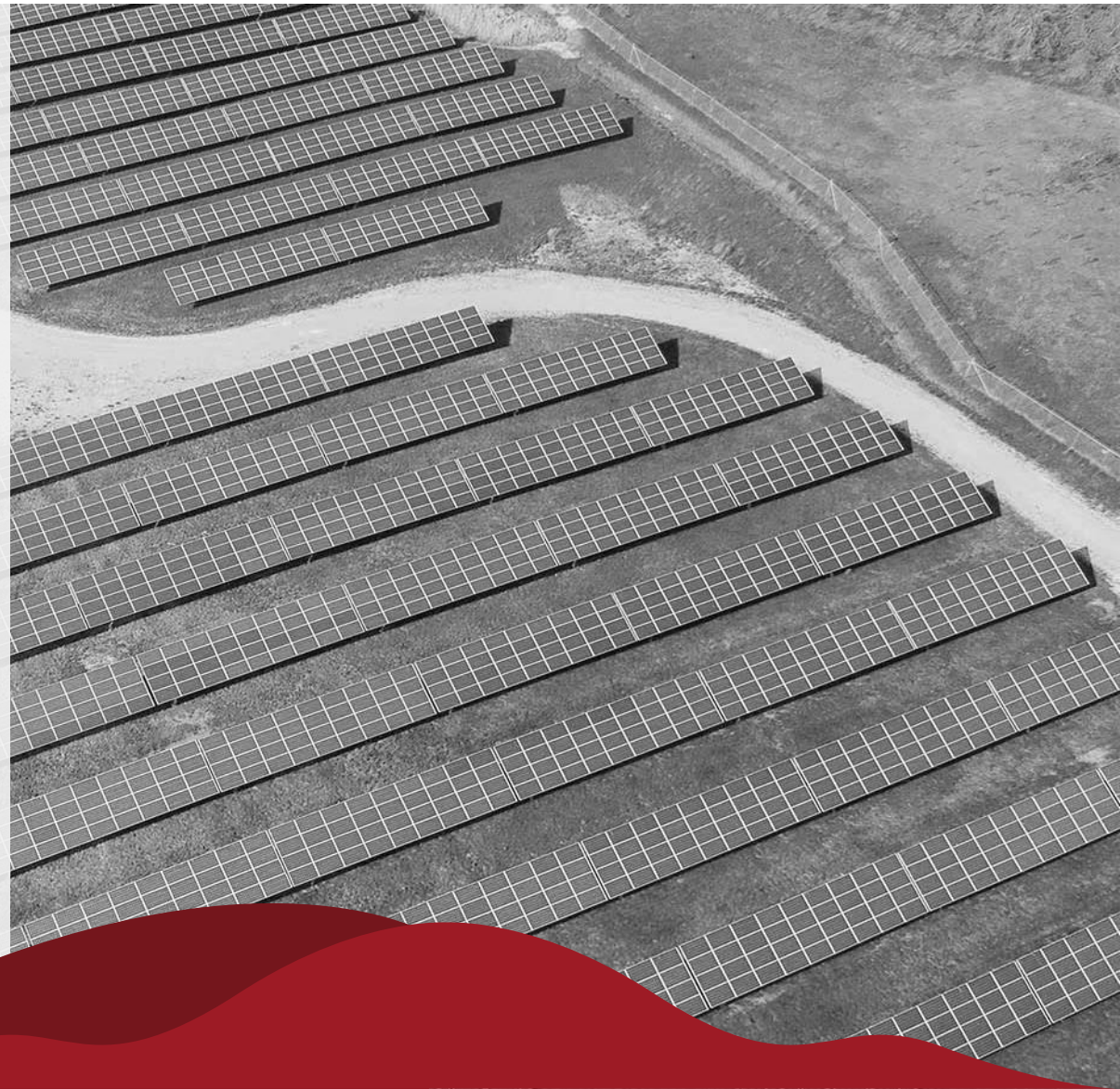
ASEAN INDONESIA 2023

MINISTRY OF ENERGY AND MINERAL RESOURCES
THE REPUBLIC OF INDONESIA

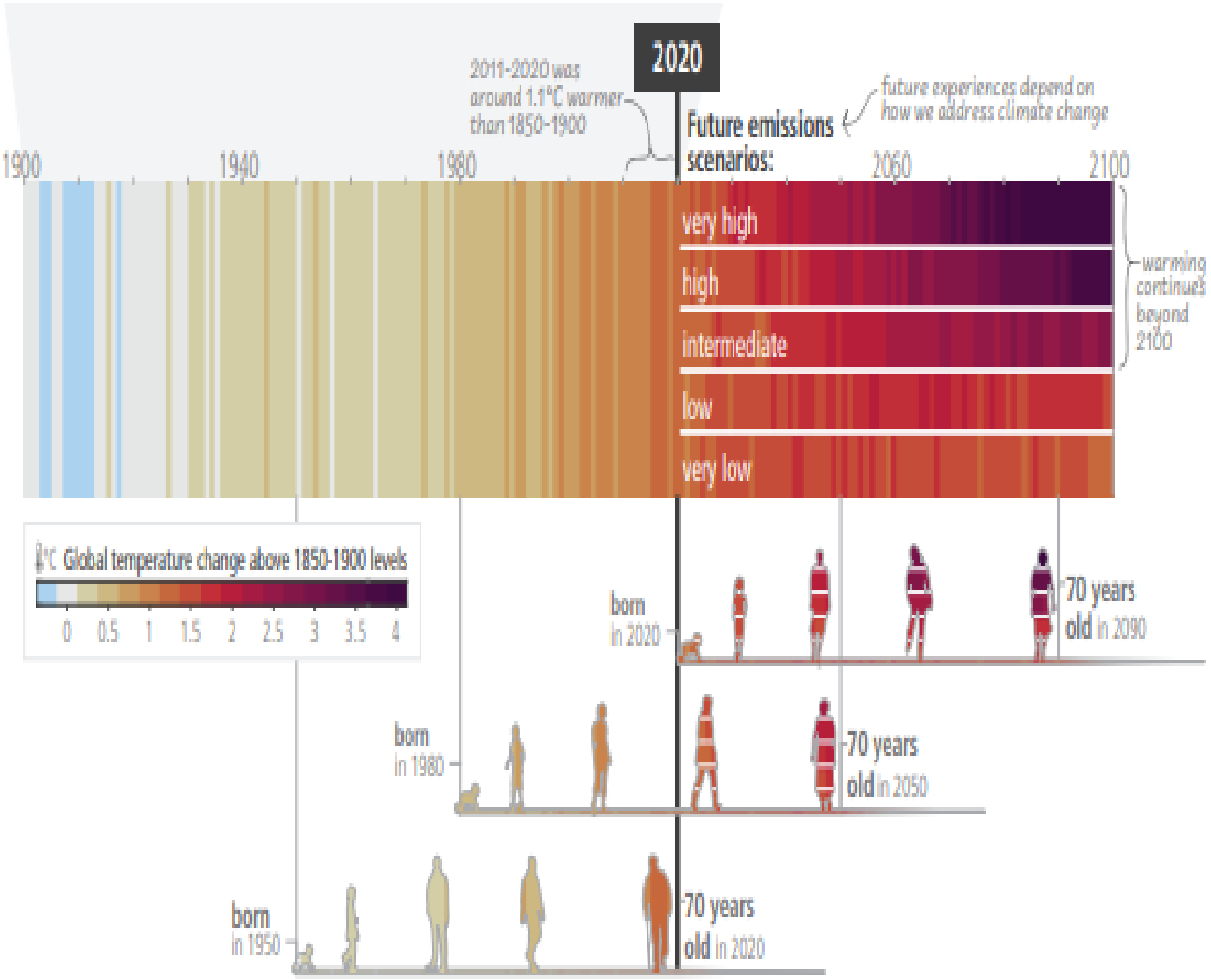
INDONESIA SOLAR SUMMIT 2023

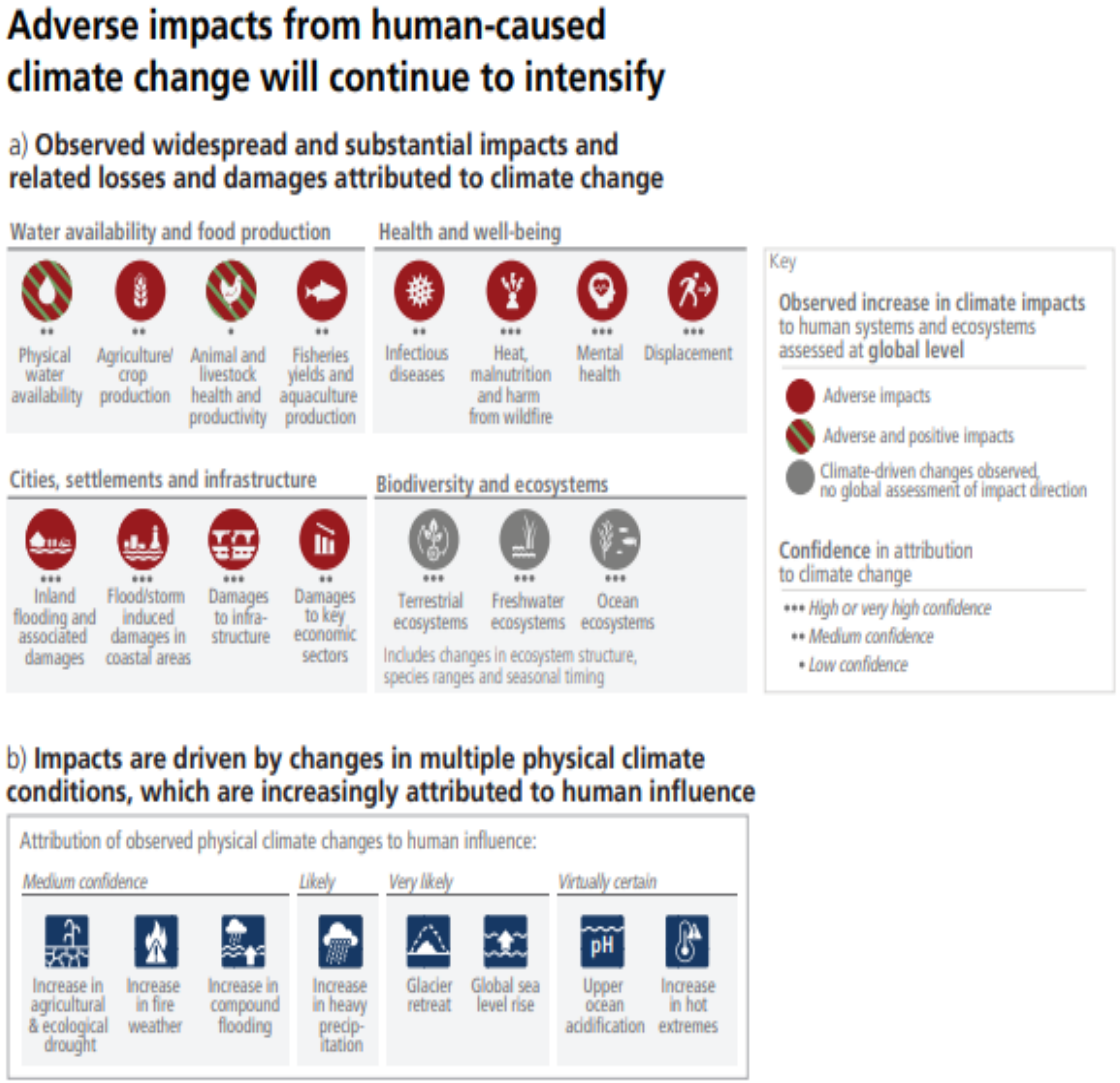


Jakarta | July 26th 2023

#Energy Transition

GLOBAL TEMPERATURE

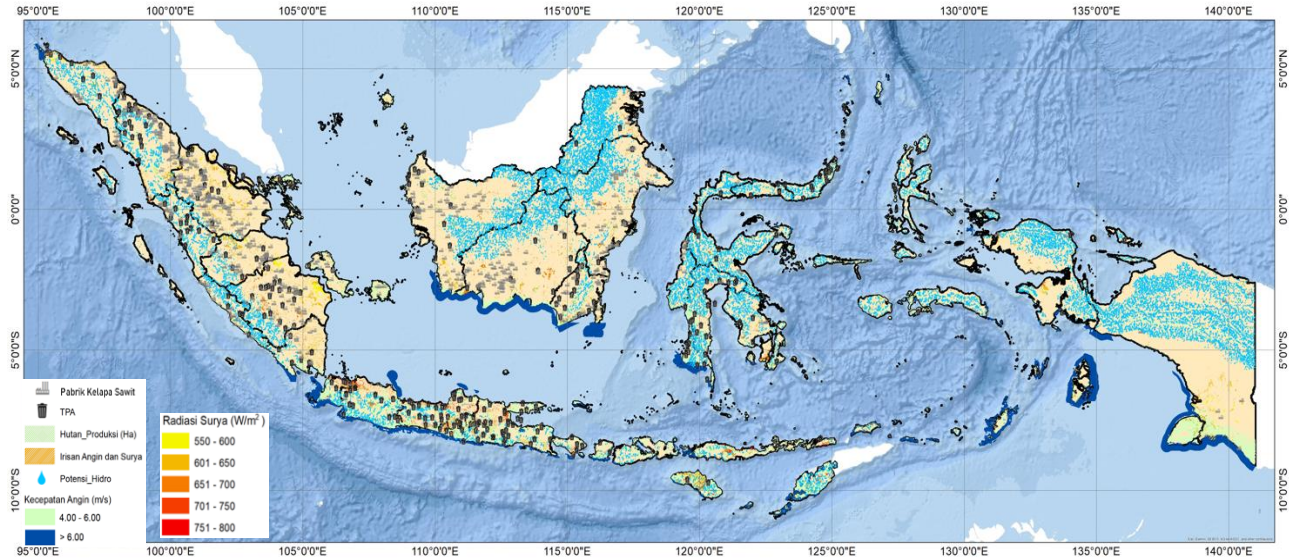




Source: Intergovernmental Panel on Climate Change (IPCC)

INDONESIA'S NRE POTENTIAL

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 NRE development is very open, especially supported by environmental issues, climate change, and increased electricity consumption per capita."

NRE POTENTIAL AND UTILIZATION

ENERGI	POTENSI (GW)	PEMANFAATAN (MW)
SURYA	3.294	300,9
HIDRO	95	6.693,3
BIOENERGI	57	3.088,4
BAYU	155	154,3
PANAS BUMI	23	2.365,4
LAUT	63	0
TOTAL	3.689	12.602*

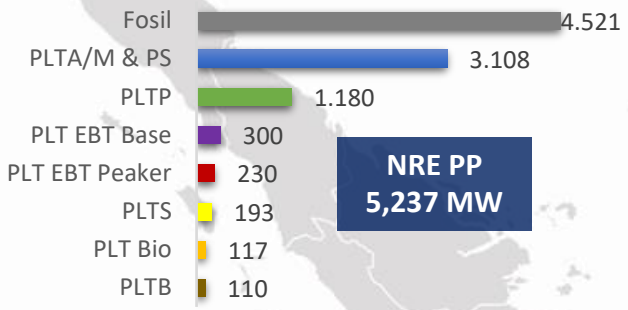
*) Realisation 1st quarter 2023
Nuclear potential: Uranium 89.483 ton - Thorium 143.234 ton

- Hydro potential is spread throughout Indonesia, especially in North Kalimantan, NAD, West Sumatra, North Sumatra, and Papua
- Solar potential is spread throughout Indonesia, especially in NTT, West Kalimantan and Riau which have higher radiation
- Wind potential (> 6 m/s) is mainly found in NTT, South Kalimantan, West Java, South Sulawesi, NAD and Papua
- Ocean Energy potential is spread throughout Indonesia, especially Maluku, NTT, NTB and Bali
- Geothermal potential is spread in the ring of fire area, including Sumatra, Java, Bali, Nusa Tenggara, Sulawesi and Maluku

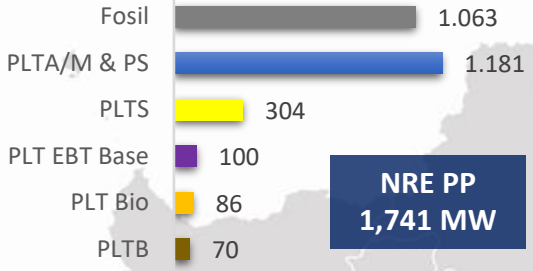
NRE PP DEVELOPMENT PLAN YEAR 2021-2030 - *GREEN* RUPTL

- 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.

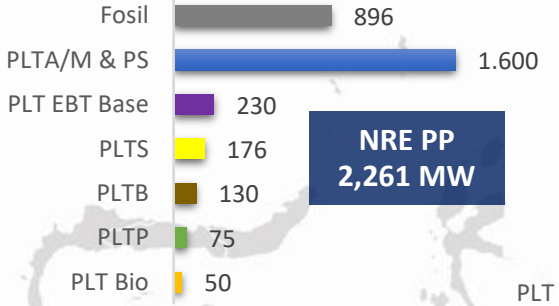
SUMATERA



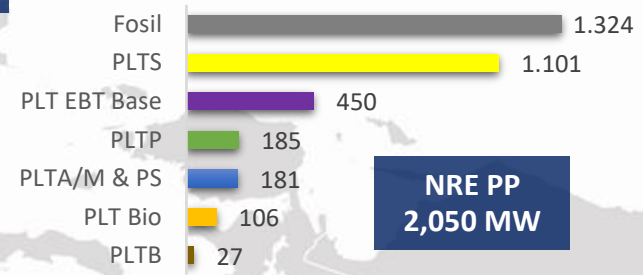
KALIMANTAN



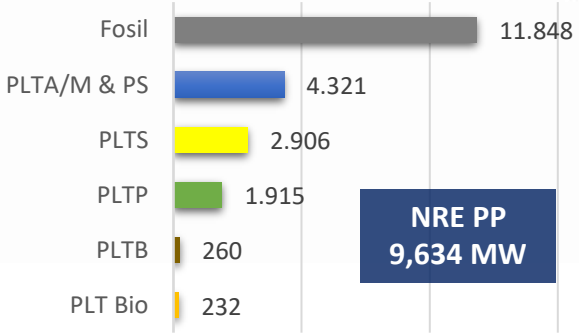
SULAWESI



MALUKU PAPUA NUSA TENGGARA



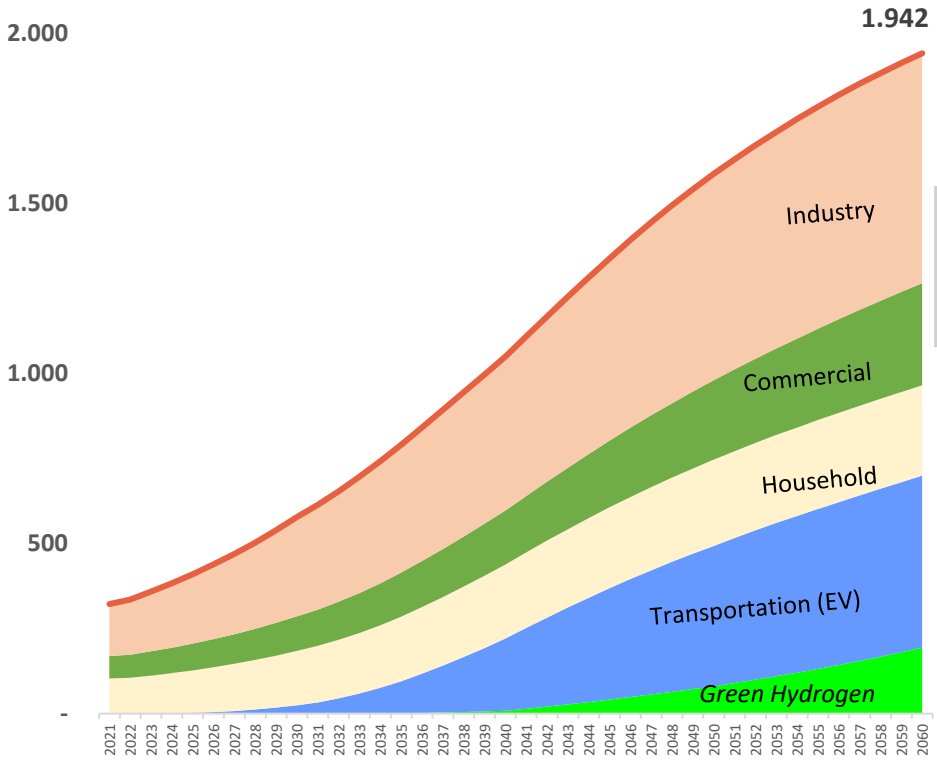
JAWA MADURA BALI



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

ELECTRICITY SUPPLY PLAN 2060

Electricity Demand by Sector | TWh

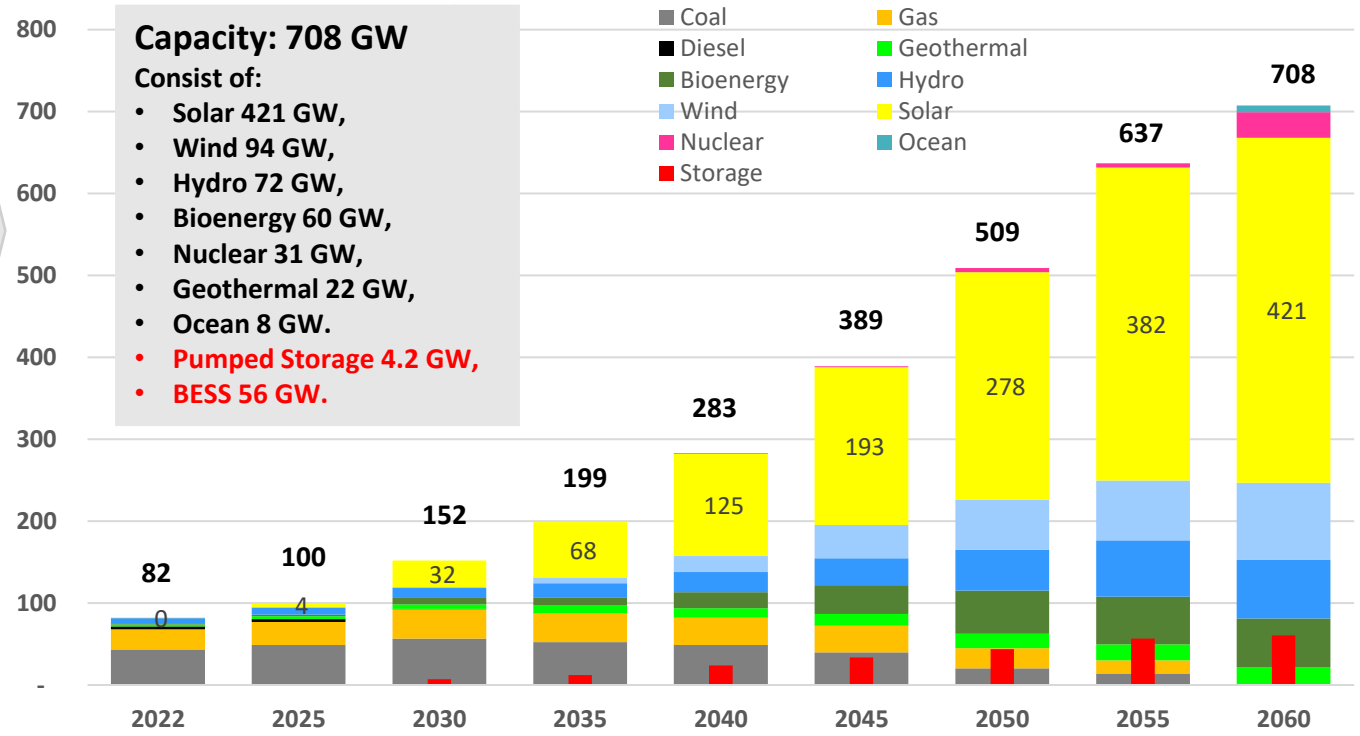


Power Plant Capacity | GW

Capacity: 708 GW

Consist of:

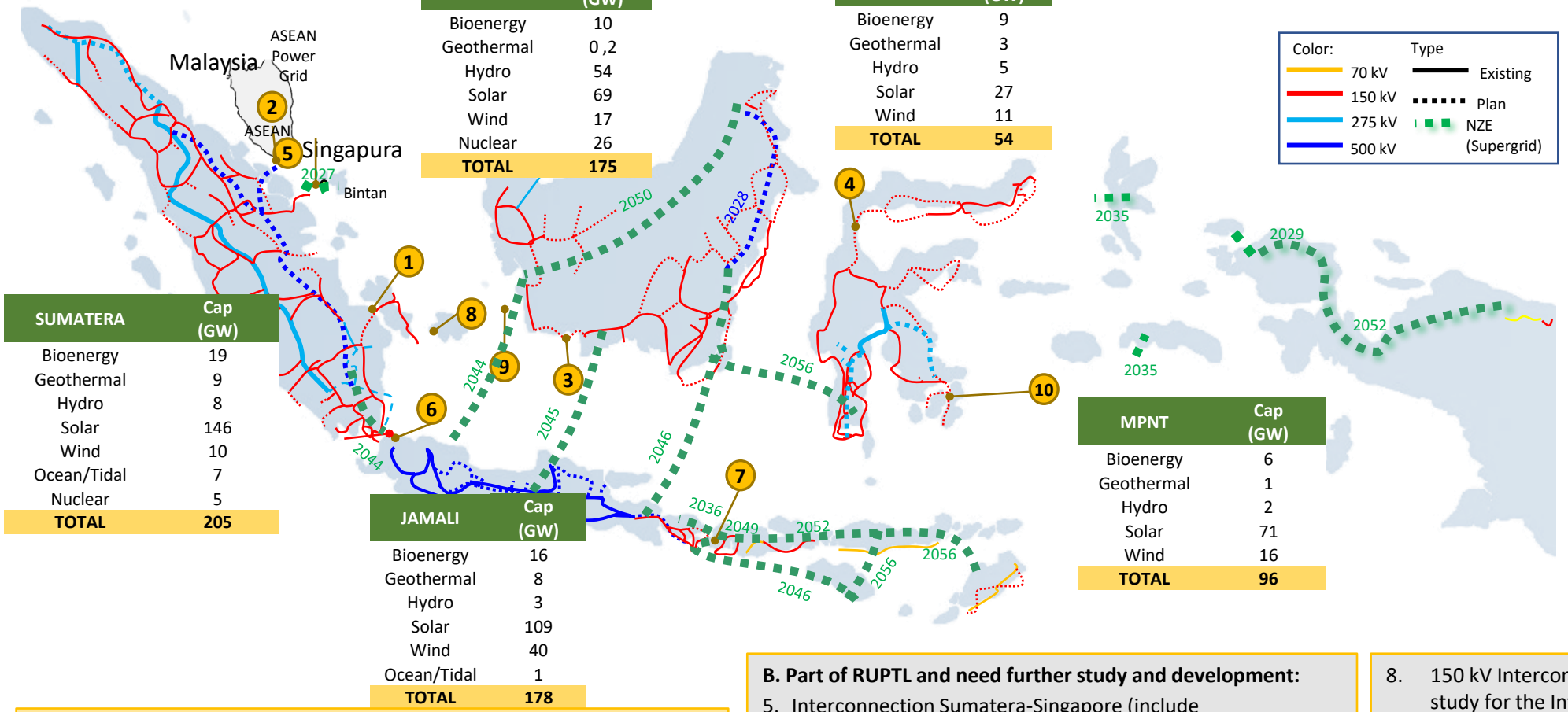
- **Solar 421 GW,**
- **Wind 94 GW,**
- **Hydro 72 GW,**
- **Bioenergy 60 GW,**
- **Nuclear 31 GW,**
- **Geothermal 22 GW,**
- **Ocean 8 GW.**
- **Pumped Storage 4.2 GW,**
- **BESS 56 GW.**



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.

SUPER GRID AND RE 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/Tidal	7
Nuclear	5
TOTAL	**205**

JAMALI	Cap (GW)
Bioenergy	16
Geothermal	8
Hydro	3
Solar	109
Wind	40
Ocean/Tidal	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/Tidal	8
Nuclear	31
TOTAL	**708**

The invested interconnection will be decreased if REBID is implemented.

A. Listed in *RUPTL*:

1. 150 kV Interconnection Sumatera-Bangka (2022);
2. 500 kV Interconnection Sumatera-Malaysia (2030), Supporting ASEAN Power Grid;
3. 150 kV Interconnection Kalimantan (2023);
4. 150 kV Interconnection Northern and Southern Part of Sulawesi (Tambu-Bangkir COD 2024).

B. Part of RUPTL and need further study and development:

5. Interconnection Sumatera-Singapore (include Interconnection Sumatera-Bintan), supporting ASEAN Power Grid;
6. 500 kV Interconnection Sumatera-Jawa;
7. 150 kV Interconnection Bali-Lombok (require further study for Interconnection Jawa-Nusa Tenggara);
8. 150 kV Interconnection Bangka-Belitung (require further study for the Interconnection of Sumatera-Kalimantan);
9. Interconnection Belitung-Kalimantan (require further study for the Supergrid Nusantara program);
10. 150 kV Interconnection Baubau-Sulbagsel (require further study for the Bau-Bau Sulbagsel Interconnection System Reliability).

REGULATION TO ACCELERATE THE ENERGY TRANSITION

Carbon Tax & Carbon Trade
(Act 7/2021 and Presidential Decree 98/2021)

1. A carbon tax is imposed on carbon emissions that **have a negative impact on the environment.**
2. The subject of the carbon tax is **an individual or entity** that purchases goods that **contain carbon and/or carries out activities that produce carbon emissions.**
3. The imposition of a carbon tax is carried out by considering **the carbon tax roadmap set by the Government** and/or the carbon market roadmap.
4. **The carbon tax rate** is set at a minimum of **IDR 30.00 per kg CO_2e.**

The carbon tax will be implemented in 2022 in the CFPP with a cap & tax scheme.

Carbon Trading Implementation

Scope of MEMR Regulation 16/2022

- GHG Emission Reporting Mechanism for Power Plants
- GHG Emissions Cap for Coal Fired Power Plants
- Carbon Trade Mechanism
- Evaluation of carbon trading and Technical Emissions Approval Auction Mechanism for Power Plants

Emission Cap for CFPP is divided into 4 categories:

CFPP Type	Installed Capacity	Benchmark Intensity Cap ($tonCO_{2e}$/ MWh)
Non-Mine Mouth & Mine Mouth	25≤MW<100	1.297
Non-Mine Mouth	> 400 MW	0.911
Non-Mine Mouth	100 ≤ MW ≤ 400	1.011
Mine Mouth	≥ 100 MW	1.089

Note: only applies to the CFPPs connected to the PLN network *) Valid no later than 2024

Source: DG of Electricity, Update January 26, 2022

Presidential Decree No.112/2022 on Acceleration of Renewable Energy Development for Electricity Provision

Goal:

- **Increase investment** in the Renewable Energy sector;
- **Acceleration to reach renewable energy targets** in the national energy mix in accordance with the National Energy Policy;
- **Reducing the current trade deficit** in the energy sector;
- **Reducing greenhouse gas emissions**.

Provides framework for RE based electricity provision:

- ✓ Renewable Energy Development is carried out based on the RUPTL, which takes into account the target of the renewable energy mix, supply-demand balance, and the economic value of power plants.
- ✓ Price and procurement mechanism for RE PP
- ✓ Terms for the energy transition

Draft of New Energy and Renewable Energy Law

*A **comprehensive regulation** is needed to create a sustainable and fair **NRE development that benefits all levels of society***

This law was initiated by DPR RI and DPD RI and is included in the National Priority Legislation **(Prolegnas) for 2022. Include terms for :**

Thank You

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