

**INETTT**  
International  
Network of  
Energy Transition  
Think Tanks



**IESR**  
Institute for  
Essential Services  
Reform

# Indonesia's Net Zero Energy System Compatible with 1.5 C

Institute for Essential Services Reform  
COP27 side event - 9 November 2022 - Sharm El Sheikh



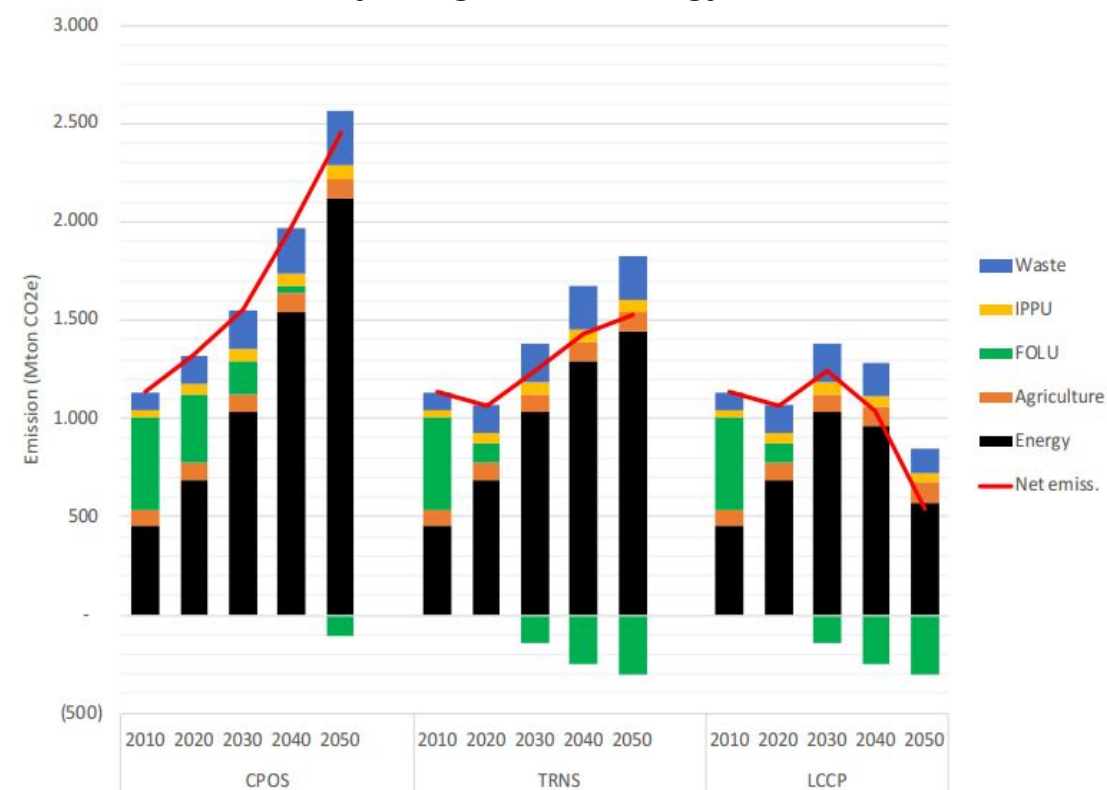
# Current Indonesia's Climate Policy **is not aligned with the Paris Agreement**, a more ambitious target is required



## Current Indonesia Climate Policy



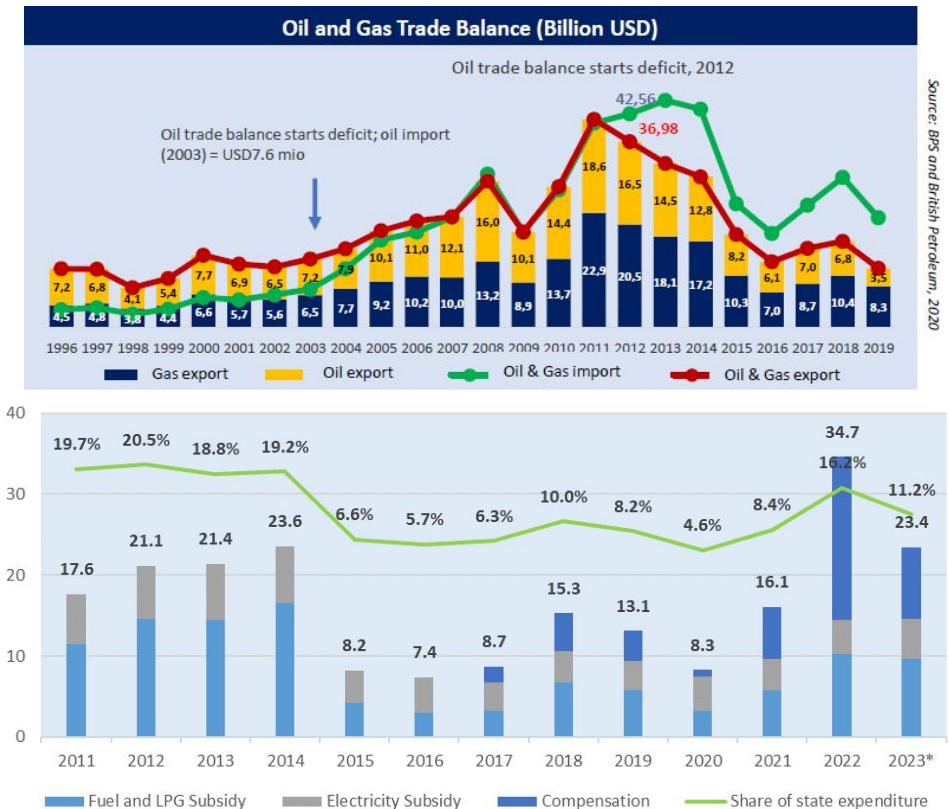
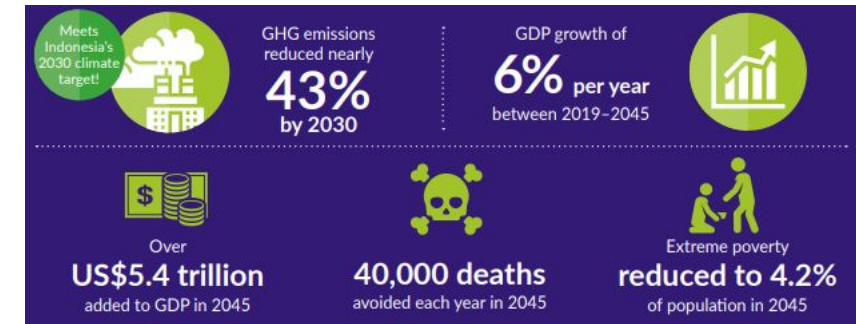
## Emission pathway for all scenarios under Ministry of Environment and Forestry Long Term Strategy LCCR



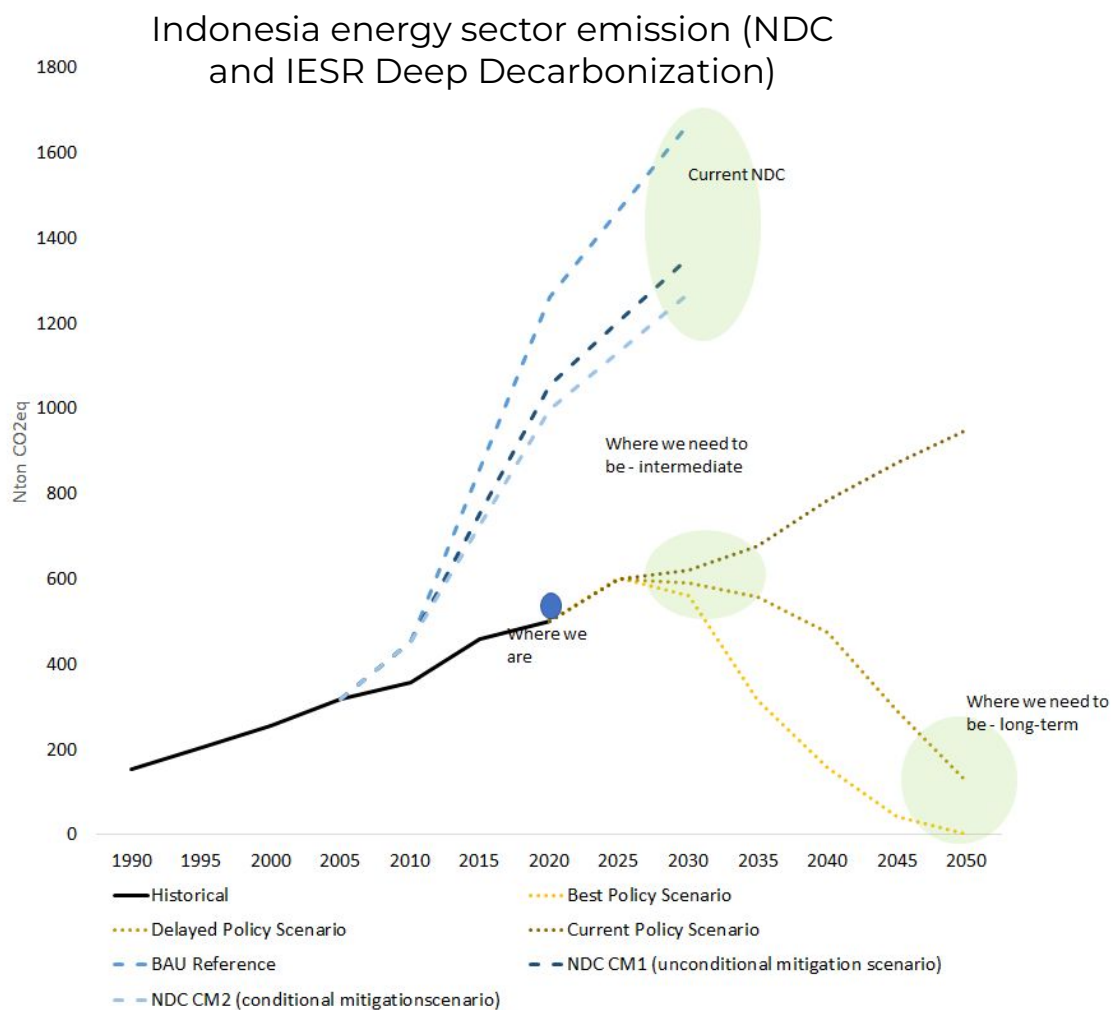
# The urgency of Indonesia's energy transition is becoming more visible

The government has viewed the necessity on embracing the energy transition, some of the backgrounds are:

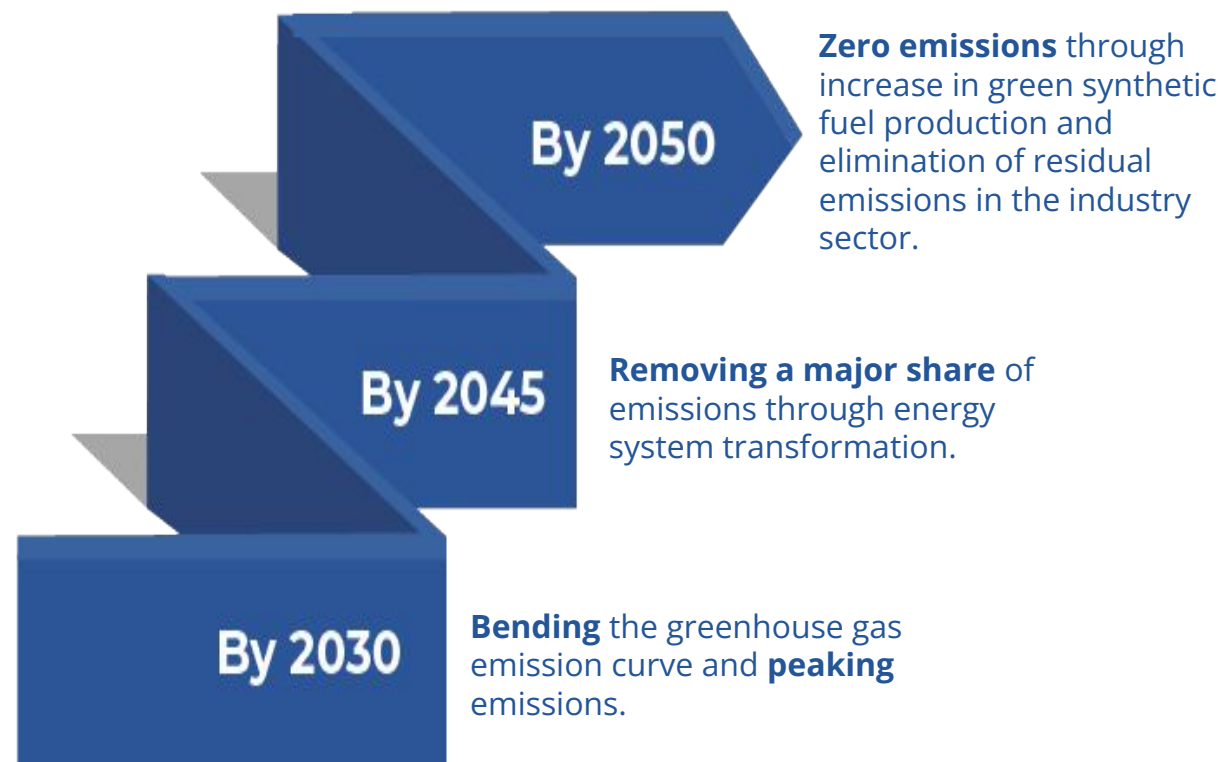
- The Ministry of National Development Planning (Bappenas) Low Carbon Development showcase a higher benefit when Indonesia reach its conditional NDC target, ranging from higher economic growth, job creation, health etc.
- Since becoming net oil importer, Indonesia trade balance depends with the domestic oil consumption.
- Energy subsidies has taken a toll on the state expenditure, especially with the rise of commodity prices in 2022. Energy subsidies create a “barrier” for energy transformation, reformulation of energy subsidy is a priority agenda for the government.



# Reaching zero emission by 2050 is technically and economically feasible, thus opening up opportunity to scale-up climate policy

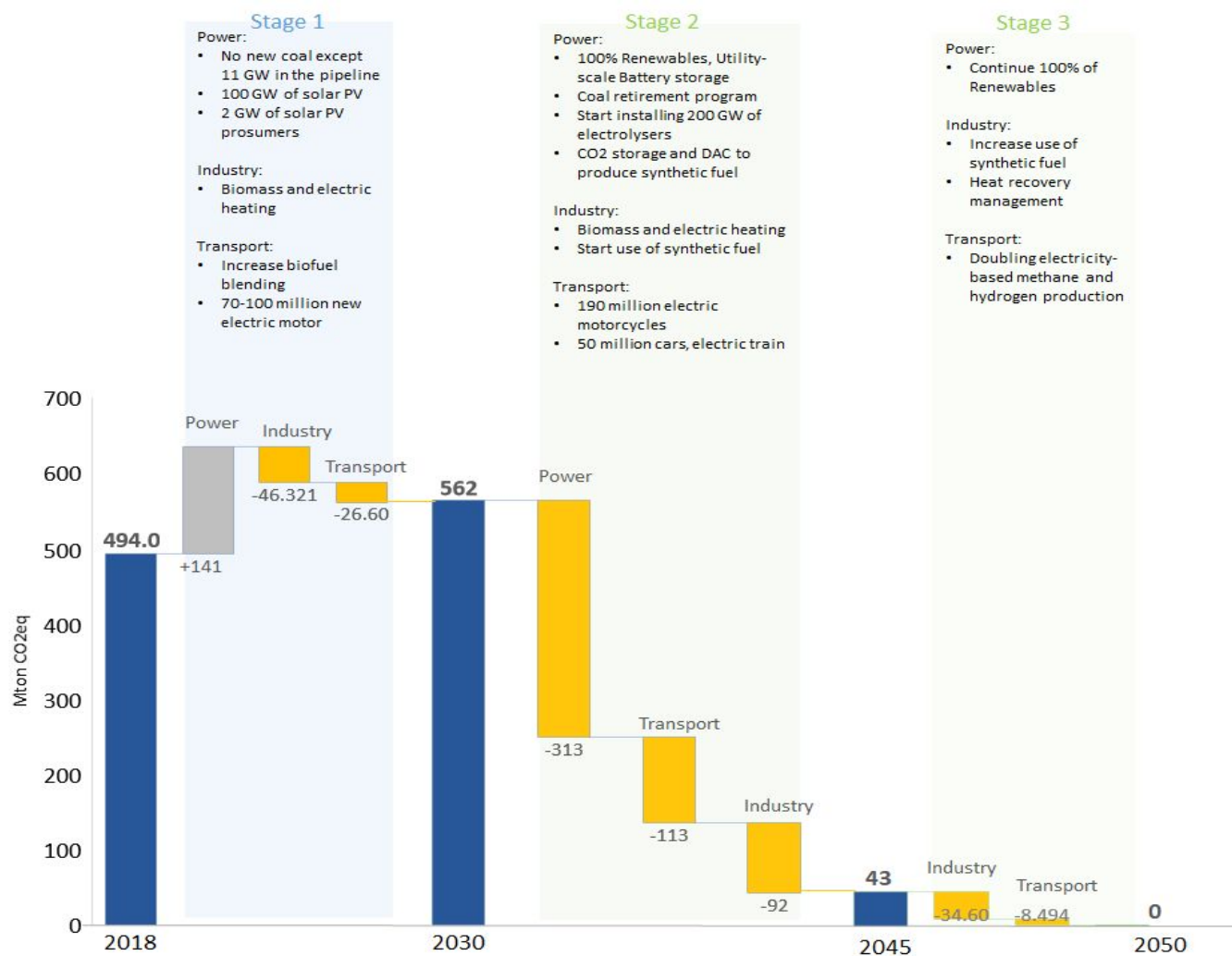


Our Best Policy Scenario (BPS) lays out three stages of emission reduction in the energy system:





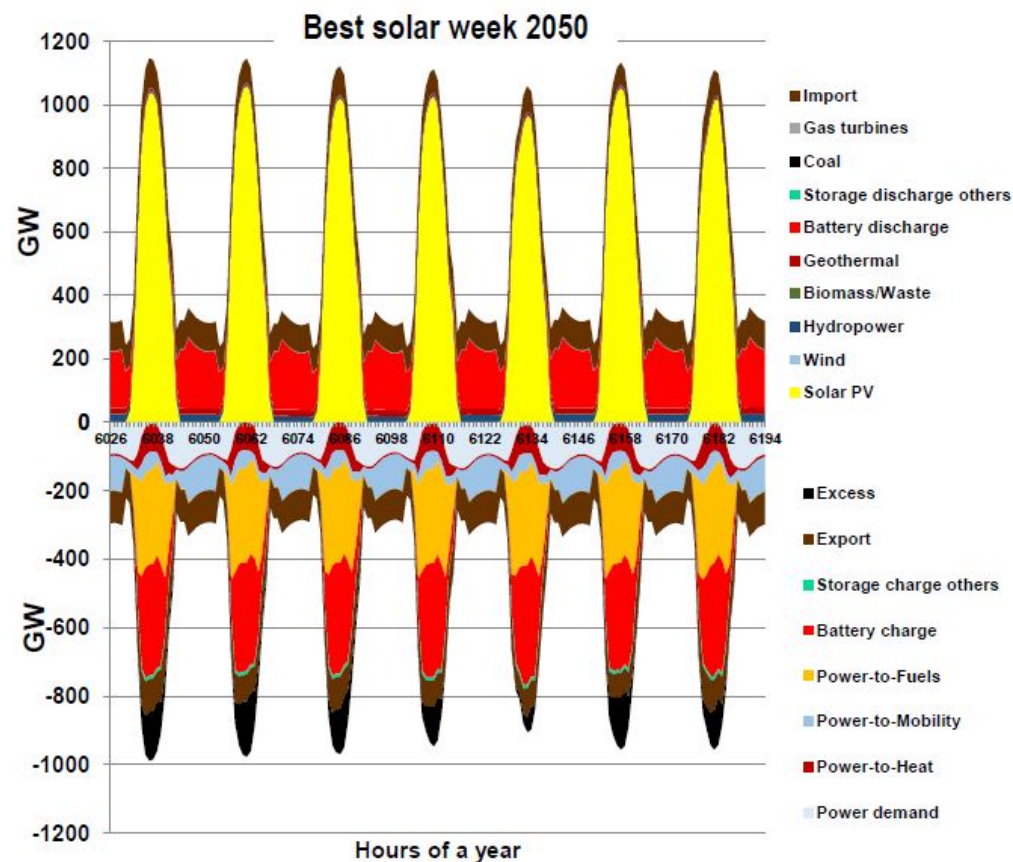
# Decarbonization efforts have to ramp up simultaneously overall energy system, this decade (2020-2030) is the critical period



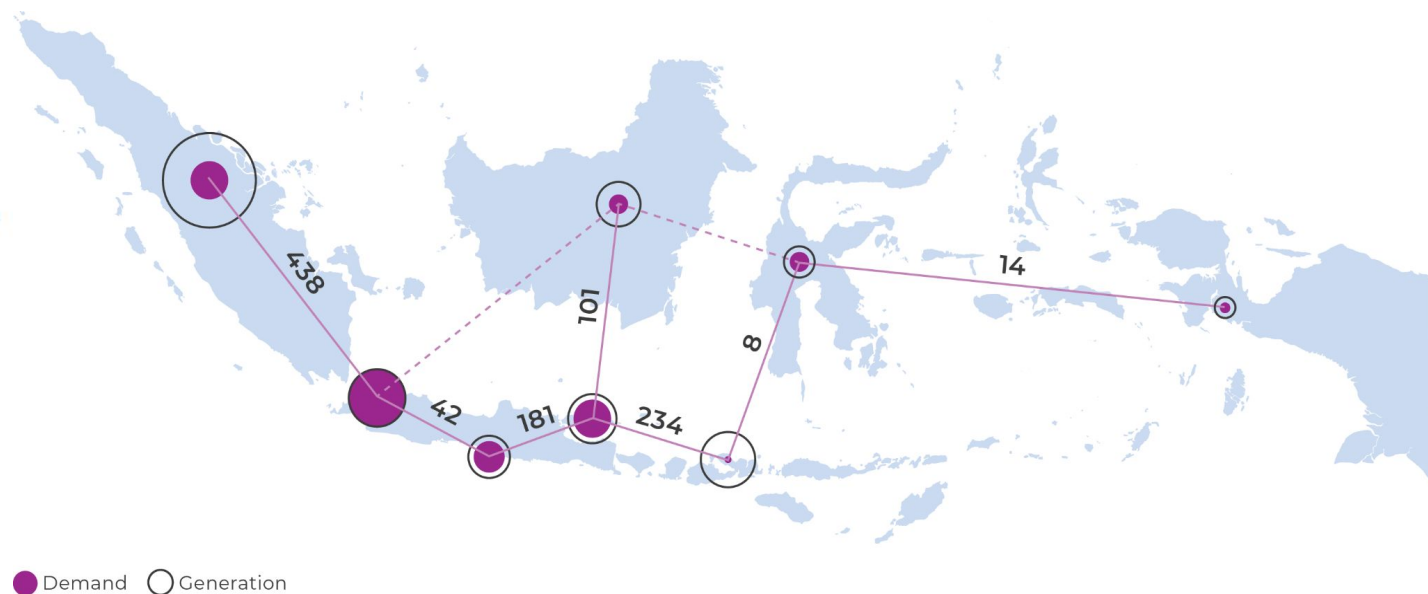
- By 2030, power sector would be key in delivering low carbon and affordable energy as electrification of transport and heat sector is becoming common.
- Renewable energy and supporting infrastructure investment have to scale up to 25-30 billion USD per year. Current renewable energy investment only reach 1.6-1.8 billion USD
- Indonesia is getting on track, with some notable development in the past year:
  - G20 Presidency - Sustainable energy transition as priority issue
  - Presidential Regulation 112/2022 on renewable tariff and early coal retirement roadmap
  - President Instruction 7/2022 on deployment of battery electric vehicle for public institution
  - Ministerial Regulation 26/2021 on rooftop solar

# Solar energy is the backbone of the energy system. Grid flexibility and integration is key.

Power Sector Demand and Supply Profile  
in a week in 2050

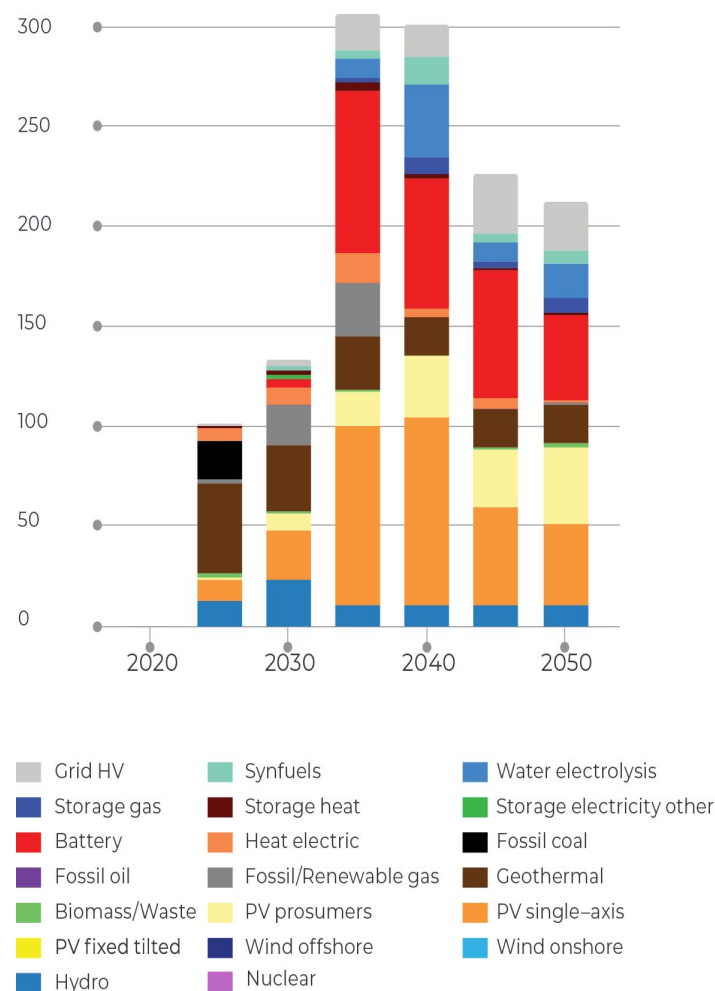


Electricity demand and generation across  
different island/power system in 2050



- Energy demand would still be centered around Java-Bali grid system where more than half of the population reside.
- Therefore interconnectivity between system and islands would give benefits in term of allowing for greater flexibility to integrate the VRE as well as utilizing the abundant RE in other less populated areas

# Multi-stakeholder participation must be encouraged to cover the required amount of investment for a zero emission energy system



Capex in 10-year intervals [b\$]	2030	2040	2050
PV utility-scale	35.7	183.2	89.8
PV prosumers	9.9	47.4	67.8
Battery	4.8	146.3	106.9
Geothermal	79.1	46.8	38.2
Hydro	36.2	22.2	21.8
Biomass/Waste	2.3	0.9	2.9
Water electrolysis	0	45.9	25.3
Synfuels	2.3	17.8	11.1
Heat electric	14.6	18.7	5.8
Storage gas	0.1	11.2	11.5
Storage heat	3.4	6.5	2
Storage electricity other	2.2	0	0
Grids HV	3.3	34.8	53.9
Fossil coal	19.3	0	0
Natural gas	21.7	26.6	0.6
Fossil oil	0.1	0	0.4
<b>Total</b>	<b>235</b>	<b>608.3</b>	<b>438</b>

- Annual energy system investment would grow to USD 45-60 billion after 2030
- Private and even general public participation are required to fill the investment gap.
- Investment from energy consumers (prosumers) could even fill up to 10-15% of investment requirement. Creating an enabling policy is prerequisite to nurture this investment.

# IESR will continue to provide evidence-based recommendation with the principle of just, affordable, sustainable energy transition toward zero emission energy system by 2050



Power



Transport &  
Industry



Economy

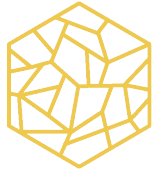
## Priority energy transition effort until 2025



## What IESR is currently working on

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"><li>• Moratorium and early retirement of coal fired power plant</li><li>• Accelerated renewable energy deployment</li><li>• Assist the MEMR into establishing the early coal retirement roadmap and pre-FS of wind, FPV, and PHES</li><li>• Power system model using PLEXOS</li><li>• Provide enabling environment for accelerating solar rooftop - solarhub.id, work with association</li></ul> | <ul style="list-style-type: none"><li>• Electrification of road transport and low grade heat demand</li><li>• Establish baseline and reference for industry, including SMEs</li><li>• Prepare decarbonization roadmap for five energy intensive industries in Indonesia and scoping out opportunity for SMEs</li><li>• Support national program for electric two-wheeler conversion</li></ul> | <ul style="list-style-type: none"><li>• Prepare development plan out of fossil economy</li><li>• Assist the regional government of Paser &amp; Muara Enim for their development planning</li><li>• Assist Central Java for becoming solar province</li><li>• Net-zero Bali 2045</li></ul> |
|--|---|---|





**INETTT**  
International  
Network of  
Energy Transition  
Think Tanks



**IESR**  
Institute for  
Essential Services  
Reform

# Thank You

*Accelerating Low Carbon Energy Transition*

 [www.iesr.or.id](http://www.iesr.or.id)

 [iesr.id](https://www.facebook.com/iesr.id)

 [iesr.id](https://www.instagram.com/iesr.id)

 [IESR](https://twitter.com/IESR)

 [iesr](https://www.linkedin.com/company/iesr)

