Indonesia

IEA role in ASEAN

- Providing Priority Energy Deliverables for Indonesia
- Coordinating with ASEAN and Indonesia

Government of Indonesia is looking forward to continue our collaboration with IEA in our pursuit for sustainable energy transition.


THANK YOU
G20
INDONESIA
2022