

Korea's Carbon Neutrality Initiatives

Asia Clean Energy Forum 2023

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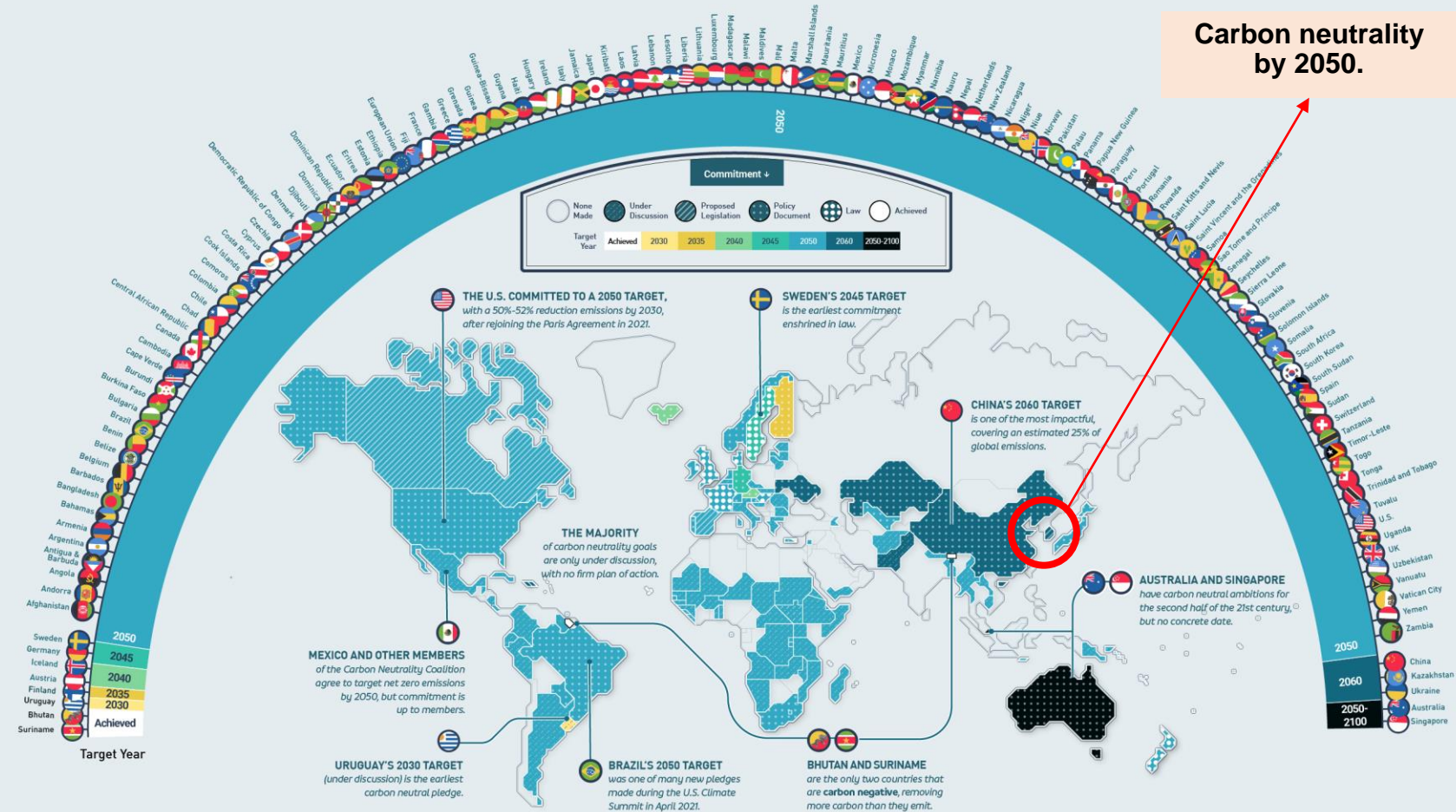


Net-zero Goals



RACE TO NET ZERO CARBON NEUTRAL GOALS BY COUNTRY

Which countries have made a carbon neutral pledge?
This map breaks down pledges by target year and level of commitment.



NDC Goals



40%

2018–2030

... to reduce total national GHG emissions by **40% from the 2018 level**, which is 727.6 MtCO₂eq, **by 2030**... This indicates the Republic of Korea's enhanced ambition towards the goal of **carbon neutrality by 2050**.



46%

2013–2050



50-52%

2005–2030



68%

1990–2030



45%

2005–2030

Reference: Country NDC submission – UNFCCC Registry
(<https://unfccc.int/NDCREG>)

Carbon Neutrality Coalition



The Carbon Neutrality Coalition brings together a group of pioneering countries that have agreed to develop ambitious climate strategies to meet the long-term objectives of the Paris Agreement. **Now 30 countries** join Carbon Neutrality Coalition.

At COP27 – member countries agreed on a framework for how best to build and implement plans to reach net-zero emissions.

Framework for Net-Zero Climate Action

- Engage Stakeholder
- Foundational Decisions
- Establish Governance
- Implement Sectoral Policy
- Align Finance and Investment



Countries already taking actions

**탄소중립·녹색성장 국가전략 및
제1차 국가 기본계획**
[중장기 온실가스 감축목표 포함]

2023. 4.

관계부처 합동

**National Strategy and First National
Basic Plan for Carbon Neutrality
and Green Growth**

(including medium- to long-term greenhouse gas
reduction targets)

April 2023

The plan includes South Korea's mid- to long-term
GHG reduction targets to meet its climate goals.

South Korea Vision and National Strategic Plan

[Vision]

Towards to a carbon-neutral society with the goal of realizing carbon neutrality by 2050 through a development in harmony between environment and economy

[Strategic objectives]

“Carbon-neutral, green growth, and becoming leaps into Global Pivotal State”

[3 Policy Directions]

Responsible Actions

Science-based decision making and policy development

Just transition

Compliance to laws and procedures with emphasis on bilateral cooperation and social consensus

Innovation-led carbon neutral and green growth

GHG reduction and economic and social structure transformation based on innovations

Responsible carbon neutrality actions to reduce GHG in a specific and efficient manner

1. Reduce GHG through carbon-free power sources such as nuclear power plants and renewable energy
2. Transition to a low-carbon industrial structure and a circular economy
3. Transition to a carbon-neutral society through decarbonization of the country

Innovative carbon-neutral and green growth led by the private sector

4. Accelerating carbon-neutral green growth through science and technology innovation and regulatory improvement
5. Creating a market and leading the global market by fostering core industries
6. Establishing and operating carbon-neutral-friendly financial programs and expanding investment

Carbon neutrality through the empathy and cooperation of all members of society

7. Reduce energy consumption and practice carbon neutrality
8. Carbon-neutral green growth centered on provinces
9. Support industrial and job transition for the stability of workers' employment and companies' growth

4 strategies and 12 major tasks

Adaptation to the Climate Crisis and Active Carbon Neutrality Leading the International Community

10. Establishing a foundation for adapting to the climate crisis were all stakeholders cooperate
11. Leading the implementation of carbon neutrality in the international community
12. Establishment of permanent heterogeneous management and reflux system for all tasks

Implementation

- Establishment of the basic plan for National Carbon Neutrality and Green Growth – **Every 5 years**
- Presidential Commission on Carbon Neutrality and Green Growth + Central ministries + Local governments' permanent consultative body operation and systematic implementation inspection – **Every year**

South Korea Emission Reduction Targets

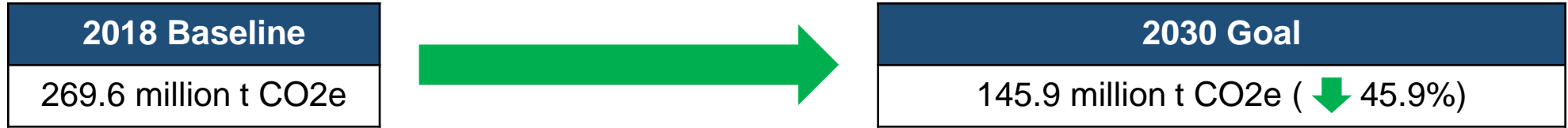


Summary of South Korea Emission Reduction Goals

Sector		Baseline Year (2018)	2030 Goals	
			Announce in Year 2021	Revised Goal Year 2023
Total Emissions		727.6	436.6 (40.0%)	436.6 (40.0%)
Emissions	Energy Transition	269.6	149.9 (44.4%)	145.9 (45.9%)
	Industry	260.5	222.6 (14.5%)	230.7 (11.4%)
	Building	52.1	35.0 (32.8%)	35.0 (32.8%)
	Transportation	98.1	61.0 (37.8%)	61.0 (37.8%)
	Agriculture and fishery	24.7	18.0 (27.1%)	18.0 (27.1%)
	Waste	17.1	9.1 (46.8%)	9.1 (46.8%)
	Hydrogen	(-)	7.6	8.4
	Carbon Leakage	5.6	3.9	3.9
Absorption and Removal	Carbon Sinks	(-41.3)	-26.7	-26.7
	CCUS	(-)	-10.3	-11.2
	International Mitigation Outcome	(-)	-33.5	-37.5

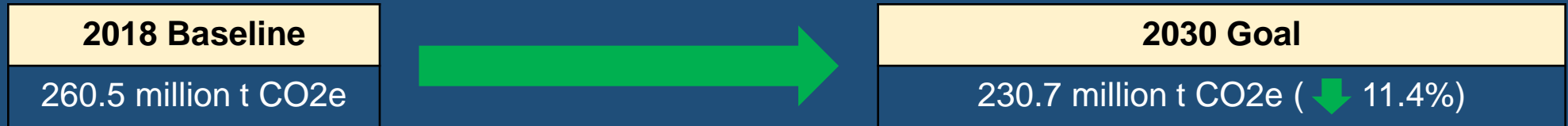
(Unit: 1 million tons CO2e; parentheses indicate reduction rate compared to Year 2018)

Energy Transition



- Reduce coal power generation for decarbonization
- Conversion to LNG power generation (i.e 28 coal power generation plants will be shut down)
- Nuclear power utilization
- Increase share of renewable energy from 9.2% (2022) to 21.6% (2030)

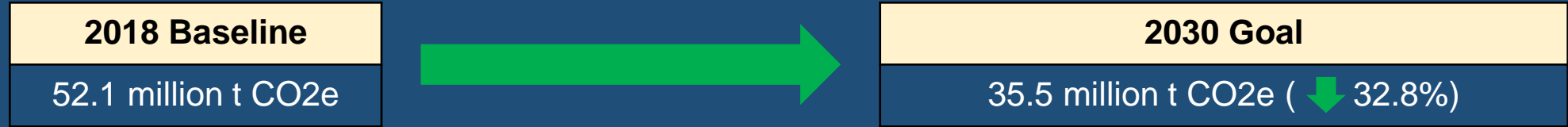
Industry



- Support and promote innovations and technologies to lower GHG emissions (i.e. Technology Innovation Fund and Support Investments for the private sector through subsidies, loans, funds, etc.)
- Monitoring and acquiring overseas technology

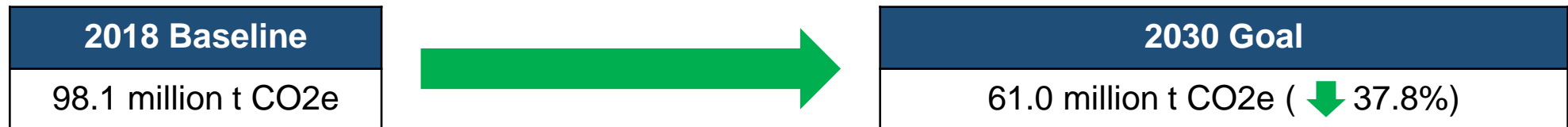


Buildings



- Strengthening the energy performance of new buildings
 - Zero-energy buildings
 - Strengthen the energy performance of small buildings
- Improve energy efficiency of buildings

Transport



- Use of electric and hydrogen vehicles
- Improve public transportation
- Decarbonization of internal combustion engines
- Green railway, aviation and shipping



Agriculture



2018 Baseline

24.7 million t CO₂e



2030 Goal

18.0 million t CO₂e (↓ 27.1%)

- Low-carbon agricultural technology and eco-friendly agriculture
- Lower GHG emissions in the agricultural (cultivation) sector
- GHG reduction in the livestock sector
- Reduction and conversion of fossil energy use in the agricultural sector and the development and distribution of eco-friendly agricultural machineries

Waste



2018 Baseline

17.1 million t CO₂e



2030 Goal

9.1 million t CO₂e (↓ 46.8%)

- Source reduction of waste at the production, distribution, and consumption stages
- Renovation of unsanitary landfills and expansion of methane capture
- Stabilize supply of waste as a recycling raw material
- Recycling of electric vehicle scrap batteries and solar panel scrap panels

Hydrogen

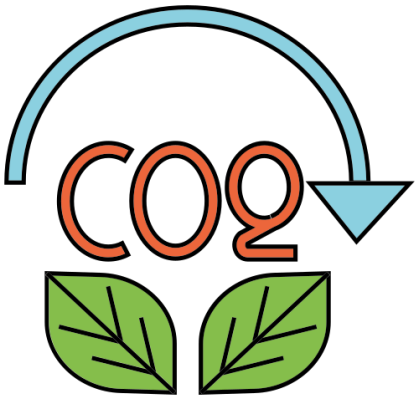


2030 Goal

Emission of 8.4 million t CO₂e

- Production of clean hydrogen
- Establishment of hydrogen infrastructure
- Expansion of hydrogen utilization

Carbon Sinks



2030 Goal

Absorption of 26.7 million t CO₂e GHG emissions

- Promotion of carbon absorption and storage function
- Restoration and management of marine sinks
- Conservation, restoration, and expansion of forest sinks

Carbon Capture, Utilization and Storage (CCUS)



2030 Goal
Capture and use of 11.2 million t CO ₂ e

- Establishing an institutional foundation for the expansion and deployment of CCUS
- Development of CCUS technology and establishment of industrial infrastructure

International Mitigation Outcome



2030 Goal
Emission reduction of 37.5 million t CO ₂ e

- Establish foundations for implementing international mitigation cooperation
- Establish international mitigation in different sectors
- Establish agreements with partner countries
- Promotion of public-private cooperation projects in the industry and energy sectors

Annual Emissions Reduction Target

Sector	2018 (Baseline)	2023	2024	2025	2026	2027	2028	2029	2030
Total	686.3	633.9	625.1	617.6	602.9	585.0	560.6	529.5	436.6
Energy Transition	269.6	223.2	218.4	215.8	211.8	203.6	189.9	173.7	145.9
Industry	260.5	256.4	256.1	254.8	252.9	250.0	247.3	242.1	230.7
Building	52.1	47.6	47.0	46.0	44.5	42.5	40.2	37.5	35.0
Transportation	98.1	93.7	88.7	84.1	79.6	74.8	70.3	66.1	61.0
Agriculture and Fisheries	24.7	22.9	22.4	21.9	21.2	20.4	19.7	18.8	18.0
Waste	17.1	15.1	14.7	14.1	13.3	12.5	11.4	10.3	9.1
Hydrogen	(-)	3.4	4.1	4.8	5.5	6.2	6.9	7.6	8.4
Carbon Leakage	5.6	5.1	5.0	5.0	4.9	4.8	4.5	4.2	3.9
Carbon Sinks	-41.3	-33.5	-31.3	-28.9	-30.4	-29.1	-28.3	-27.6	-26.7
CCUS	(-)	-	-	-	-0.4	-0.7	-1.3	-3.2	-11.2

Unit: 1 million tons CO₂e

International Mitigation Cooperation

	Paris Agreement 6.2 (Cooperative Approach)	Paris Agreement 6.4 (Sustainable Development Mechanism)
How to operate?	Decided by the participating countries/bilateral and multilateral agreement	Operated by a UN-designated supervisory body
Issuing entity	Participating governments	Supervisory Body (designated by UNFCCC)
Method of utilizing emission reduction performance	<ul style="list-style-type: none"> Used to achieve NDC goals Other international reduction objectives (shipping, aviation) 	<ul style="list-style-type: none"> Used to achieve NDC Other international mitigation cooperation (shipping, aviation) For voluntary use of companies

Key sectors for international cooperation projects

- Industry and energy
- Environment
- Land, infrastructure and transportation
- Marine and fisheries
- Agriculture
- Forestry (including REDD+)

Expanding Mitigation Cooperation

Strengthening cooperation with both developed and developing countries

Expanding participation in public-private partnership

Strengthening cooperation with international organizations and regional cooperation bodies across different sectors and specialized fields

Expanding green ODA across government departments

Bilateral Agreement under the Paris Agreement



SOCIALIST REPUBLIC OF VIET NAM

- Signed the Framework Agreement for Cooperation on Climate Change on 31 May 2021.
- It will allow the transfer of GHG reduction outcomes through voluntary cooperation between the countries under the Paris Agreement Article 6.



THE MONGOLIAN PEOPLE'S REPUBLIC

- Signed an “Implementing Arrangement for Cooperation on Paris Agreement Article 6 Cooperative Approach on 9 May 2022.
- Pilot project for reducing methane in Ulaanbaatar, Mongolia.

References:

- https://www.mofa.go.kr/eng/brd/m_5676/view.do?seq=321700
- <http://eng.me.go.kr/eng/web/board/read.do?menuId=461&boardMasterId=522&boardId=1523930>

Carbon Emission Reduction Technology in Republic of Korea

1 Top 100 Core Technologies for Carbon Neutrality

- **Energy Transition (35 in total)**

Solar Power, Wind Power, Hydrogen Supply, Carbon-Free power supply, Power Storage, Power Grid, Nuclear Power, Biomass

- **Transportation (13 in total)**

Green Vehicle, Carbon Neutral Ship

- **Industry(44 in total)**

Steel, Petrochemical, Cement, CCUS, Industry

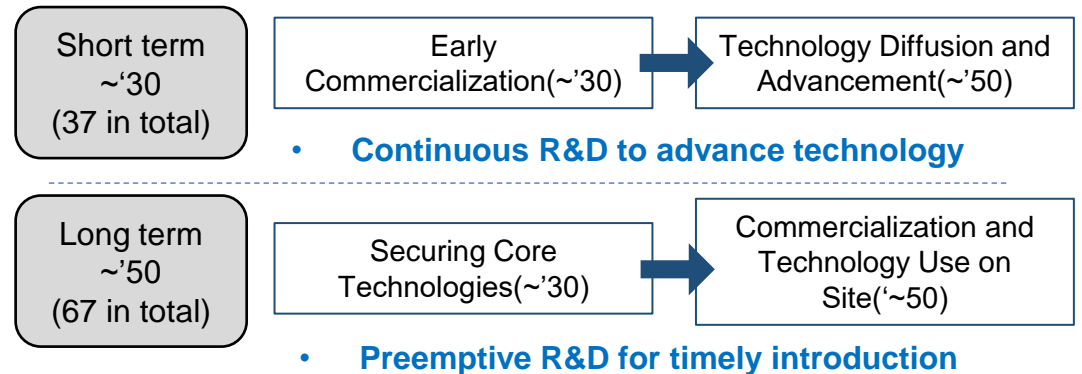
- **Building and Environment (8 in total)**

Zero Energy Building, Environment

2 Technology R&D Roadmap by Period and level

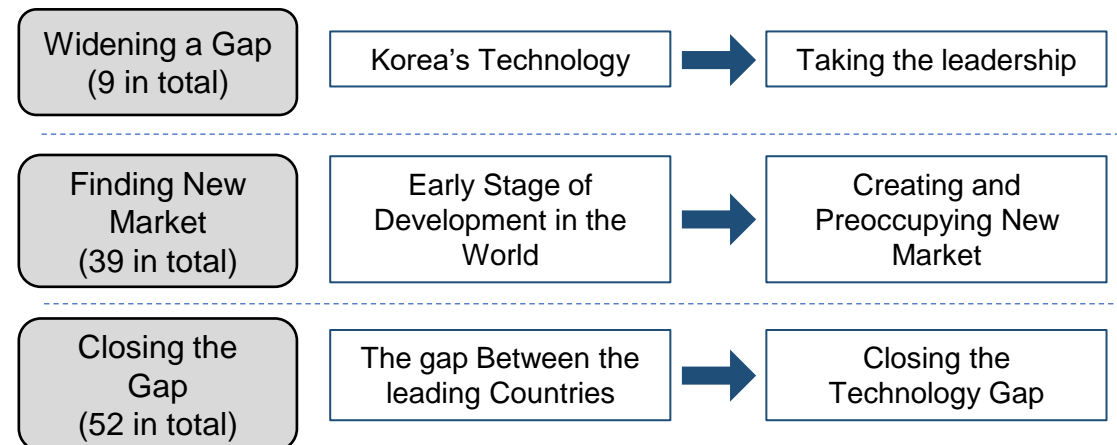
By Period

Strengthening the strategies via R&D investment and cooperation between ministries



By Technology Level

Enhance carbon neutral technology innovation

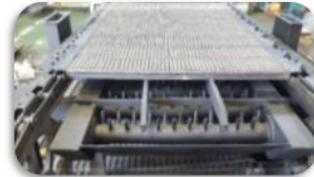


Project in Vietnam

Application steam biomass boiler technology to replace use of fossil fuels fired boilers



A boiler with complete combustion technology with **15% higher efficiency compared to other boilers**, which will improve the **Energy Cost-Efficiency**.



With 24-7 **automatic maintenance** and features air curtain effect to maintain the needed temperature



Uses a boiler shell that pass the American standard and with KSB6233 safety design



With **fully automatic reprocessing system**



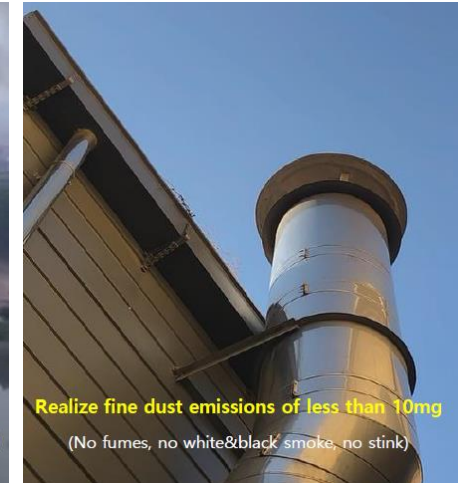
Combined with an **integrated combustion furnace to maximize efficiency** to higher than 90% and shorten temperature rise time



Features **automatic control system**



APULLPOWER Boiler installed
(Phong Khe Paper Industrial Complex, Vietnam)



Realize fine dust emissions of less than 10mg
(No fumes, no white&black smoke, no stink)

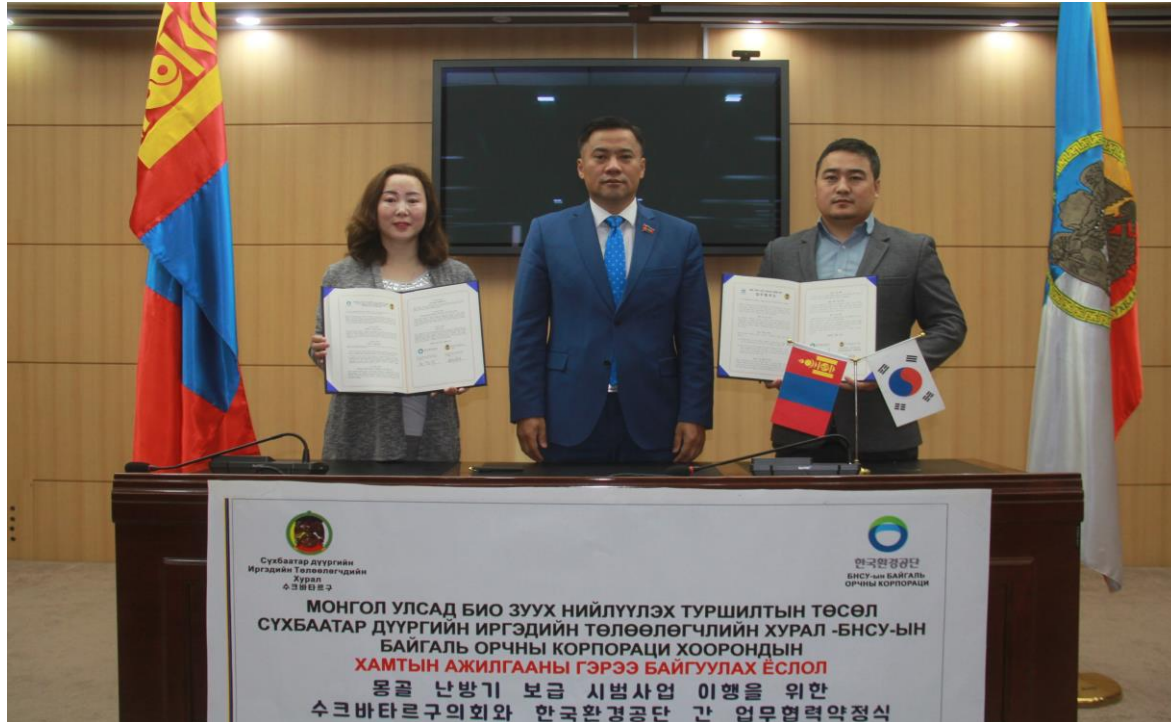
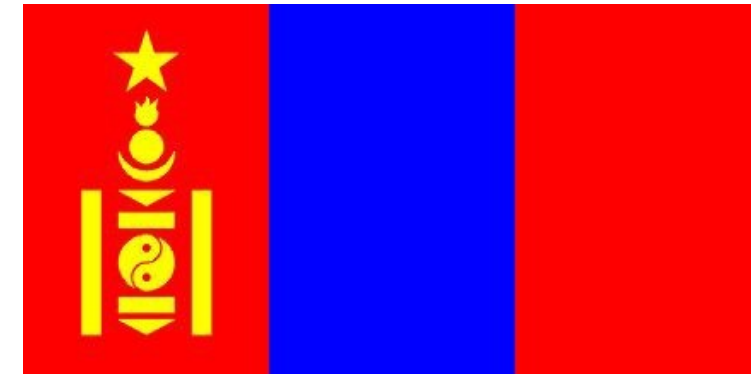


Landfill Gas Project in Mongolia

supported by Korea Ministry of Environment

Foundation for Cooperation to implement Paris Agreement 6.2

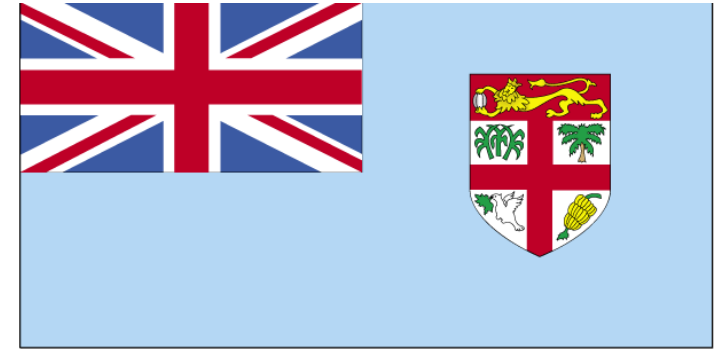
“The project is aimed at reducing greenhouse gases and improve air quality in Mongolia by collection and incineration landfill gas generated at Narangiin Enger landfill in Ulaanbaatar, Mongolia.”



GCF Project in Fiji

Agro-photovoltaic project for climate change mitigation

“This project aims to overcome barriers of financing, technical capacity, and limited availability of land by supporting an innovative technology that combines photovoltaic power generation and agricultural production.”



Ref: http://www.koreatimes.co.kr/www/tech/2021/04/515_307386.html?RD



Ref: SAP016: Fiji Agro-photovoltaic Project in Ovalau

Thank you!

