

Need for mitigation, transformative action and future scenarios

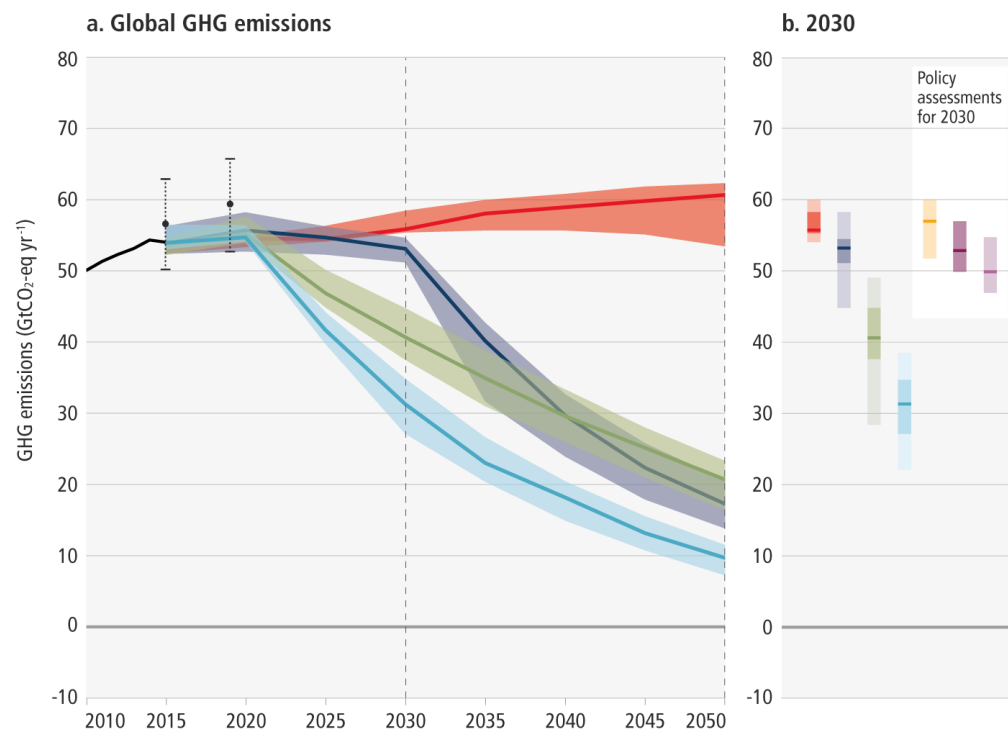
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Kyoto University, Japan

28th, April, 2023

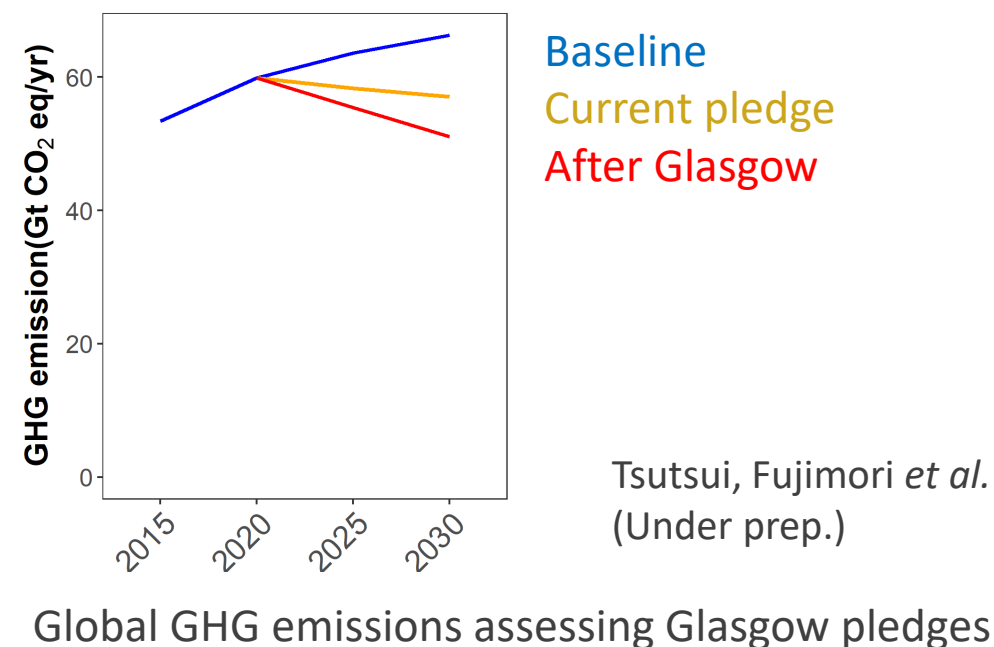
Outreach event on the IPCC Sixth Assessment Report key findings
and their relevance to Asia @ Bangkok

Near-term requirement and current pledges



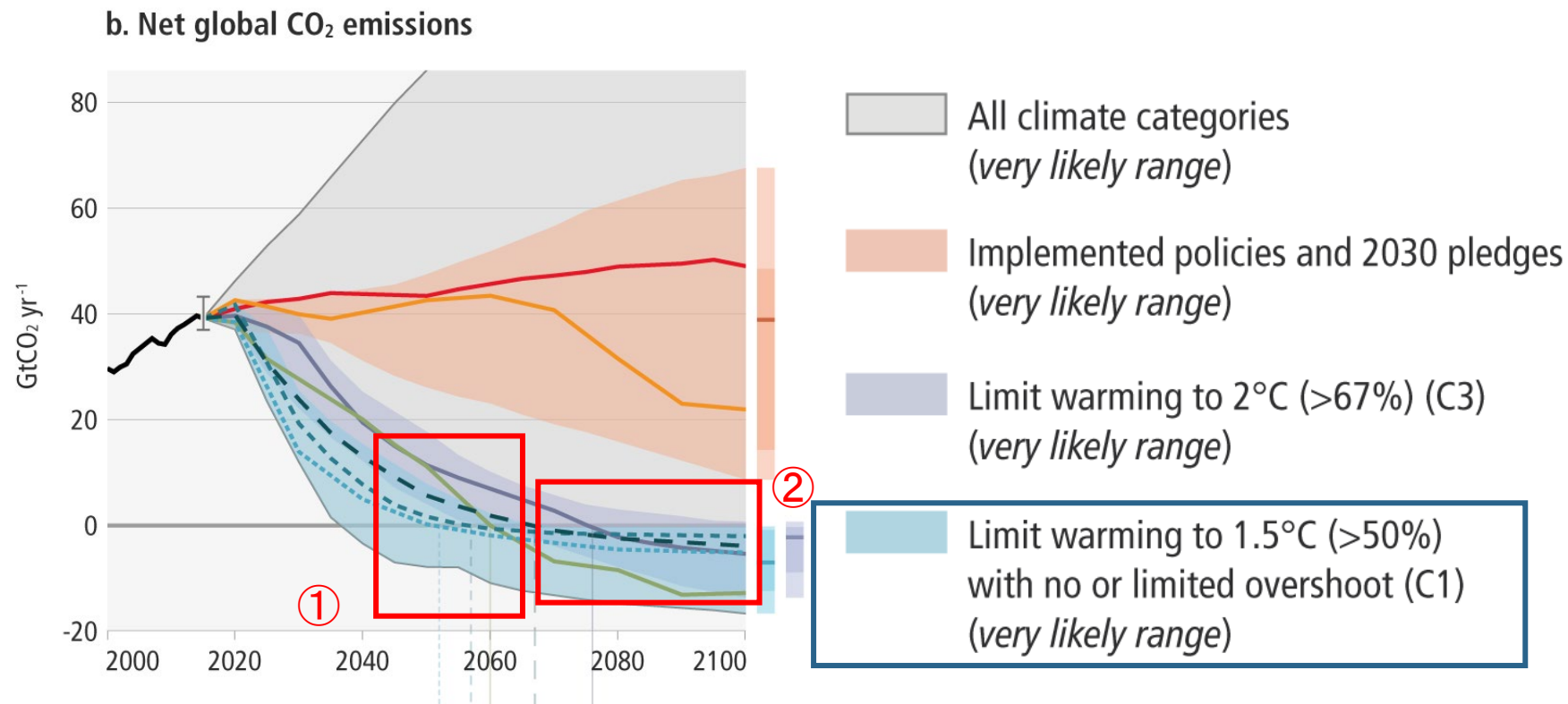
Modelled pathways:

- Trend from implemented policies
- Limit warming to 2°C (>67%) or return warming to 1.5°C (>50%) after a high overshoot, NDCs until 2030
- Limit warming to 2°C (>67%)
- Limit warming to 1.5°C (>50%) with no or limited overshoot
- - - • - - - Past GHG emissions and uncertainty for 2015 and 2019 (dot indicates the median)



- Emissions under current pledges (before Glasgow) is much higher than 1.5 °C pathways
- Pledges after Glasgow were not assessed in AR6, but probably still insufficient to 1.5 °C
- **Strengthening current system transformation**

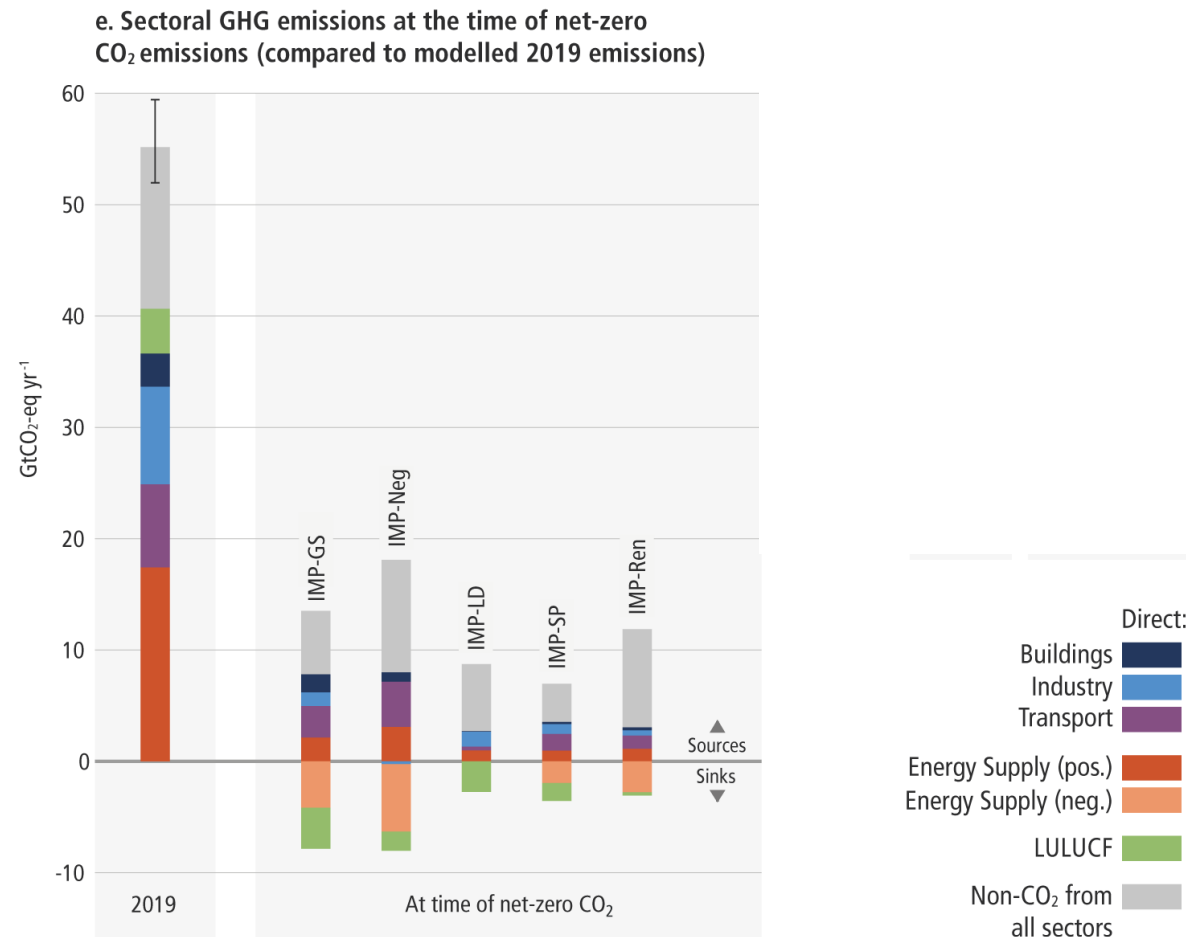
Requirement for long-term emissions reduction



- ① Net-zero emissions around mid-century
→ Consistent with current many national carbon neutral goals
- ② Net carbon dioxide removal (CDRs) would be needed in the latter half of century
→ who is going to take? How much?

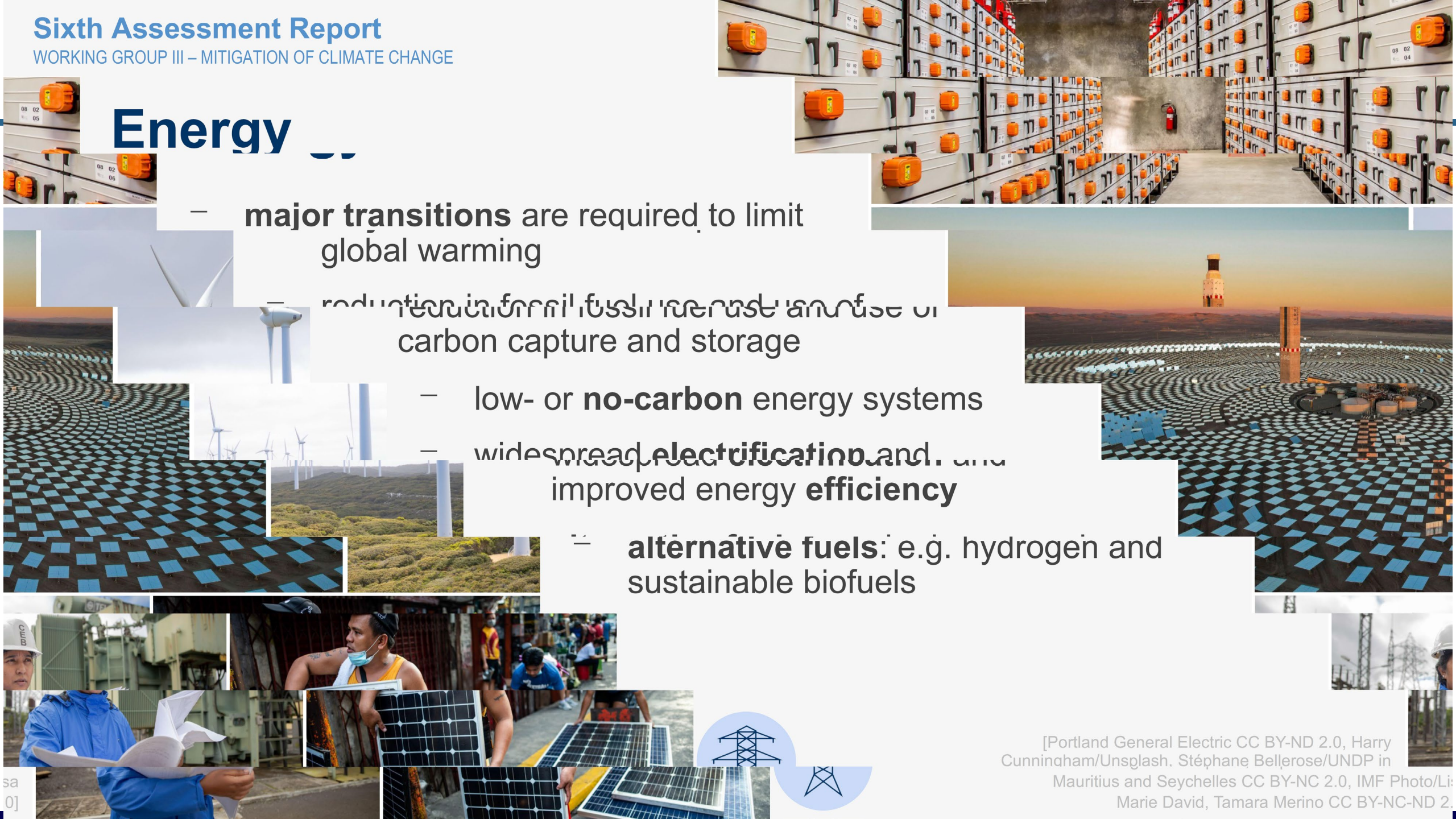
Multiple options in achieving net zero emissions

- Residual emissions varied among pathways
- Key questions
 - ✓ How to deal with the hard-to-decarbonize sectors
 - ✓ How to and how much we would rely on CDRs



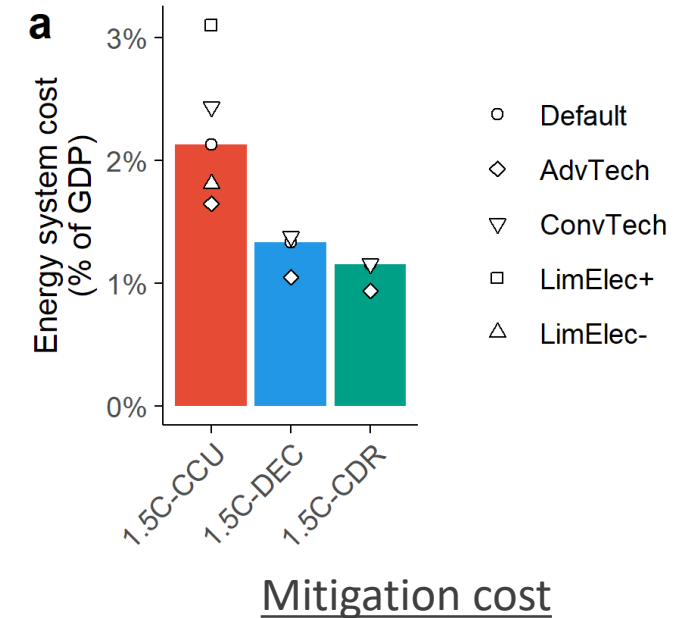
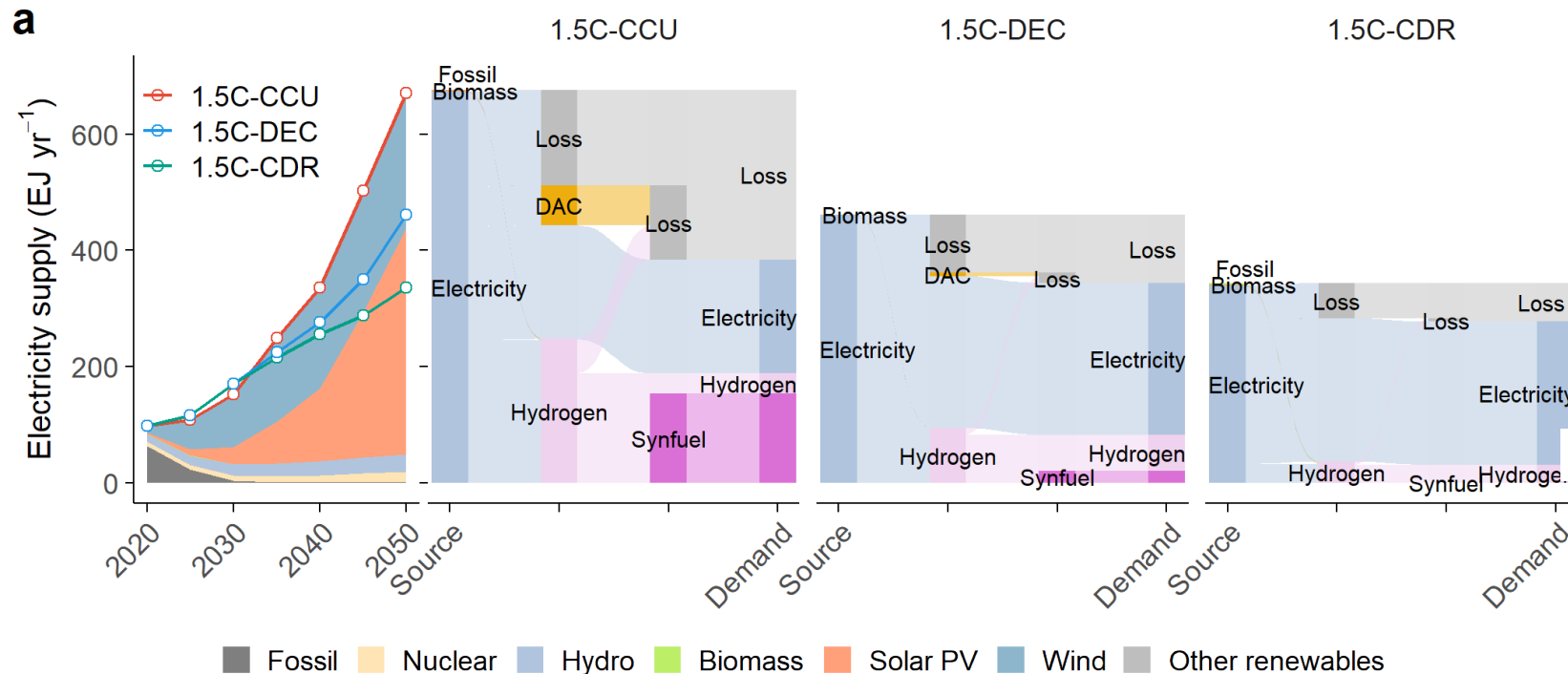
Energy

- **major transitions** are required to limit global warming
- **reduction in greenhouse gas emissions** from carbon capture and storage
- **low- or no-carbon** energy systems
- **widespread electrification** and **improved energy efficiency**
- **alternative fuels**: e.g. hydrogen and sustainable biofuels



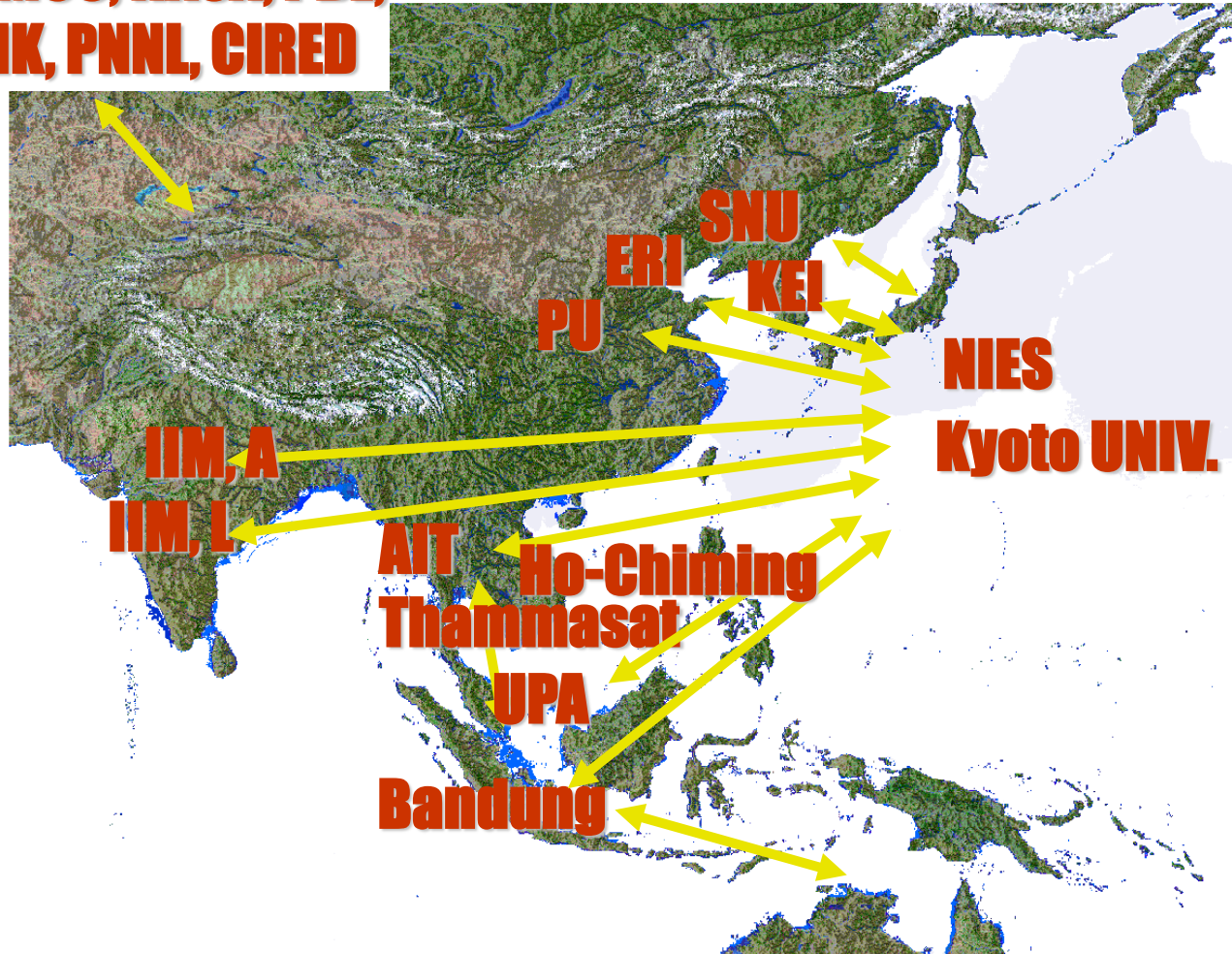
An example of transformation using AIM model

- Three alternative pathways to realize net-zero emissions
 - **Carbon Capture and Utilization (CCU; supply side)**, demand side measures, and CDR
- CCU is mainly used for synthetic fuel production. CCU moderates the demand side drastic changes
- While cost would be an obstacle, CCU-based measures would be an option.



The AIM (Asia-Pacific Integrated Model) as International Collaborative Network

**CMCC, IIASA, PBL,
PIK, PNNL, CIRED**



JAPAN

National Institute for Environmental Studies (NIES)
Kyoto University

CHINA

Energy Research Institute (ERI)
Peking University (PU)

INDIA

Indian Institute of Management (IIM),
Ahmedabad
Indian Institute of Management (IIM),
Lucknow

KOREA

Seoul National University (SNU)
Korea Environment Institute (KEI)

THAILAND

Asian Institute of Technology (AIT)
Thammasat University

MALAYSIA

University Putra Malaysia (UPM)

VIETNAM

Ho-Chiming University

INDONESIA

Bandung University



Photo from 21st
AIM international
workshop held in
2015