

Legal and political framework for CCUS development in Asia

アジア域におけるCCUSの法政策フレームワーク

Meiji University

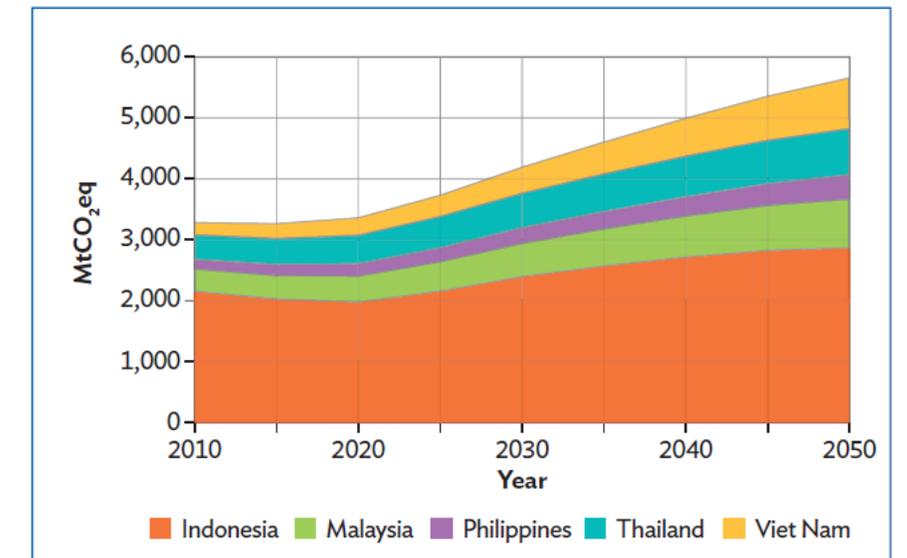
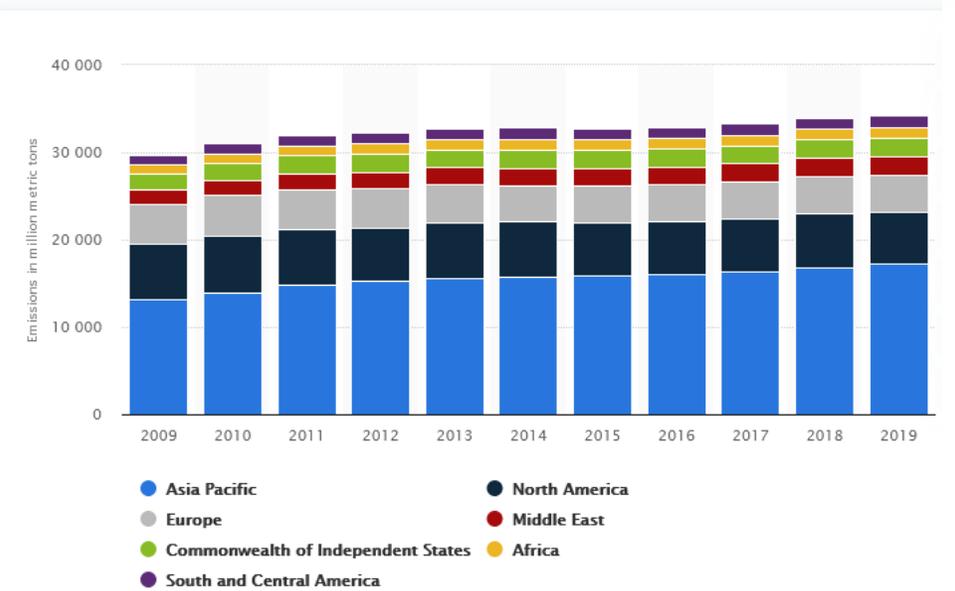
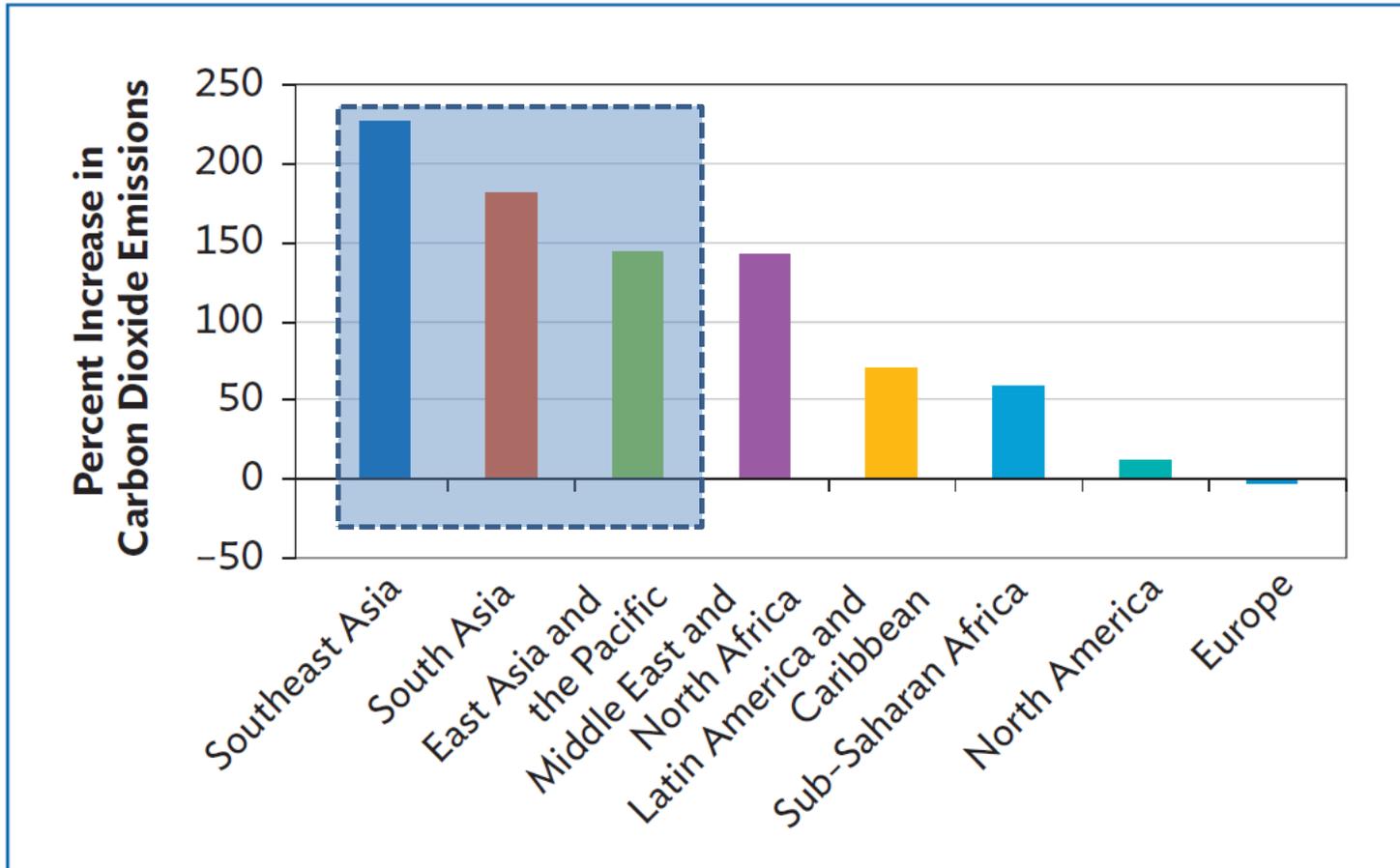
Dr. Eiji Komatsu

Dr. Kenichiro Yanagi

Dr. Akihiro Nakamura

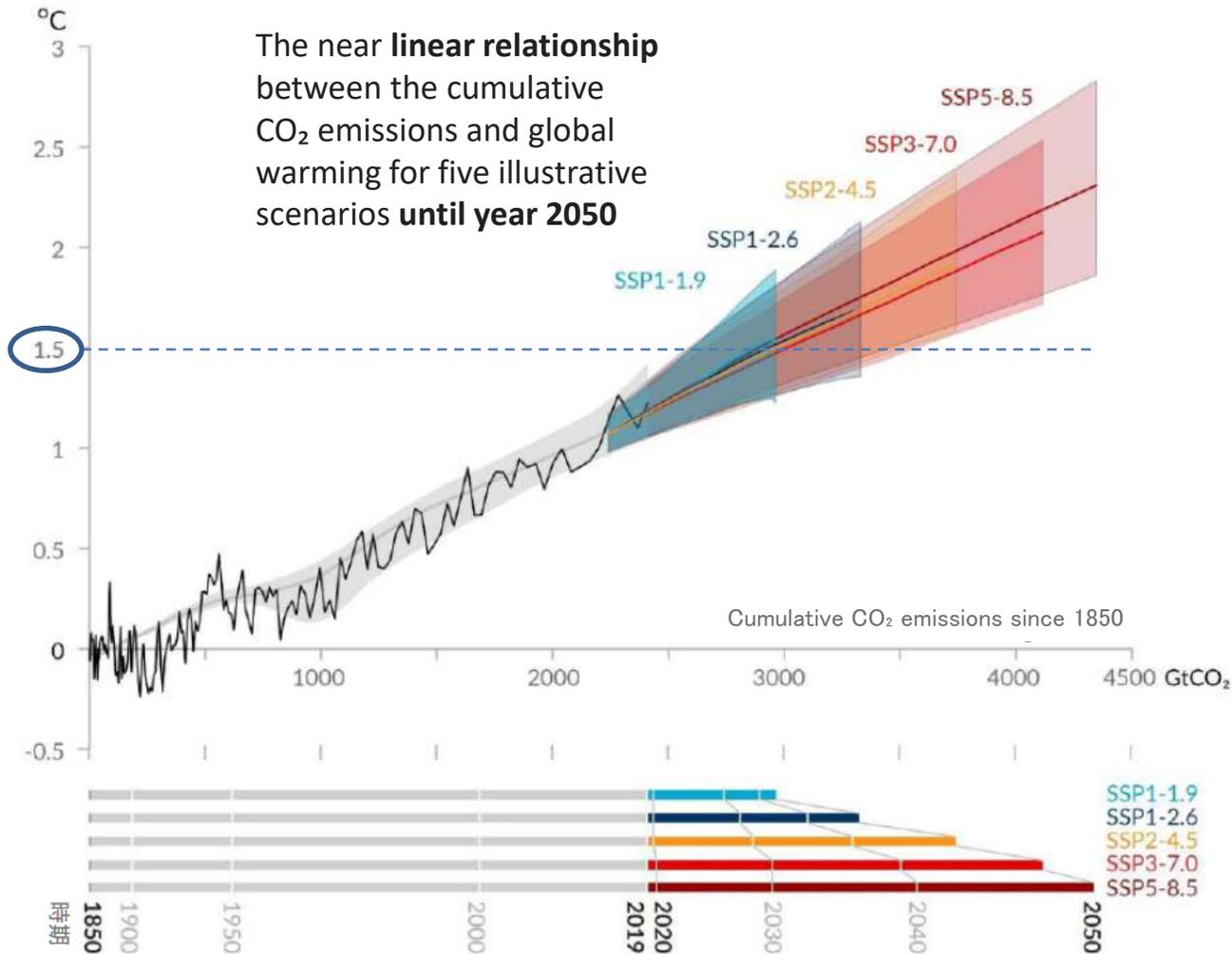
Increases in Total Carbon Dioxide Emissions in Asia Regions, World

アジア地域のCO₂排出量の現状と予測

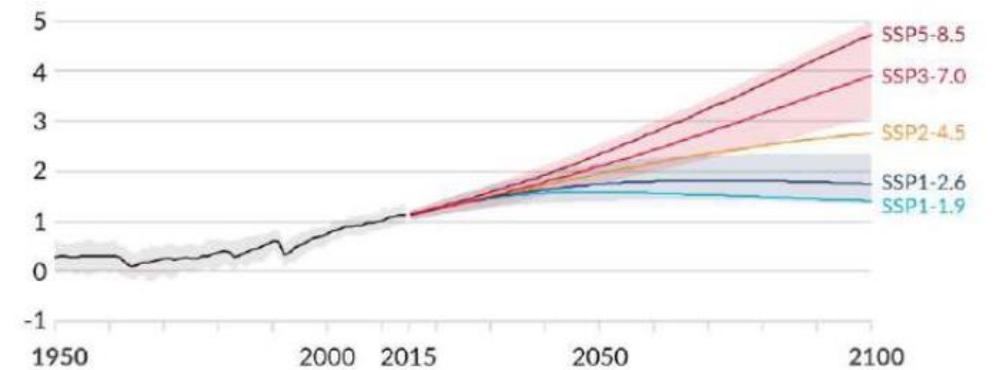


IPCC, AR6 WG1 Report (2021)

Global surface temperature increase since 1850-1900 as a function of cumulative CO₂ emissions (GtCO₂)



Global surface temperature change relative to 1850-1900



Global surface temperature comparative with 1850-1900

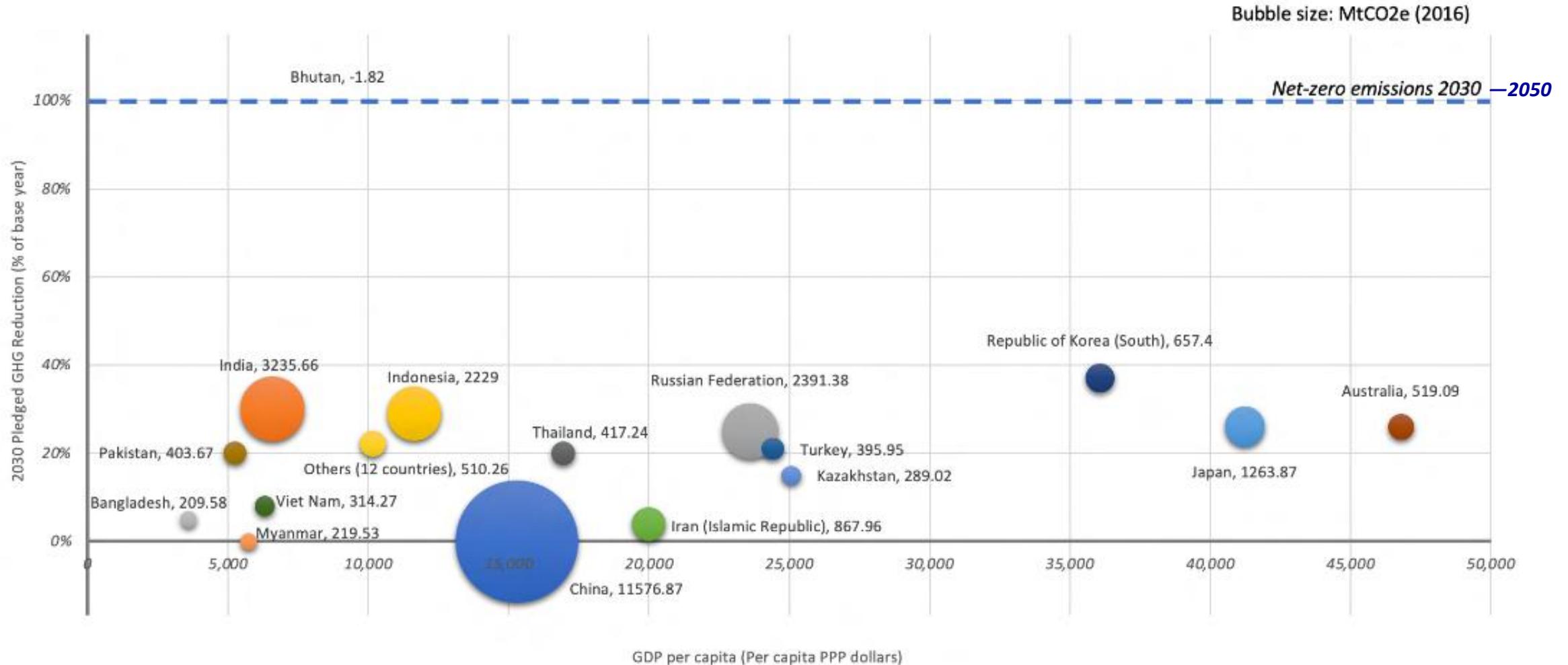
- **2001-2020: 0.99 [0.84 to 1.10] °C**
- **2011-2020: 1.09 [0.95 to 1.20] °C**

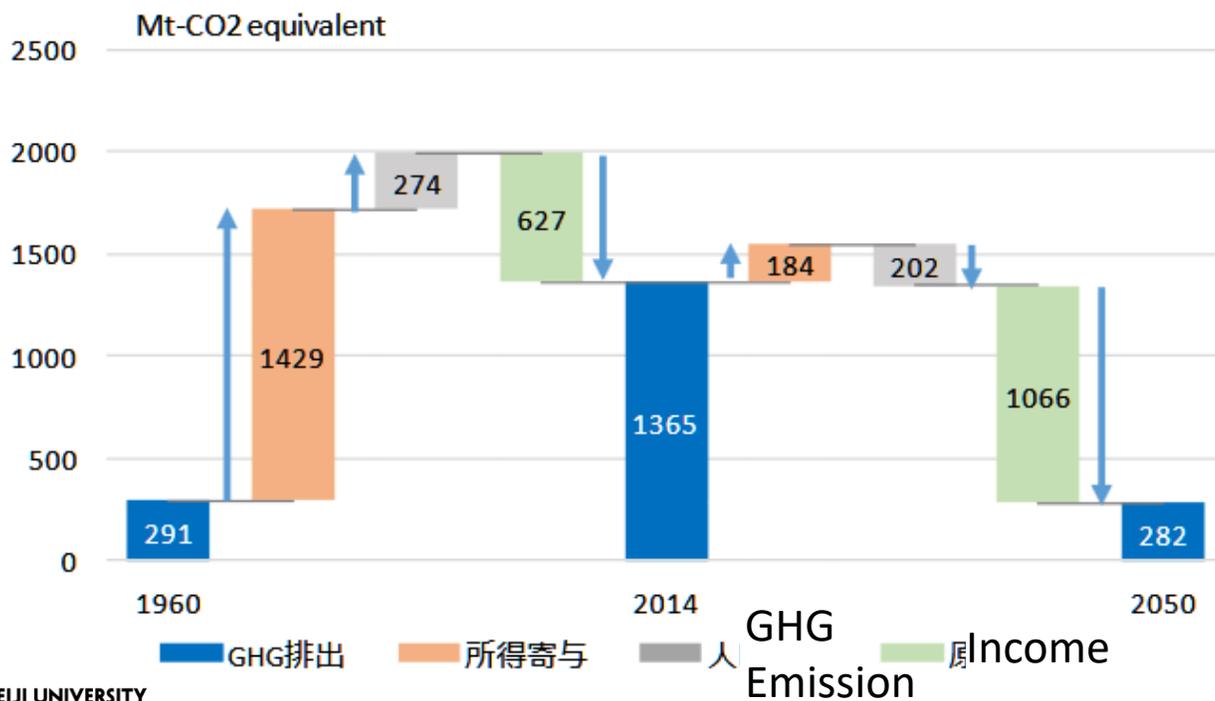
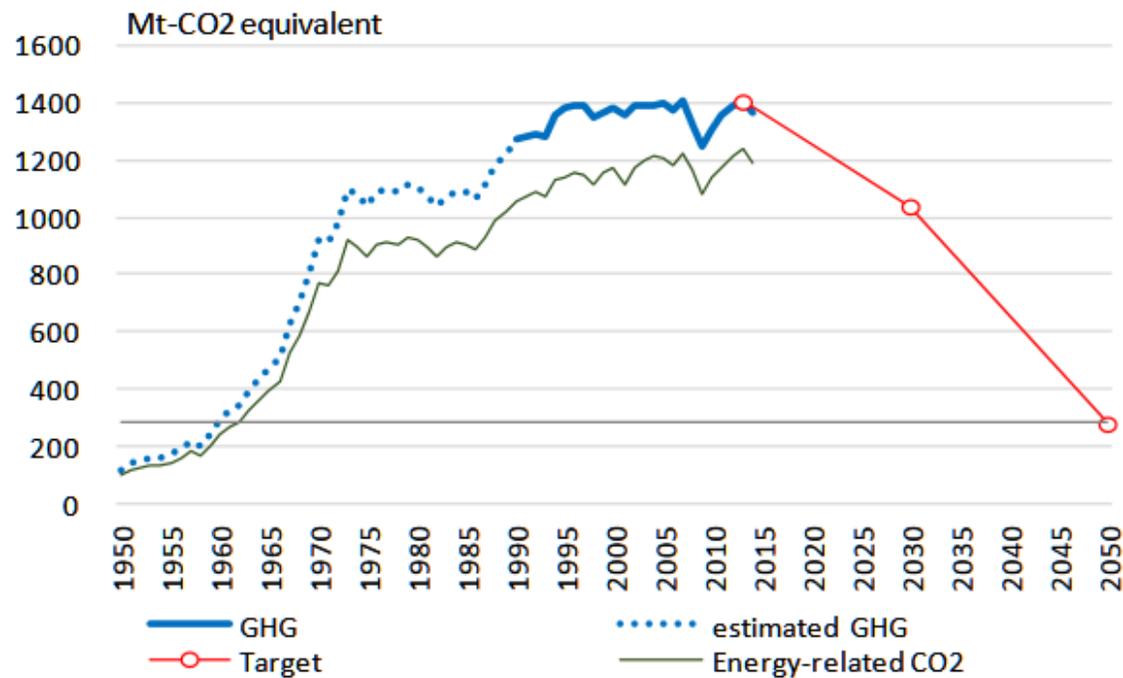
The estimated increase since AR5 is **+0.19 [0.16 to 0.22] °C** principally due to further warming since 2003–2012 ().

Additionally, methodological advances and new datasets contributed **approximately 0.1°C** to the updated estimate of warming in AR6.

Asia-Pacific comparison of historical GHG emissions to GDP per capita and NDC pledges for GHG emission reduction

アジア太平洋地域のGHG排出量と排出削減目標の比較





Carbon neutrality target

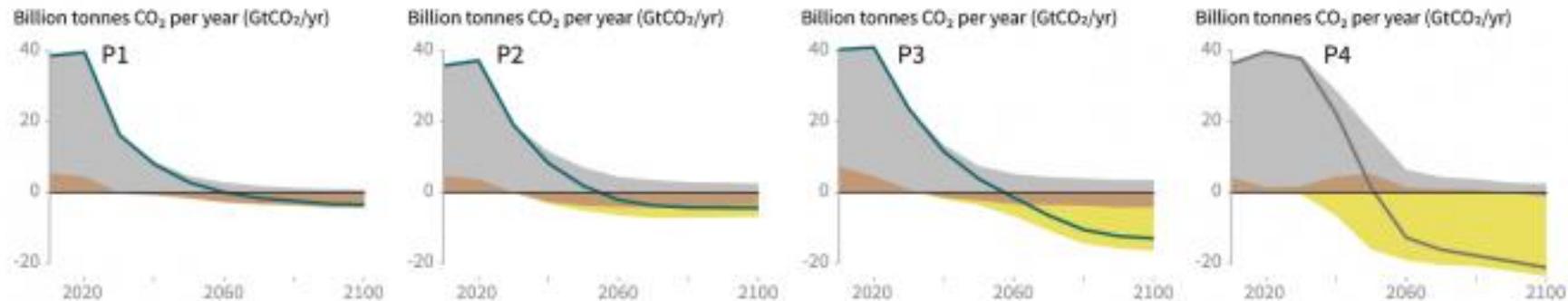
Special Report: Global Warming of 1.5 °C (IPCC, 2018)

Characteristics of four illustrative model pathways

Different mitigation strategies can achieve the net emissions reductions that would be required to follow a pathway that limits global warming to 1.5°C with no or limited overshoot. All pathways use Carbon Dioxide Removal (CDR), but the amount varies across pathways, as do the relative contributions of Bioenergy with Carbon Capture and Storage (BECCS) and removals in the Agriculture, Forestry and Other Land Use (AFOLU) sector. This has implications for emissions and several other pathway characteristics.

Breakdown of contributions to global net CO₂ emissions in four illustrative model pathways

● Fossil fuel and industry ● AFOLU ● BECCS



P1: A scenario in which social, business and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A downsized energy system enables rapid decarbonization of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used.

P2: A scenario with a broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

P3: A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

P4: A resource- and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

The Clean Energy Technologies for All Sectors

全セクターに活用できるクリーンエネルギー

1. CCT (Clean Coal Technology)
2. Thermal Power with CCS (Carbon Dioxide Capture and Storage)
3. GTL (Gas to Liquid)
4. Solar Power
5. Solar Thermal Power
6. Solar Thermal Use
7. Passive Solar
8. Biomass Power/Waste Power+CCS
9. Biomass/ Waste Thermal Use +CCS
10. Biomass Fuel/ Production of waste Fuel

11. Wind Power
 12. Hydroelectric Power
 13. Geothermal Power +CCS +DAC
 14. Geothermal Use +CCS +DAC
 15. Thermal Energy Conversion
 16. Ocean Thermal
 17. Aquamarine Power; wave energy.
 18. Tidal Power
 19. Fuel Cell
 20. Co-generation
- ※Green : Zero or Negative Emission in Life Cycle

Major Barriers for CCUS by ADB

主なCCUS導入に対する障壁

1. Strategic Policy

- incomplete/insufficient policy and regulatory framework
- inadequate international targeted funding mechanisms to support CCUS in emerging economies

2. Technical

- perceived and real technical risks (due to limited number of CCUS installations)
- challenge to proving CCUS at **large-scale in industrial and power sector**

3. Commercial

- **high capital costs and auxiliary energy consumption, but no additional revenues**

4. Financial

- high operational risks due to multi-sectoral complexities
- long-term storage liabilities
- **uncertainties on carbon prices and weak CO2 off-take agreement regime**

5. Public Acceptance

- lack of information
- real and perceived risks and safety concerns

Toward, Bilateral, Multilateral Agreement, International Standard for CCUS implementation in Asia Region

アジア域においてCCUSの事業化と二国・多国間共同実施に向けた政策的視点

- I. It is necessary to clarify the issues of existing international law in the Asian region. For example, since most Asian countries do not participate in the London Convention, **it is should show roadmap to develop standardization of CCS technology and implementation code** (eg, Development of Asian codes based on ISO / TC265).
- II. To sharing of information for sustainable carbon dioxide in the Asian region, it is necessary to consider guidelines such as **open innovation and infrastructure policy, market mechanism and ownership provision** for establishment of storage sites, pipelines clusters.
- III. Establish and implement opportunities to develop **CCS framework laws, regulations and guidelines** to develop bilateral and multilateral agreements in the Asian region. Especially common understanding regarding the provisions regarding **long-term maintenance after the site closure, including the transfer of responsibility**.
- IV. Currently, in the London Convention, some proposals have been made to allow transboundary storage from parties, but transboundary storage is difficult because transit admittance is not allowed. **In addition, it is necessary to legally consideration the implementation of CCS which has a possibility of advection beyond borders.**

Conclusion of Comparative Analysis towards a Comprehensive Legal Framework

CCS先進国の包括的な法規制の必要性

There is a need for a comprehensive legislative framework for Large-scale CCS projects. Our study conducted a comparative analysis by using a range of case studies in the EU, U.S, U.K and Australia. The EU-CCS Directive comprehensively regulates “long-term liability especially for storage, closure and post-closure management”, which is one of the most critical issues for introducing CCS deployment and its market.

The elements in the list addressed below need to be considered

- ✓ Permits for storage and closure plans
- ✓ Establishing quality standards for storage and closure
- ✓ Risk assessment for CO₂ leakage
- ✓ Long-term liability system
- ✓ Financial security and mechanism for site-closure
- ✓ Corrective measures for incidental and unforeseen events
- ✓ Establishing the level of security clearance (Regulating the term of transfer of authorization)
- ✓ Long-term liability from operators and transfer of responsibility after post--closure
- ✓ Authority and permit process

Long-term liability includes MRV/maintenance, corrective and remediation measures for unforeseen events and issues and their financial action and dispute resolution system, CO₂ credit liability.

Proposed Requirements for common rules and guidelines for bilateral and multilateral agreements in the Asian region アジア域における二国・多国間協定のための共通ルール及びガイドライン作成の項目

1. Definition of international responsibilities of Member States with agreement on protection and conservation of marine environment (eg. UNCLOS Article 235)
2. The Parties shall set standards of international law and clarify the details of the responsibilities of the regulations concerning the regulation of waste and other disposal in the ocean (eg. LP Article 15)
3. Cooperating countries will work together with other countries to implement measures to avoid all contamination of waste and other disposal rules in the ocean (eg. OSPAR Article 4)
4. Application and conditions of storage permit (eg. London Protocol: Annex I and II 2011)
5. Precautionary principle, polluter pays principle and clarification of best available technology (BAT) (eg. LP Article 3 and OSPAR Article 2)
6. Transport regulations
7. Agreements on carbon dioxide emissions credits (eg. ETS Directive Article 12 and 25)
8. Clarification of ownership of storage sites in Asia (eg. CCS Directive Article 4 (1))
9. Permission of access to transport network and clarification of rights to reservoir site in Asia (example: CCS Directive Article 21 (1))
10. Regulation of transboundary storage complex in Asian region, responsibility of jurisdiction determined by the agreement country, in cases of corrective and remedial measures, security measures, when carbon dioxide leakage occurs (eg. CCS Directive Article 24)
11. Regulations on Liability (eg. CCS Directive Article 3, 16, 17, 18, 19, 20, 26 and 28)
12. It is necessary to consider whether to clarify regulations concerning carbon dioxide transport/storage, technology transfer etc. by the international public law
13. Regulation on financial mechanism and carbon credit mechanism

※: Red Requirements can be applied to existing law in the developed country

(UNCLOS 1982, OSPAR 1992, ETS Directive 2009, CCS Directive 2009, Basel convention 1989)

Thank you for your attention

If any questions, contact ccs2016@meiji.ac.jp

