

ADVANCING TRANSPARENCY IN INDONESIA'S NATIONAL GREENHOUSE GAS INVENTORY

Insights from the First Biennial Transparency Report

Summary with emphasis on National Greenhouse Gas Inventory
2000–2022 reporting cycle

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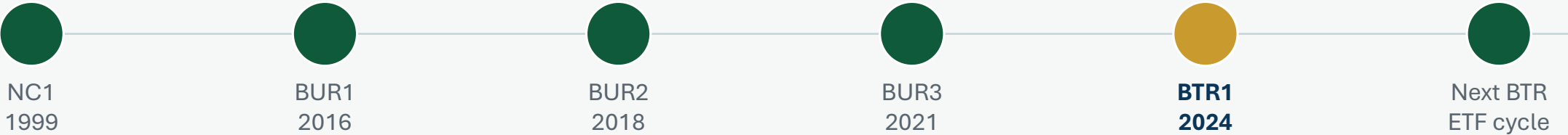
BTR1 in context: transparency architecture

What the report covers, and why the National GHG Inventory is central

Indonesia’s BTR1 is the first biennial transparency report under the Paris Agreement ETF. It updates the national inventory, NDC progress, mitigation, adaptation, and support information.

Inventory as backbone

The National GHG Inventory anchors sector trends, NDC tracking, key category analysis, uncertainty, and future improvement priorities.



ETF reporting principle

Transparency, accuracy, completeness, consistency and comparability are operationalized through data governance, QA/QC and documented methods.

Flexibility applied

Indonesia reports limitations and applies flexibility in areas constrained by resources, data and capacity.

National GHG emissions/removals profile in 2022

Total with LULUCF: 1,382,854.50 kt CO₂e; without LULUCF: 1,070,542.93 kt CO₂e

1.383 million kt

CO₂e total emissions/removals with LULUCF

1.071 million kt

CO₂e total emissions without LULUCF

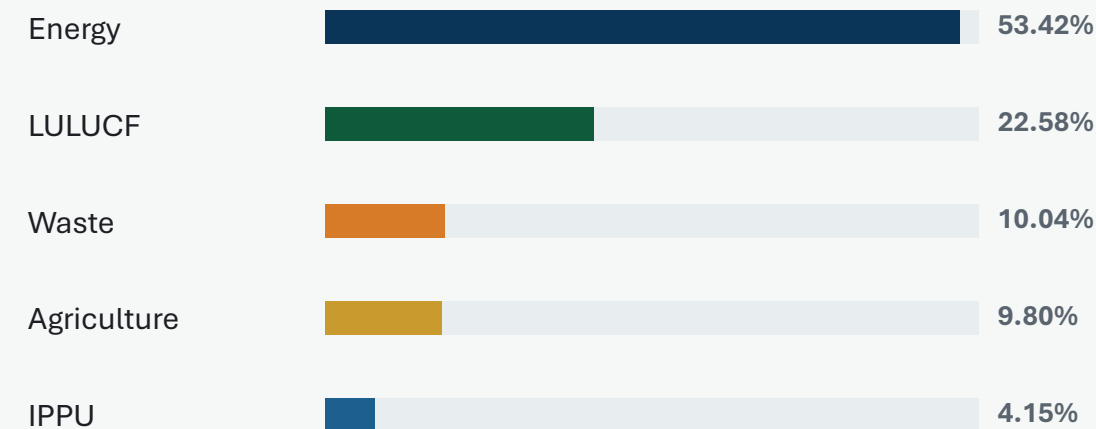
77.75%

CO₂ share in total with LULUCF

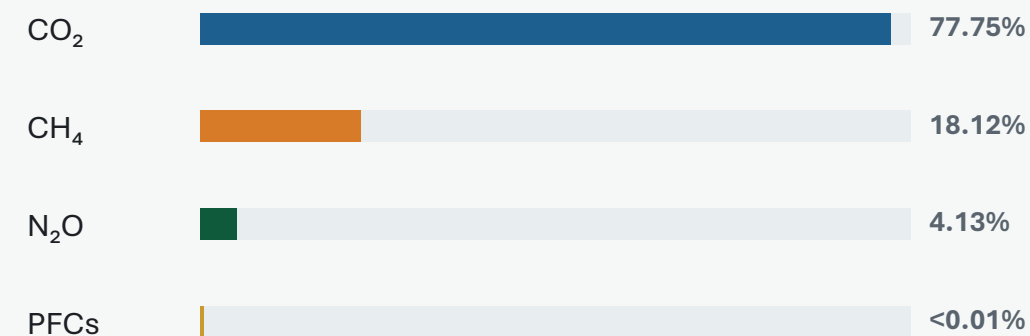
18.12%

CH₄ share in total with LULUCF

2022 sector contribution, with LULUCF



2022 gas profile, with LULUCF

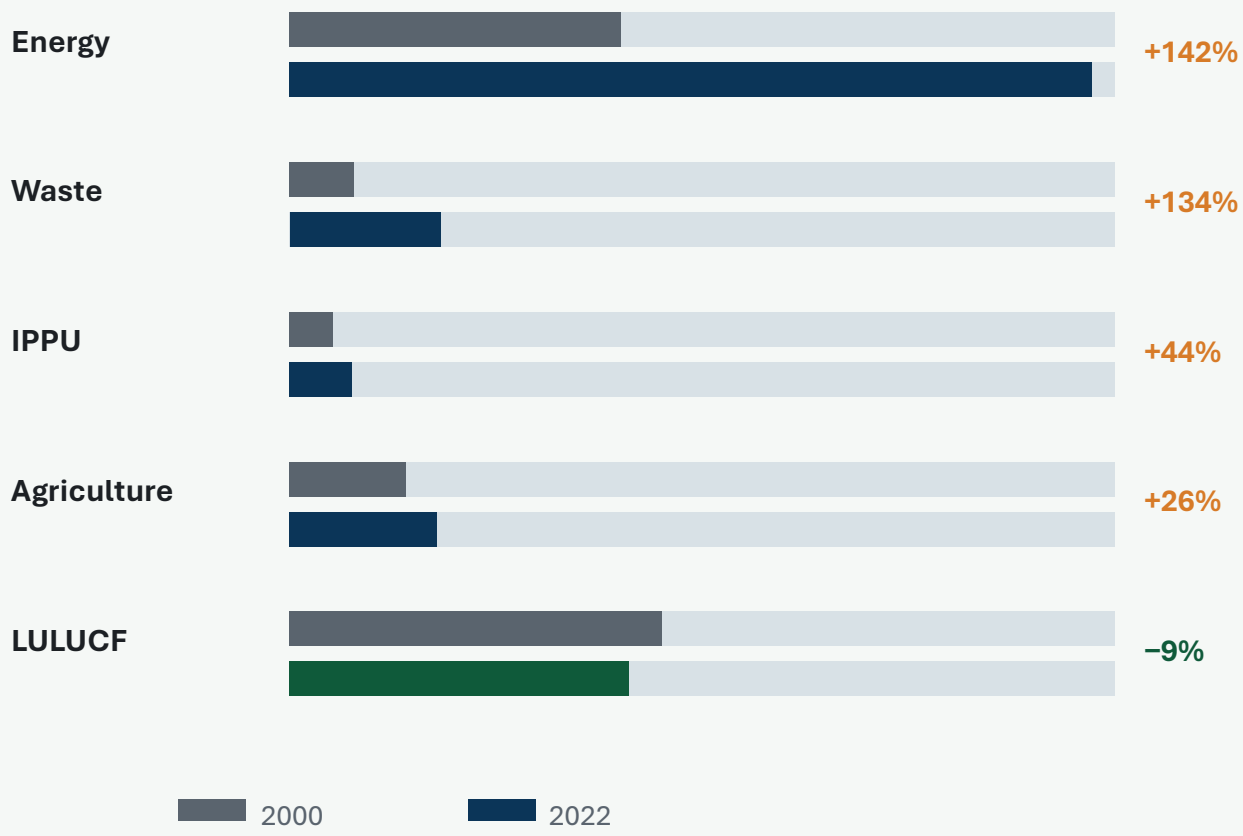


Energy dominates total emissions. LULUCF remains a major source/sink system, while agriculture and waste are CH₄/N₂O-sensitive sectors.

Emission trends: 2000 to 2022

National totals increased, driven mainly by energy and waste growth; LULUCF decreased slightly

Sector emissions/removals (thousand kt CO₂e)



Total with LULUCF

854,503 kt CO₂e in 2000 → 1,382,855 kt CO₂e in 2022
Overall increase: +62%

Total without LULUCF

511,512 kt CO₂e in 2000 → 1,070,543 kt CO₂e in 2022
Overall increase: +109%

Policy signal

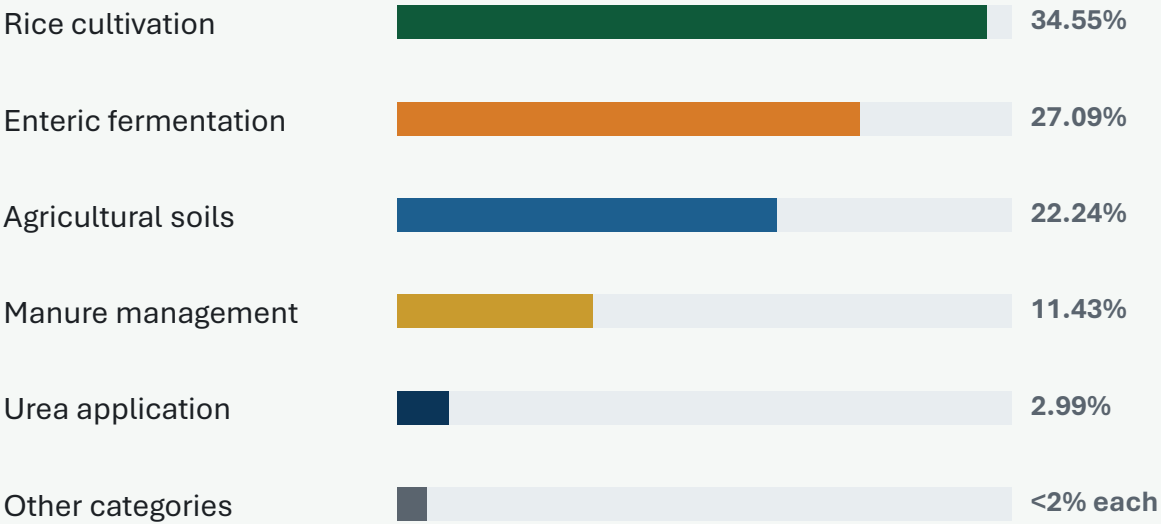
Mitigation and inventory improvement should focus on fast-growing emissions, while preserving sink integrity and reducing land-based uncertainty.

Source: Indonesia BTR1 (2024); Indonesia National Inventory Document 2000–2022 (2024)

Agriculture within the National GHG Inventory

Agriculture contributes 135,565.84 kt CO₂e in 2022; dominated by CH₄ and N₂O sources

Agriculture sub-category contribution, 2022



Gas split in agriculture, 2022



Inventory implications

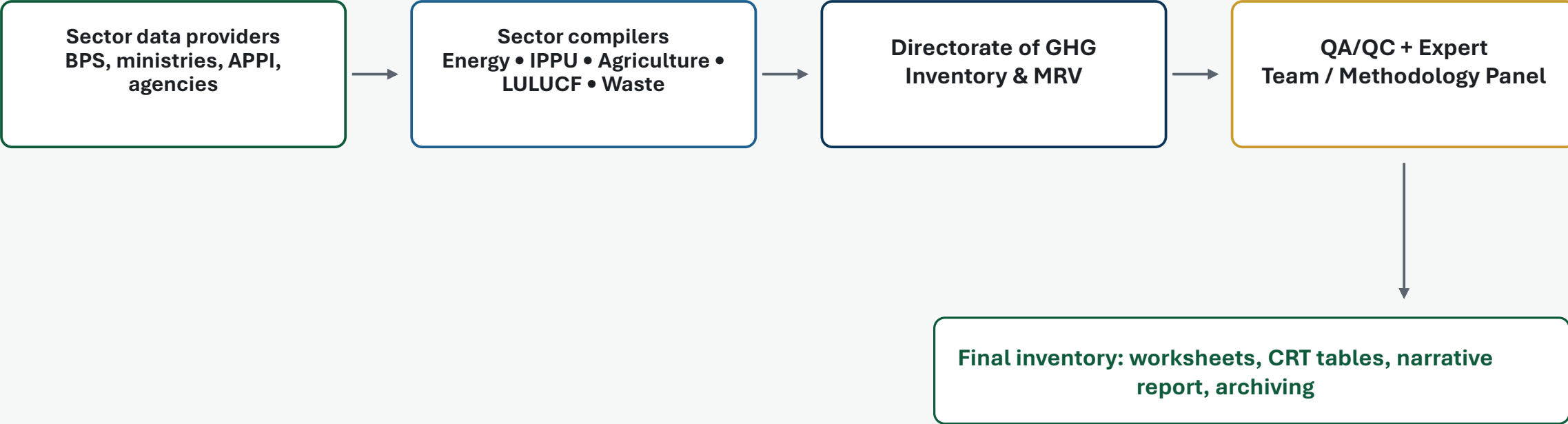
The agriculture inventory is highly sensitive to rice water regime, livestock activity data and N inputs. These determine both mitigation priorities and uncertainty sources.

Primary agricultural gases

CH₄ from rice, enteric fermentation and manure management; N₂O from agricultural soils and manure; CO₂ from urea and liming.

Current inventory management system

Coordinated national process with sector ministries, data providers, expert review and central compilation



Coordination anchor

DHCC-CPG / Ministry of Environment–Environmental Management Agency acts as UNFCCC National Focal Point; Directorate of GHG Inventory and MRV coordinates the inventory across five sectors.

Traceability anchor

Linked worksheets and documented sources support data collection, calculations, uncertainty, key category analysis, review, revisions and archiving.

Methodologies and data sources

Methods align with IPCC guidance, with Tier 2/country-specific methods for several major agricultural CH₄ categories

Core methodology choices

Guidelines	2006 IPCC Guidelines; 2013 Wetlands Supplement; 2019 Refinement
Metrics	100-year GWP values from IPCC AR5
Agriculture methods	Tier 2 + country-specific EF for enteric fermentation, manure CH ₄ and rice CH ₄ ; Tier 1/default for many other sources
Inventory software	IPCC software / calculation worksheets, CRT tables and narrative reporting

Agriculture activity data sources

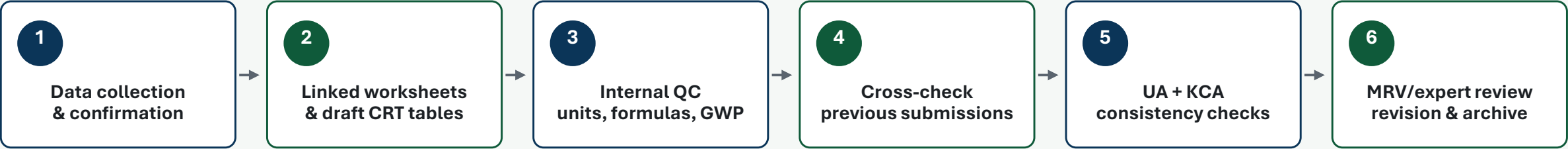
 Livestock population	BPS & Agricultural Statistics
 Rice harvested area	BPS & Agricultural Statistics
 N fertilizer / urea	APPI, BPS
 Burned area / biomass burning	PKHL, MoEF
 Liming	APPI + acid/peat land assumptions

Practical message

The inventory combines official statistics, ministry data, industry data, country-specific parameters, IPCC defaults and expert review. Method choice should follow key category relevance and data availability.

QA/QC: checks that make the inventory defensible

QA/QC links data integrity, calculation control, review, revision and archive management



QC focus areas

Category mapping • activity data • emission factors • parameters • formulas • units • GWP conversion • time-series consistency • completeness • notation keys

QA role

QA is carried out by reviewers not directly involved in inventory execution, to confirm that procedures and standards are followed.

Current improvement need

General uncertainty assessment

Tier 1 error propagation quantifies category, national total and trend uncertainty

13.79%

2022 overall uncertainty with LULUCF

10.27%

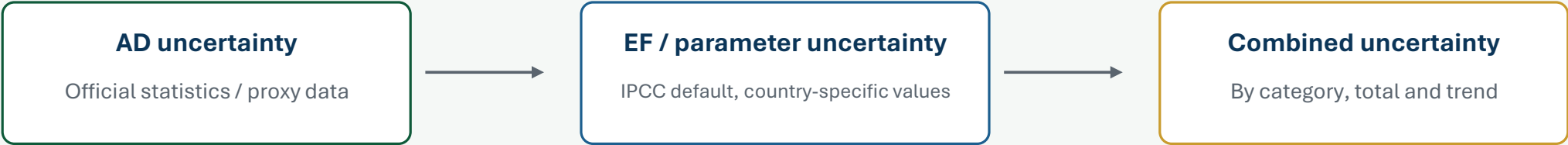
2022 overall uncertainty without LULUCF

28.95%

trend uncertainty with LULUCF

31.62%

trend uncertainty without LULUCF



Main interpretation

Uncertainty is lower for national totals than for many individual categories because category contributions are weighted. Trend uncertainty remains substantial and is important for interpreting progress over time.

Agriculture implication

Uncertainty priorities include rice scaling factors, livestock parameters, manure management fractions, nitrogen inputs, liming/urea proxies and spatial-temporal representativeness.

Completeness and flexibility applied

BTR1 covers the main sectors and gases, while transparently reporting data and capacity limitations

Sectors covered Energy • IPPU • Agriculture • LULUCF • Waste

Gases reported CO₂ • CH₄ • N₂O • PFCs

Gases not estimated HFCs • SF₆ • NF₃ • NMVOC • SO_x, due to data limitations

Notation keys NO / NE / IE applied according to category mapping and data availability

Flexibility statement

Indonesia states that BTR1 has not fully fulfilled all reporting requirements and applies flexibility provisions under Article 13, considering available resources and capacities.

Completeness assessment

The inventory is broadly complete for the five sectors and four reported gases, but selected categories/gases remain not estimated or aggregated where activity data, resources or methods are limited.

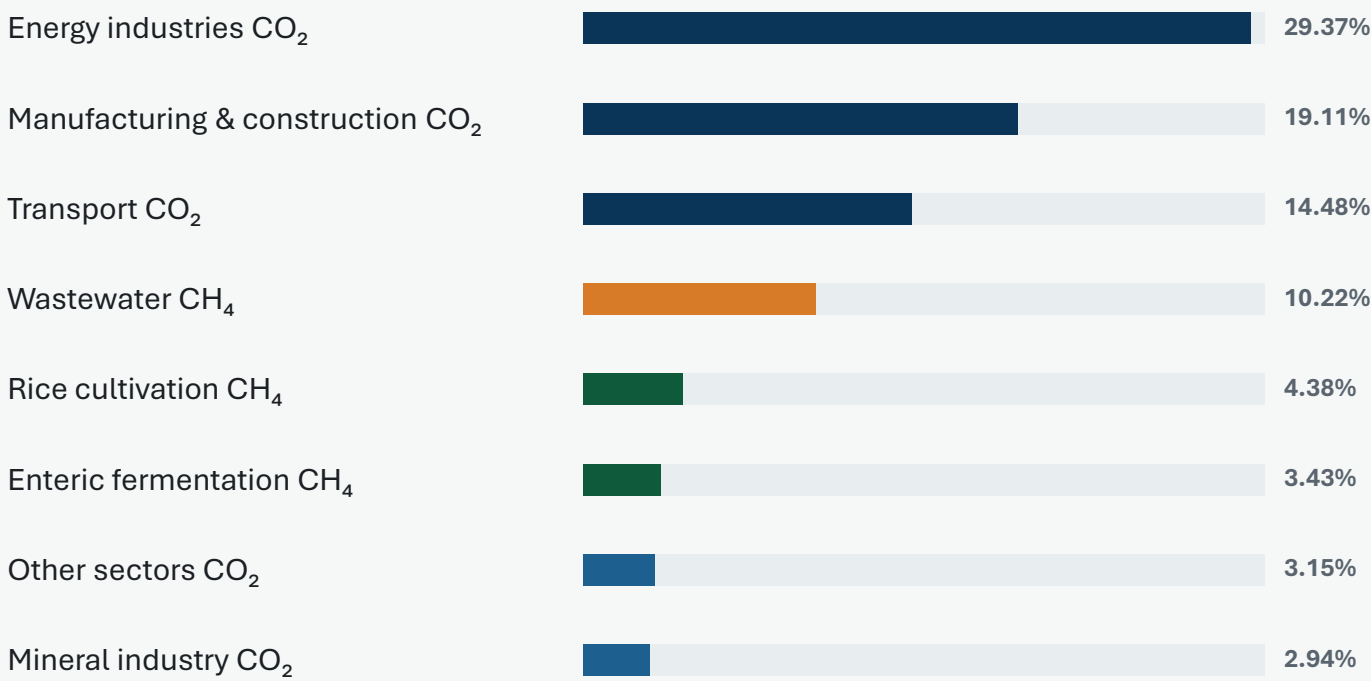
Improvement principle

Move from notation-key transparency to strengthened data collection, subcategory disaggregation, spatial traceability and documented expert judgement.

Key categories:

Approach 1 level/trend assessment with 95% cumulative threshold; assessed with and without LULUCF

Top 2022 key categories without LULUCF: level assessment



Key categories in 2022

With LULUCF: 17 key categories
Without LULUCF: 14 key categories

Agriculture appears in KCA

Rice cultivation CH₄, enteric fermentation CH₄, direct N₂O from managed soils and manure management N₂O appear among key categories without LULUCF.

Use of KCA

Prioritize higher-tier methods, QA/QC resources, uncertainty reduction and data system improvements for the most influential categories.

Summary messages

Indonesia's BTR1 shows a functional inventory system with clear opportunities for strengthening

1

Inventory profile

Energy dominates national emissions; LULUCF remains a major source/sink system; agriculture and waste are central for CH₄/N₂O management.

3

Governance

The system uses sectoral data flows, central coordination, expert review, QA/QC, uncertainty analysis and KCA.

2

Agriculture focus

Rice cultivation, enteric fermentation, agricultural soils and manure management explain most agricultural emissions.

4

Next improvements

Higher-quality AD, spatial disaggregation, parameter documentation, automated reconciliation, stronger QA, and uncertainty refinement.

BTR1 is not only a compliance document — it is a roadmap for improving data systems, sector methods, and mitigation accountability.

Source: Indonesia BTR1 (2024); Indonesia National Inventory Document 2000–2022 (2024)