Policy scenarios to be assessed by TOCSIN integrated model

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Introduction

- We aim to develop a set of policy scenarios that can be assessed by the models developed in other work packages of the TOCSIN project

- We aim to accomplish building scenarios in two steps with essential focus on the first step:

  - **a small set of core scenarios** with three possible cooperative energy R&D spillover strategies and early participation of India and China, associated with a central GHG reduction path.

  - to refine scenarios which the game theorists propose to identify self-enforcing agreements.

Cooperative strategies to encourage energy R&D spillovers

- Strategy – 1: Competitive efforts to prevent energy R&D spillovers.
  - no bilateral or global cooperation on energy R&D spillovers but a strong competition of economy between countries.
- Strategy – 2: Cooperative spillovers in low-carbon technologies
  - new energy technologies would be created, developed and initially demonstrated in ICs and that ICs would be willing to transmit the technologies to DCs via directly patent purchase, FDI, and other channels for embodied R&D spillovers
- Strategy – 3: Full spillovers for low-carbon technologies from ICs to DCs
  - the same purchasing cost and availability of low-carbon technologies among all regions.

Climate change mitigation target and distribution of emission budgets

The central reduction path (Target - 1):

- **3.5 W/m^2: representing the stabilization in 2100 of 450ppm for CO_2 alone or 550ppm CO_2 equivalence**
- **4.5 W/m^2: representing the stabilization in 2100 of 550ppm for CO_2 alone or 650ppm CO_2 equivalence**

- **Emission distribution rules:**
  - **contraction & convergence;**
  - **equal per capita; shares of GDP;**
  - **inverse to base year emissions (responsibility);**
  - **politically based**

- **Regions:**
  - **IC1: USA, Canada, Australia and New Zealand**
  - **IC2: EU25 and Japan**
  - **NIC: China, Mexico, Brazil, Russia, Turkey**
  - **DC: India, African and Oceania countries.**

Scenario runs

Target – 1 + Strategy – 3:

- this scenario assumes that after all low-carbon technologies (including both existing and will be fully developed ones) would be made available for all countries to purchase with an identical cost.

Target – 1 + Strategy – 2:

- this scenario suggests a cooperative energy R&D cooperative strategy between countries under the carbon reduction requirement of Target 1.

Target – 1 + Strategy – 1 → Strategy – 2 → Strategy – 3:

- this scenario describes a gradual transition towards ever-more cooperative strategies and energy R&D spillovers.

Target – 1 + Strategy – 1:

- this scenario proposes a most pessimistic cooperative strategy in technology transfers, or it can be referred to a non-cooperative outcome,