Country Report
Indonesia Policy Toward Carbon Neutral

SKEM

Nomor SHE:

Tingkat Hemat Energi
SEMAKIN BANYAK BINTANG SEMAKIN HEMAT

Radityo Cahyo Yudanto
Energy Conservation Analyst

Presented on :
ECAP 34

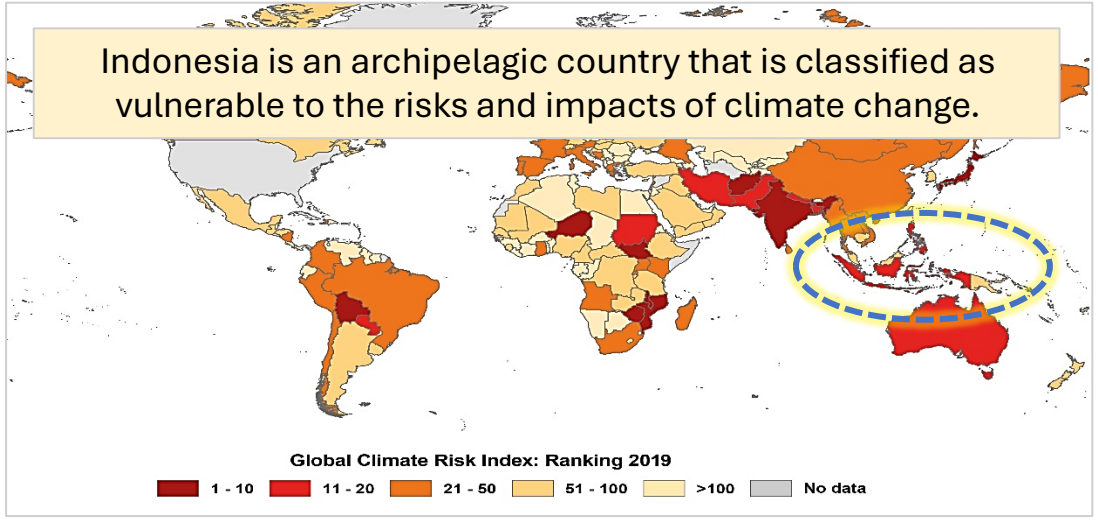
Tokyo, November 13th 2024

INDONESIA COMMITMENT IN CLIMATE CHANGE

"Since 1981-2018, Indonesia has experienced a temperature increase trend of around **0.03°C** per year." *Source: BMKG (2020)*

"Indonesia is experiencing a sea level rise of **0.8-1.2 cm/year**, while around **65%** of its population lives in coastal areas." *Source: Bappenas (2021)*

"Climate change has increased the frequency of disaster events by **82%** since 2011-2021."
Source: BMKG (2023)



Sumber: German Watch – Climate Risk Index (2021)

PARIS AGREEMENT

Keeping the global temperature increase no more than 2°C, with efforts to reduce, less than 1.5°C.
(COP 21, ratification in National Constitution 16 / 2016)

Enhanced NDC (E-NDC)

Achieving a reduction in greenhouse gas emissions of **31.9%** (unconditional), and **43.2%** with international support (conditional) by 2030.
(COP 27 Egypt, proposed in LTS-LCCR 2050 document)

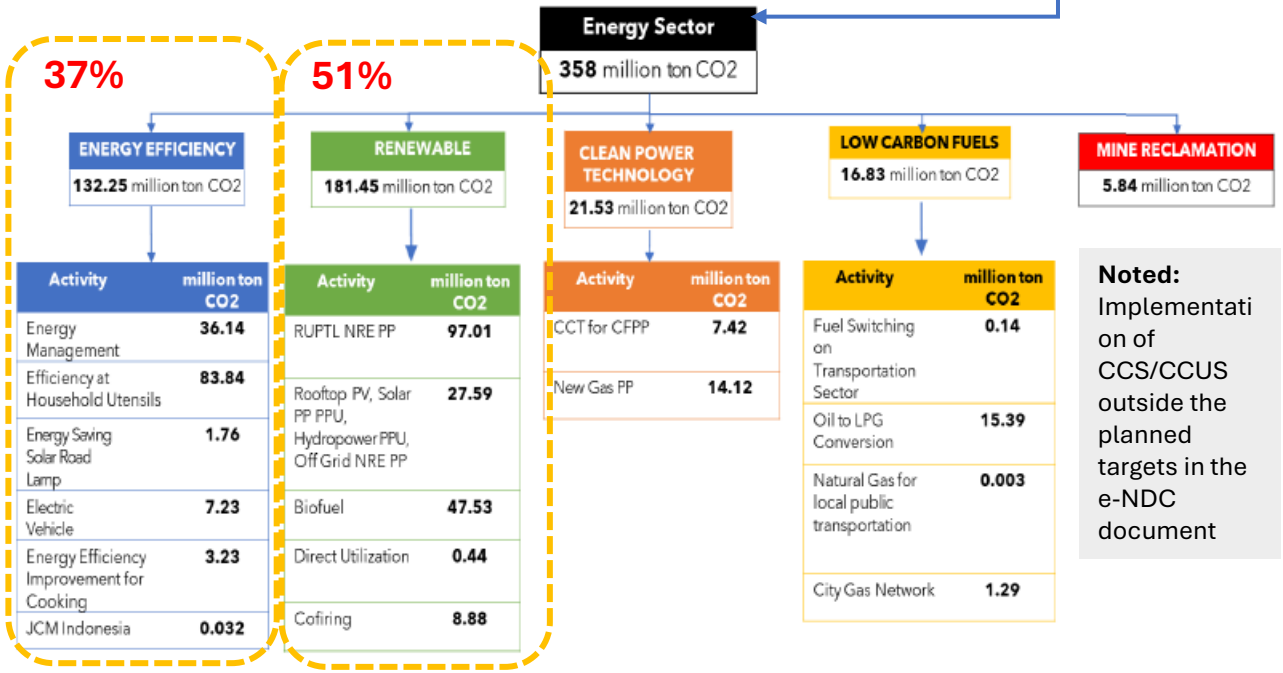
Net-Zero Emission (NZE)

Achieving net zero conditions, with a 2060 energy sector emissions target of **129** million tCO2e (around 95% of business-as-usual).
(COP 26 Glasgow, planned)

E-NDC COMMITMENT IN ENERGY SECTOR

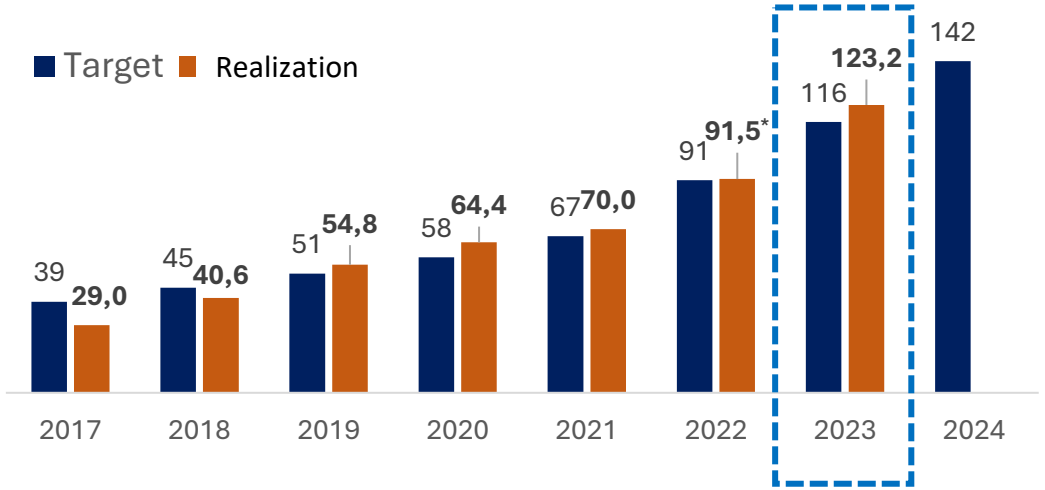
ENHANCED NDC 2030

No	Sector	GHG Emission 2010 (Million Ton CO_2e)	GHG Emission in 2030			Emission Reduction	
			BaU	CM1	CM2	CM1	CM2
1.	**Energy**	**453,2**	**1.669**	**1.311**	**1.223**	**358**	**446**
2.	Waste	88	296	256	253	40	45,3
3.	IPPU	36	70	63	61	7	9
4.	Agriculture	111	120	110	108	10	12
5.	Forestry	647	714	217	-15	500	729
	TOTAL	**1.334**	**2.869**	**1.953**	**1.632**	**915**	**1.240**



Noted: Implementation of CCS/CCUS outside the planned targets in the e-NDC document

GHG REDUCTION REALISATION ON ENERGY SECTOR

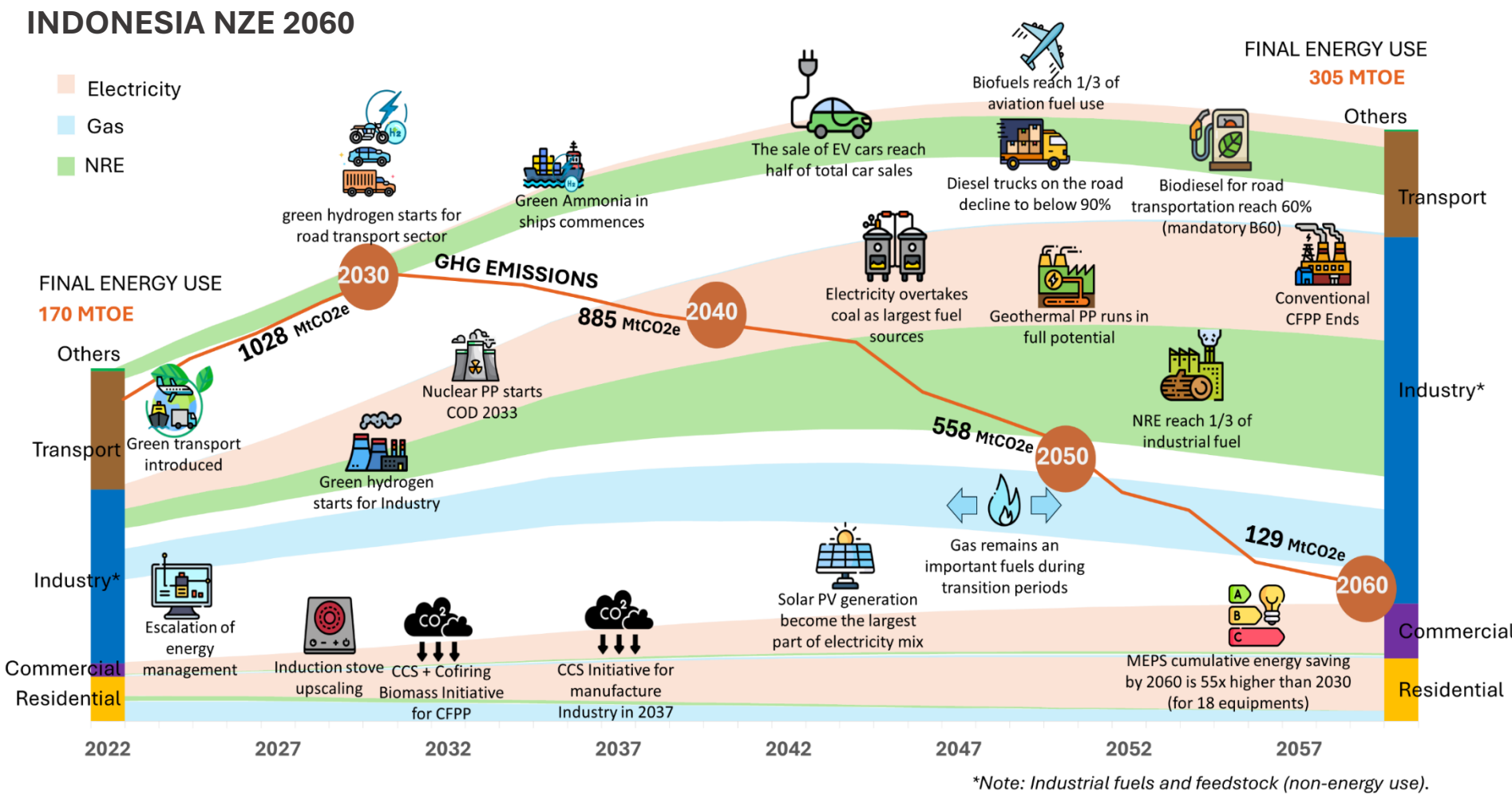


Unit | Million Ton CO_2e

No	Mitigation Activity	2023		Target 2030	% Achieve from Target 2030
		Target	Real		
1	**Energy Efficiency**	**29,14**	**31,87**	**132,25**	**24,1%**
2	New and Renewable Energy	51,00	51,29	181,45	28,3%
3	Low Carbon Fuel	15,92	15,55	16,83	92,4%
4	Clean Generation Technology	16,54	13,33	21,53	61,9%
5	Other Activity	3,95	11,18	5,84	191,4%
	TOTAL	**116,45**	**123,22**	**358,00**	**34,4%**

NZE ROADMAP IN ENERGY SECTOR

Reduction of NZE emissions in 2060 by 95% from the BaU scenario through optimization of the supply side by increasing renewable energy and optimizing demand by implementing energy efficiency.



*Note: Industrial fuels and feedstock (non-energy use).

Sumber: Draft Net-Zero Emission Indonesia 2060 (EBTKE, 2024)

NZE STRATEGY

1. **Efficiency Energy** (Energy Mgmnt, MEPS, Labelling, dll.)
2. **Elektrification** *(*EV, Industrial Electrification, dll.*)*
3. ***Phasing down* PLTU** (New Coal Moratorium, early retirement, or Conversion).
4. **NRE Development** (on-grid, off-grid & Biofuel)
5. **New Energy Resource** (e.g. nuclear, hidrogen, ammonia, dll.)
6. **CCS/CCUS**

REGULATION TOWARD CARBON NEUTRAL

01 National Constitution No .16 / 2016

Ratification of the Paris Agreement to The United Nations Framework Convention on Climate Change.

"Commitment to reduce Greenhouse Gas (GHG) emissions through submission of the Nationally Determined Contribution (NDC) document"

02 National Constitution No. 7 / 2021

Harmonization of Tax Regulations
”Implementation of Carbon Tax on Coal Generation Power Plant”

03 Gov Regulation No. 46 / 2017

Environmental Economic Instruments

"Emissions Trading is an incentive/disincentive mechanism in Environmental Economic Instruments"

04 Presidential Reg No 98 / 2021

Implementation of Carbon Economic Value for Achieving Nationally Determined Contribution Targets and Controlling Greenhouse Gas Emissions in National Development

"The implementation of the Carbon Economic Value (NEK) is carried out through a carbon trading mechanism."

05 MEMR Reg No 22 / 2019

Guidelines for Implementing GHG Inventory and Mitigation in the Energy Sector

"GHG inventory reporting obligations for business actors in the energy sector to the Ministry of Energy and Mineral Resources"

06 MEF Reg No 21 / 2022

Implementation of Carbon Economic Value
“Regulation of implementation of NEK at national level, including carbon trading mechanism”

07 MEMR Reg No 16 / 2022

Procedures for Implementing the Carbon Economic Value of the Electric Power Generation Subsector
"Regulation of the implementation of NEK in the electric power generation subsector"

08 Financial Authority Reg No 14 / 2023

Carbon Trading through Carbon Exchange

“Regulation, licensing, supervision, and development of carbon trading through carbon exchange”

MITIGATION TO REDUCE GHG EMISSION IN ENERGY SECTOR

"Control efforts to reduce risks due to climate change through activities that can reduce emissions or increase GHG absorption and storage/strengthening of carbon reserves from various emission sources"

a. NRE Utilization (geothermal, hydro power, wind power, biomass, biofuel, solar power, sea power, dan etc)


Geothermal


Hydro Power


Wind Power


Solar Power


Biomass Power


Ocean Current Power


Ocean Wave Power

b. Utilization of clean coal and gas power generation technology


Ultra Super Critical Coal PP


Steam Gas PP

c. Subtitute energy from high carbon fuel to low carbon fuel


Coal

Fuel


Gas

d. Technology Efficiency (Energy Conservation)

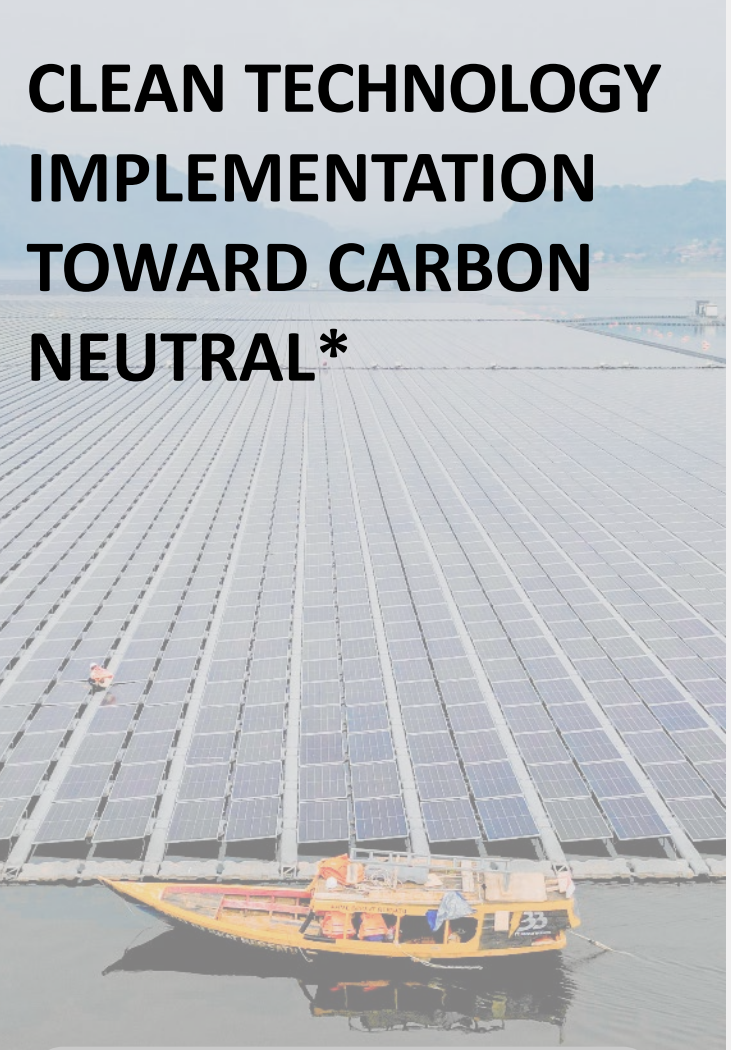

Train


Aircraft


LED


Turbine

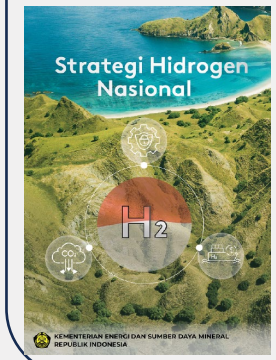
CLEAN TECHNOLOGY IMPLEMENTATION TOWARD CARBON NEUTRAL*



The projection of the renewable energy mix in 2023 is 13.1%

Hydrogen and Ammonia

- Socialization of **National Hydrogen Strategy** Document in December 15th 2023



- **Hydrogen and Ammonia National** Roadmap (in progress)
- Preparation **of Business Regulations and Licensing**(inprogress)
- Inauguration of the **First Green Hydrogen Plant** in Indonesia – Muara Karang Hydrogen Plant

Biofuel

Biodiesel realization

12,2 million kL

Market trial bioethanol (E5)

Commercial flight bioavtur (J2.4)

Cofiring

In 44 Coal Power Plant

1,04 TWh *green energy*

Implementation of NRE PP

NRE PP Total Installed Capacity

13.155 MW

Hydro	6.784 MW	Bio	3.195 MW	Wind	154,3 MW
Solar	573,8 MW	Geo	2.417 MW		

EV Implementation

Two Wheel	Four Wheel	EV Conversion
152.280 unit	43.789 unit	346 unit

Emission Reduction and Energy Conservation

GHG Emission Reduction	Energy Saving
31,87 Million ton CO_2e	10,42 Million BOE

*Data status by January 2024

Government Regulation No. 33/2023 : Energy Conservation

Energy Conservation : systematic, planned and integrated efforts to conserve domestic energy resources and increase the efficiency of their use.

Main points of Gov Reg No. 33/2023 :

1. **Energy Management** Implementation (ISO 50001)
2. Lowering the **energy consumption threshold** to determine of energy management obligations :
   a) Energy Producer ≥ 6000 TOE
   b) Energy User:
      - Industrial Sector ≥ 4000 TOE
      - Transportation Sector ≥ 4000 TOE
      - Building Sector ≥ 500 TOE
3. Mechanism for implementing energy conservation in the central and regional government
4. Development of ***Energy Service Company*** **(ESCO)**
5. **Minimum Energy Performance Standards (MEPS)**
6. Other strategic aspect (financing, cooperation etc.)

Energy Conservation on the Downstream Side

Improve energy efficiency

carried out through the implementation of energy-saving behavior and/or the **implementation of energy-saving technology**

carried out in **energy supply activities** (exploitation of energy resources and energy production) and **energy utilization** (industrial, transportation, building and household sectors).

Energy Producer	Energy source user	Energy User
1 **Energy Management**	4 ***Energy Services Company*** **(ESCO)**	7 Innovation and research
2 **MEPS & Labelling**	5 Public Awareness	8 Cooperation
3 Financing	6 Capacity Building	

"regulate on Gov Reg No. 33 /2023"

ENERGY MANAGEMENT MANDATORY

Energy Management must be carried out by Energy Producer, Energy Source Users, and Energy Users if energy consumption in one year exceeds a certain threshold.

Threshold Energy Mgmt in Gov Reg 33/2023

Energy Producer **≥ 6000 TOE**	Industrial Sector **≥ 4000 TOE**	Transport Sector **≥ 4000 TOE**
Building Sector **≥ 500 TOE**	Central and Regional Government **Must**	

Energy Management

1. Energy Manager Appointing
2. Have energy conservation program
3. Conduct Energy Audit
4. Imlement Energy Audit Recommendation

Report to Government (MEMR)

Estimation of the Impact of Threshold Changes on Energy Management

Noted : baseline from Gov Reg 70/2009 Energy Conservation

Saving Potential (in 2030)	Energy Producer	Indus-Trial	Transpor-tation	Building	TOTAL
Energy	3,56 Million TOE	5,28 Million TOE	0,4 Million TOE	66 Thousand TOE	**9,9 M TOE**
Cost	Rp. 9,4 trillion	Rp. 20,8 trillion	Rp 4,2 trillion	Rp 0,9 trillion	**Rp 35,3 T**

Energy Management Implementation (2023)

Note: From 331 Company (Industrial and energy producer) EM Reporting.

10,42 Million BOE
Energy saving

Rp 8,1 Trillion
Cost saving

8.4 M tCO2e
Emission Reduction

Energy Conservation Investments (2023)

Note: **253** from 331 company report investment of energy conservation activity.

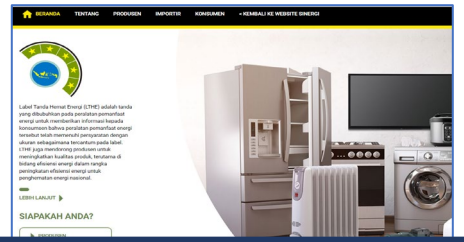
973 Activity
EC Investments

Rp 6,71 Trillion
Total Investment Value

MINIMUM ENERGY PERFORMANCE STANDARDS (MEPS) & LABELLING

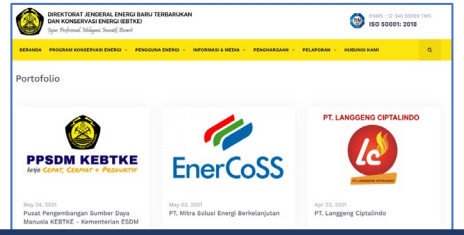
INTEGRATED DIGITAL PLATFORM : ENERGY CONSERVATION INFORMATION SYSTEM ("SINERGI")

https://simebtke.esdm.go.id/sinergi/

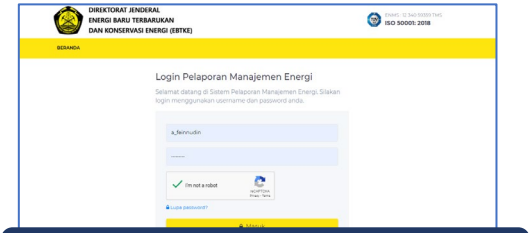


MEPS Database

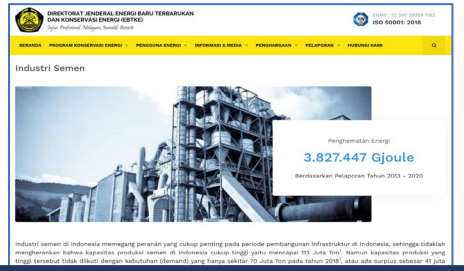
EE Certification Personnel



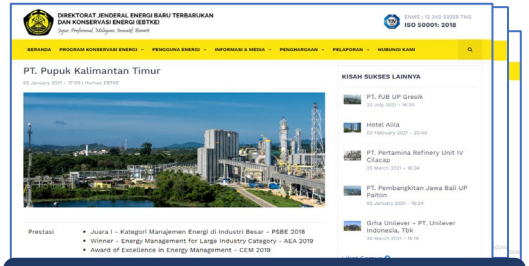
ESCO Information



EM Reporting System (POME)



Benchmark



Success Story, etc.

Target until 2030: MEPS implementation for **11 Appliances** (min.), with potential GHG reduction from MEPS Mandatory around **83.8 M tonne CO2e.**

MEPS Achievement (%) (2023)

Energy Saving (2023)

Energy saving realization around **2,07 TWh**, electricity cost reduction **Rp 3 Trillion**, dan emission reduction **2,18 M tonne CO2**.

No.	Appliances	Production/ Import (unit)	Energy Saving (GWh)	Emission Reduction (M tonne CO2)	Energy Saving (Rp Trillion)
1	Air Conditioner	2.616.326	1.907,91	1,76	2,76
2	Rice cooker	4.868.459	5,84	0,27	0,000008
3	Refrigerator	1.466.035	158,66	0,15	0,23
		TOTAL	**2.066,57**	**2,18**	**2,99**

CARBON ECONOMIC OPPORTUNITIES FOR EMISSION REDUCTION IN ENERGY SECTOR

EMISSION REDUCTION MONETIZATION THROUGH CARBON TRADING PLATFORMS

IDXCarbon
Indonesia Carbon Exchange

Volumes currently traded (power sector projects):

1,36 juta tCO2e

(based on SRN PPI KLHK per August 23th 2024)

The MEMR c.q. Directorate of Energy Conservation is currently providing assistance to **5 companies** (7 entities) for the preparation of the SPEI Mitigation Action Plan. A total of 10 energy sector projects have been approved and received catalytic funds of **Rp 718 million** from BPDLH, with an estimated potential emission reduction of **5.5 million tCO2.**

CJ CHEILJEDANG
INDONESIA POWER
Otsuka PT Amerta Indah Otsuka
SIDOMUNCUL
PLN Nusantara Power

ECV (Economic Carbon Value) Validator :

- Mutuagung Lestari
- Sucofindo
- TUV Nord Indonesia
- TUV Rheiland Indonesia

GHG MITIGATION ACTIONS IN THE FRAMEWORK OF ENERGY EFFICIENCY AND EMISSION REDUCTION MONETIZATION POTENTIAL

No	Mitigation Action	GHG Estimated Reduction(tCO2)	Company
1	Improve Boiler Efficiency	75.482	PT Cheil Jedang Indonesia (Jombang)
2	Turbo Chiller Replacement	484.839	
3	Recovery Condenser Heat Pump Installation	73.331	PT Cheil Jedang Indonesia (Pasuruan)
4	*Upgrade* evaporation and crystallization (from 1 to 3 unit)	113.850	
5	*Upgrade* evaporation and crystallization (from 1 to 5 unit)	258.609	
6	Energy Efficiency Program in Factory	16.201	PT Amerta Indah Otsuka
7	*Biomass boiler* utilization in production unit	68.616	PT Sidomuncul
8	Using *Combined Cycle* (Add On) Gas Power Plant	4.128.851	PT PLN Indonesia Power
9	Conversion from *Single Cycle Generator* to *Combined Cycle* Block 2 PLN NP UP Muara Tawar	167.293	PT PLN Nusantara Power (UP MTW)
10	Operation of Oil Gas Power Plant in Sumbagut 2 *Peaker* 250 MW	179.212	PT PLN Nusantara Power (UP Arun)
	TOTAL	**5.566.248**	

Total monetization from 10 Program SPEI under BPDLH =
Rp 327,30 billion (20,9 million USD)
*Carbon price Rp 58.800/tonCO2 (~4 USD/tonCO2) based on carbon price August 23th 2024.

Source: Carbon Price IDX (https://idxcarbon.co.id/id/data-daily), ***1 USD** = 15.600 IDR*

CHALLENGE AND OPPORTUNITIES

DECARBONIZATION DEVELOPMENT CHALLENGE

1 Economy and Technology

- Requires high technology and is still imported;
- good engineering practices to encourage the reliability of the electric power system; and
- relatively expensive compared to fossils.

2 Infrastucture

- Supply of renewable energy generators far from the demand load; and
- Availability of supporting infrastructure in the development of renewable energy developed in-situ.

3 *Supply & Demand*

- Temporary oversupply conditions in the JAMALI system until 2028; and
- EBT supply centers tend to be far from load centers.

4 Funding

- High investment value of 28.5 billion USD per year;
- limited funding, especially concessional loans;
- high investment risk (example: geothermal).

5 Social Response

- Governance balances the social aspect (people centered development); and
- Indonesia is the largest coal supply chain country.

OPPORTUNITIES

	Supply	*Demand*
Policy Support	▪ *Feedstock Availability* ▪ Carbon tax ▪ Carbon trade ▪ *Early Retirement Coal PP*	▪ Energy Management; ▪ MEPS ▪ Eco Labelling
Infrastructure	▪ *Super Grid* ▪ *Power Wheeling*	▪ EV dan EV Charging Station; ▪ City Gas Network; ▪ Induction Stove
Financial Support	▪ fiscal dan non fiscal incentives ▪ Grants and Loans ▪ Funding/Financing	▪ Fiscal and non-fiscal incentives ▪ Grants and Loans ▪ Funding/Financing
R&D dan Technology	▪ CCS/CCUS ▪ Hydrogen/ NRE	▪ Efficiency Energy ▪ Energy Conservation Technology

Participation of all stakeholders, including human resource development, is needed to achieve a Just Energy Transition and meet the Climate Change Mitigation Goals.

Thank You

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@djebtke Ditjen EBTKE

Address

Jl. Pegangsaan Timur No.1,
Cikini, Menteng Jakarta