KEMENTERIAN KOORDINATOR
BIDANG PEREKONOMIAN
REPUBLIK INDONESIA

Landscape Approach and Energy Transition:
Role of State-Owned Companies

Deputy Minister for Food and Agribusiness,
Coordinating Ministry for Economic Affairs

Country Overview

Indonesia's Enhanced Nationally Determined Contributions (ENDC)

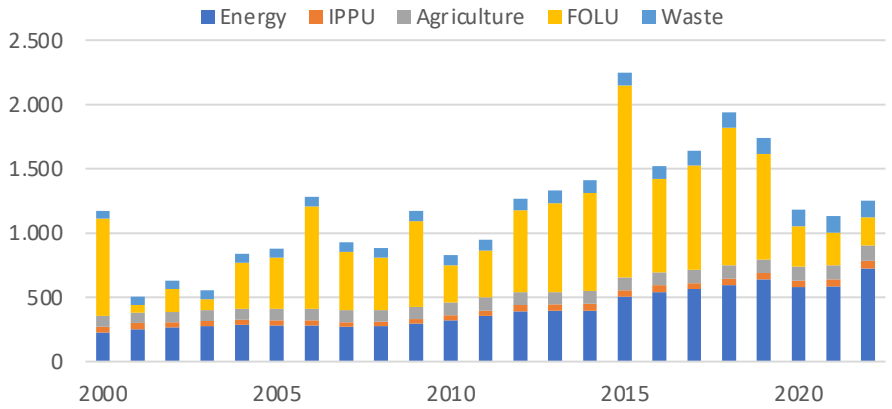
envisions an emission reduction of 31,89—43,20% across all sectors by 2030 below its business-as-usual scenario.

Sector	Projected Emissions in $MtCO_2e$ (2030)	Emission reduction (unconditional—conditional)
Energy	1.669	12,5—15,5%
Waste	296	1,4—1,5%
Industrial Processes and Product Use	69,6	0,2—0,3%
Agriculture	119,66	0,3—0,4%
Forestry and Other Land Uses	714	17,4—25,4%

Source: KLHK, 2022

Indonesia's historical GHG emissions 2000-2022

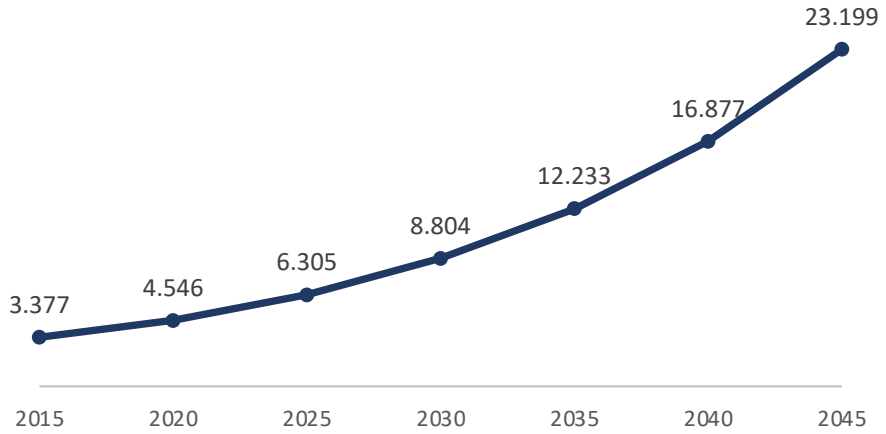
(in $MtCO_2e$)



Source: KLHK, 2024

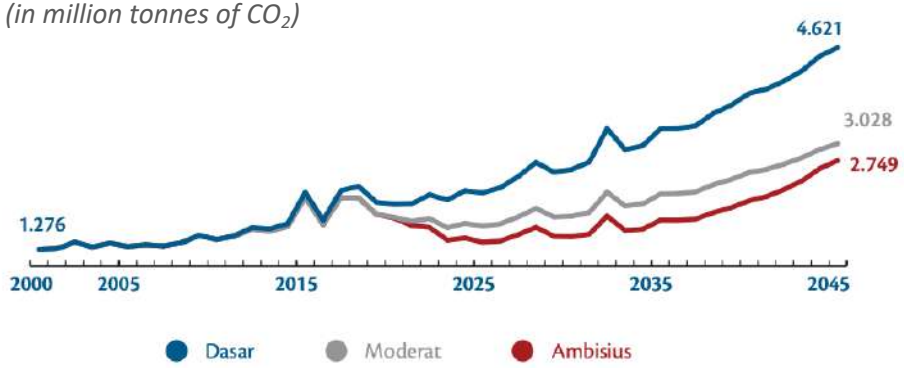
Indonesia's projected GDP per capita

(in USD)



Projected emission and pathways to reduction

(in million tonnes of CO_2)

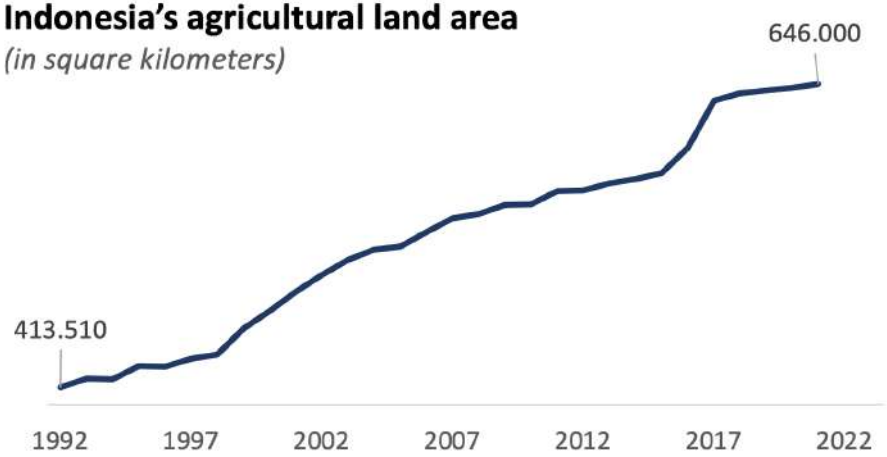


Source: Bappenas, 2023

Indonesia has also stated to reach **net-zero emissions by 2060**, underscoring the importance of ensuring economic, societal, and environmental wellbeing.

Integrated spatial planning is needed to address competing land use needs

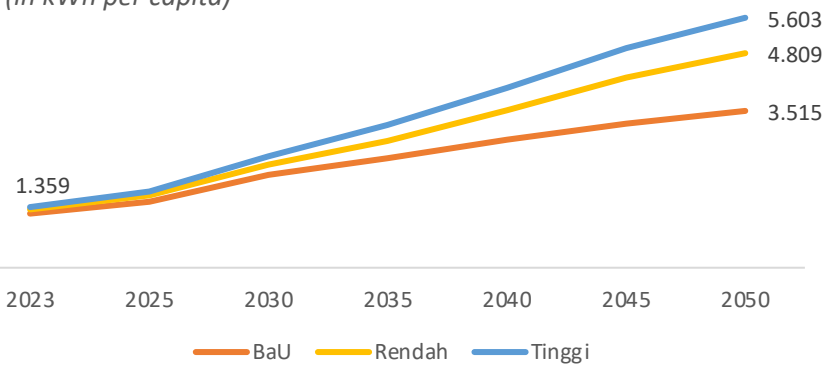
Indonesia's agricultural land area
(in square kilometers)



Source: World Bank, 2024; ASEAN, 2024

34% of Indonesia's total land area is for agriculture and the demand is rising as population grows. The same can be observed for energy consumption.

Energy consumption projection (RUKN Draft)
(in kWh per capita)



Source: ESDM, 2023

Energy production per spatial requirement by source

Energy source	Spatial energy density (TWh/km^2)
Biomass	0,001
Wind (onshore)	0,019
Wind (offshore)	0,034
Geothermal	0,043
Solar PV	0,087
Concentrated Solar Power (CSP)	0,178
Hydro	0,296
Coal (with CCS)	0,793
Coal (without CCS)	1,110
Oil	1,573
Natural Gas (with CCS)	2,523
Natural Gas (without CCS)	3,280
Nuclear	6,703

Source: Noland, J. K., et al, 2022

"A sixfold increase will occur in the spatial extent of power generation, from 0.5% in 2020 to nearly 3.0% of land areas will be used for electricity generation in 2050 [globally]."

require a **multistakeholder** and **multisectoral** collaboration in deploying a landscape approach to achieve **multiple** economic, social, and environmental **benefits**.

Modernizing Agriculture through Electrification

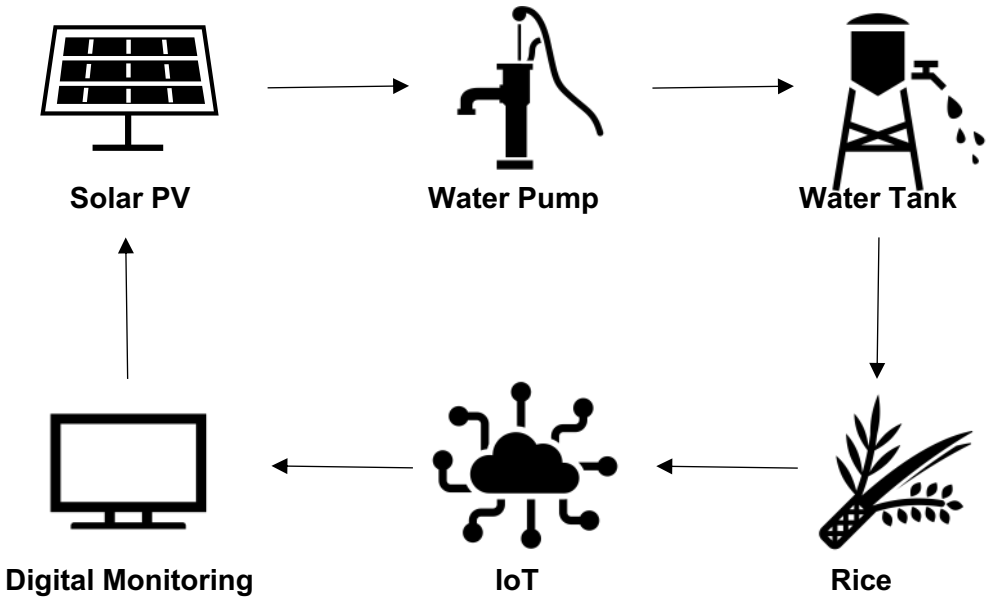

Bakti Relawan BUMN

- Water Pump System
- Land Preparation
- Drying
- Mills
- Chilling
- Milking Process
- Feed Processing
- Oil and Nut Presses
- Egg Incubators

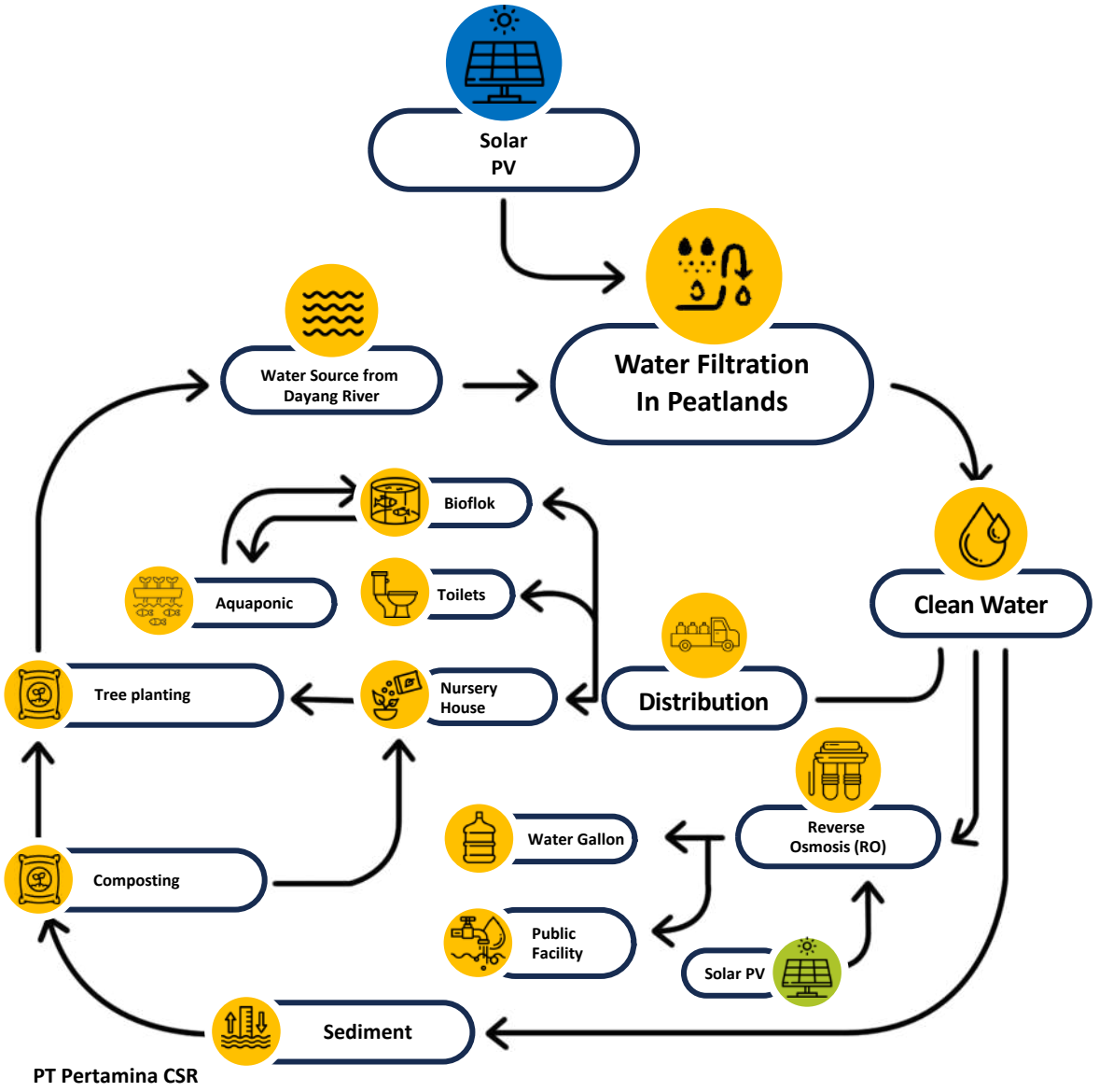
Deploying Solar PV for Irrigation System

Solar Power Plant for Irrigation System

27.5 kWp	Solar PV Capacity
83 Hectares	Size of Land
3 Times Harvesting	Harvesting
50 L/s	Pumping capacity

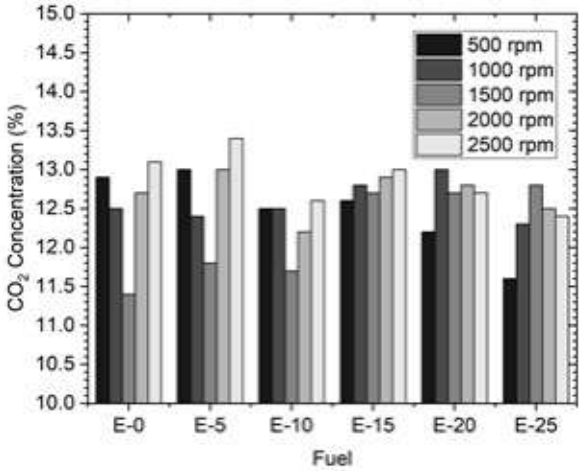


Clean energy for clean water: A state-owned company's CSR



Aquaponic	**6,6-7**	**Water PH**	**3x**	Revenue Increment	**2x** Water and Food Savings
	Rp 31.990.000/year	Annual Revenue			
Irrigation for Agriculture	**2x**	Yield increment	**Rp. 14.000.000/year**	Annual Revenue	
Reverse Osmosis	**71,4%**	Cost reduction	**2 Districts**	Market	
	101 gallon	Sales	**7.749 People**	Beneficiaries	
	Rp 184.325.000	Annual Revenue			
Piping/Distribution	**116 HH**	Beneficieries	**73 KK**	Beneficiaries	
Clean Energy for Infrastructure	**8 kWp**	Solar PV capacity	Innovation		
	10 kWh	Battery capacity			
	Rp16 Mn	Savings			
	15 ton CO_2 eq/year	Carbon reduction			

Carbon pricing as a catalyst to propel green transition



Source: Iskandar R, et al, 2022

- There are 259 dams with an area of about 73.5 thousand hectares that have the potential to produce 14 thousand to 25 thousand megawatts.
- Floating solar power plants on dams have the potential to result in 5.4-8.1 trillion rupiah of carbon revenues or around 4.8-7.2% of the investment value.
- Case study: Cirata Floating Power Plant

- In the General Energy Plan/RUEN, the government targets 11,6 million kiloliters of biodiesel to be supplied in 2025.
- Synergies between state-owned companies such as PT Pertamina, Garuda Indonesia, and PT Dirgantara Indonesia (PTDI) have also contributed to the success of the pilot testing of bioavtur/SAF 2.4.
- To support B40 implementation next year, roughly 17 million kiloliters of crude palm oil must be supplied.

- Bioethanol is targeted to be produced at 3,4 million kilolitres in 2025.
- Presidential Decree No. 40/2023 concerning the Acceleration of National Sugar Self-Sufficiency and the Provision of Bioethanol as Biofuel.
- Thorough examination of the life-cycle emissions of bioethanol must be considered.
- One research shows a 30% emission reduction using E25 (Iskandar R, et al, 2022)

THANK YOU

THE COORDINATING MINISTRY OF
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