



Progress in Greenhouse Gas Mitigation, Carbon Sink Enhancement and Carbon Dioxide Removal in Japan

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Today's Agenda

1. Japan's Latest GHG Inventory and Climate Targets

- FY2024 inventory results
- Updated NDC and net-zero pathway

2. Coastal Blue Carbon Ecosystems in Japan

- National inventory reporting
- Blue carbon enhancement

3. Emerging Carbon Removal Approaches

- Seaweed cultivation and deep-ocean carbon sequestration
- Carbon-storing concrete

4. Key Messages

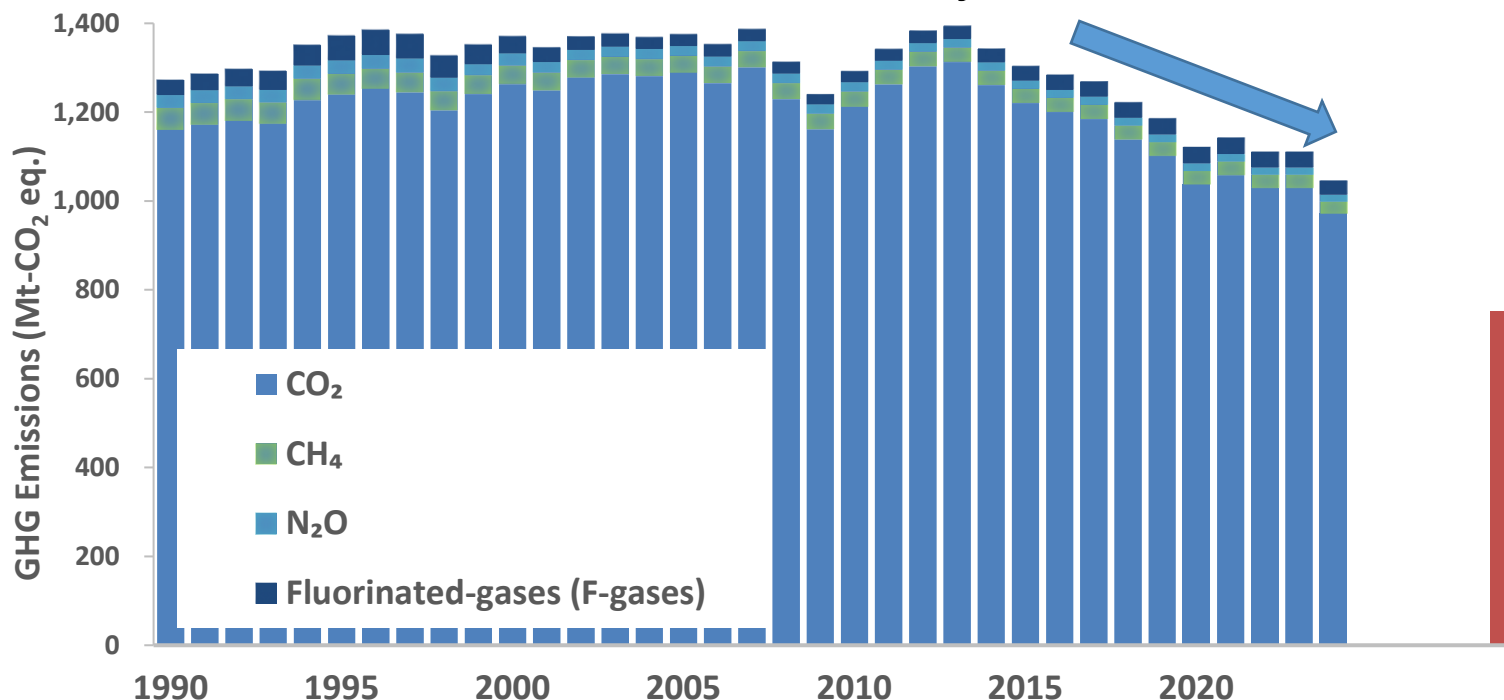
1. Japan's Latest GHG Inventory and Climate Targets



GHG Emissions

FY2024: **1,046 million** tonnes-CO₂ eq.

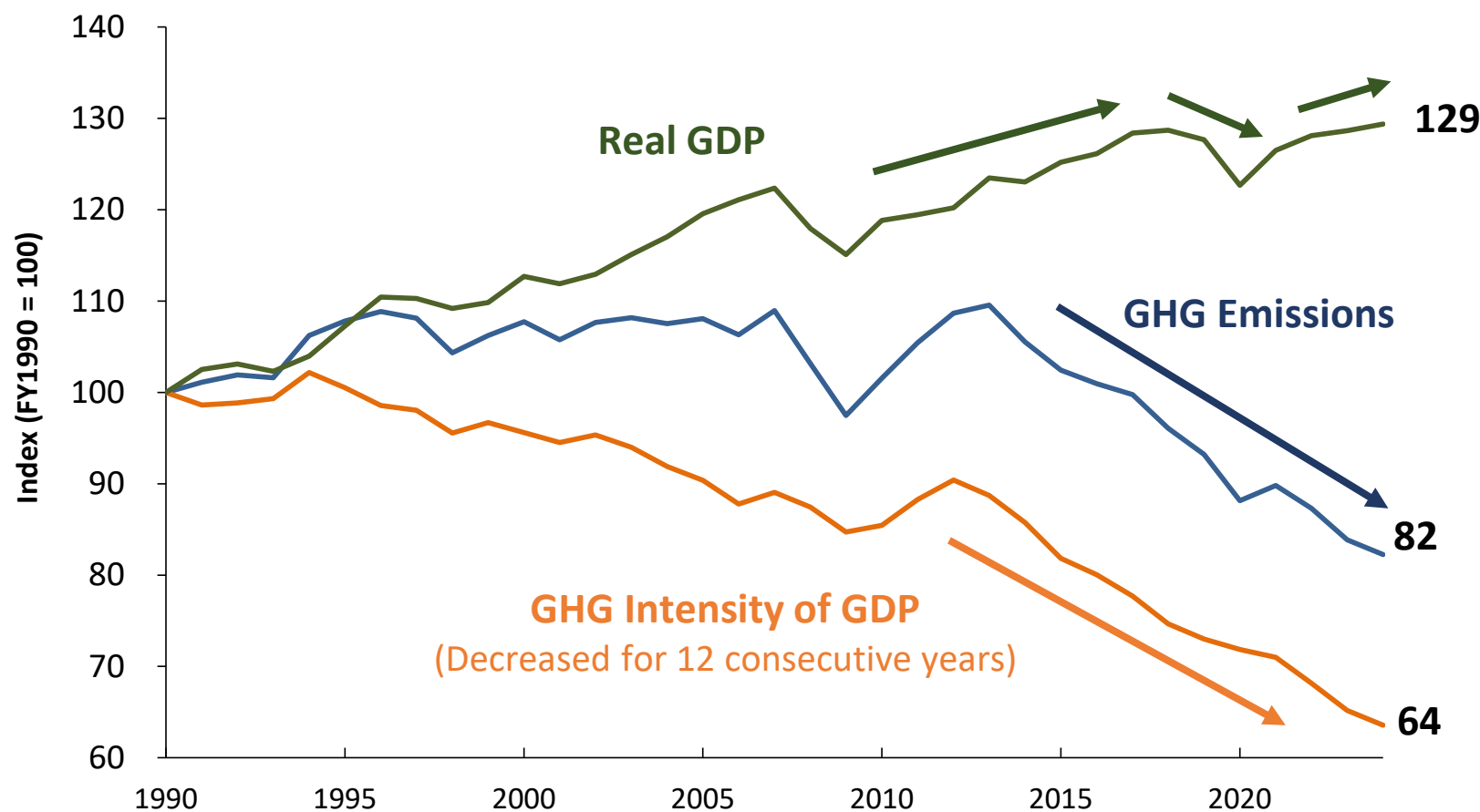
- ✓ Decrease by 1.9% from FY2023 mainly due to reduced energy consumption resulting from the decarbonization of power and a reduction in energy consumption due to decreased domestic production activity in the manufacturing sector.
- ✓ Decrease by 24.9% from FY2013 due to the reduced energy consumption and a decrease in CO₂ emissions from electricity production due to the wider use of low-carbon electricity.



FY2030 target:
46% decline
compared to
FY2013
(continuing
strenuous efforts
to 50%)

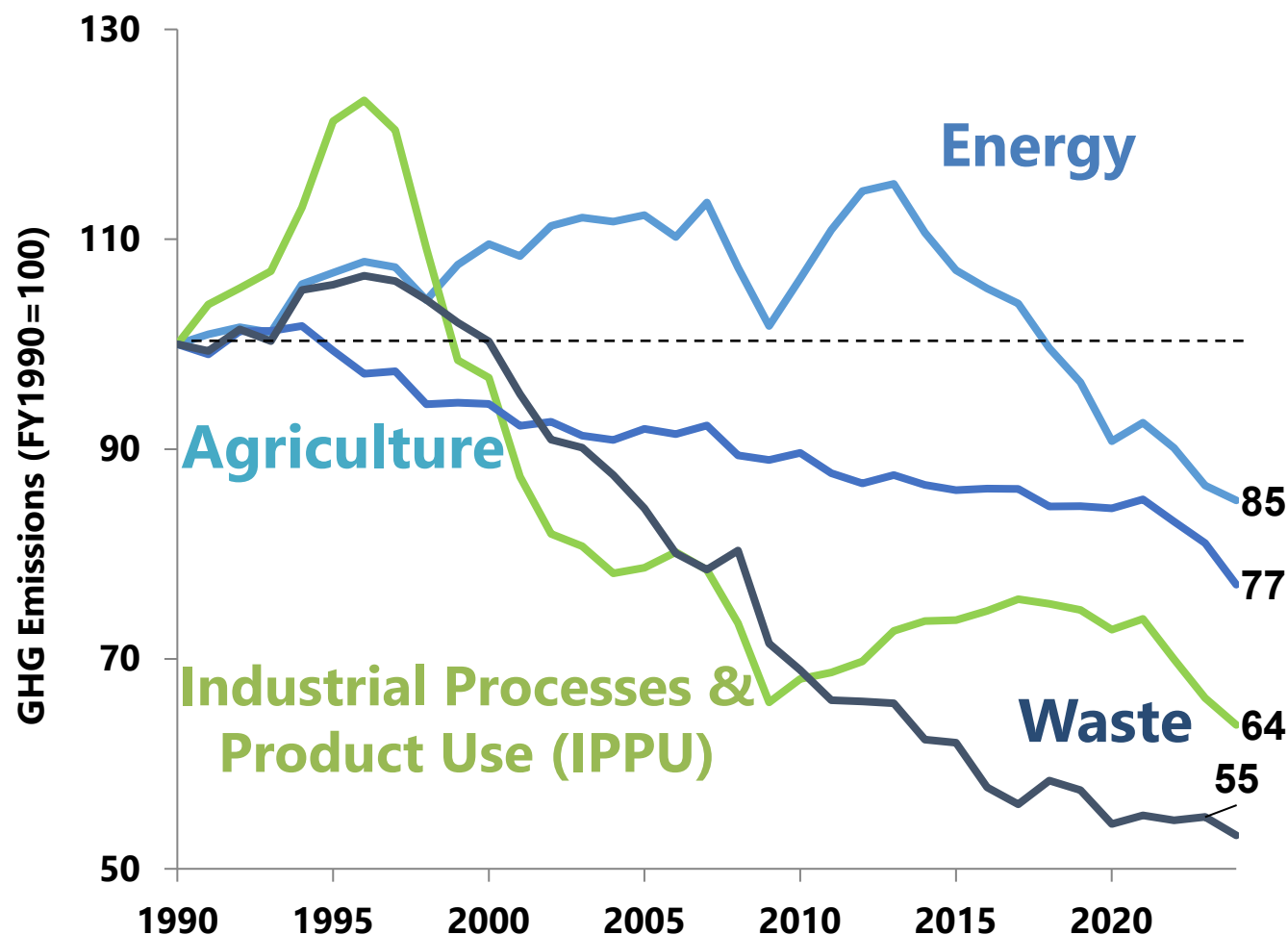
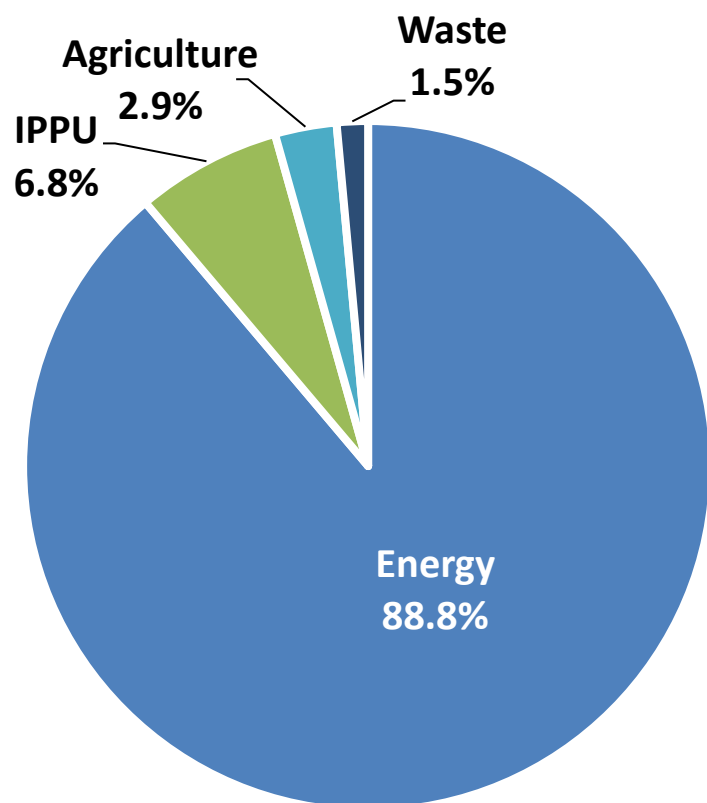
Trends of GHG Intensity of GDP

- ✓ **GHG intensity of GDP has been decreasing** for 12 consecutive years compared to FY2013.



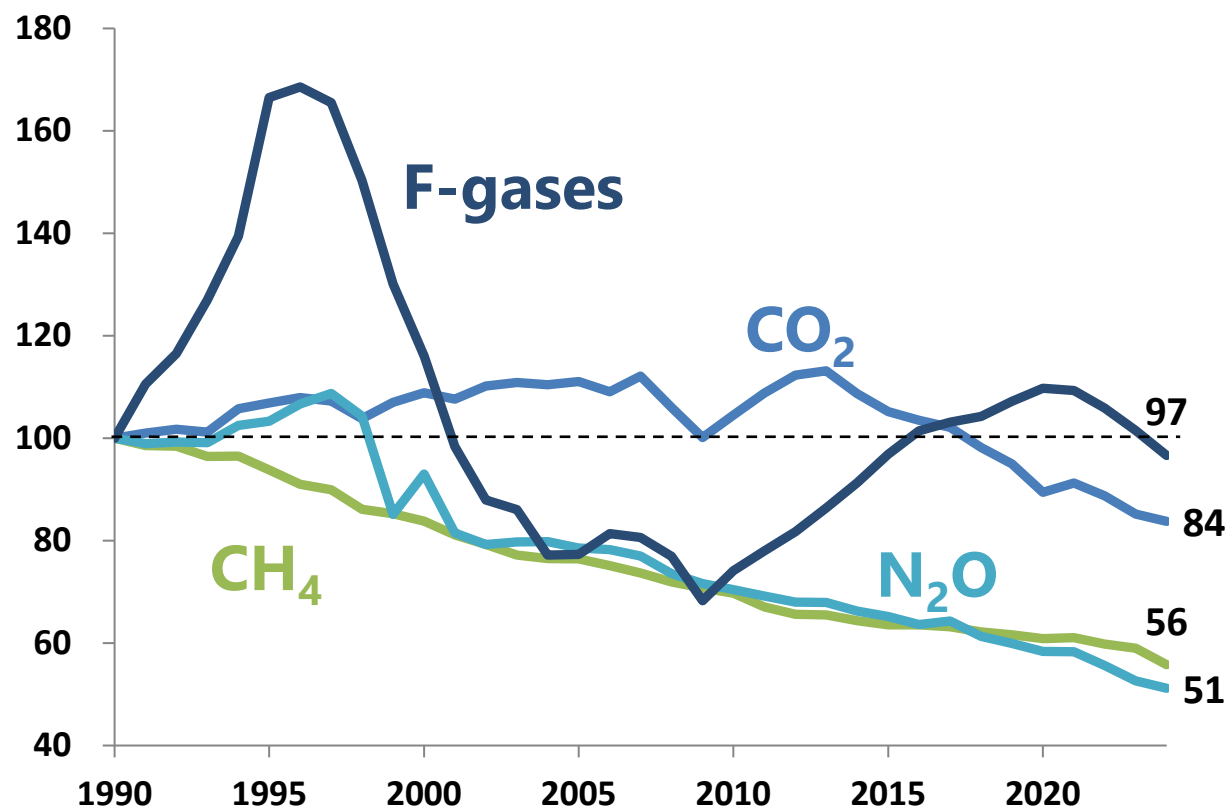
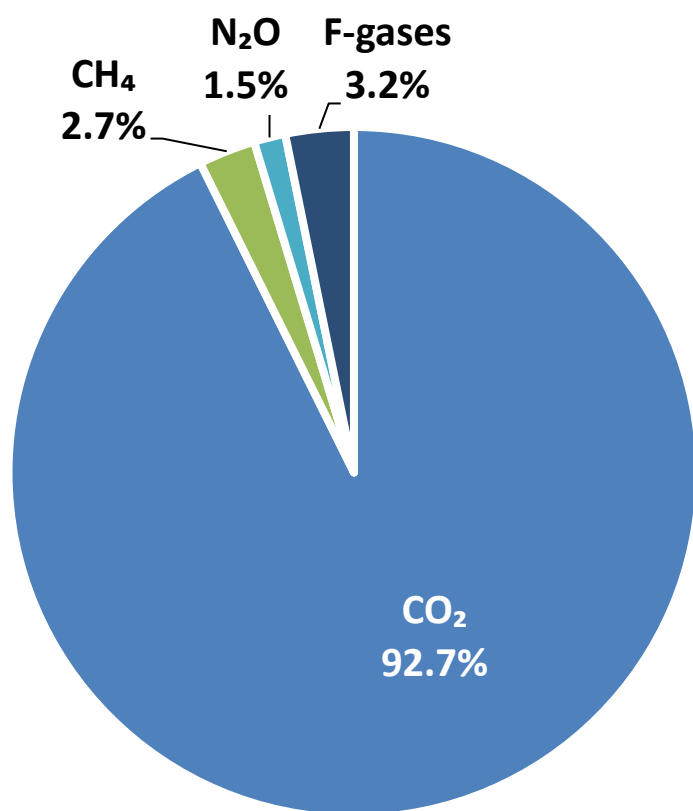
GHG Emissions by Sector (excl. LULUCF)

- ✓ **Emissions from the energy sector**, the largest source, **decreased compared to FY2013** due to the progress in energy saving activities and the decrease in thermal power generation.



GHG Emissions by Gas (excl. LULUCF)

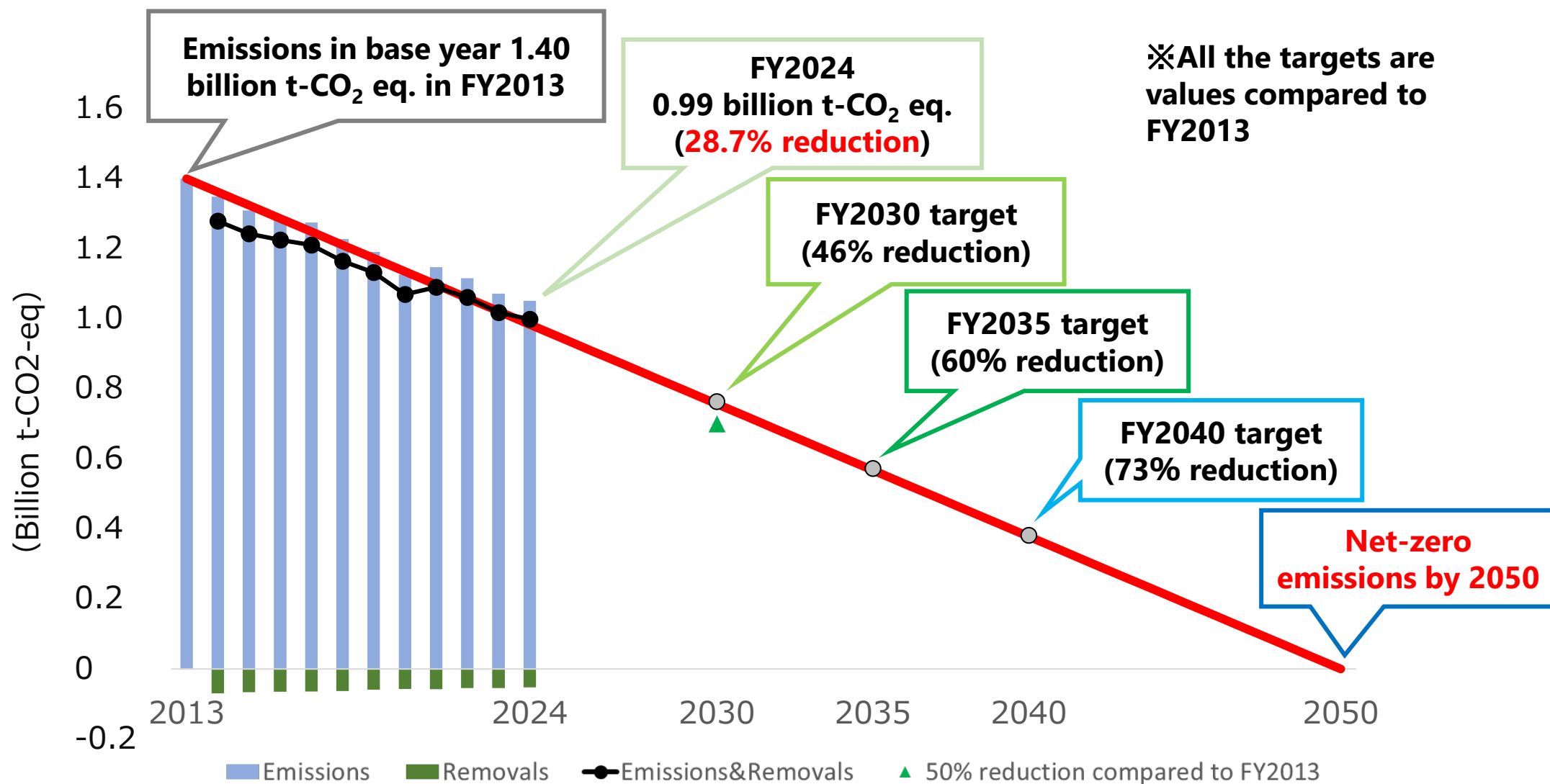
- ✓ **F-gas emissions** have further declined compared to 2022, when F-gas emissions turned to a decrease for the first time since their increasing trend began in 2009. In addition, emissions fell below 100 percent of the 1990 level for the first time in nine years, since 2015. We will continue our efforts to reduce emissions going forward.



Progress toward the 2030 Target

Greenhouse Gas Emissions and Removal (Unit: million t-CO ₂)		2013 Emission※ ¹	2024 Emissions sub-target※ ¹	2024 Reduction rate	2030 Reduction rate sub-target※ ²
		1,394	994	▲29%	▲46%
Energy-derived CO ₂		1,235	907	▲27%	▲45%
Sector	Industry	463	334	▲28%	▲38%
	Business & others	235	162	▲31%	▲51%
	Household	209	146	▲30%	▲66%
	Transportation	224	187	▲17%	▲35%
	Energy conversion	104	79.1	▲26%	▲47%
Non-energy-related CO ₂		130	107	▲18%	▲14%
HFCs and other 4 gases (PFCs, SF ₆ , NF ₃)		28.8	32.2	+12%	▲44%
Greenhouse gas removals		-	▲52.3	-	-
Joint Crediting Mechanism(JCM)		We aim to achieve international emission reductions and removal in 2030 through public-private partnership. The credits acquired by Japan will be counted appropriately to achieve Japan's NDCs.			

Pathway to Net Zero by 2050



<Source> Ministry of the Environment of Japan

Japan is promoting Green Transformation (GX) toward the simultaneous achievement of decarbonization and economic growth.

2. Coastal Blue Carbon Ecosystems in Japan



Japan is working to incorporate carbon removals from coastal blue carbon ecosystems into its national GHG inventory.

Blue Carbon in Japan's National GHG Inventory

- **For the first time in the world, removals in seagrass meadows and seaweed beds were estimated and reported in April 2024.**
- Reported removals amounted to approximately 0.34 Mt CO₂ eq. in FY2023 and 0.32 Mt CO₂ eq. in FY2024.
- From FY2025, we began to study calculation and evaluation of the amount of blue carbon in offshore areas expected as a large carbon sink.

<Photos>

UNEP 「Blue Carbon」 : <https://wedocs.unep.org/handle/20.500.11822/7772>

MOE Japan : <https://www.env.go.jp/nature/saisei/>

Status of Reflection of Blue Carbon Ecosystems in Greenhouse Gas Inventories

Mangrove Forests



Reflected in inventory
submitted in 2023

Seagrass and Macroalgae (Seaweed)



Reflected in inventory
submitted in 2024

Salt Marshes and Tidal Flats



To be discussed
in the future

3. Emerging Carbon Removal Approaches



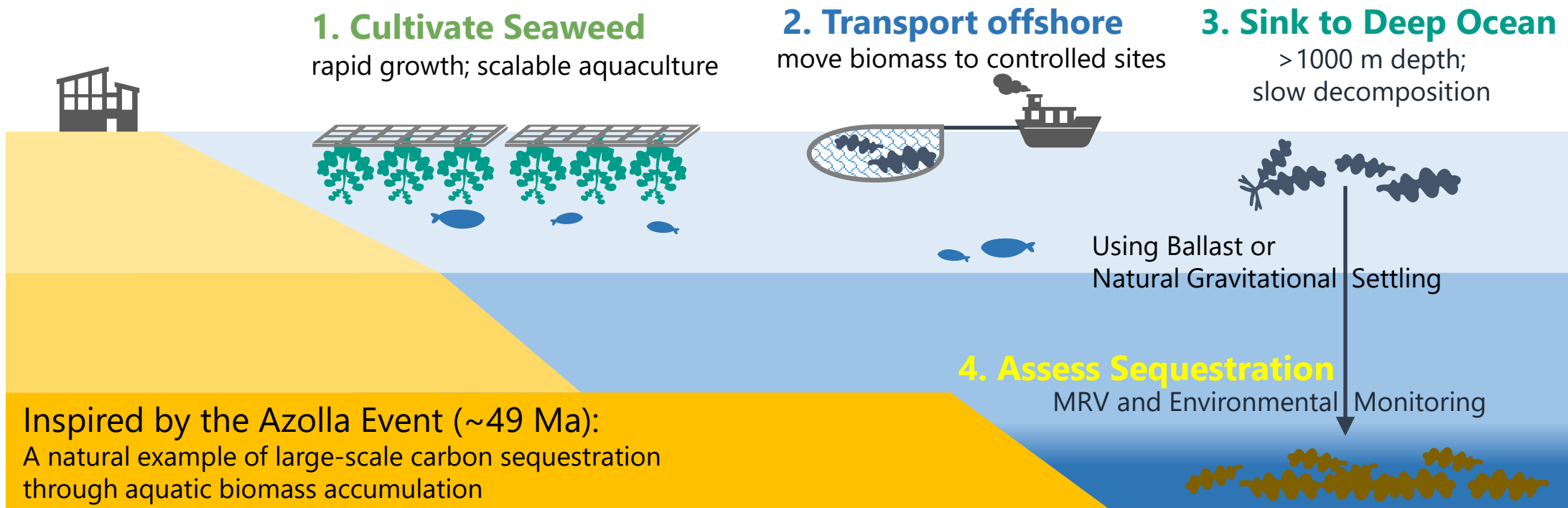
Seaweed cultivation and deep-ocean sequestration



Carbon-storing concrete

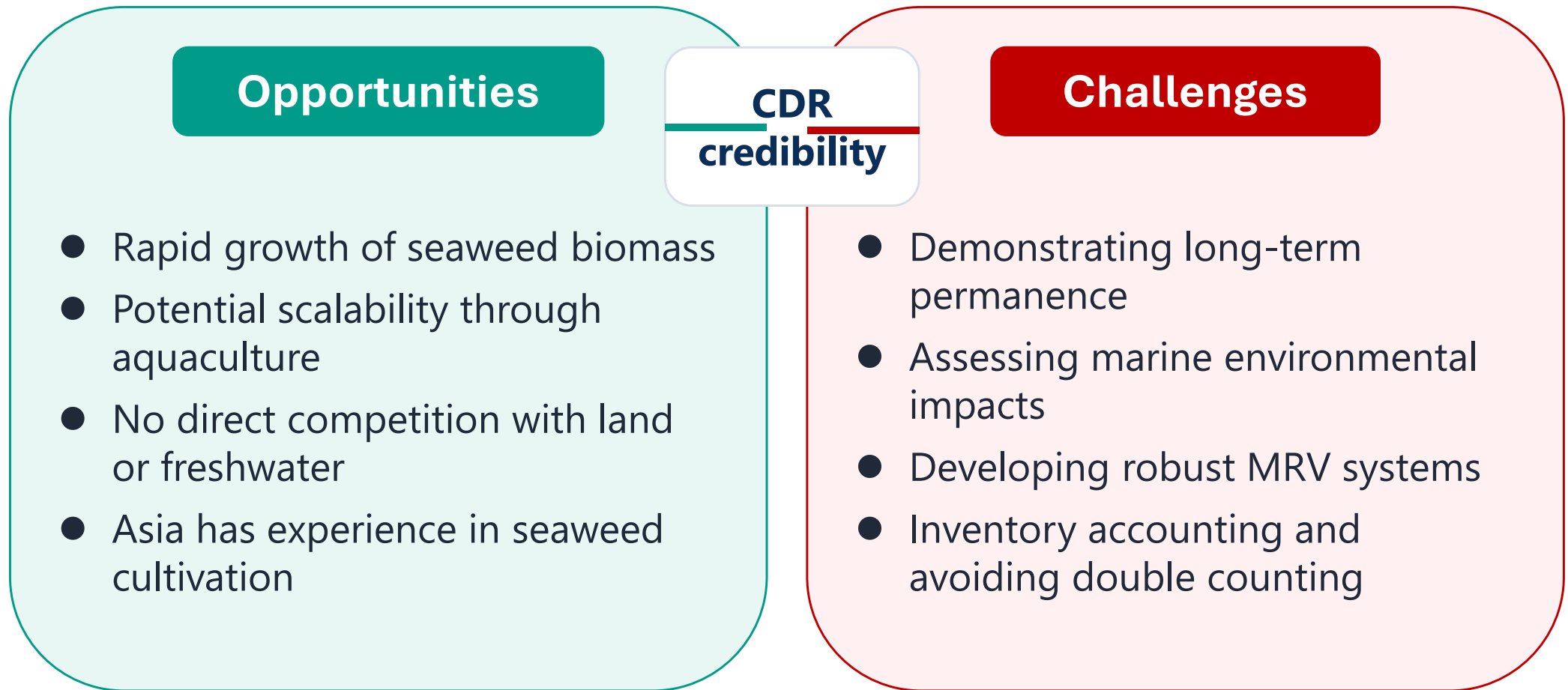
Seaweed cultivation and deep-ocean carbon sequestration

- A possible future pathway combining nature-based capture and marine engineering
- Japan is examining the possibility of producing and cultivating seaweed, sequestering it in the deep sea, and estimating/assessing the amount of carbon sequestration.



Opportunities and Challenges for Blue Carbon CDR

- Scientific credibility depends on permanence, impacts and MRV



Blue carbon CDR may offer significant potential, but inventory-ready reporting requires robust evidence and safeguards.

Carbon-Storing Concrete in Japan's National GHG Inventory

- Japan reports carbon storage from selected CDR-related construction materials in its national GHG inventory.
- Accounting is based on quantified carbon storage supported by MRV and measures to avoid double counting.

CO₂ Fixing Concrete

Calculate the amount of CO₂ forcibly fixed inside concrete as calcium carbonates during manufacturing.



Biochar Concrete

Calculate the amount of CO₂ fixed in concrete that stores carbon, by mixing in biochar made with carbonated woody biomass



Concrete Using CO₂-derived Material

Calculate the amount of CO₂ fixed inside the concrete manufactured by using carbonate material that fixes CO₂.



Key Messages

- Progress emerging removals
- ① Japan is making steady progress toward its **climate targets** and **net-zero goal**.
 - ② **Carbon sinks** and **CDR** are becoming increasingly important components of climate policy.
 - ③ **Blue Carbon** and **Carbon-Storing Concrete** are practical examples for inventory development.
 - ④ Japan's experience may contribute to international discussions on inventory methodologies for CDR and CCUS.

Thank you for your kind attention

Strengthening Support for National Inventories



Ministry of the Environment