Toranomon Hills Forum, Tokyo

February 4th, 2025

# FY2024 ALPS International Symposium

## - Global warming countermeasures and policies of major developed countries in a diversifying international context -

Research Institute of Innovative Technology for the Earth (RITE)

# Backgrounds and Objectives of ALPS IV



ALPS IV: Project for international cooperation on the analysis and assessment of technologies for climate change mitigation under the Ministry of Economy, Trade and Industry

- As global warming is bound to have severe impacts on the whole planet, there are high expectations for solutions to this issue. However, while global warming affects various sectors in every country of the world, its impacts are not uniform. Mitigation measures and associated costs that countries can afford to take and pay may differ to very large extent. Therefore, model development and model-based analysis and evaluation for global warming countermeasures and policies considering the status of each country/region and industry are needed in order to build truly effective climate policies.
- Within this project, we assess mitigation and adaptation measures, climate finance and climate policy in a consistent and comprehensive manner, taking into account the latest scientific knowledge on the subject, recent trends in international negotiations, and cooperating with international research organizations. Our goal is to contribute to the discussions in international negotiations, e.g., IPCC and COP, and to the development of an international framework and of a national strategy for green growth, namely, a virtuous cycle of environment and growth in the long-term strategy.

ALPS: ALternative Pathways toward Sustainable development and climate stabilization

# Overview of the ALPS project



## Risk management strategy for climate change responses

- Understanding uncertainties, e.g., climate change science, damages and adaptations, countermeasures and mitigation costs, socioeconomics and international framework.
- Analysis on long-term target and the emission pathways for 2050, 2100 and further (global $CO_2$ net zero emissions).
- Evaluation of impacts of mitigation costs and international competitiveness regarding short-and-mid-term target up to 2030 (NDCs) and evaluation of Border Carbon Adjustment.
- Research on damages and adaptations and model development to be reflected on risk management strategy.
- Evaluation of long-term low emission scenarios of NETs (BECCS, DACS, etc.) to be reflected on risk management strategy.
- Evaluation of Solar Radiation Management (SRM).
- Evaluation of innovation.
- Synergies and trade-offs with SDGs.

## Modeling and Analysis in systematic and quantitative manner

- Improvement of DNE21+, DEARS, and GLaW and analysis using those models.
- Participation in international model comparison projects mainly in Europe & US and presentation of model analysis results.

## Evaluation of Green Growth in economic perspective

- Evaluation of Green Growth (decoupling) and data-based analysis.
- Estimation of $CO_2$ emissions based on consumption.
- Analysis on energy efficiency of Japan and major countries.
- Evaluation of equity of burden by income class due to FIT or other policies.
- Issues regarding $CO_2$ emission reduction policies under electricity deregulation (learning from Europe).

## Technological evaluation in cross-sectoral perspective

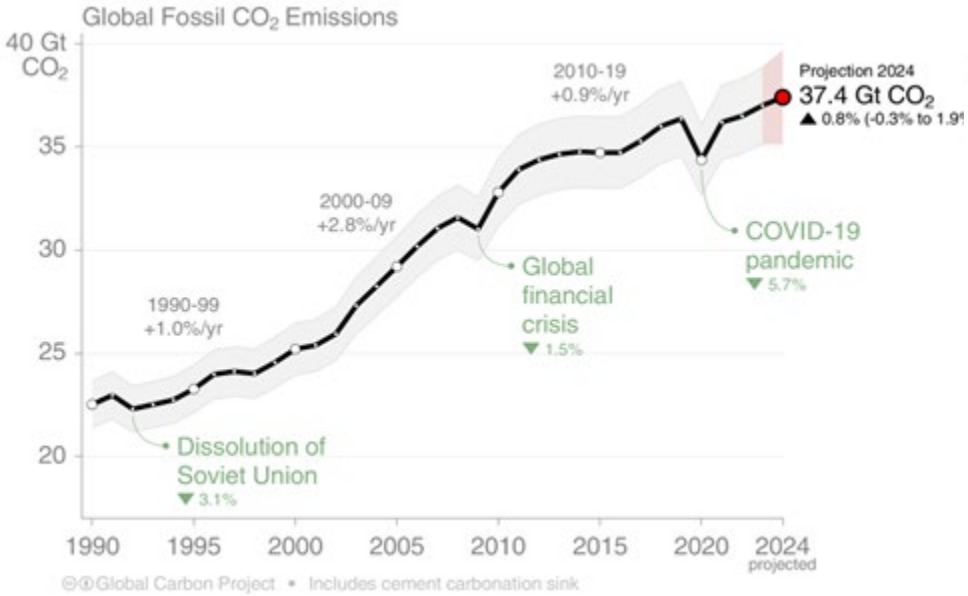
- Integrated evaluation of social changes, such as acceleration of sharing economy induced by IoT & AI and reduction in embodied goods by improving demand-supply efficiency.
- Evaluation of hydrogen use including CCUS and whole system of oil refinery, petrochemical, shale gas ad biorefinery.
- Evaluation of food system.
- Research on other technologies.

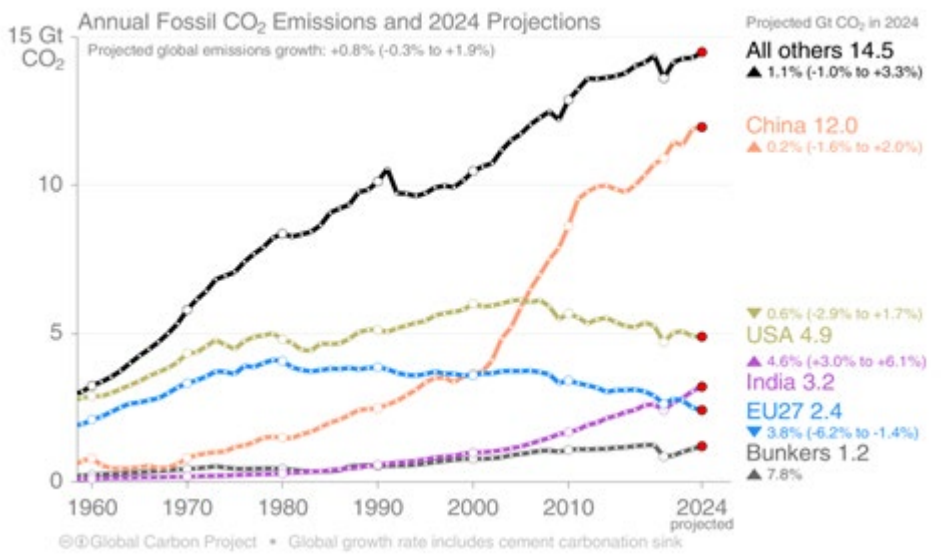
## Evaluation of innovation and investment

- Evaluation of the role of general-purpose technologies (e.g., ICT, material technology).
- Evaluation of innovation inducing policies.
- Research on the trend of ESG investment and green finance analysis.

# $CO_2$ emission trajectories in the world and major countries



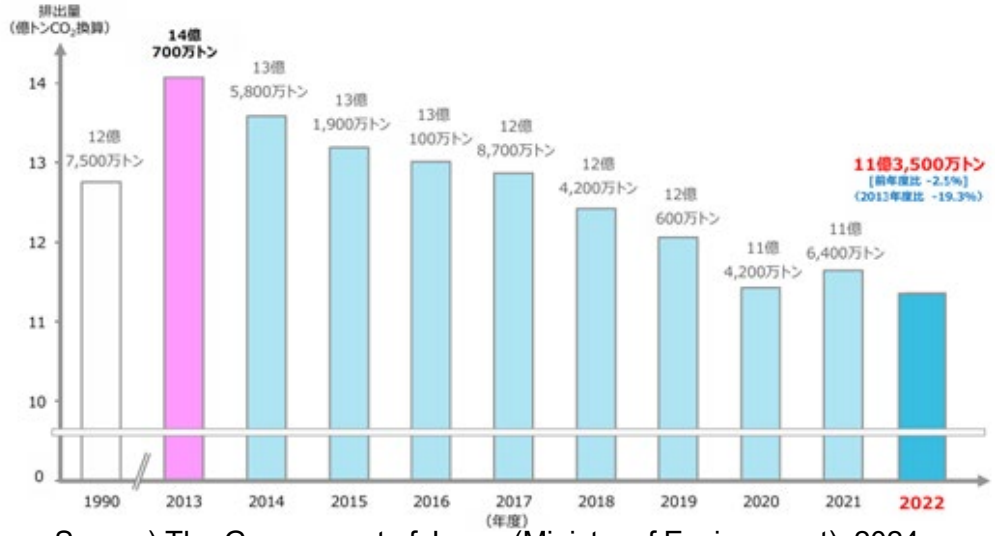



Source) Global Carbon Project, 2024

- **The coupling between the economy and $CO_2$ emissions continues on the global level. When $CO_2$ emissions decrease significantly, economic conditions (GDP, income) worsen.**
- **Manufacturing industries, with high $CO_2$ intensity in particular, are being transferred from developed to developing countries.**

## GHG emissions in Japan

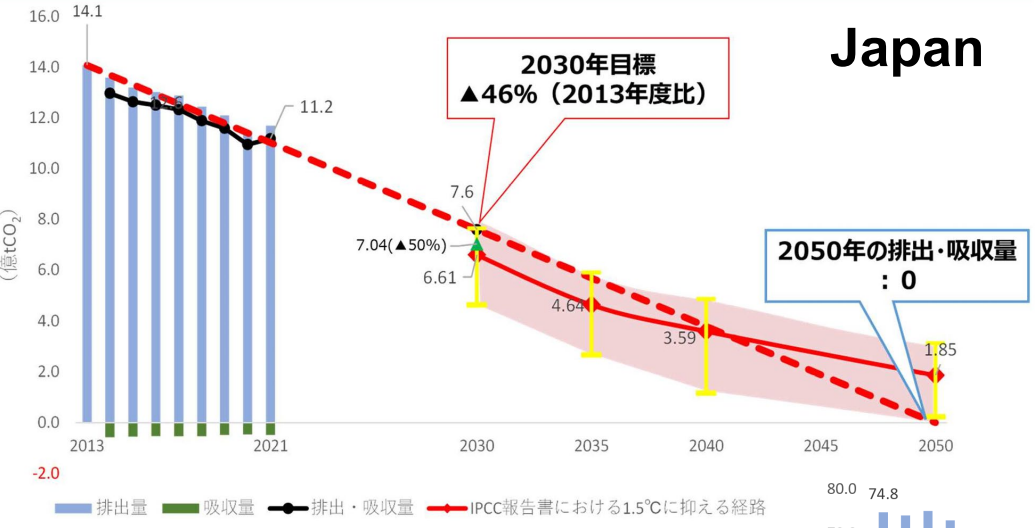



Source) The Government of Japan (Ministry of Environment), 2024

# The trends of emissions reduction in Japan, US, and EU

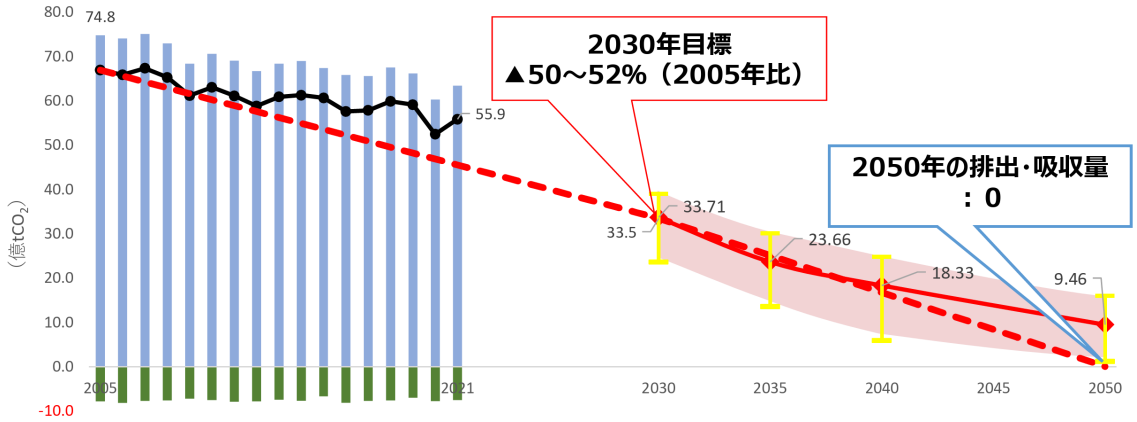


## Japan

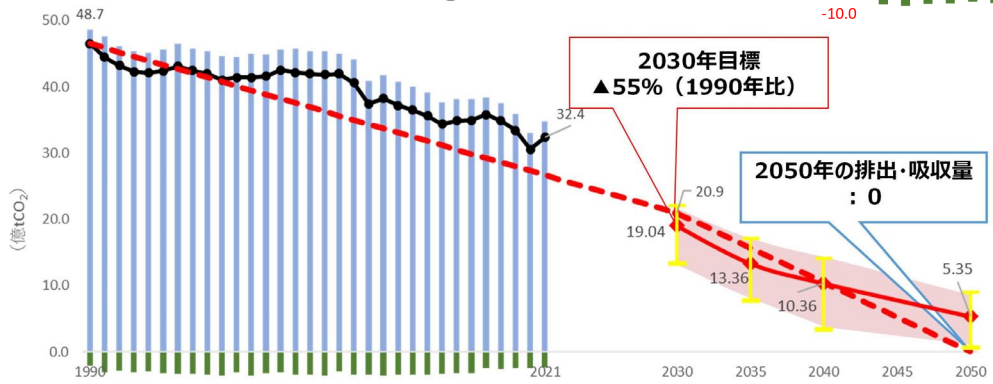



**Even major developed countries are not making steady progress in emissions reduction to achieve the NDCs.**

## U.S.




## EU

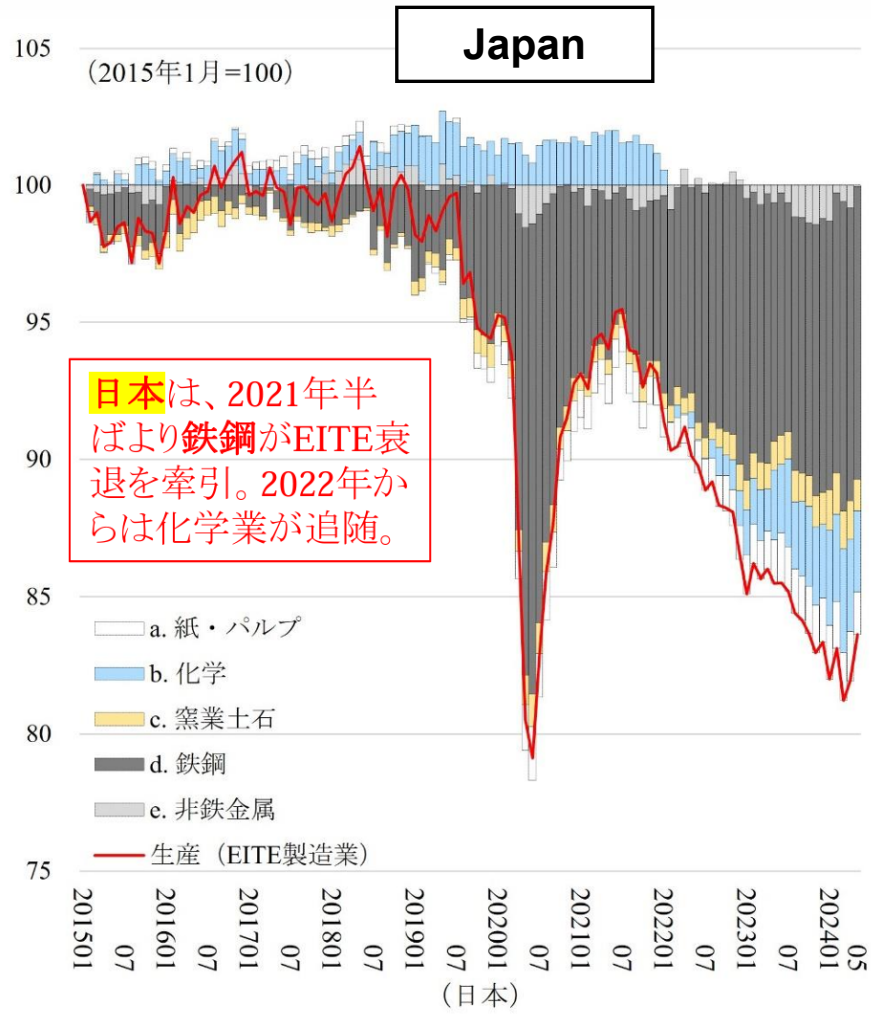


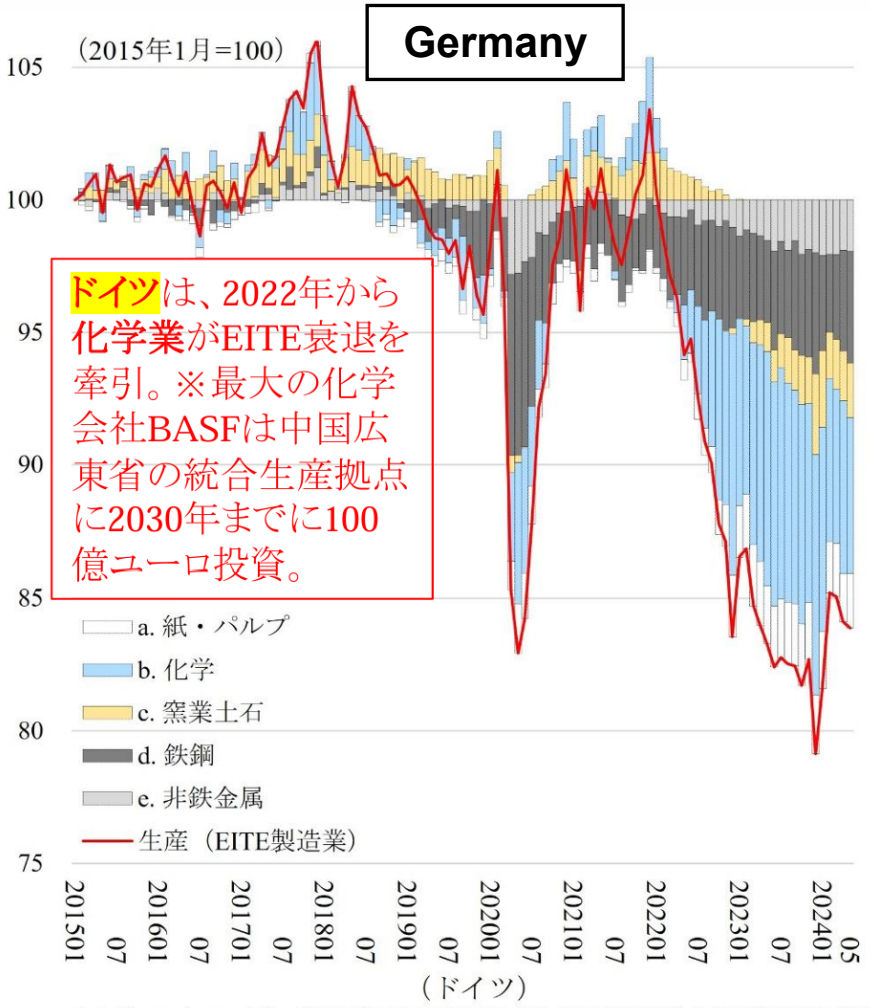

Source) Ministry of Environment, Japan, 2023

# Manufacturing production and contribution by sector in EITE in Japan and Germany



EITE: Energy-Intensive Trade-Exposed Output



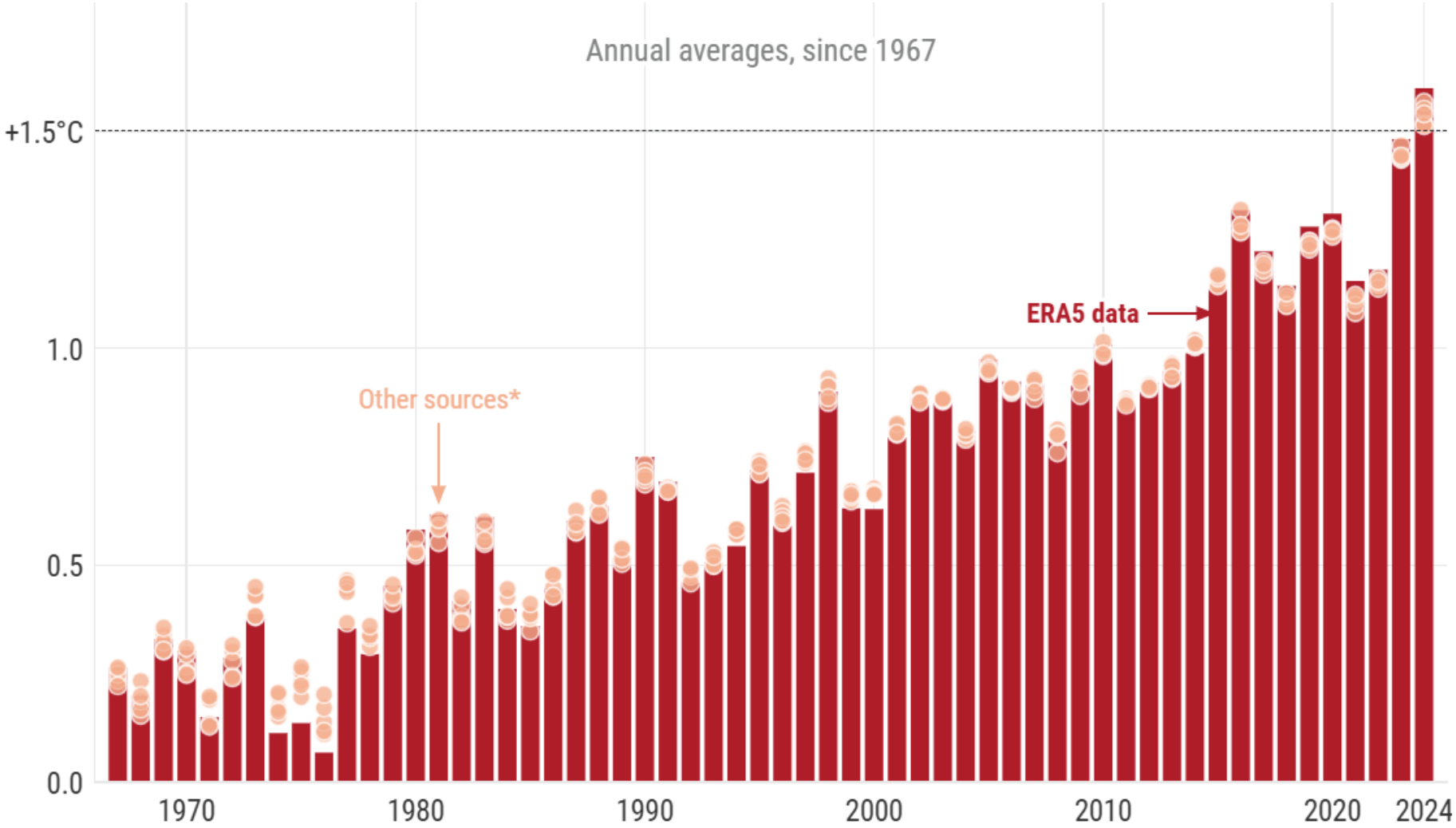



単位：2015年1月値＝100 。出典：ECM_JPN_202407（慶大産研野村研究室，2024年8月3日公表）。測定の詳細はNomura and Inaba (2024)"Post-Pandemic Surges of Real Unit Energy Costs in Eight Industrialized Countries,“ RCGW Discussion Paper, Research Center on Global Warming, Development Bank of Japan.

Source) Koji Nomura, Working Group of Experts for the Realization of GX, 2024

# 2024 was the first year with global average temperature more than 1.5℃ above the pre-industrial level






Source) Copernicus Climate Change Service (C3S) (2025)

# COP28 Outcomes: Global Stock Take



- **Recognizes the finding in the Synthesis Report of the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, based on global modelled pathways and assumptions, that global greenhouse gas emissions are projected to peak between 2020 and at the latest before 2025 in global modelled pathways that limit warming to 1.5 °C with no or limited overshoot... Also recognizes that limiting global warming to 1.5 °C with no or limited overshoot requires deep, rapid and sustained reductions in global greenhouse gas emissions of 43 per cent by 2030 and 60 per cent by 2035 relative to the 2019 level…**
- **… calls on Parties to contribute to the following global efforts, in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches:**

(a) Tripling renewable energy capacity globally and doubling the global average annual rate of energy efficiency improvements by 2030;

(b) Accelerating efforts towards the phase-down of unabated coal power;

(c) Accelerating efforts globally towards net zero emission energy systems, utilizing zero- and low-carbon fuels well before or by around mid-century;

(d) Transitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science;

(e) Accelerating zero- and low-emission technologies, including, inter alia, renewables, nuclear, abatement and removal technologies such as carbon capture and utilization and storage, particularly in hard-to-abate sectors, and low-carbon hydrogen production;

(f) Accelerating and substantially reducing non-carbon-dioxide emissions globally, including in particular methane emissions by 2030;

(g) Accelerating the reduction of emissions from road transport on a range of pathways, including through development of infrastructure and rapid deployment of zero- and low-emission vehicles;

(h) Phasing out inefficient fossil fuel subsidies that do not address energy poverty or just transitions, as soon as possible;

- **Recognizes that transitional fuels can play a role in facilitating the energy transition while ensuring energy security;**

# Importance of strengthening measures in Asia



**AZEC（Asia Zero Emission Community）is a Platform for cooperation towards carbon neutrality/net-zero emissions in the Asia region, involving partner countries from 11 nations (Australia, Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Philippines, Singapore, Thailand, and Viet Nam)**

- AZECは、2022年１月、岸田総理（当時）が、施政方針演説において、**アジア各国が脱炭素化を進めるとの理念を共有し、エネルギートランジションを進める**ために協力することを目的として提唱。
- ASEANの多くの国は、**電力の大宗を石炭・天然ガスの火力発電に依存し、産業構造の高い割合を製造業が占めるなど日本と同様の課題。脱炭素化の取組が遅れると、**ASEANは**グローバルなビジネス機会を喪失**するおそれ。
- 但し、現下の国際情勢下、**脱炭素化の取組**は、**経済成長とエネルギー安全保障を両立**する形で進める必要あり。
- 即ち、各国の事情に応じた**多様な道筋による現実的な形**で、**着実にアジアの脱炭素を進めていく**必要があり、そのため、AZECの枠組みの下、**日本の技術やファイナンスを活用していくことは、世界の脱炭素化のために重要**（日本自身の温室効果ガス（GHG）排出量は世界の３％）。

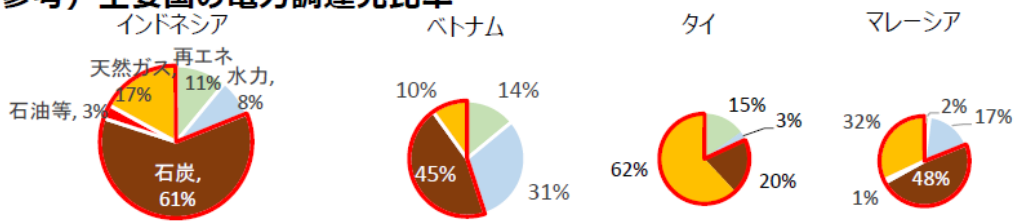
**参加国**


- これまで首脳会合（2023年12月：東京）と閣僚会合（2023年3月：東京、2024年8月：ジャカルタ）を開催
- エネルギーセクターを中心に、再エネやグリーンアンモニア等の個別プロジェクトを推進

⇒ アジアの産業やエネルギー構造を変えていくための面的なアクションが必要な状況

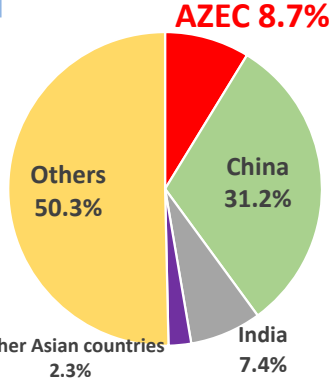
**2024年は今後10年のためのアクションプランを含む共同声明に合意し、新たなフェーズへ**

**（参考）主要国の電力調達先比率**




Source) The Government of Japan

**Regional share of global $CO_2$ emissions (2022)**




Source) Created based on IEA2024

# Major topics of this symposium



- The 2030 targets were raised to a certain extent in an attempt to “increase ambition” toward COP26 in 2021, however, most of them were only among developed countries. COP27 in 2022 also aimed to raise the emissions reduction targets, but there was almost no success. At COP28 in 2023, the GST decision document expressed a desire to continually strive for the 1.5℃ target, but to achieve it might be extremely difficult considering the reality that the global temperature has already exceeded 1.5℃, although it may only be temporal. Even major developed countries are not making steady progress in emissions reduction.
- While the world has set ambitious long-term goals and is proceeding efforts to achieve carbon neutrality, it has not succeeded in reducing emissions on a global scale so far. What is going wrong?
- Concerns are growing over the impacts on international industrial competitiveness and carbon leakage due to the gap between the strengthened targets of developed countries and the more moderate emission reduction targets of developing countries.
- Incidents that threaten global cooperation, such as war in Ukraine and Israel-Gaza conflict, are occurring frequently. Politics around the world are also becoming unstable.
- In order to address energy, climate change, and industrial policies in an integrated manner, the Japanese government formulated the draft of the revised Strategic Energy Plan and Plan for Global Warming Countermeasures (including the next NDC) and the GX2040 Vision draft at the end of 2024.
- What should governments and businesses (industry, finance, etc.) do towards realization of CN and in the transition to it? What are the risks and opportunities?
- As our world becomes more divided, is it necessary to change the way to address climate change?

# Today's Symposium Program



| | | |
|---|---|---|
| 10:00 | Welcome Remarks | Dr. YAMAJI Kenji, President, RITE |
| 10:05 | Introductory Remarks | Mr. TAJIRI Takahiro, Deputy Director-General for Environmental Affairs, Ministry of Economy, Trade and Industry (METI) |
| 10:15 | Introduction | Dr. Akimoto Keigo, Group Leader, Systems Analysis Group, RITE |
| 10:30 | Lecture | "Global trend for the policies toward carbon-neutral world" Dr. Nebojsa Nakicenovic, Distinguished Emeritus Scholar and Former Deputy Director General, IIASA |
| 11:20 | Lecture | "Carbon Neutrality in South-East Asia: A policy perspective" Dr. Shobhakar Dhakal, Professor, Asian Institute of Technology (AIT) |
| 12:10 | Lunch break | |
| 13:10 | Lecture | "Carbon Neutrality in Korea" Dr. Tae Yong Jung, Professor of Sustainable Development, Yonsei University |
| 14:00 | Lecture | "Climate and trade under geopolitical competition" Dr. Milan Elkerbout, Fellow, Resources for the Future(RFF) |
| 14:50 | Lecture | "The Trump Administration's Reversal of U.S. Energy and Environmental Policies" Dr. Ueno Takahiro, Senior Researcher, CRIEPI (Central Research Institute of Electric Power Industry) |
| 15:40 | Lecture | "Analysis of emission reduction scenarios and policy in Japan" Dr. Akimoto Keigo, Group Leader, Systems Analysis Group, RITE |
| 16:30 | Closing Remarks | HONJO Takashi, Senior Managing Director, RITE |