

Emission trading, linking, offsetting

... how do they interact with
complementary policies and support
mechanisms ?

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Hertie School of Governance



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

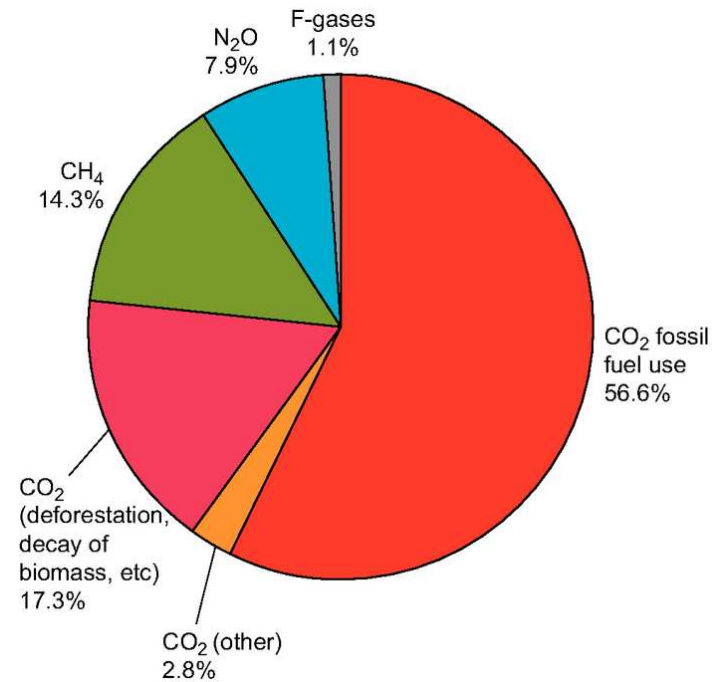


Working Group III
Mitigation of Climate Change



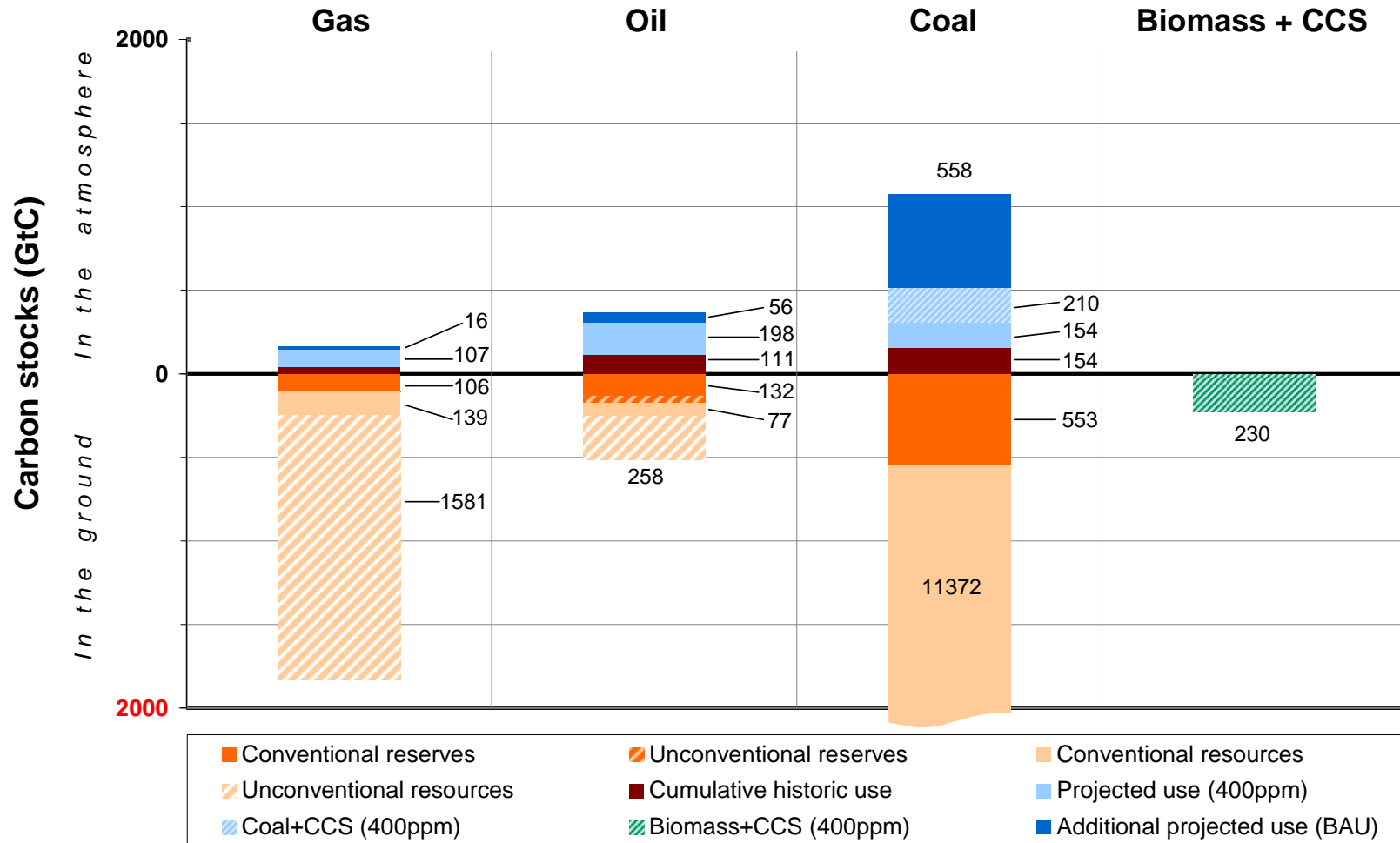
Climate Change and Fossil Resources

- Large contribution of fossil fuels combustion to global warming
- Climate policy will reduce use of fossil resources
- Carbon resources in the ground are large



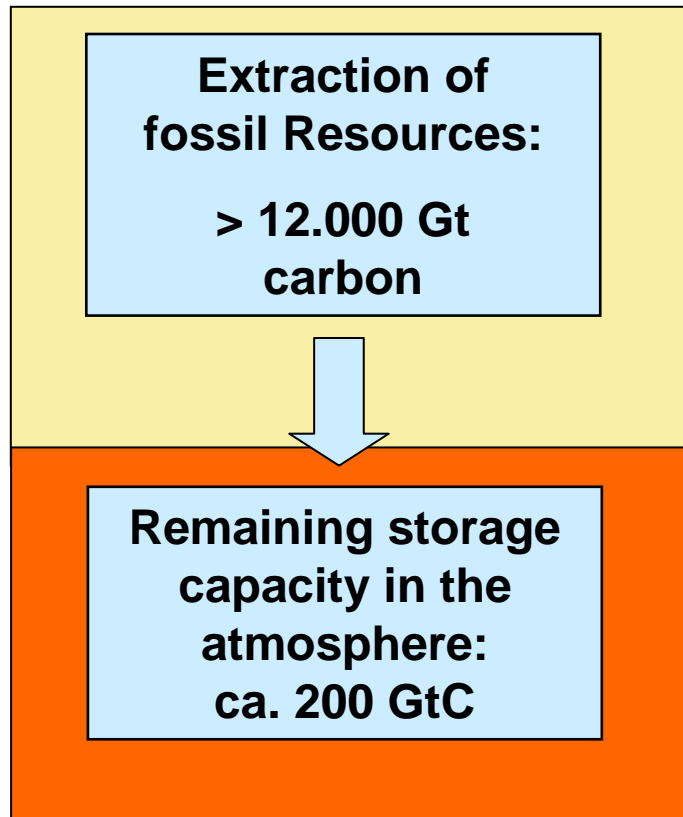
(IPCC 2007)

Carbon in Soil and Atmosphere



Source: Kalkuhl and Edenhofer 2010

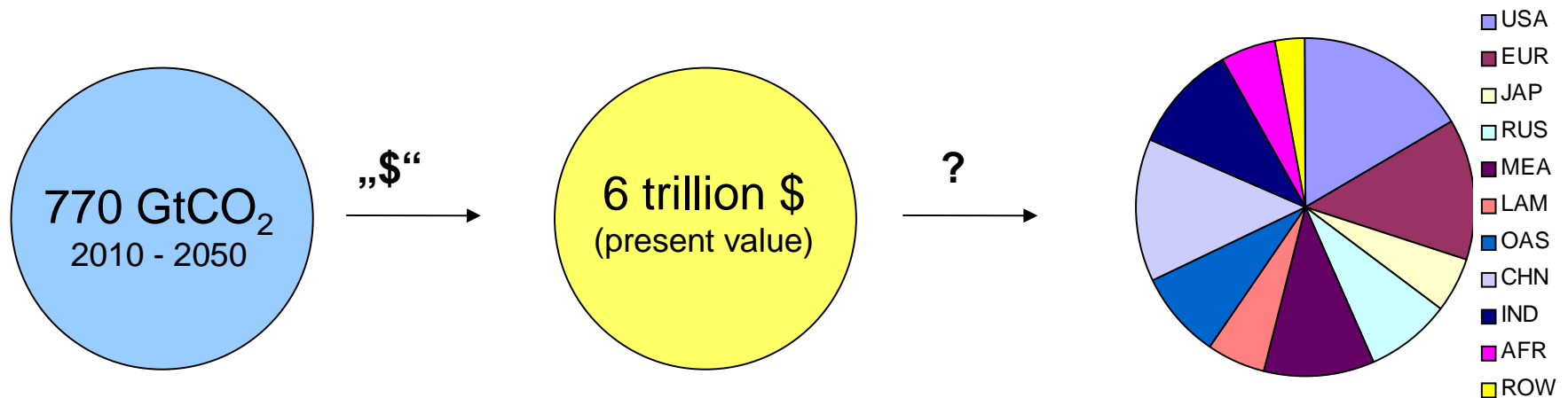
Cap and trade guarantees meeting a climate target



- Rent = economic scarcity
- „Scarce“ carbon budget implies a scarcity rent
- But fossile resources are devalued
- Need to (re)distribute rents
- **Need for global and national Institutions**

The Challenge of Redistribution

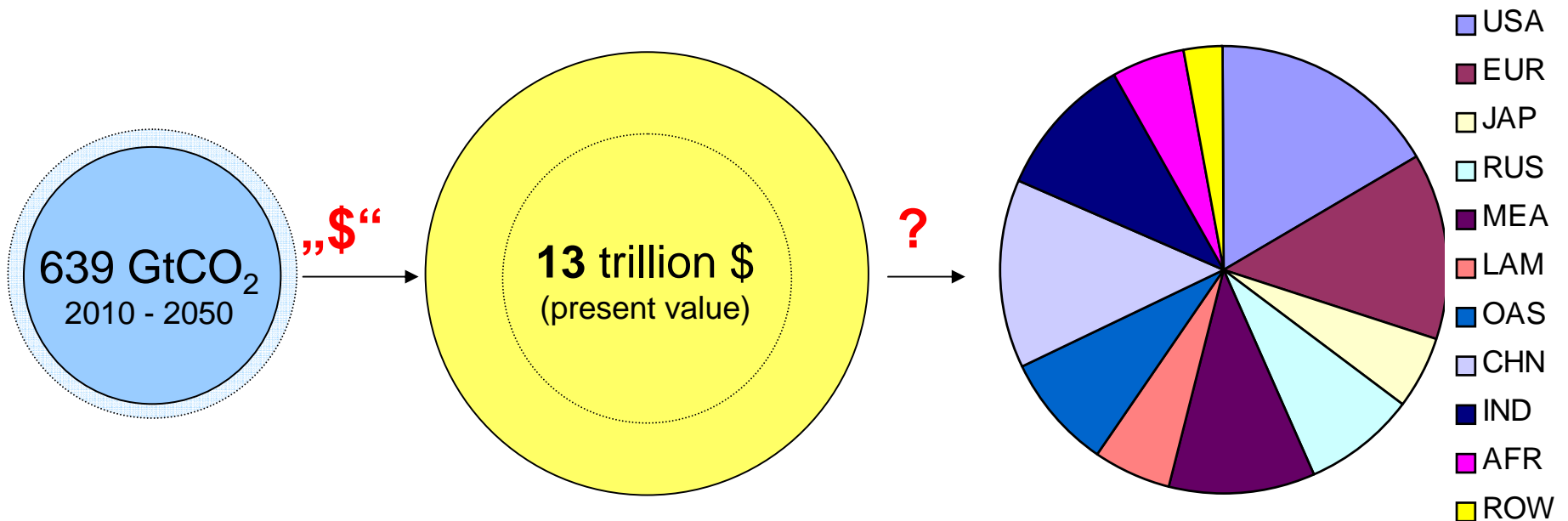
- A 2°C climate target only permits very few additional CO₂ emissions.
- Cap & Trade signals this scarcity on markets – emergence of a new rent
→ „climate rent“



→ How to distribute this rent amount nations?

The Challenge of Redistribution

Limited availability of CCS:



→ Climate rent is dependant on all kinds of assumptions!

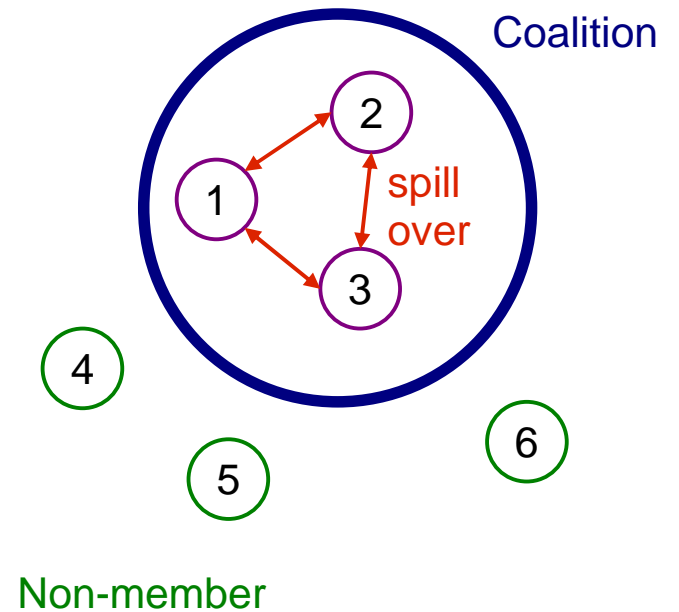
International Environmental Agreements

- Global climate policy implicitly assumes full international cooperation
- In reality: lack of a global authority
 instead: international environmental agreements (IEA)
- Participation is low whenever IEA (Barrett 1994) actually achieve something
- Can a clever design of environmental agreements achieve higher participation?
 Bali 2007
- Possibilities:
 - Research Cooperation
 - Trade restrictions
 - Permit trade with non-members of the agreement



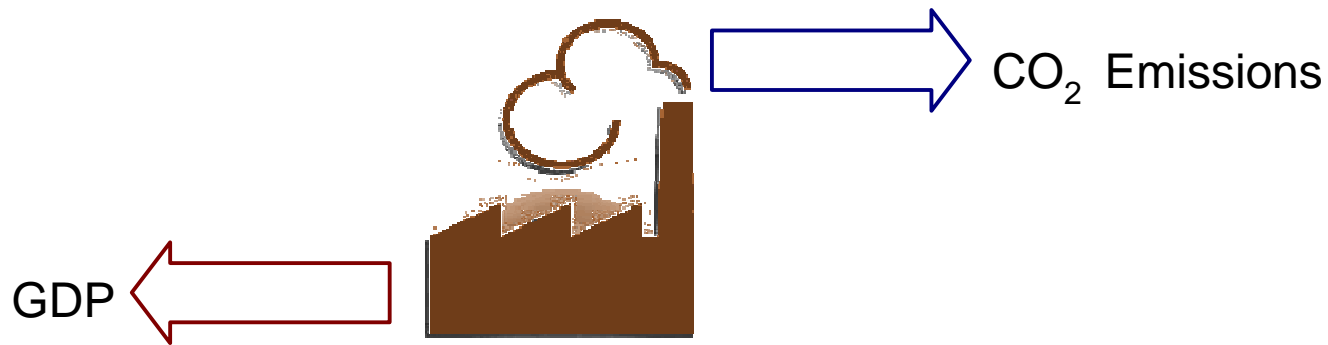
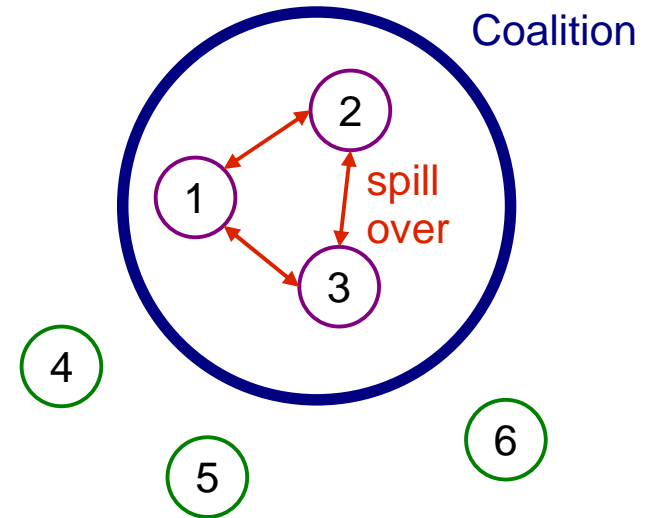
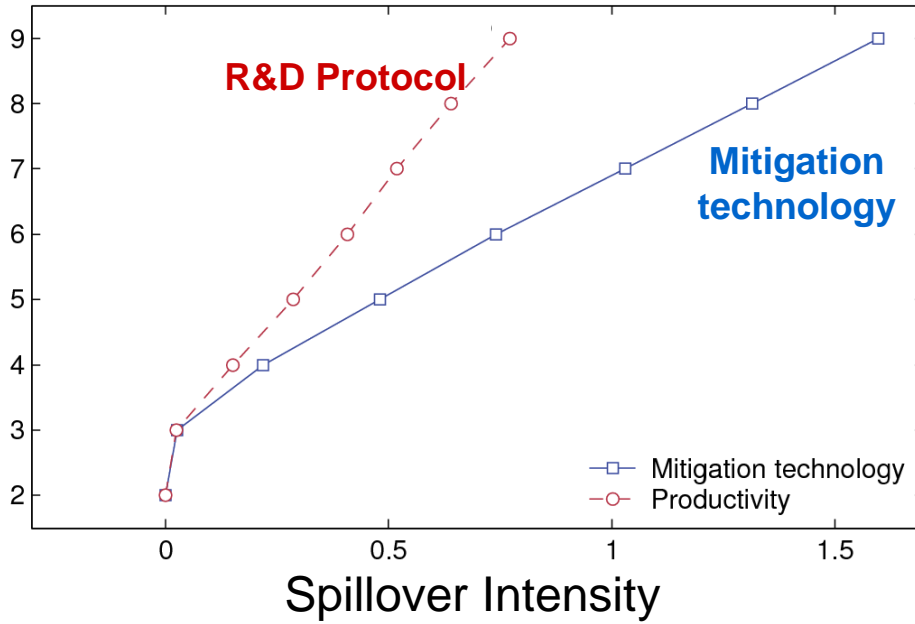
Research cooperation

- Research (R&D) exhibits *spillover*
- Policy may foster spillovers by encouraging research partnerships
- When spillovers are exclusive to coalition members, participation may increase
- R&D regarding
 - Mitigation technology
 - General productivity improvements



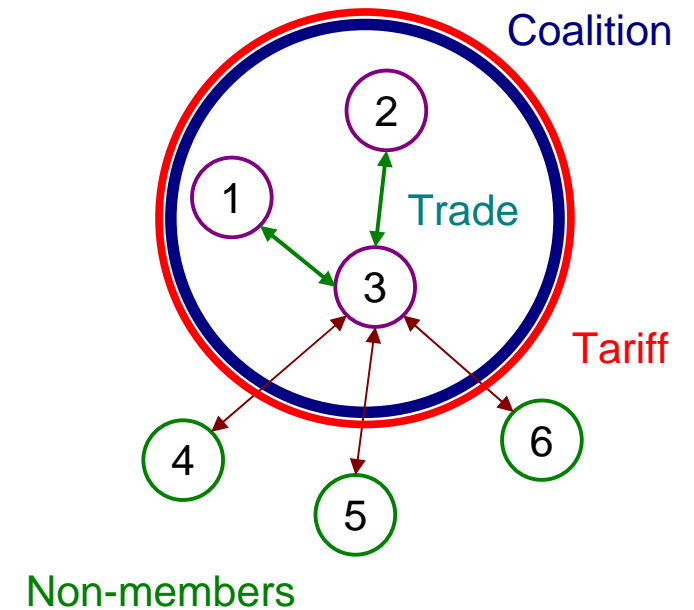
Research cooperation

Participation



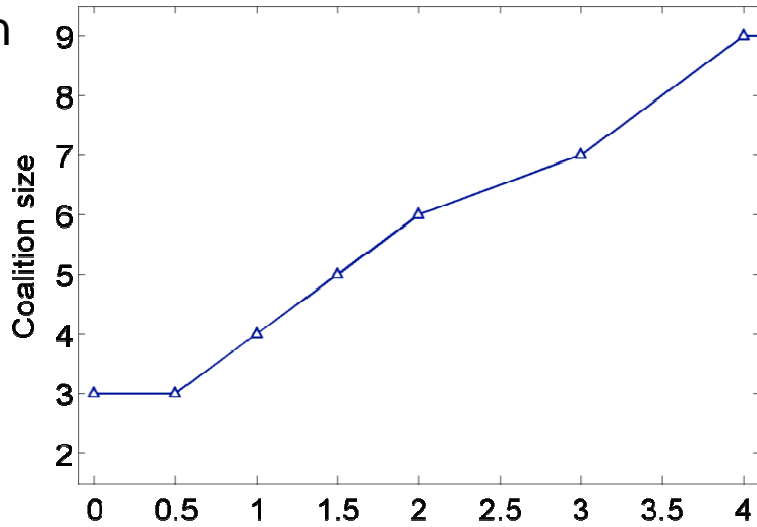
Trade restrictions

- Coalition members raise tariffs on import from non-members
- Stiglitz:
 - “*unfair advantage*” for countries that do not participate in climate policy
 - “energy tax” to restore a level playing field

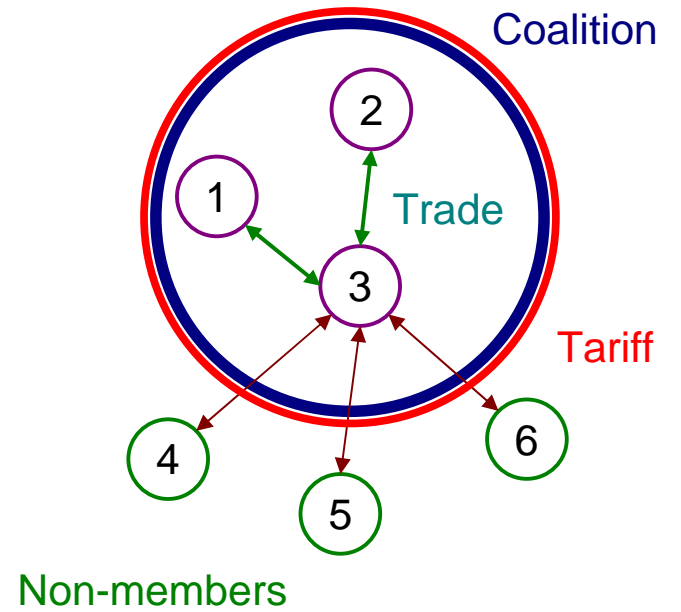
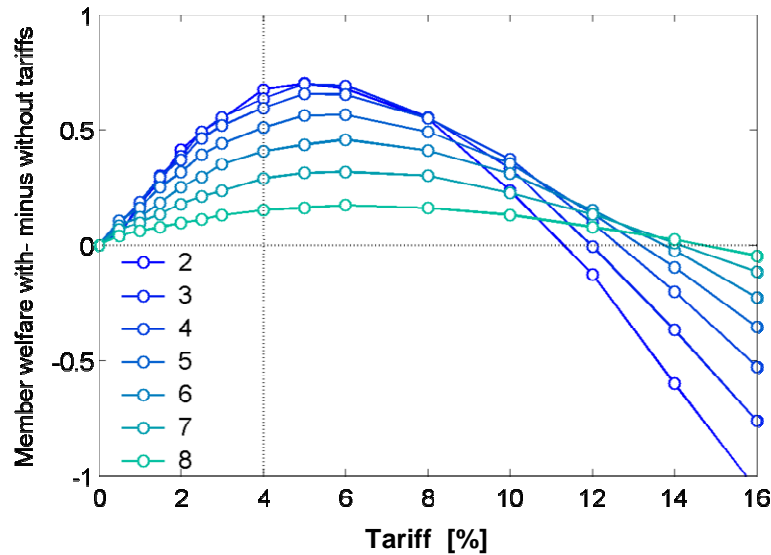


Trade restrictions

Participation

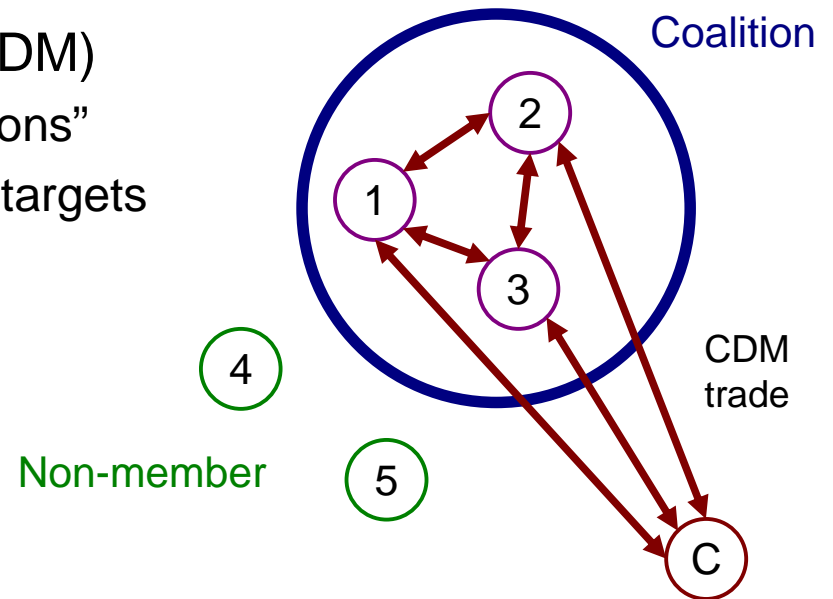


Gains for coalition members

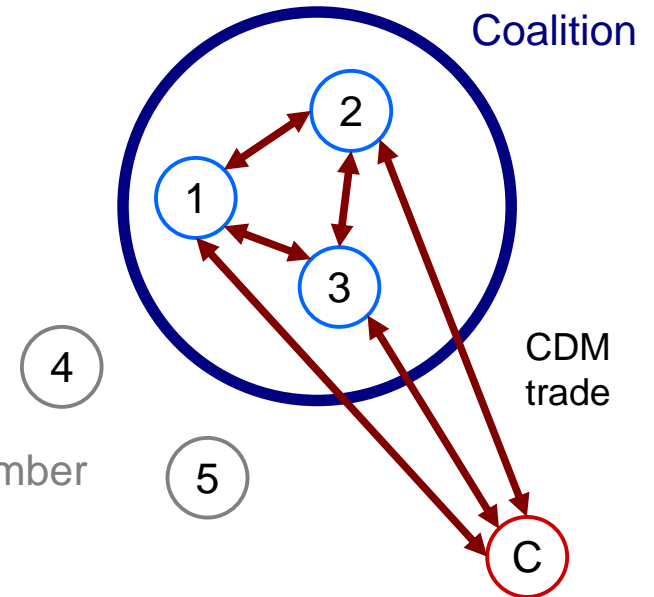
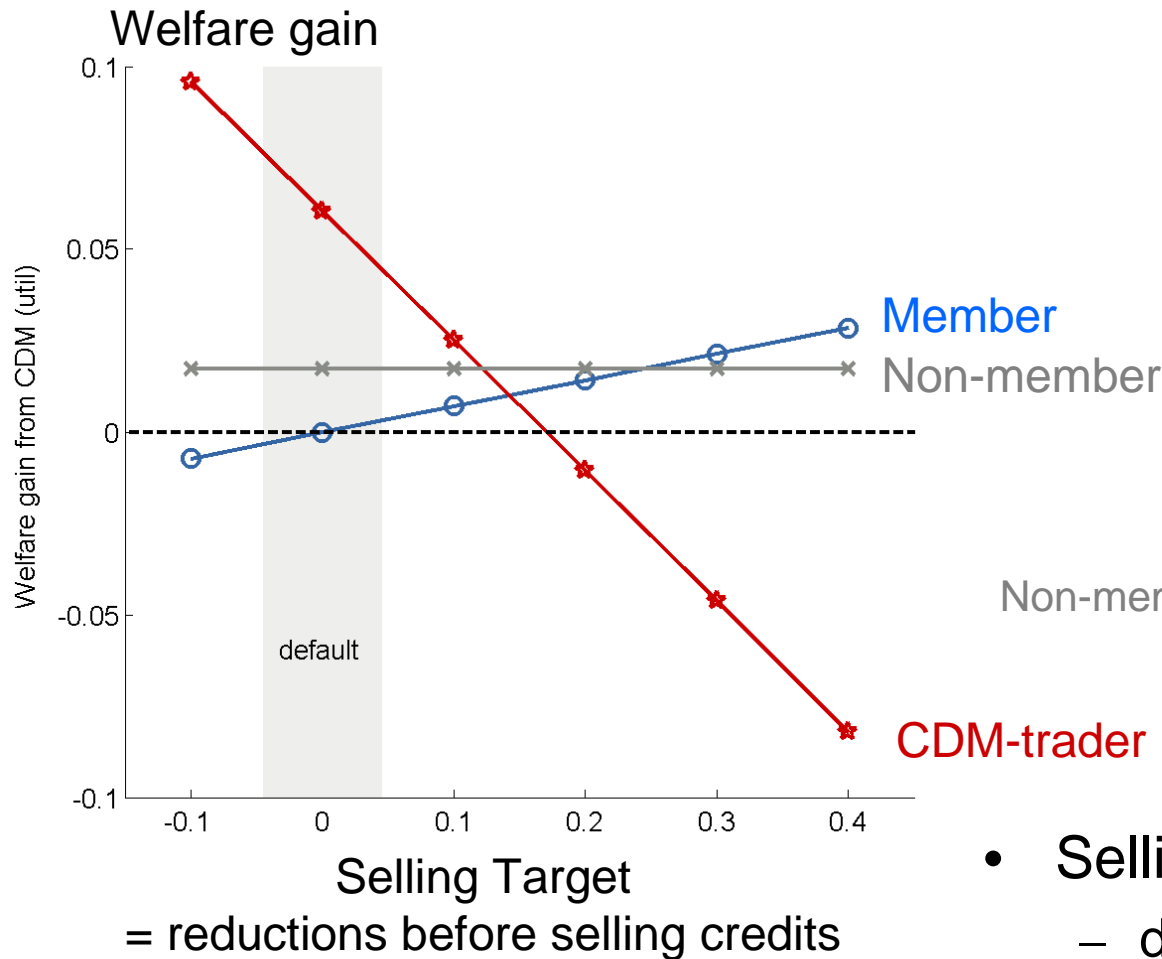


Permit trade with non-members

- Kyoto's flexible mechanisms
 - Permit trade (ETS)
 - Joint Implementation (JI)
 - Clean Development Mechanism (CDM)
 - Aim: "cost-effective emission reductions"
 - Facilitate complying with abatement targets for Annex 1 countries
 - (Clean) Development aid through technology transfers
- Post-Kyoto
 - "Improved CDM"
- Our aim:
 - **Permit trade** with non-members to strengthen participation



Permit trade with non-members

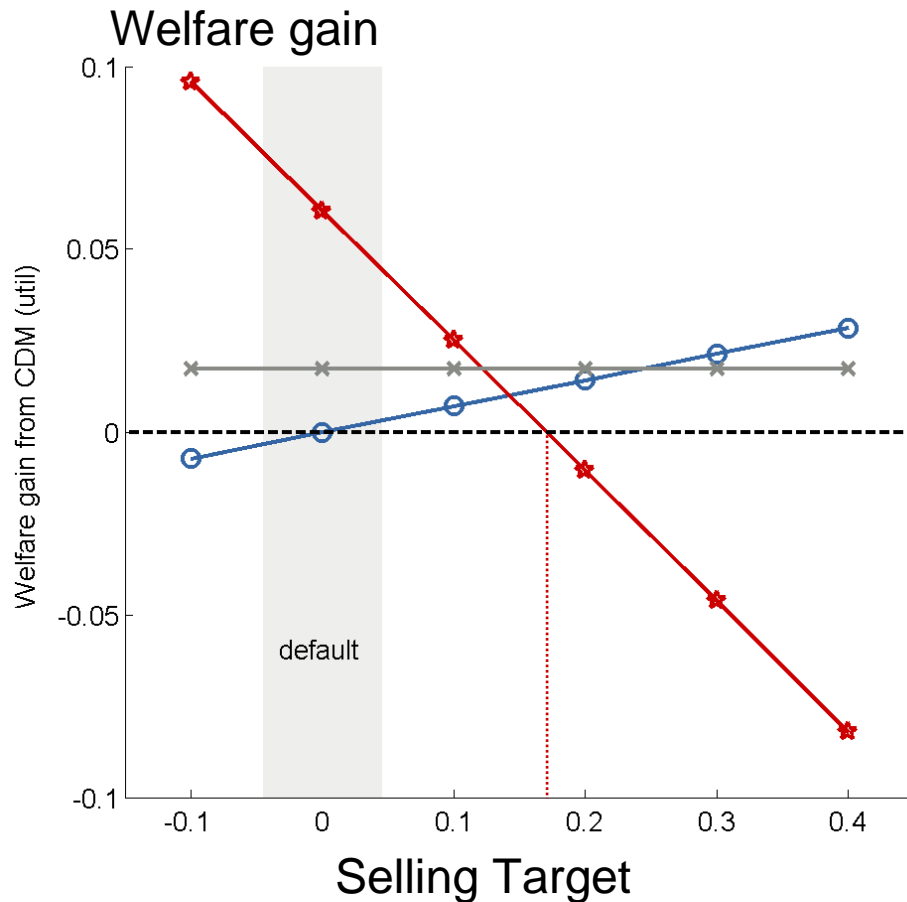


- Selling targets
 - determine the distribution of the gains from CDM trade

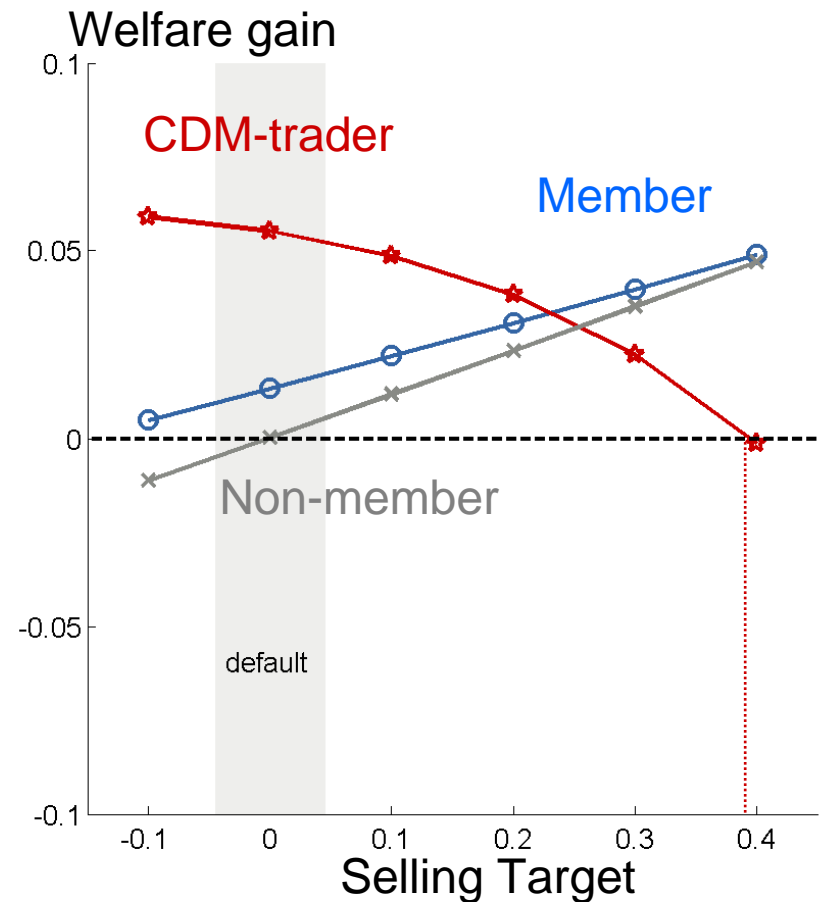
Exemplary results for a coalition of 5

Permit trade with non-members

CDM *ex ante* – symmetric players



CDM *ex post* – heterogeneous players



- Shifting gains improves **member payoff**
- ...but not enough to outweigh the increased **free-riding incentive**
- CDM *ex post* prevents increased free-riding
- Heterogeneity increases scope for CDM credit sales

Scope for cooperation?

- Model:
Improved cooperation via:
 - Research cooperation
 - Permit trade with non-members
- Reality:
Open questions:
How to induce spillovers?
Strong effekt on participation?
- Modelling approach suggests potential to improve incentive structure
- But: „Cooperative Climate Policy“ remains difficult to achieve:
 - High stakes (rents, redistribution)
 - Strong free-riding incentive (similar to Prisoners' Dilemma)

Summary

- Emission trading, linking, offsetting ...
 1. Emission permits create a “climate rent”
 - Size varies with assumptions on technologies, climate target, ...
 - Distributional issues → high stakes in international negotiation
 2. Free-riding incentives complicate negotiations
 - Linking climate negotiation with other issues (research, trade)
 - Design “flexible mechanisms” to be incentive compatible