BADAN PUSAT STATISTIK

SENSUS EKONOMI 2026

DRAFT

MEASURING EMISSIONS IN INDONESIA

Presentation at UN Net Zerowebinar

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SETTING THE CONTEXT

Climate change has been in the global spotlight due to the increasing impact felt by the world community and on the environment.

- The global average temperature has increased by approximately 1.1°C since the pre-industrial era and is projected to rise by 1.5°C to 4.5°C by the end of the 21st century.
- Global sea levels have risen by about 20 cm since the late 19th century and are projected to increase by 26 cm to 82 cm by the end of the 21st century.
- The frequency and severity of extreme weather events, such as heatwaves, droughts, and floods, have increased globally.
- The acidity level of ocean waters has increased by 26% since the pre-industrial era due to the absorption of carbon dioxide from the atmosphere.

Source: Intergovernmental Panel on Climate Change (IPCC)

INDONESIA'S COMMITMENT TO CLIMATE CHANGE

- Indonesian Law Number 6 of 1994 on the Ratification of the United Nations Framework Convention on Climate Change (UNFCCC)
- Indonesian Law Number 17 of 2004 on the Ratification of the Kyoto Protocol to the UNFCCC
- Indonesian Law Number 16 of 2016 on the Ratification of the Paris Agreement to the UNFCCC

Indonesia's Report Submissions to the UNFCCC

1994	2001	2011	2017	2018	2021	2024
First National Communication (NC1)	First Biennial Updated Report (BUR1)	Second National Communication (NC2)	Third National Communication (NC3)	Second Biennial Updated Report (BUR2)	Third Biennial Updated Report (BUR3)	First Biennial Transparency Reports (BTR)

Source: Ministry of Environment

NET ZERO EMISSION (NZE) POLICY IN INDONESIA

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The Net Zero Emission (NZE) policy in Indonesia is primarily carried out by several ministries/institutions, including:

Ministry of Energy and Mineral Resources (MEMR)

MEMR leads the development and implementation of the energy transition roadmap towards Net Zero Emissions (NZE) in the energy sector, including the early retirement of coal-fired power plants, the implementation of CCS/CCUS technologies, and the development of renewable energy. This commitment has been reaffirmed in various national and international forums, such as COP26 and the G20 Summit in Bali.

Ministry of Environment (MoE)

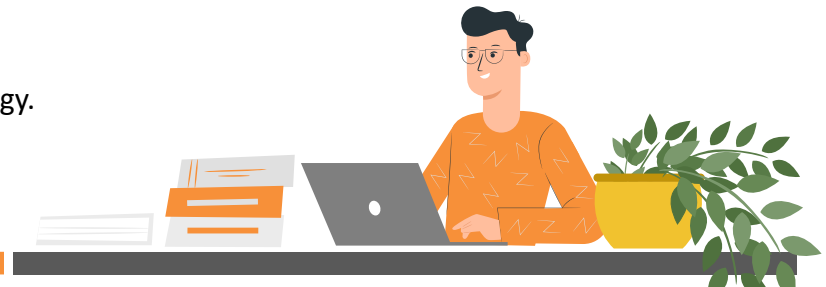
MoE leads the forestry and land use (FOLU) sector, which is a major contributor to carbon absorption. MoE also manages the national emissions inventory and reporting to UNFCCC.

Ministry of Finance (MoF)

Provides funding instruments and fiscal incentives, such as carbon taxes, green subsidies, and climate financing mechanisms.

Coordinating Ministry for Economic Affairs

Plays a significant role in integrating economic policies with the energy transition as part of the national strategy.



INDONESIA NET ZERO NARATIVES: KEY PROGRAMS AND STRATEGIES

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Energy Sector

- **Gradual phase-out of coal-fired power plants:** No new coal plants after 2030 (except those under construction) (esdm.go.id).
- **Renewable energy expansion:** Targeting 367 GW of renewables by 2060, including 115 GW solar PV, 46 GW hydro, 41 GW green ammonia, and 37 GW wind (smaller scale by 2050 but accelerating from now) (esdm.go.id).
- **Implementation of CCS/CCUS and energy storage:** To support grid stability as renewable energy increases (esdm.go.id).
- **Energy efficiency and electrification:** Expanding green electricity and electrifying industry and transportation (esdm.go.id).
- **Carbon pricing and domestic carbon market:** Cap-and-trade and carbon tax implemented for coal power plants since 2022, plus integration of the national carbon market (ppid.menlhk.go.id).

Industry & Transportation Sector

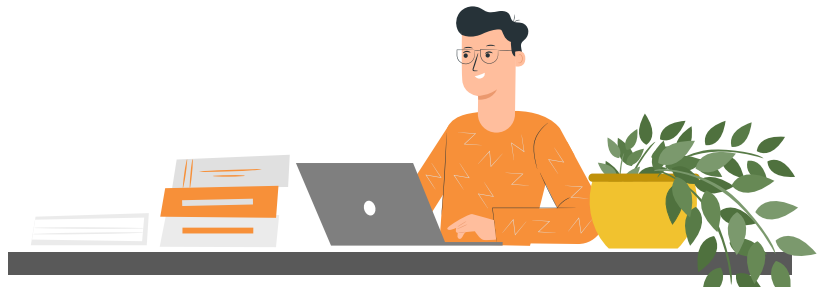
- **Industrial decarbonization**: Energy audits, low-carbon standards, green industry certification, and roadmaps for key sub-sectors such as cement, metals, fertilizer, chemicals, F&B, and automotive.
- **Transportation electrification**: Promoting electric vehicles (EVs), low-carbon public transport, and supporting infrastructure.

Forestry & Land Use Sector

- **FOLU as a carbon sink**: Peak emissions in the forestry sector are projected after 2030, then become a net sink by around 2050 (palmoilina.asia).
- Efforts to control deforestation and restore peatlands are integrated into the national strategy.

Grants & Financing Sector

- **Mobilizing green investments**: Through green sukuk, public-private financing facilities (KPBU, GREM, SDG Indonesia One), and tax incentives for renewable energy investors (Hijauku.com, esdm.go.id).
- **Energy Transition Mechanism (ETM)**: Framework to mobilize public and private funds for a just energy transition (Hijauku.com).



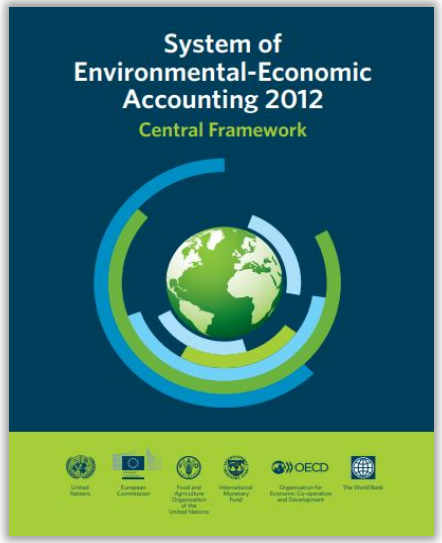
MEASURING EMISSION IN INDONESIA

Aspect	Ministry of Environment (KLH)	BPS – Statistics Indonesia
Main Role	**National focal point** for climate change and GHG inventory	National Statistical Office responsible for environmental-economic data
Framework Used	**IPCC Guidelines** (2006 or 2019 Refinement)	**SEEA – System of Environmental-Economic Accounting** (UN standard)
Focus	Measuring **GHG emissions/removals** from all sectors (Energy, IPPU, Agriculture, Waste, LULUCF)	Measuring **interlinkages between environment and economy**, e.g., emissions by industry, energy use
Output	National GHG Inventory, NIR (National Inventory Report), Biennial Update Reports (BUR), Biennial Transparency Reports (BTR)	SEEA modules: **Air Emission Accounts**, **Physical Energy Flow Accounts**
Level of Disaggregation	Based on **emission sources** (e.g., fuel combustion, livestock, land-use change)	Based on **economic sectors** (e.g., agriculture, manufacturing, households) using **ISIC** classification
Use in Policy	Supports reporting under **Paris Agreement**, NDC tracking, carbon pricing policies	Supports **Green GDP**, sustainable development indicators, economic planning with environmental integration
Reporting Obligation	Required under **UNFCCC and Paris Agreement**	Voluntary under UN SEEA framework, supports national and SDG reporting
Strength	Detailed and standardized emission tracking, aligned with global climate obligations	Integrated with economic data; provides sustainability metrics in GDP context

TOTAL GHG INVENTORY → IPCC Manual

AIR EMISSIONS ACCOUNTS → SEEA Manual

SYSTEM OF ENVIRONMENTAL-ECONOMIC ACCOUNTING (SEEA)

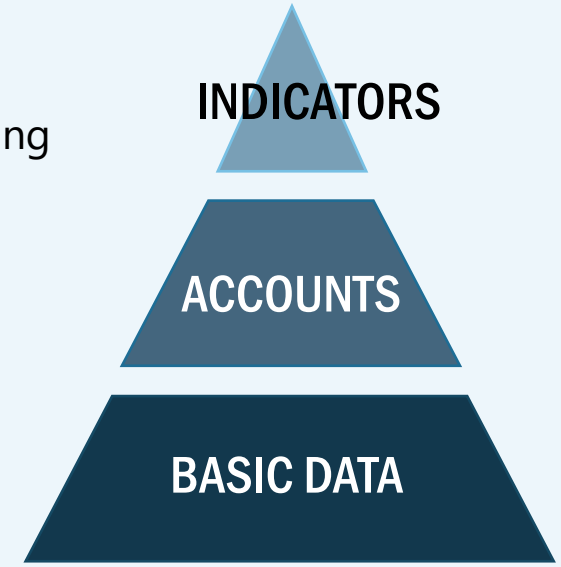


SEEA is a conceptual framework for understanding the interactions between the economy and the environment, and for describing stocks and changes of environmental assets

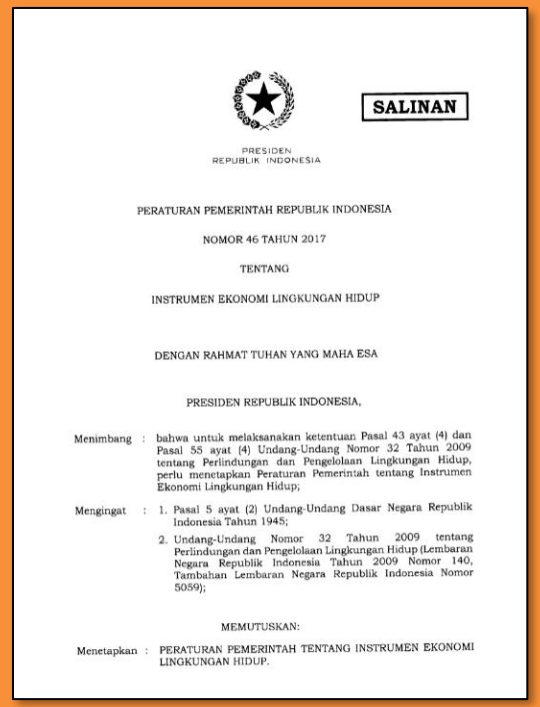
INTEGRATED STATISTICS

The SEEA was designed to be coherent and complementary with other international standards, recommendations and classifications.

- It is based on **agreed-upon** concepts, definitions, classifications, and accounting rules.
- The SEEA **provides a structures** to compare and contrast source data and allows the development of aggregates, indicators and trends across a broad spectrum of environmental and economic issues.



National Legal Foundation on the Compilation of SEEA Accounts in Indonesia



SALINAN

PRESIDEN
REPUBLIK INDONESIA

PERATURAN PEMERINTAH REPUBLIK INDONESIA

NOMOR 46 TAHUN 2017

TENTANG

INSTRUMEN EKONOMI LINGKUNGAN HIDUP

DENGAN RAHMAT TUHAN YANG MAHA ESA

PRESIDEN REPUBLIK INDONESIA,

Menimbang : bahwa untuk melaksanakan ketentuan Pasal 43 ayat (4) dan Pasal 55 ayat (4) Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, perlu menetapkan Peraturan Pemerintah tentang Instrumen Ekonomi Lingkungan Hidup;

Mengingat : 1. Pasal 5 ayat (2) Undang-Undang Dasar Negara Republik Indonesia Tahun 1945;

2. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 140, Tambahan Lembaran Negara Republik Indonesia Nomor 5059);

MEMUTUSKAN:

Menetapkan : PERATURAN PEMERINTAH TENTANG INSTRUMEN EKONOMI LINGKUNGAN HIDUP.

Government Regulation Number 46 of 2017 concerning Environmental-Economic Instruments

Article 6 Paragraph 1

The Natural Capital and Environmental Accounts are prepared by agencies that have government duties in the field of statistics.

Article 6 Paragraph 4

Ministries, institutions and/or Regional Governments that have authority related to natural resources and the environment are required to provide sectoral statistical data and information for the compilation of Natural Capital and Environmental Accounts to agencies that have government duties in the field of statistics.

COORDINATION WITH LINE MINISTRIES FOR THE COMPILATION OF ENVIRONMENTAL ACCOUNTS

Kementerian PPN/ Bappenas

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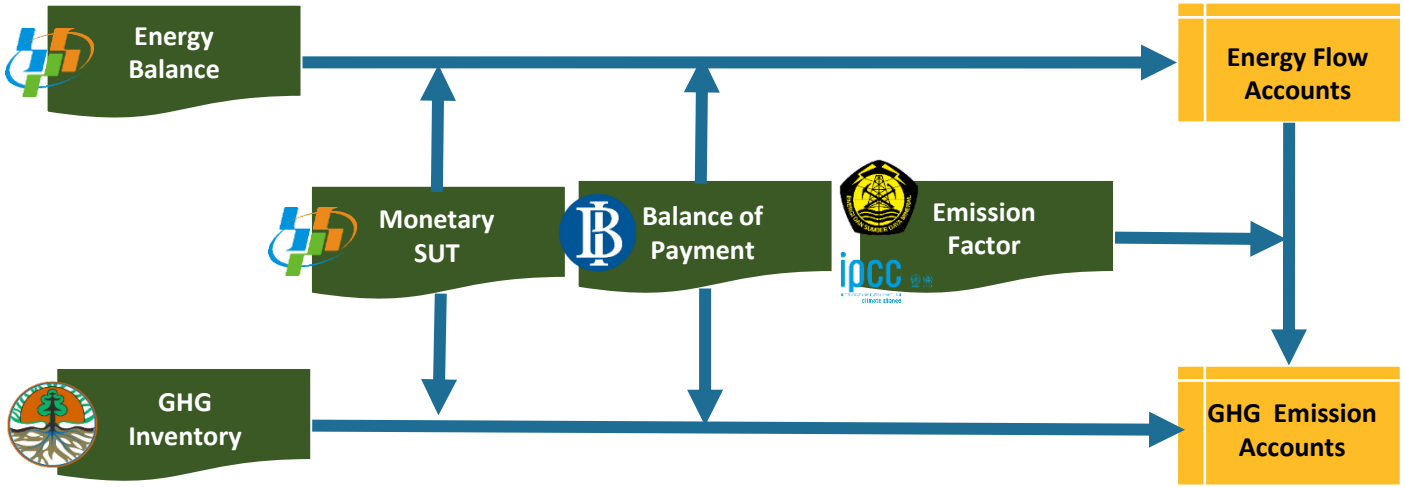
COMPILATION OF ENERGY FLOW ACCOUNTS IN INDONESIA

BPS has compiled SEEA flow accounts since 2017 after receiving technical assistance from UNSD
Currently, the annual publication of Indonesia flow accounts consists of:

- *Physical energy flow accounts (Rec 2 DGI-3)*
- *Air emission accounts for green house gasses (Rec 1 DGI-3)*

The Compilation Process of Indonesia Energy Accounts



SDGs Indicators Energy flow accounts

7 AFFORDABLE AND CLEAN ENERGY

- ✓ Renewable energy share in the total final energy consumption
- ✓ Energy intensity measured in terms of primary energy and GDP

SDGs Indicator Air emission accounts

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

- ✓ CO_2 emission per unit value added

Methodology for Compiling the Greenhouse Gas Emissions Accounts

The total greenhouse gas (GHG) emissions remain constant; however, they are disaggregated by industries and household categories.

GHG Inventory

GHG Emission Accounts

Only includes greenhouse gas (GHG) emissions from economic activities conducted by resident economic units.

DATA REFORMAT TO GHG EMISSION PSUT

ADJUSTMENT

- RESIDENCE PRINCIPLE
- ACTIVITY COVERAGE

SUPPORTING SOURCE DATA

- Monetary SUT
- Energy Accounts
- Balance of Payment
- Air Transport CO_2 Emission

DATA SOURCE FOR AIR EMISSONS ACCOUNTS COMPILATION

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Biennial Update Report (BUR) which is submitted to UNFCCC

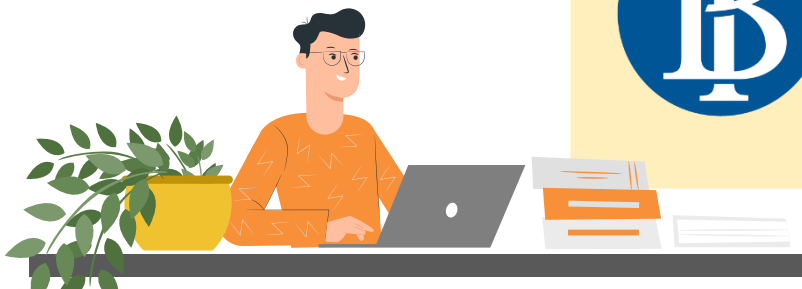
Physical Energy Flows Accounts (PEFA) from BPS

GHG inventory data from Ministry of Environment and Forestry

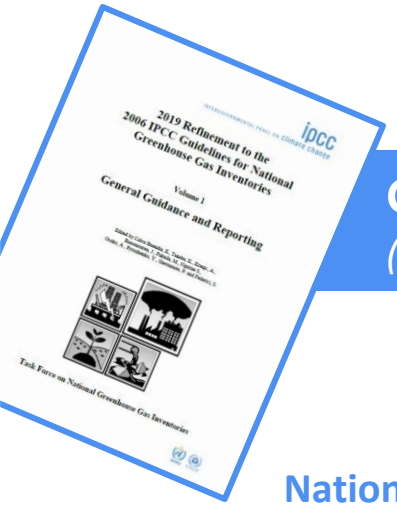
Monetary Supply and Use Table (SUT) from BPS

Balance of Payment data from Bank Indonesia

Air Transport CO_2 Emissions from OECD



FROM GHG INVENTORY TO AIR EMISSIONS ACCOUNTS



GHG INVENTORY
(territory principle)

National GHG Emissions in Indonesia (Gg CO2e), 2023

Categories	GHG Emission
Energy	752,280
Industrial Processes and Product Use (IPPU)	59,854
Agriculture	104,979
Forestry and Other Land Use (FOLU)	220,744
Peat Fire	86,154
Waste	136,335
TOTAL	**1,360,347**

AIR EMISSION ACCOUNTS
(residence principle)

Bridge Table from GHG Inventory to GHG Emission Accounts (Gg CO2e), 2023

Categories	GHG Emission
Total GHG Emission in Indonesian territory	**1,360,347**
***Plus* GHG emission from Indonesian residents abroad**	**871**
***Less* GHG emission from non-residents in Indonesian territory**	**-844**
***Less* GHG emission from FOLU and Peat Fire**	**-306,898**
Total GHG Emission from Indonesian residents	**1,053,476**

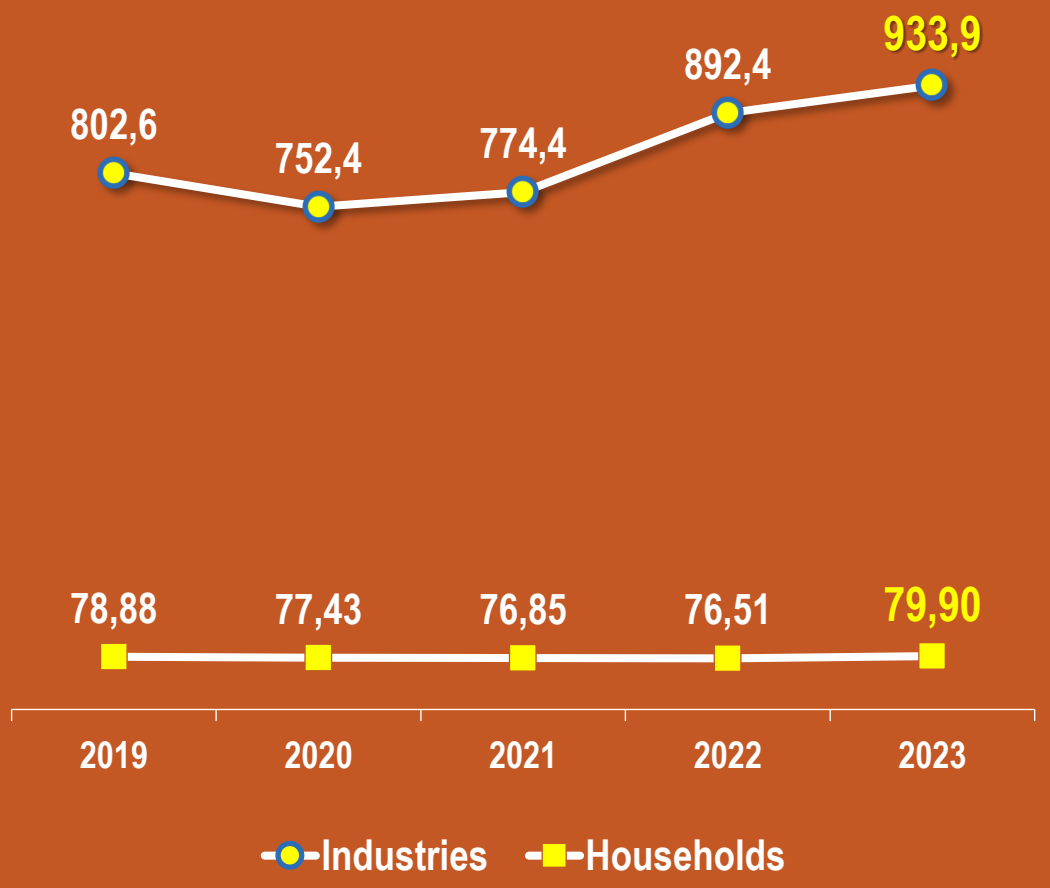
Target 9.4

By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries acting in accordance with their respective capabilities

AIR EMISSIONS ACCOUNTS

To monitor SDGs' Achievment (Goal 9)

Greenhouse Gas Emissions by Industries and Household (million tons), 2019–2023



CO_2 Emission Intensity by Industries, 2023 (tons CO_2e per billion rupiah)

TOTAL INDUSTRIES: 60,48

Agriculture, Forestry, and Fishing	Mining and Quarrying	Manufacturing
6.49	15.23	118.51
Electricity and Gas Supply	**Transportation**	**Other Industries**
2,202.70	143.70	4.03

ISSUES AND CHALLENGES

Differences in Principle between IPCC and SEEA

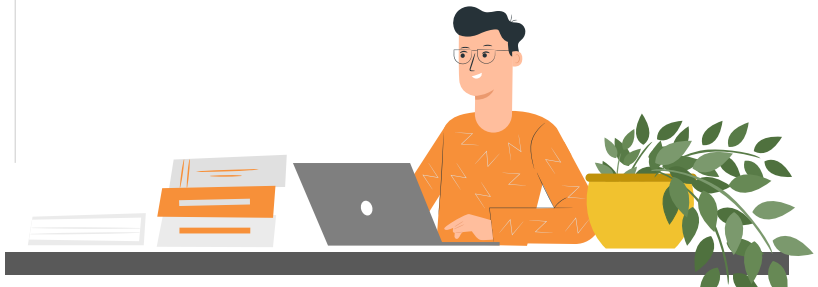
- *GHG Inventory uses territory principle while Air Emission Account applies residence principle*
- *It is necessary to inform stakeholders concerning such difference and emphasize that Air Emission Account complements GHG Inventory, not replace it*
- *AEA is less popular than GHG inventory*

Availability of Data Sources

- *In order to comply with the SEEA framework, the compilation of Air Emission Accounts requires detailed data by industry and by product*
- *Some institution may provide the data but not as detailed as needed*

Data Sharing Mechanism

- *Sectoral data is managed by each ministry/agency*
- *BPS has to request the data to each ministry/agency separately to collect the required data*



WAY FORWARD

To **promote and communicate** the existence and importance of Air Emissions Accounts (AEA), the following international organizations under or associated with the UN can provide strong support:

- regional workshops and knowledge-sharing events.
- Amplifies BPS efforts to a regional audience (government, academia, NGOs).
- Linking AEA to policy issues like air quality, climate change, and sustainable development.

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TERIMA KASIH

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MILIK INDONESIA!

"Mari Kawal Bersama, Langkah Besar Wujudkan **Kemandirian Perekonomian Bangsa** Untuk **Indonesia yang Lebih Sejahtera**"

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https://sensus.bps.go.id/se2026/

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