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# Indonesia's Energy Transition: Prospect and Challenges

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*Electric & Power Indonesia Exhibition: Road to Energy Transition*

Jakarta, 12 September 2019



# Energy Transition in Words

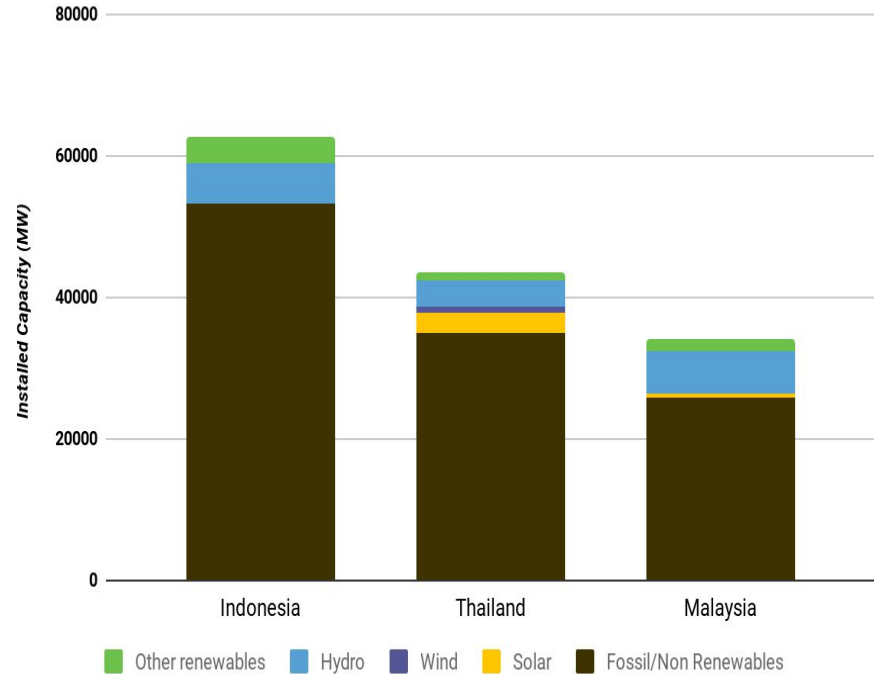
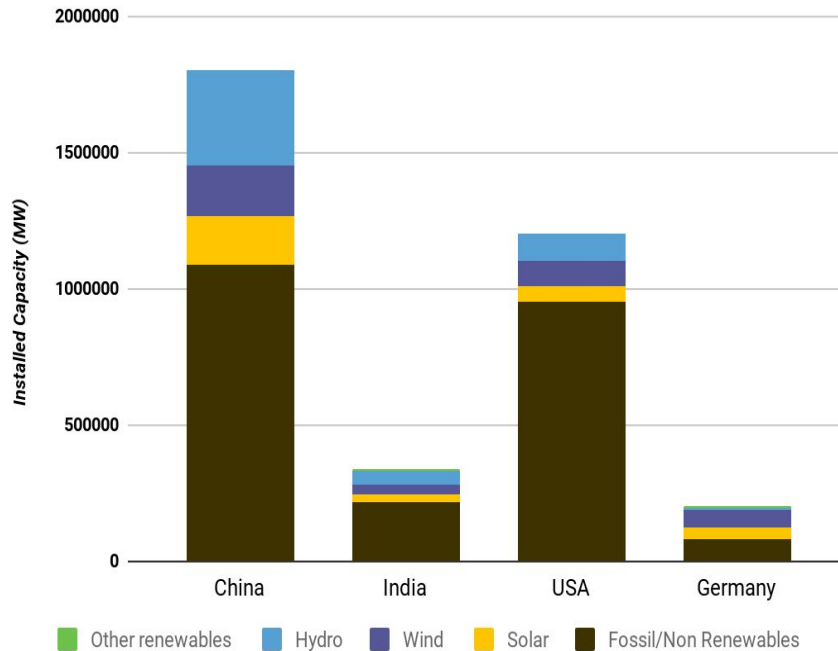
“The energy transition is a pathway toward transformation of the global energy sector **from fossil-based to zero-carbon** by the second half of this century.”  
(IRENA)

“The German Energy Transition or Energiewende is a long-term energy and climate strategy that is based on **developing renewable energy and improving energy efficiency.**” (Agora Energiewende)

“Fundamental **structural changes** in the energy sector.” (World Energy Council)



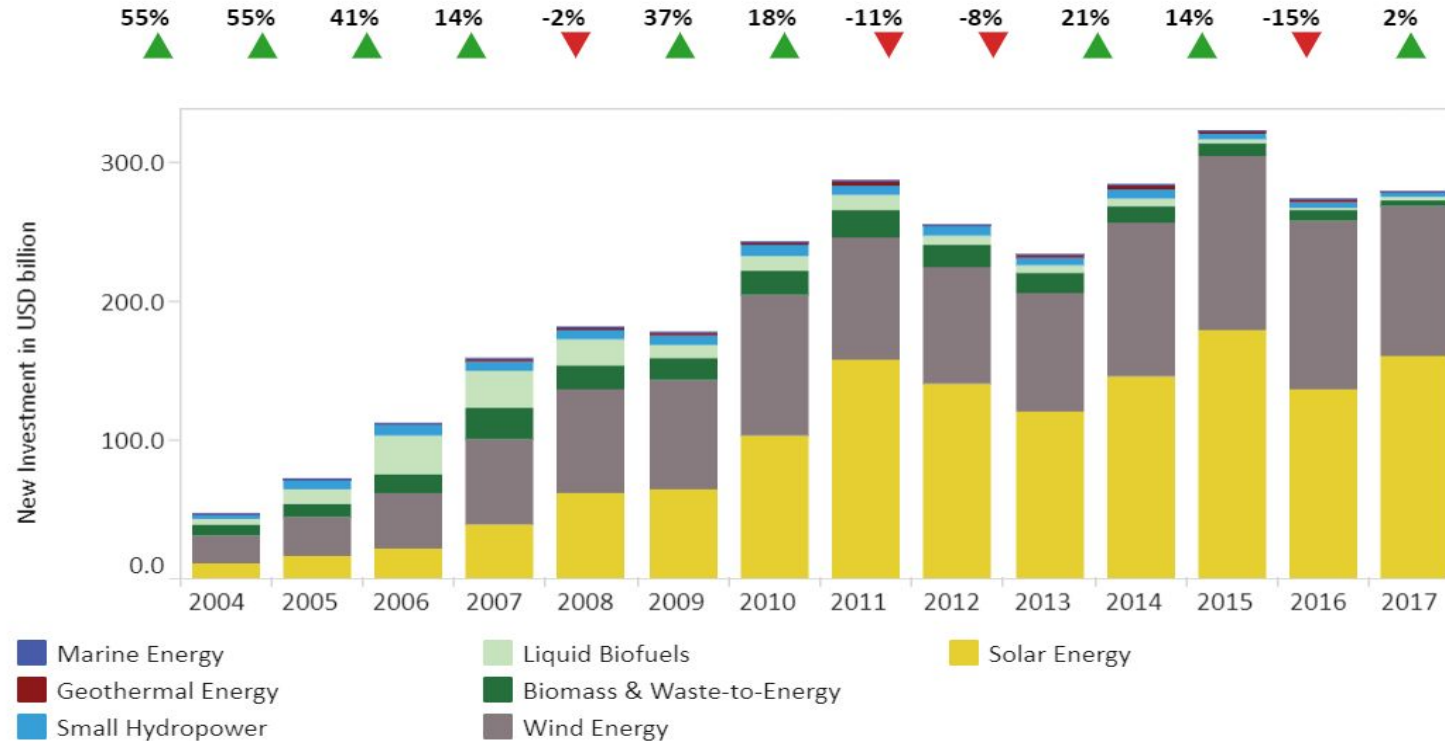
# Energy Transitions around the World



Source: IRENA, IEA



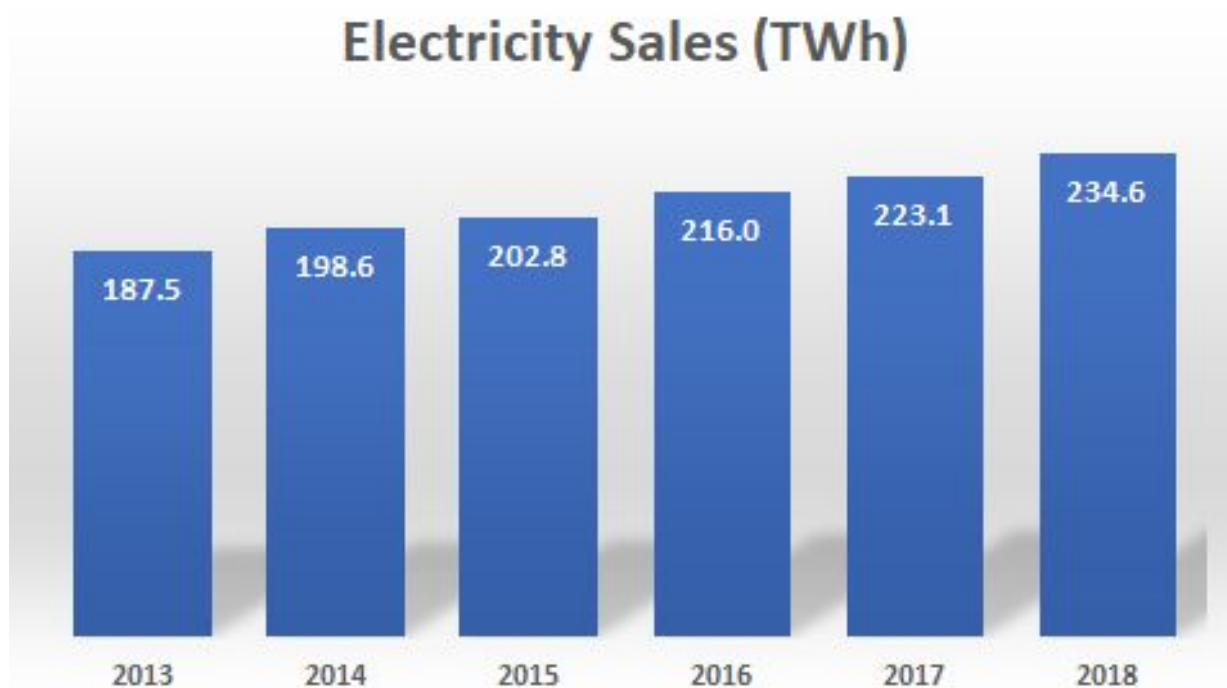
# Global Investment in Renewable Energy



Source: IRENA



# Growing electricity demand



Source: PLN





# Paris Agreement on Climate Change

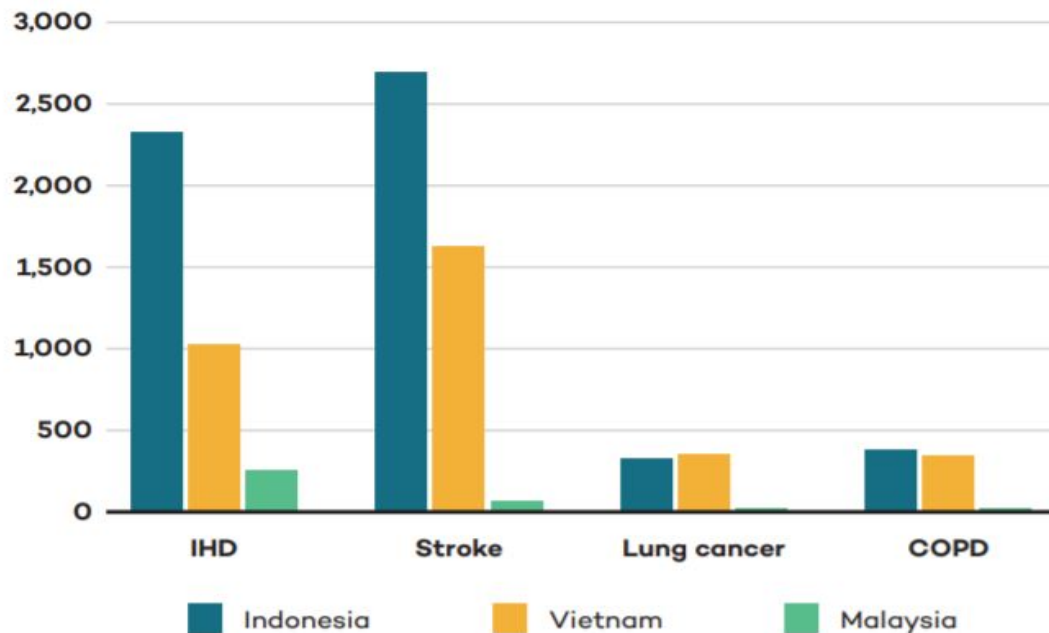


Indonesia committed to reducing emission by 29% under the Business as Usual scenario in 2030 up to 41% with international support.



# Increased coal-related health costs

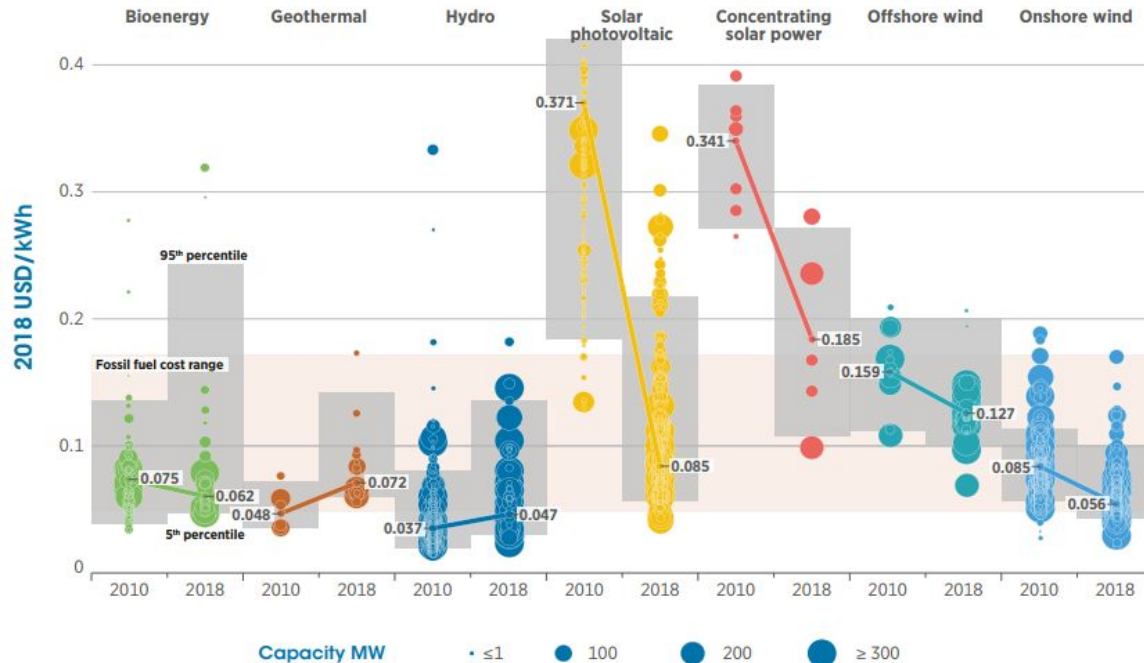
Number of coal-related deaths



IHD: = Ischemic Heart Disease  
COPD = Chronic Obstructive Pulmonary Disease

Source: IISD

# Renewable generation costs plummeting, stranded asset risk escalating



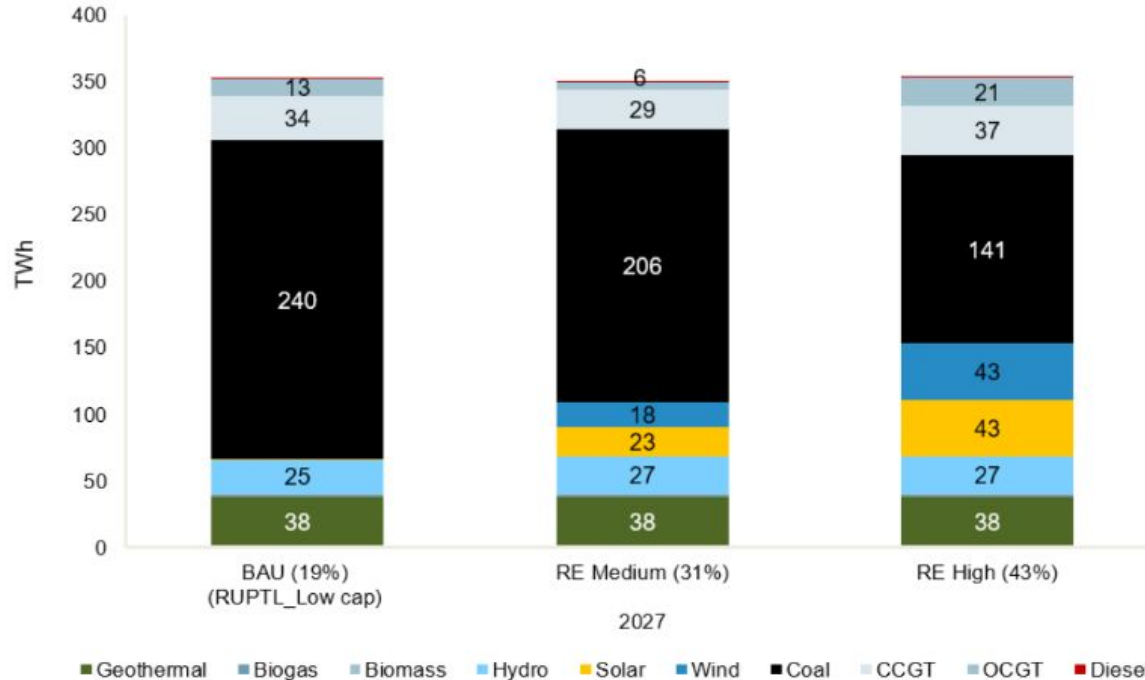
Source: IRENA, 2019



# The emergence of disruptive technologies



# 43% renewable share without needs for grid upgrade



- BAU: RUPTL
- RE Medium: 31% of RE share
- RE High: 43% of RE share



# Huge rooftop solar potential in Indonesia

## Residential Rooftop Solar Technical Potential in 34 Provinces in Indonesia



### Top 10 Provinces



### Total Residential Rooftop Solar Technical Potential, GWp



### Total Residential Rooftop Solar Market Potential, GWp

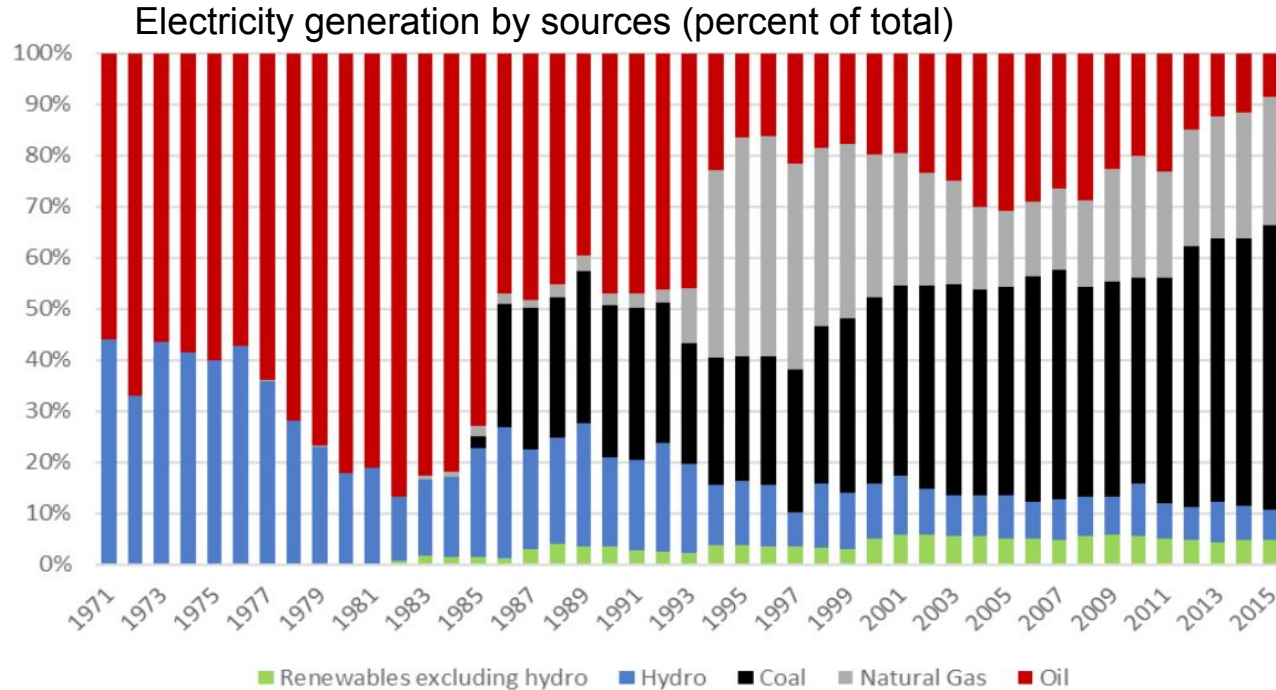


Scenario 1: 24% access factor | Scenario 2: 60% access factor | Scenario 3: 81% access factor | Scenario 4: 33% access factor

- Scenario 1: 24%
- Scenario 2: 60%
- Scenario 3: 81%
- Scenario 4: 33%



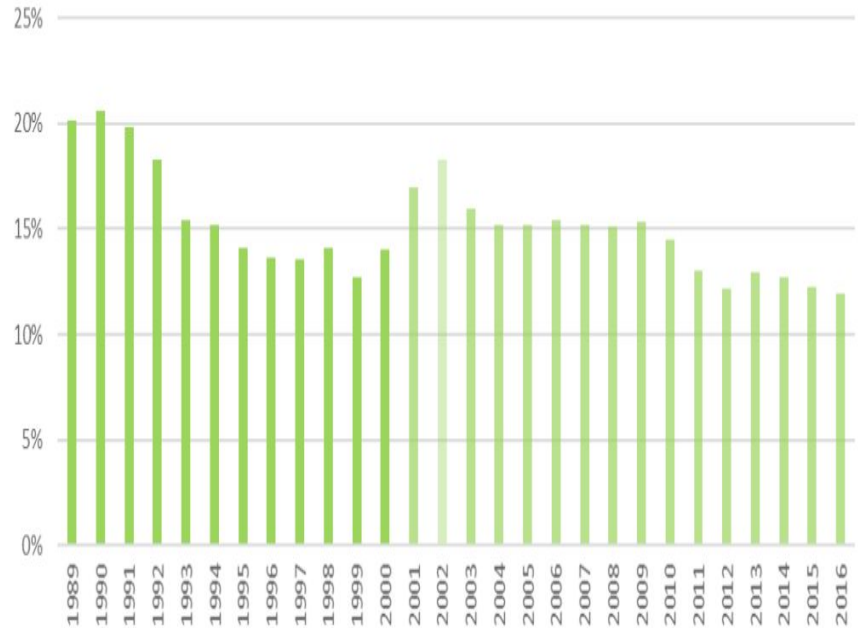
# Heavy reliance on coal to generate electricity



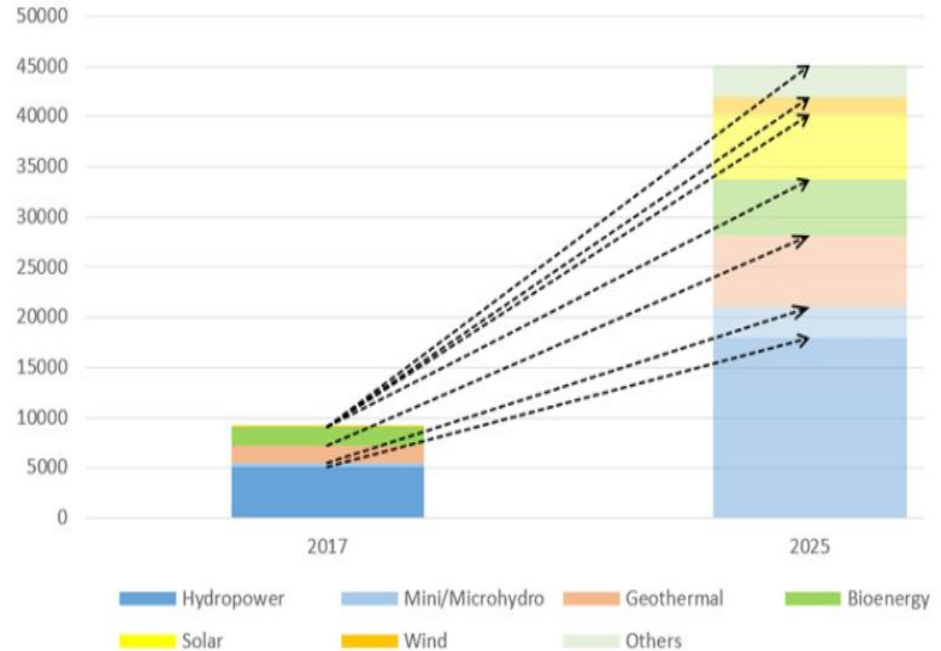


# Sluggish development of renewable energy

## Share of Renewables in Total Installed Capacity in Indonesia



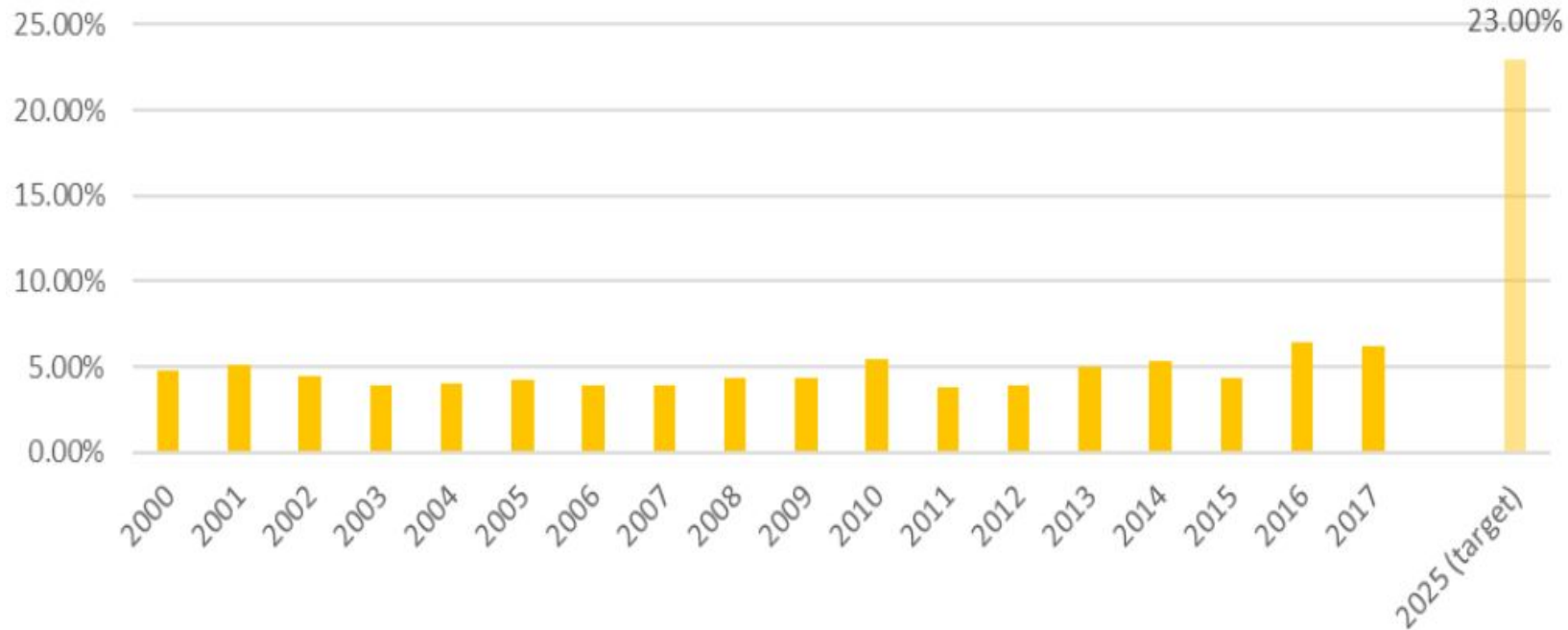
## 2017 RE Installed Capacity and 2025 Target





# A long way to go to meet the 23% renewable target

Share of Renewables in Primary Energy Mix





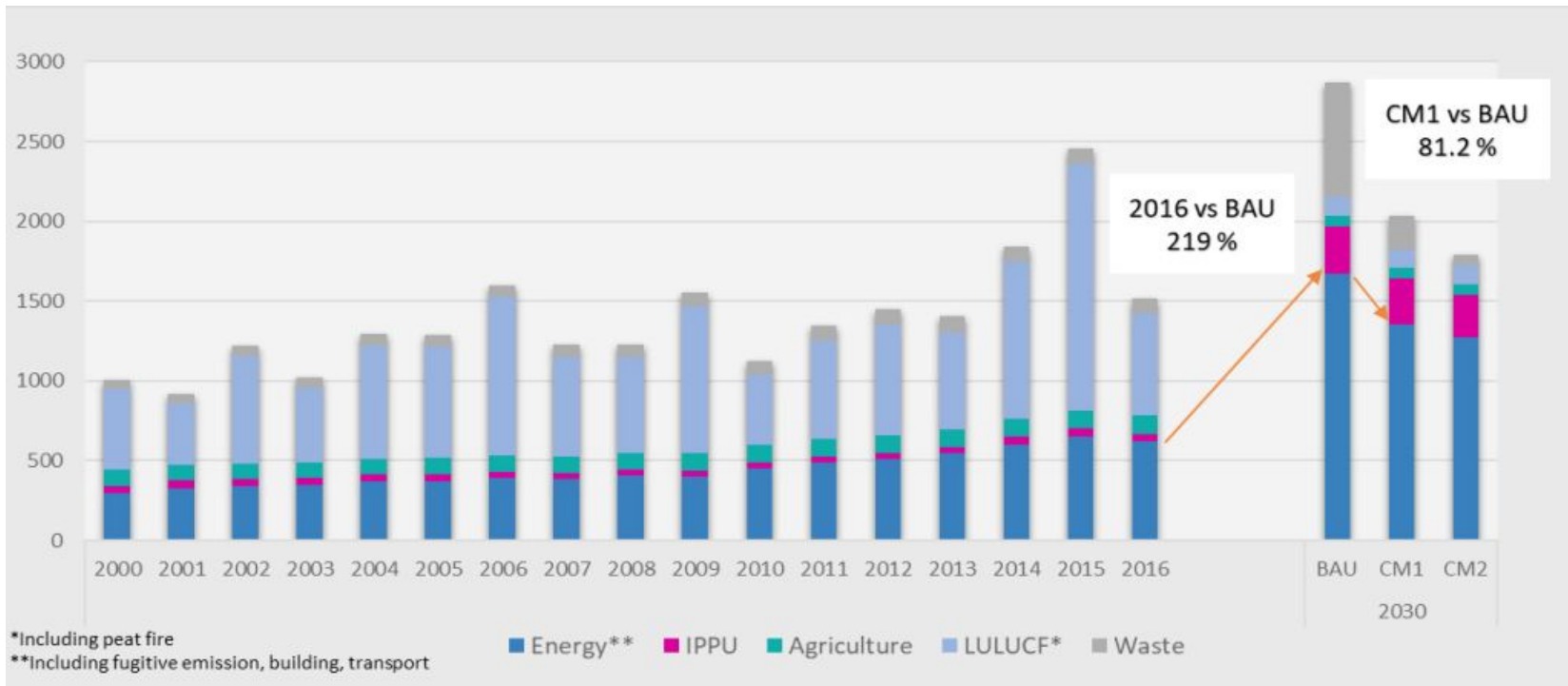


# Barriers to Energy Transition in Indonesia

- **Political economy:** coal interests (as government revenue and domestic energy sources)
- **Regulatory barriers:** lack of coordination between government institutions, regulatory uncertainties, and frequent regulatory changes
- **Market entry barriers:** energy subsidies for fossil fuels, regulated electricity tariffs, and unattractive renewable energy tariffs
- **Technical barriers:** geographic conditions, fragmented grids, and limited technical capabilities



# Reaching Indonesia's climate goal means gradual exit from coal-based electricity





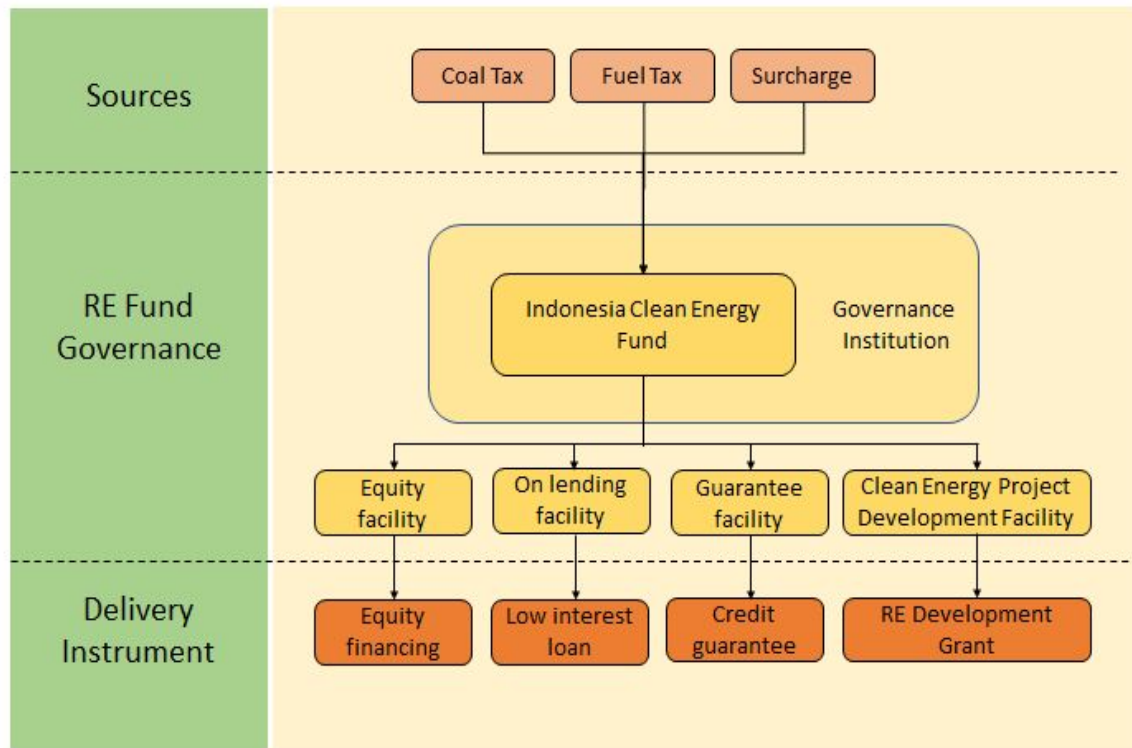
# Shifting the electricity subsidy for renewables development

Electricity Subsidy in Indonesia  
(Trillion Rupiah)



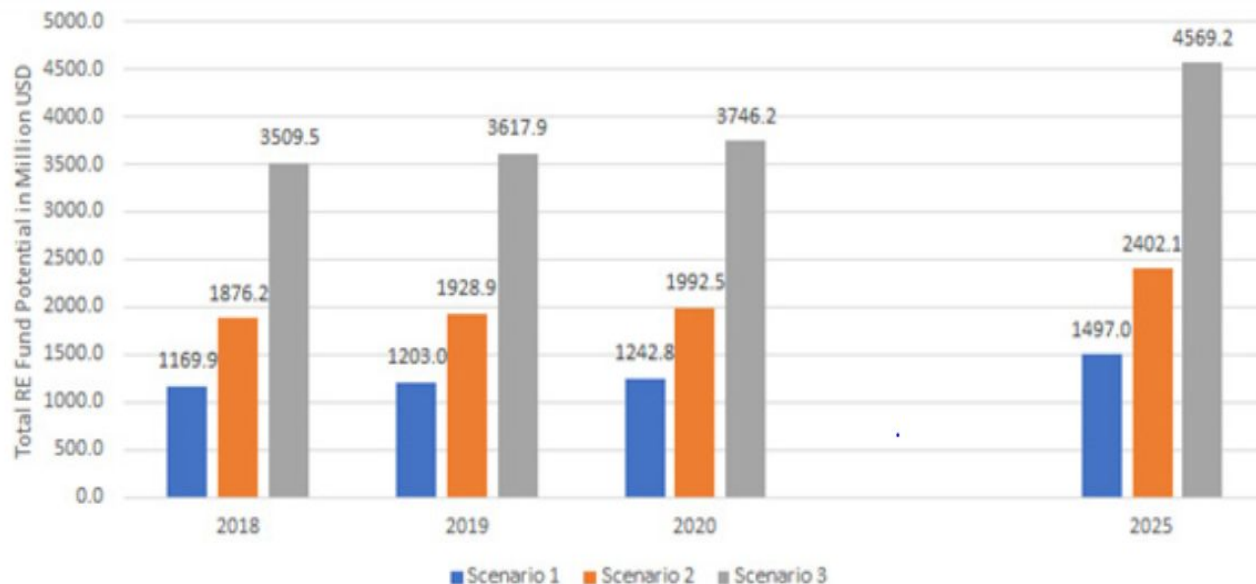


# Establishing Renewable Energy Fund





# Providing Financing Instruments for Renewables: Taxes on Coal Production and Fuel Oil, and Surcharge



## NOTE

- Scenario-1 : 1-4% coal tax, 2.5% fuel tax, 5% surcharge (R2/R3)
- Scenario-2 : 3% coal tax, 3.5% fuel tax, 15% surcharge (R2/R3)
- Scenario 3 : 5% coal tax, 7.5% fuel tax, 2% surcharge (R1), 15% surcharge (R2/R3)



# Thank You!

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