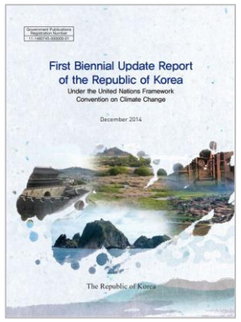
The Republic of Korea's First Biennial Transparency Report and GHG Inventory

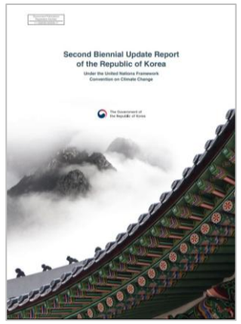
The 22nd Workshop on GHG Inventories in Asia(WGIA22)
16th July 2025, Phnom Penh, Cambodia

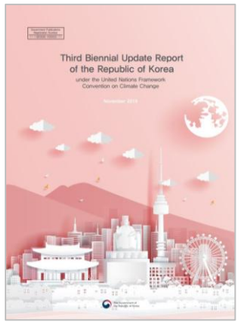
Greenhouse Gas Inventory
and Research Center of Korea

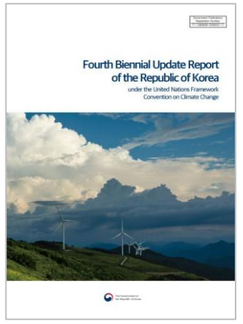
Contents

The Report of ROK









1998.2 NC1

2003.12 NC2

2012.3 NC3

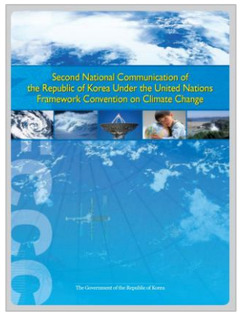
BUR1 2014.12

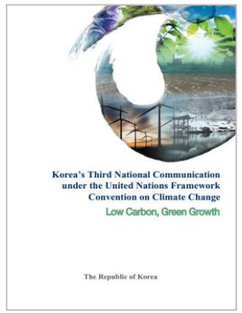
BUR2 2017.11

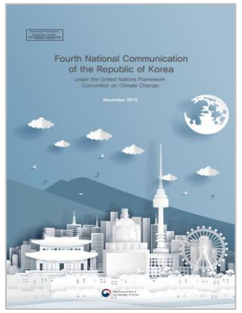
BUR3 NC4 2019.11

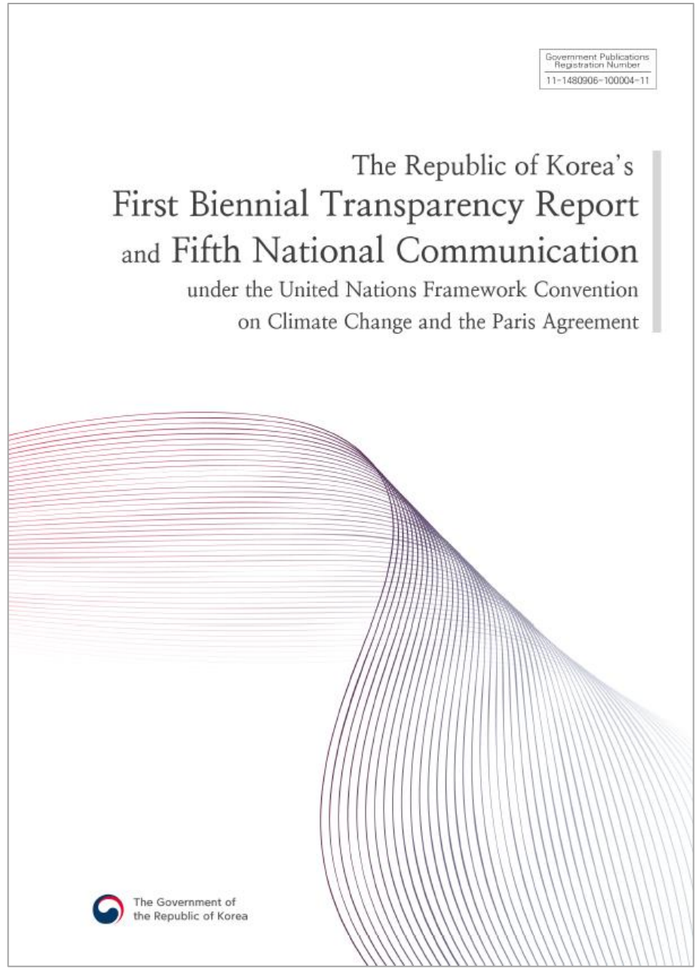
BUR4 2023.7

BTR1 NC5 2025.1









The First Biennial Transparency Report

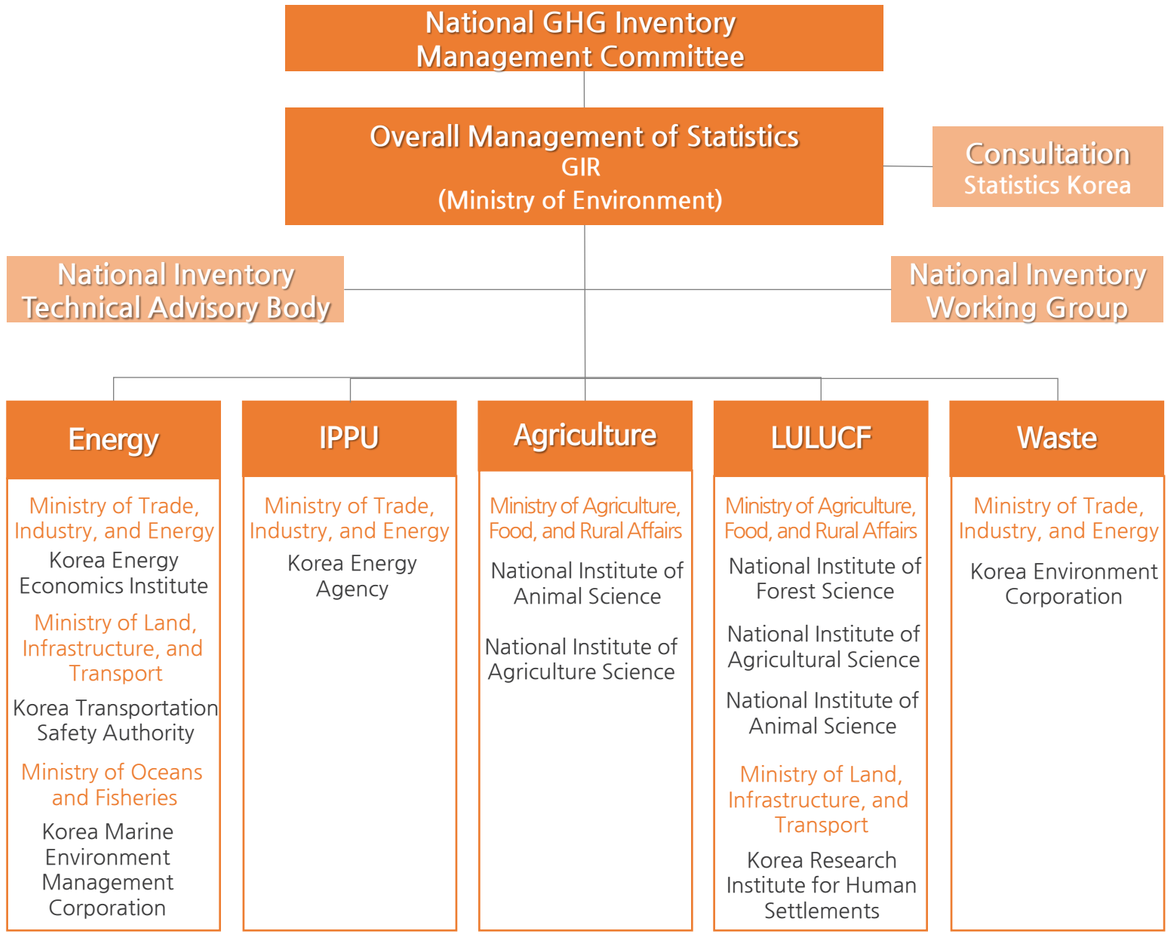
- **Chapter 1.** National Greenhouse Gas Inventory
- **Chapter 2.** Tracking Progress in Implementing and Achieving NDC
- **Chapter 3.** Climate Change Impacts and Adaptation
- **Chapter 4.** Supporting the Global Community

The Fifth National Communication

- **Chapter 1.** Research and Systematic Observation
- **Chapter 2.** Education, Training and Public Awareness

Institutional Arrangement

National GHG Inventory Preparation Framework



Preparation Process

Measurement and Reporting

- GIR prepares the MRV Guidelines to determine methodologies
- The relevant ministries collect activity data and estimate the GHG inventory based on the MRV guidelines
- The relevant ministries submit sectoral inventory to GIR through the National Inventory Report System

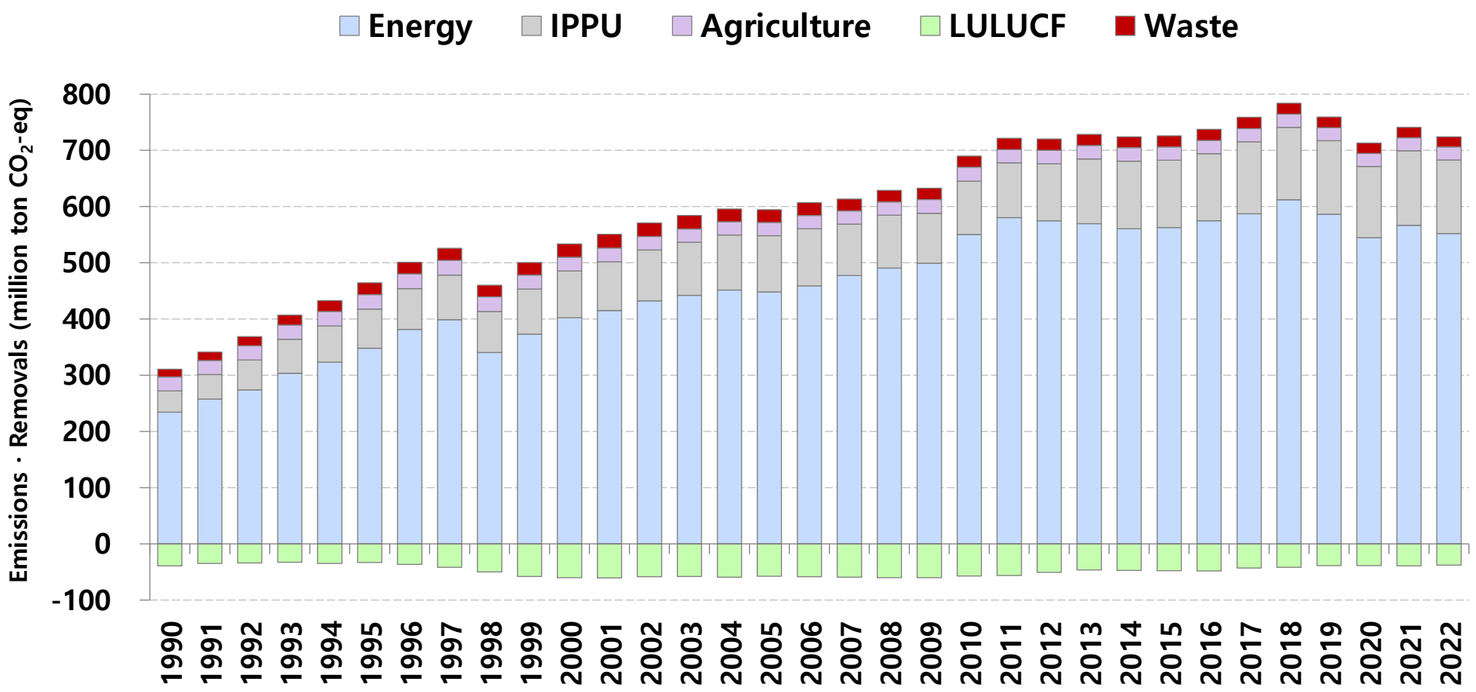
Verification

- GIR reviews and verifies the measurement methodology, activity data, and emission·removal factors

Final Confirmation and Publication

- The revised draft is confirmed through the final evaluation by the working group and committee
- The approved NIR is published through several platforms

GHG Emissions and Removals Trends of ROK (1990-2022)



In 2022,

Total emissions 724.3 Mt CO_2-eq

- **133.2%** increase from 1990
- **7.6% decrease** from the emission peak in 2018
- **2.3% decrease** from 2021

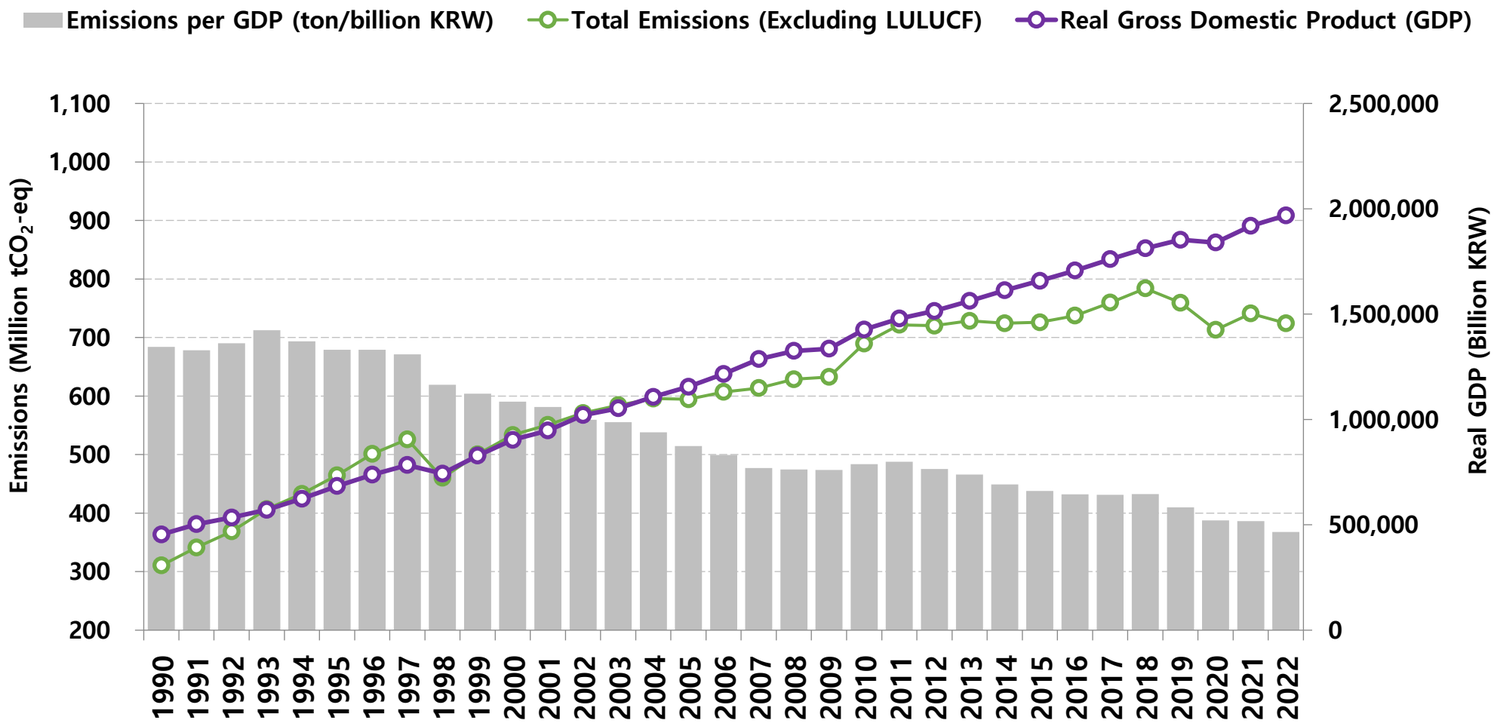
Net emissions 686.5 Mt CO_2-eq

- **152.7%** increase from 1990
- **7.5%** decrease from the emission peak in 2018
- **2.2%** decrease from 2021

Trends

- Following an increasing trend during the 1990s
- The rate of increase gradually slowed after the 2000s and reached their peak in 2018
- Beginning to decline after the peak except 2021

Total GHG Emissions per Unit of Real Gross Domestic Product



GHG emissions per GDP in 2022

Intensity (emissions per unit GDP) **367.9** t/billion KRW

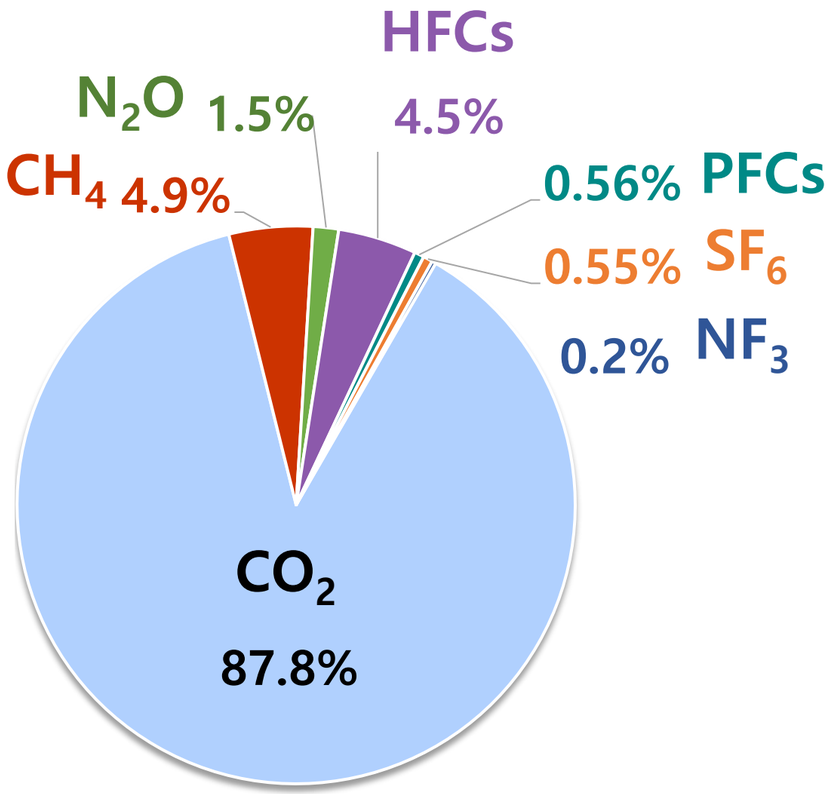
- **46.2%** decrease from 1990
- **4.7% decrease** from 2021

Trends

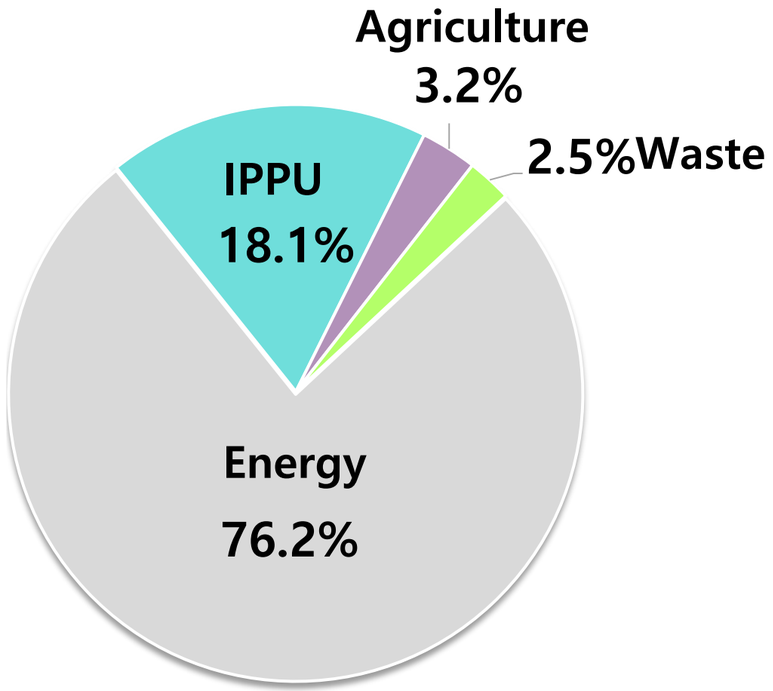
- Beginning in the 2000s, weak decoupling started
- Absolute decoupling was achieved after 2018

Total GHG Emissions by Gas and Sector (2022)

by Gas



by Sector



Trends in Emissions and Removals by Sector

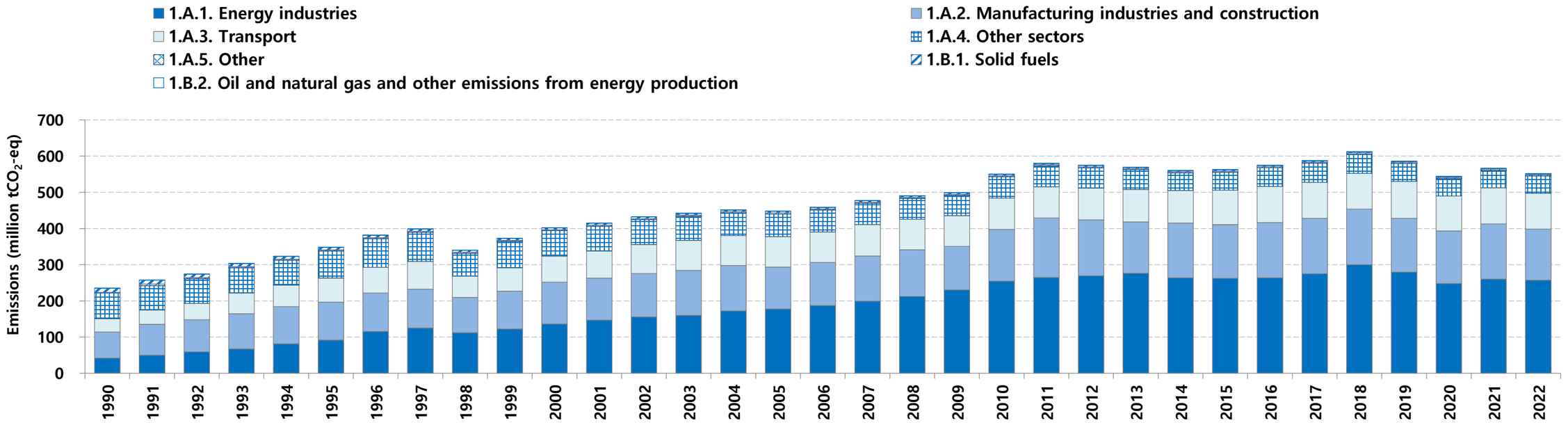
Energy

Total GHG Emissions from the energy sector

- 76.2% of total national emissions
- In 2022, 135.4% increase to 1990, 2.6% decrease to 2021

Category of the energy sector

- Fuel combustion of most of energy sector at 99.4%
- Sub-sector : Energy Industries 46.7%, Manufacturing Industries and Construction 25.5%, Transport 17.8%



Trends in Emissions and Removals by Sector

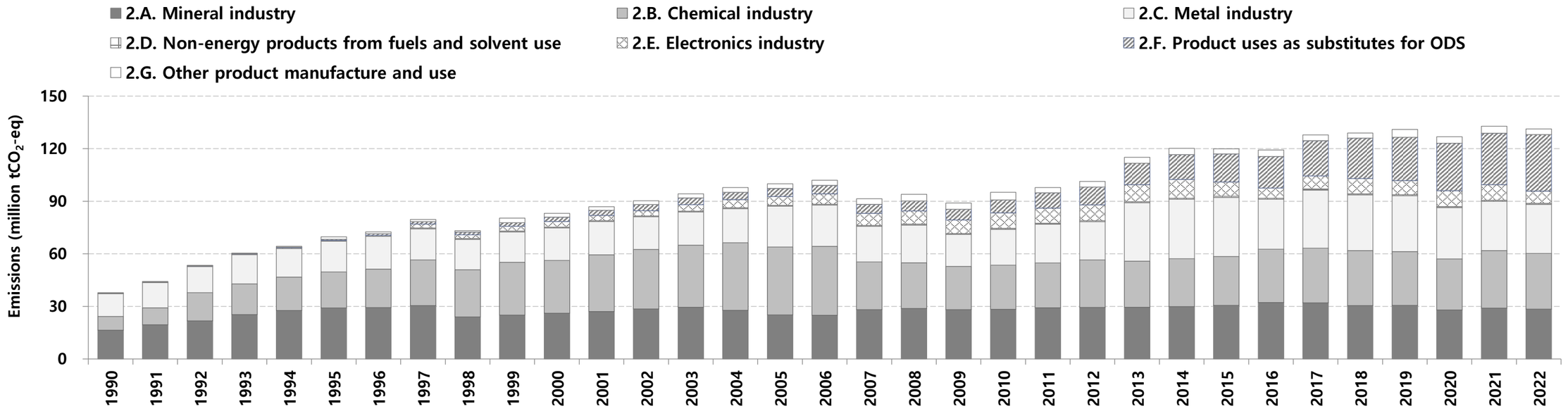
IPPU

Total GHG Emissions from the IPPU sector

- 18.1% of total national emissions
- In 2022, 247.3% increase to 1990, 1.1% decrease to 2021
- Most of the sub-sectors showed decrease to 2021

Category of the IPPU sector

- The largest of sector is Product uses as ODS substitutes at 24.5%
- Chemical Industry 24.2%, Mineral 21.7%, Metal 21.3%



Trends in Emissions and Removals by Sector

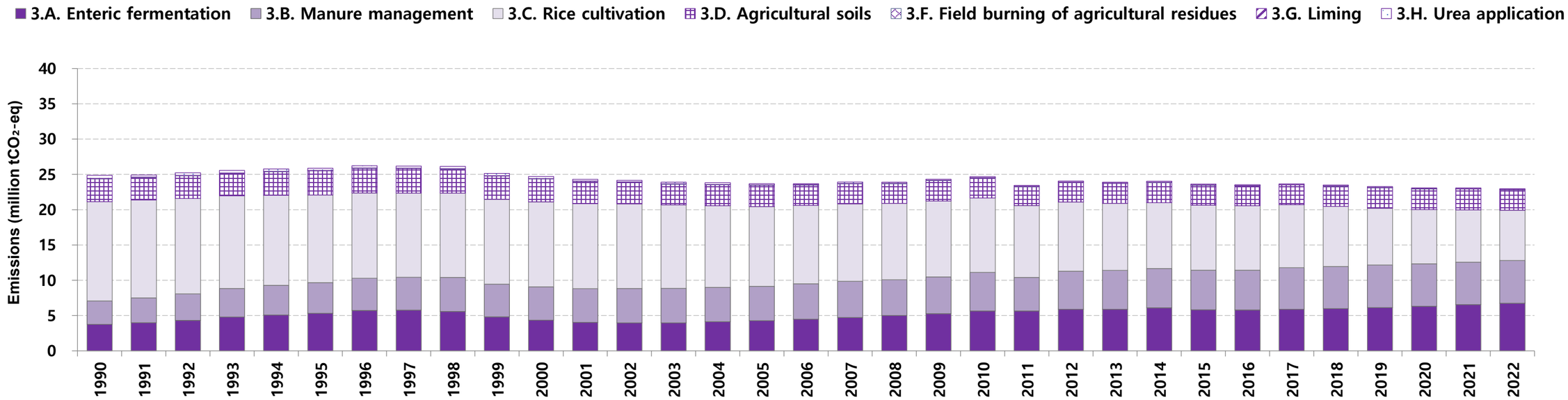
Agriculture

Total GHG Emissions from the Agriculture sector

- 3.2% of total national emissions
- In 2022, decreasing by 7.7% to 1990, 0.5% to 2021

Category of the Agriculture sector

- The largest of sector is Rice Cultivation at 31.0%
- Enteric Fermentation 29.4%, Manure Management 26.4%



Trends in Emissions and Removals by Sector

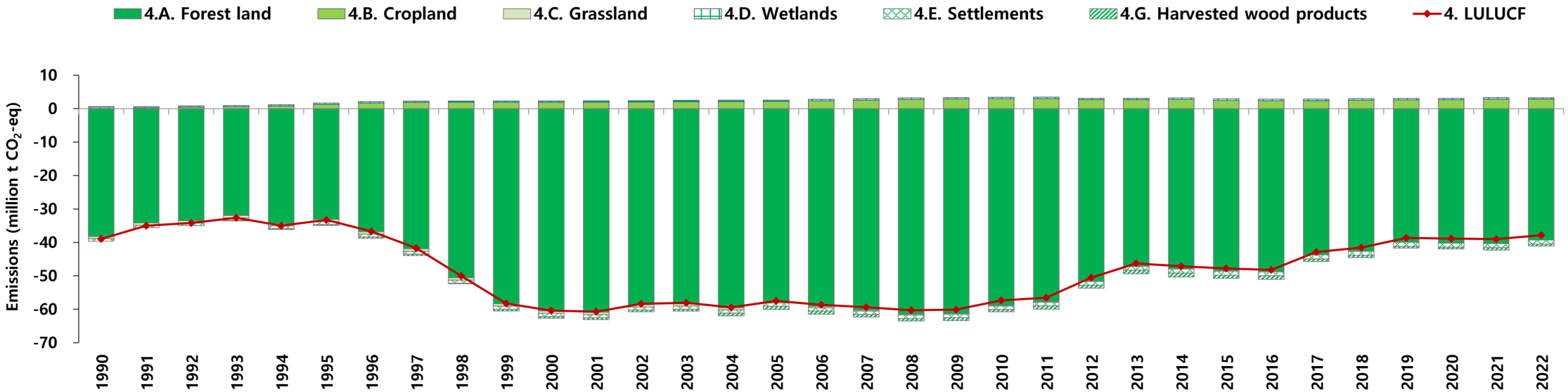
LULUCF

Total GHG Emissions from the LULUCF sector

- Total GHG net removals amounted to 37.8
- In 2022, decreasing by 2.9% to 1990, 3.0% to 2021

Category of the LULUCF sector

- The largest net Removals of sector is from Forest Land,39.3
- The largest net Emissions of sector is from Cropland, 2.9



Trends in Emissions and Removals by Sector

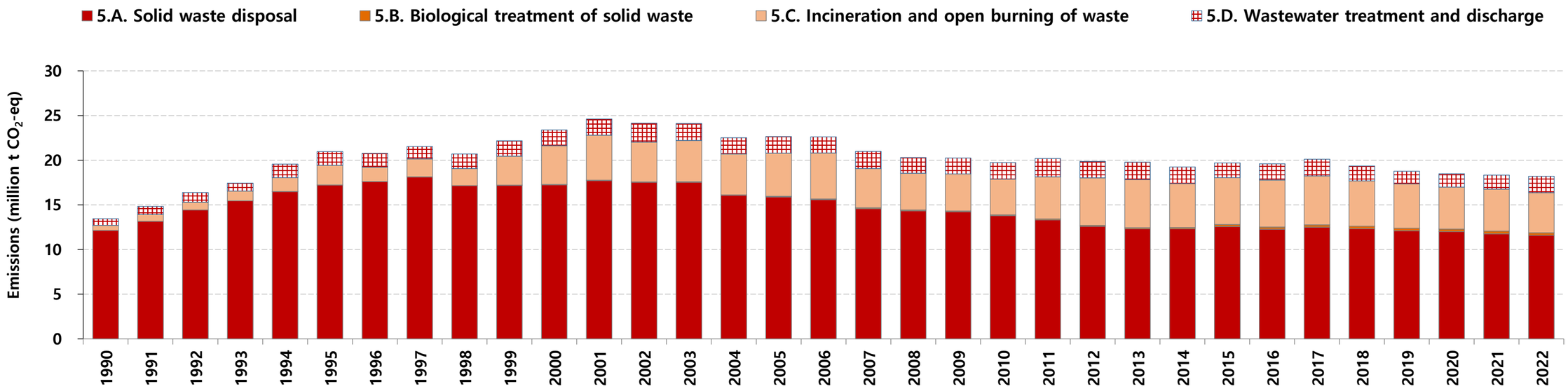
Waste

Total GHG Emissions from the Waste sector

- 2.5% of total national emissions
- In 2022, 35.3% increase to 1990, 0.8% decrease to 2021
- Generally showing an upward trend from 1990 to 2001, but after reaching a peak in 2001, Being decreasing

Category of the Waste sector

- The largest of sector is Solid Waste Disposal at 63.8%
- Incineration and Open Burning of Waste 24.6%, Waste water Treatment and Discharge 10.0%



National GHG Reduction Target

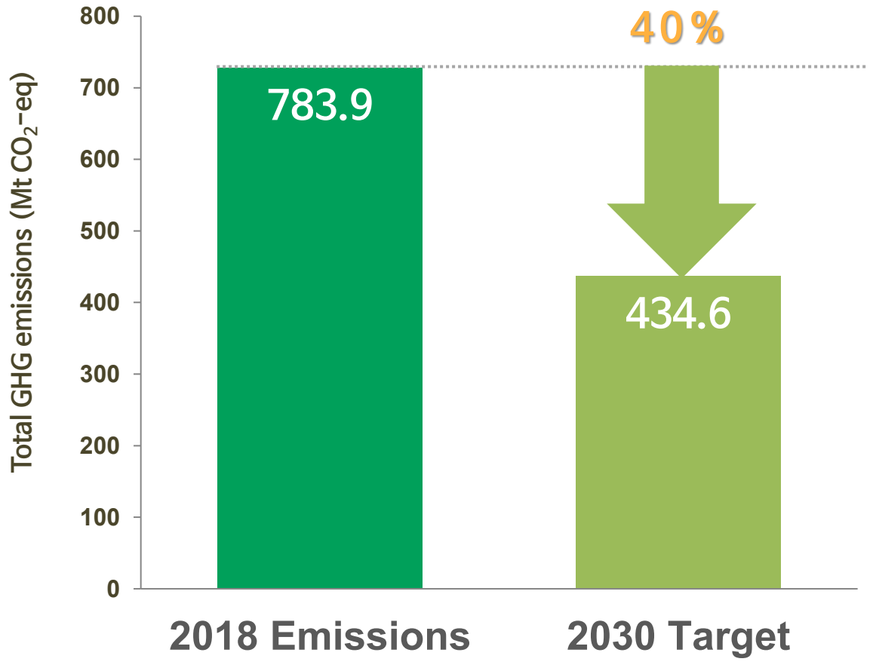
Information on Tracking Progress in Implementing and Achieving NDC

	Unit	Reference Point(2018)[1]	NDC Implementation Period		Target Level[2]	Target Year	NDC Progress Status
			2021	2022			
Annual Total GHG Emissions	Mt CO_2-eq	783.9	741.0	724.3	40%	2030	As of 2022, approx. 7.6% reduction compared to 2018
ITMOs Utilization	As international mitigation projects are at the initial stage, the ROK plans to report on NDC utilization of ITMOs and double counting prevention in its subsequent BTRs.						
NDC Achievement	As the ROK's NDC has a single-year target for 2030, achievement status cannot be verified in the first BTR						

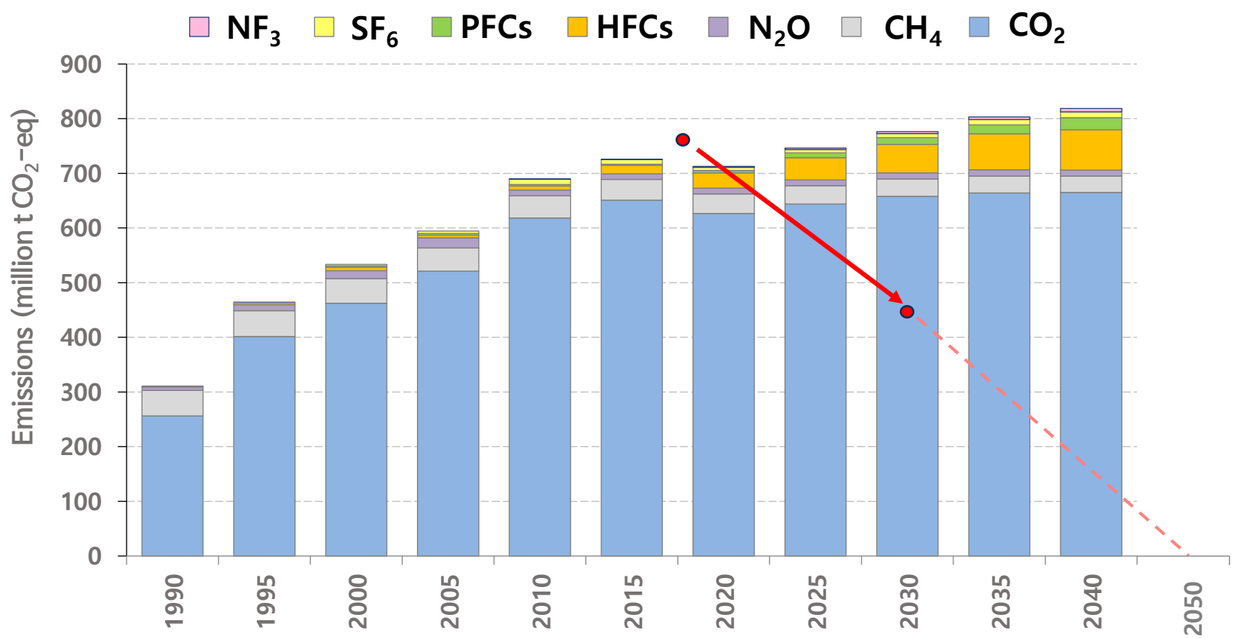
1) Updated figures due to recalculation
2) The ROK plans to use voluntary cooperation under Article 6 of the Paris Agreement as a complementary measure to its domestic mitigation efforts including LULUCF to achieve its target

National GHG Reduction Target

2030 National GHG Reduction Target



GHG Emissions by Gas: Trends and Projection



Under WM(With Measures) scenario

Mitigation policies such as the Korea Emissions Trading System, renewable energy adoption, and CH_4 capture.

Strategic and Institutionalized Improvements

Master Plan for National GHG Inventory

Legal Basis

- Article 36 of Carbon Neutrality and Green Growth Act

Purpose

- To improve national inventory quality

Contents of Plan

- Recent National Inventory
- Improvement of Activity data and Emission factor
- Internation Cooperation
- IT-system development

5-year rolling plan

The First Plan	(2015)	2015 – 2019
The Second Plan	(2020)	2020 – 2024
The Third Plan	(2025)	2025 - 2029

Data Quality Enhancement

Development of country-specific emission/removal factors

- Forming a GHG verification expert team
- Consisting of internal and external experts
- Revising the MRV guidelines for National Inventory

Improvement of activity data availability and specificity

- Reviewing the AD and tracking any changes in data provision

Enhancement in inventory methodologies, and transparency

Institutional Coordination and Communication

Title	Date	Agenda
National Workshop on Coordinated GHG Inventory Management (First Half of 2024)	2024.2.28~29	• 2024 Implementation Strategy for National GHG Statistics • Implementation Strategy for the Third Master Plan on the GHG Inventory • Discussion on 2024 MRV Guidelines by Relevant Institutions • Discussion on GHG Estimation under the 1996 and 2006 IPCC Guidelines
2nd Meeting of the BTR Working Group – Inventory Subdivision	2024.4.11	• Discussion on the Framework for Preparation and Content of the BTR and NIR
3rd Meeting of the BTR Working Group – Inventory Subdivision	2024.9.27	• Importance, contents, and Forthcoming Milestones of BTR • Overview of the Application of the 2006 IPCC Guidelines to National GHG Statistics • Statistical Advancement under the Third Master Plan
National Workshop on Coordinated GHG Inventory Management (Second Half of 2024)	2024.11.26	• Update on COP29 and Status of BTR Submissions • Strategic Approach to the UNFCCC Technical Expert Review of the BTR and NIR • Agency-Level Presentations on Mid- and Long-Term Inventory Improvement Plans
National Workshop on Coordinated GHG Inventory Management (First Half of 2025)	2025.2.25	• Deliberation on the Formulation of the Third Master Plan • Consultation on the 2025 Revisions to the MRV Guidelines

Implementation System

2050 Carbon Neutrality and Green Growth Committee
(BTR Review · Approval)

Ministry of Environment
(Overall Review of BTR Draft)

Inter-ministerial Consultative Body
(12 relevant ministries)

GIR
(Secretariat and Technical Support)

WG1 (Inventory)
- Office for Government Policy Coordination
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Trade, Industry and Energy
- Ministry of Environment
- Ministry of Land, Infrastructure and Transport
- Ministry of Oceans and Fisheries
- Statistics Korea
- Rural Development Administration
- Korea Forest Service
- Agencies by Sector..

→ **GIR** (GHG Inventory Management Team)

WG2 (NDC Implementation)
- Office for Government Policy Coordination
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Trade, Industry and Energy
- Ministry of Environment
- Ministry of Land, Infrastructure and Transport
- Ministry of Oceans and Fisheries
- Rural Development Administration
- Korea Forest Service

(Ministry of the Interior and Safety)
(Ministry of Science and ICT)

→ **GIR** (GHG Mitigation Research Team)

WG3 (Climate Change Adaptation)
- Office for Government Policy Coordination
- Ministry of Education
- Ministry of the Interior and Safety
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Trade, Industry and Energy
- Ministry of Health and Welfare
- Ministry of Land, Infrastructure and Transport
- Ministry of Oceans and Fisheries
- Korea Heritage Service
- Rural Development Administration
- Korea Forest Service
- Korea Disease Control and Prevention Agency
- Korea Meteorological Administration
- Financial Services Commission

→ **Ministry of Environment · Korea Environment Institute**

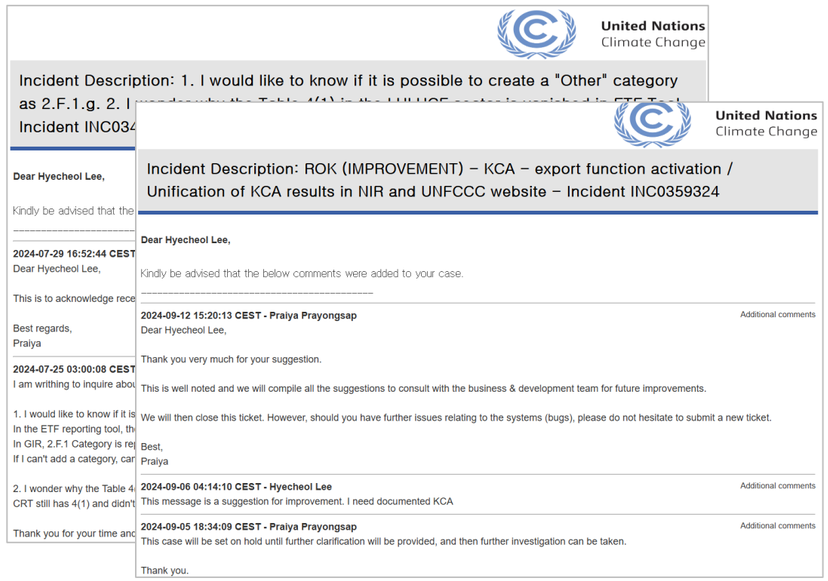
WG4 (Supporting Developing Countries)
- Office for Government Policy Coordination
- Ministry of Strategy and Finance
- Ministry of Foreign Affairs
- Ministry Science and ICT
- Ministry of Trade, Industry and Energy
- Ministry of Oceans and Fisheries
- Korea Fores Service

→ **Ministry of Environment**

Hands-on Experience with the ETF Reporting Tool

Overcoming Challenges through Active Engagement

- Identified format misalignment in **CRT output** after adding new subcategories;
- Discovered a **subtotal discrepancy** in the Agriculture module of the CRT;
- Observed **incomplete method/EF display** in Industrial Processes (2.G and 2.E.5) for specific gases;
- Usability concerns regarding the **KCA module** were raised, and export/filtering functions were subsequently added for improved accessibility.



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Building capacity
by resolving technical issues collaboratively

Thank you

Greenhouse Gas Inventory
and Research Center of Korea

GHG Inventory Management Team, Associate Researcher

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