

Evaluations of climate change response measures considering several constraints and multi objectives in the real world

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1. Temperature change targets under the Paris Agreement

The Paris Agreement states the 2°C and 1.5°C targets. However, they contain political uncertainties.

2. Uncertainty in climate sensitivity

Climate sensitivity is still highly uncertain. The likely range (>66% probability) is between 1.5 and 4.5°C according to the IPCC AR5. The allowable emissions are very different according to only a small differences of 0.5°C of climate sensitivity.

3. Global emission pathways for meeting the temperature target

For the temperature stabilization, net CO₂ zero emission is required. On the other hand, allowable emissions in the near- or middle-future vary widely even for the same temperature target according to the uncertainties. Negative emissions are required for the overshoot of temperature.

4. Considerations both on climate change mitigation and adaptation

The temperature targets such as the 2°C are very challenging. Not only climate change mitigation but also adaptation are important.

5. Synergy and trade-off with sustainable development

Our society faces several agenda regarding sustainable development including poverty eradication, food access, water access, energy security, air pollution not only climate change.

6. Gaps of emission reduction costs between for achieving the NDCs individually and the same amount of emissions reduction idealistically

There are large differences across nations in marginal abatement cost of the submitted NDCs under the Paris Agreement. On the other hand, the estimations of the mitigation costs for long-term emission reduction pathways like the IPCC reports etc. assume the least-cost measures. We should recognize the gaps between the real world and the idealistic costs.

7. Issues of IPCC

The IPCC assessment reports are written basically based on the scientifically reviewed articles. In addition, the principle is “not policy prescriptive but policy relevant”. Under the conditions, the IPCC reports have the dilemma that it is valuable in practice but not easily accepted to the realistic solutions considering economic, social and political constraints in the real world.