



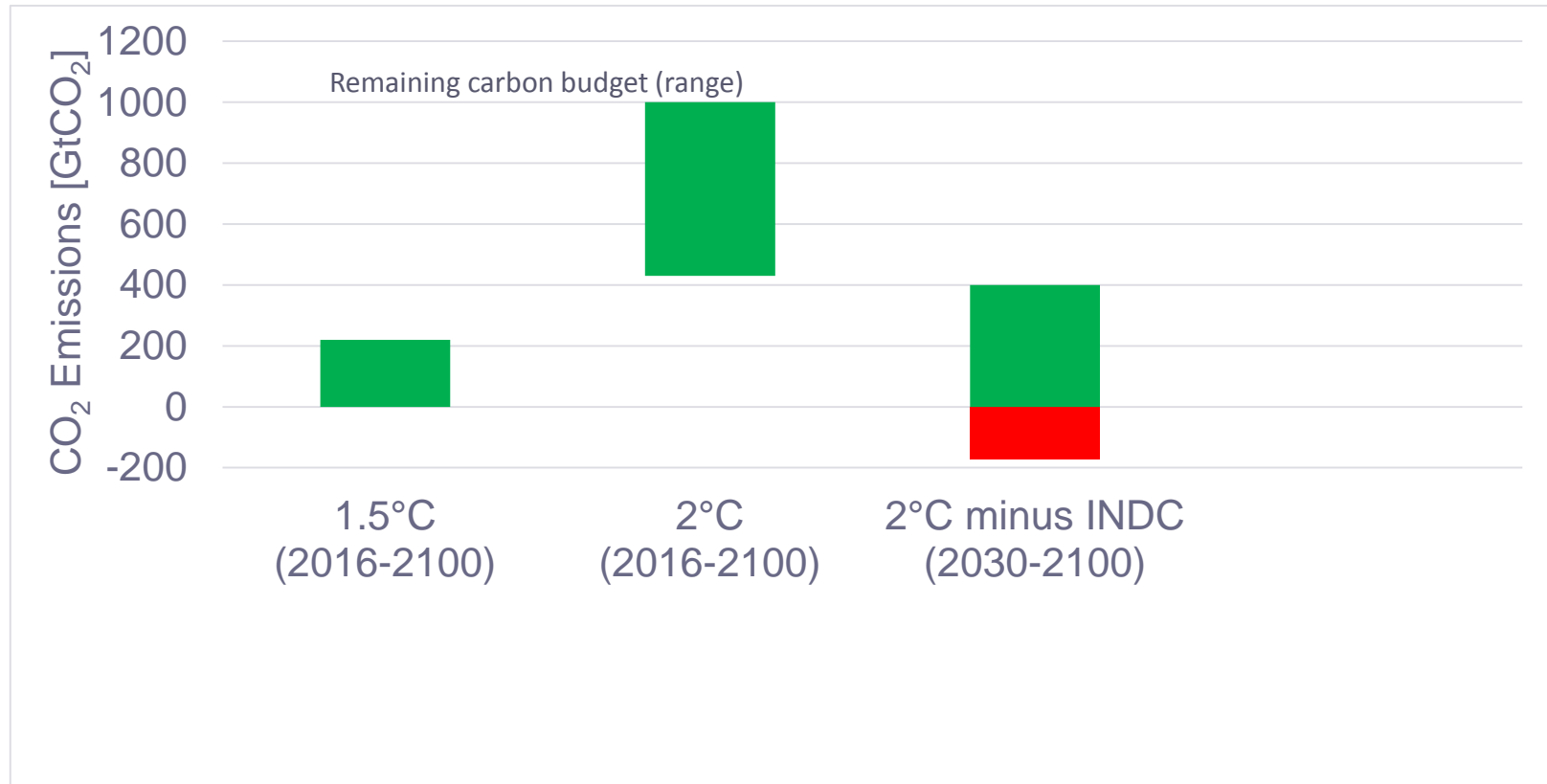
Mercator Research Institute on
Global Commons and Climate Change gGmbH

Coordinated CO₂ Prices and Strategic Transfers

Ottmar Edenhofer and Ulrike Kornek
Workshop Realizing the Potential of the Paris
Agreement
COP22, Marrakesh
17 Nov 2016

The global carbon budgets

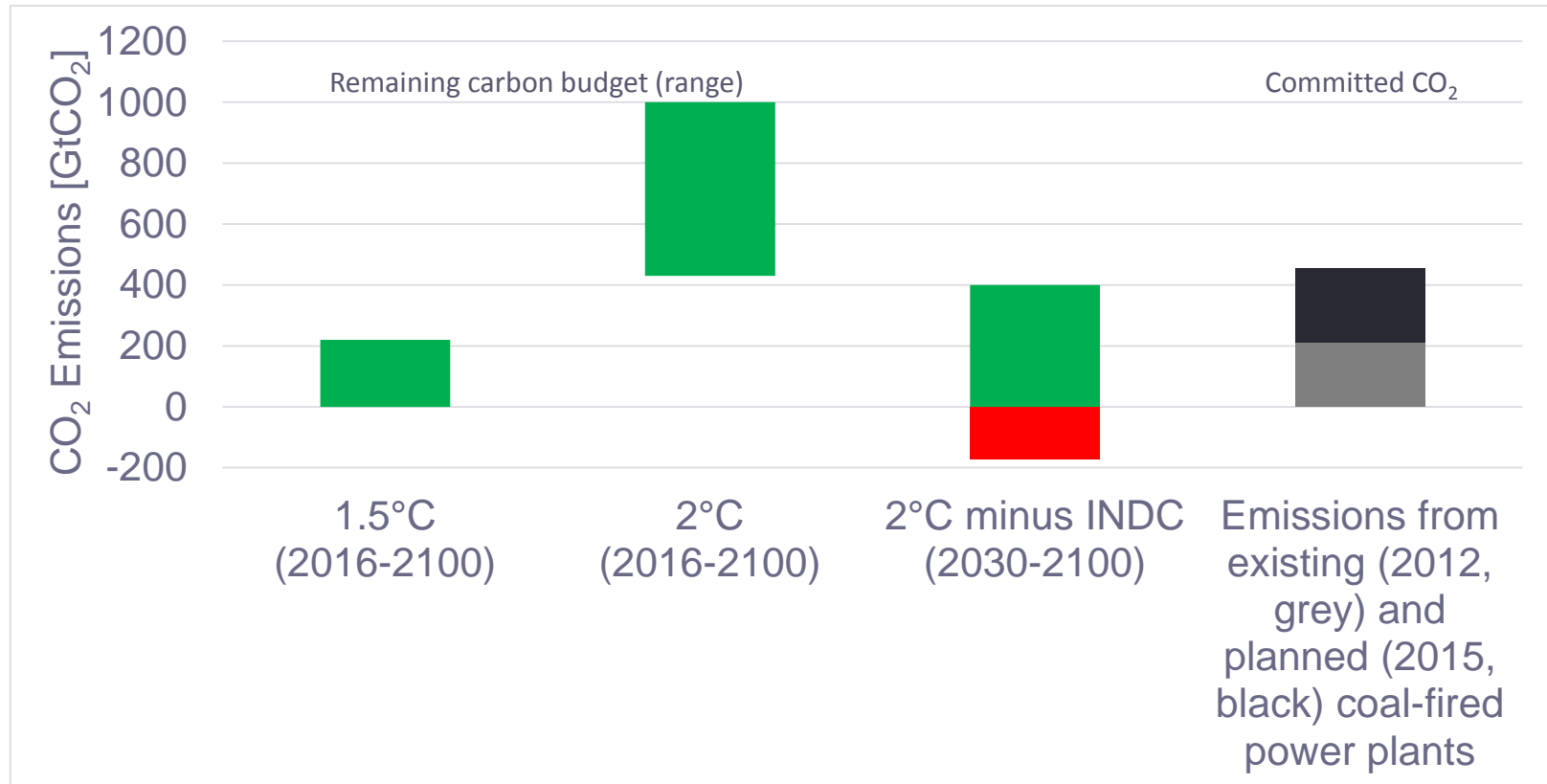
- Intended Nationally Determined Contributions are inconsistent with the temperature target.



Data sources: Rogelj et al. (2015), IPCC AR5 WGIII (2014), Minx et al. (2016), Davis and Sokolow (2014), Global Coal Plant Tracker (2015)

The global carbon budgets and coal

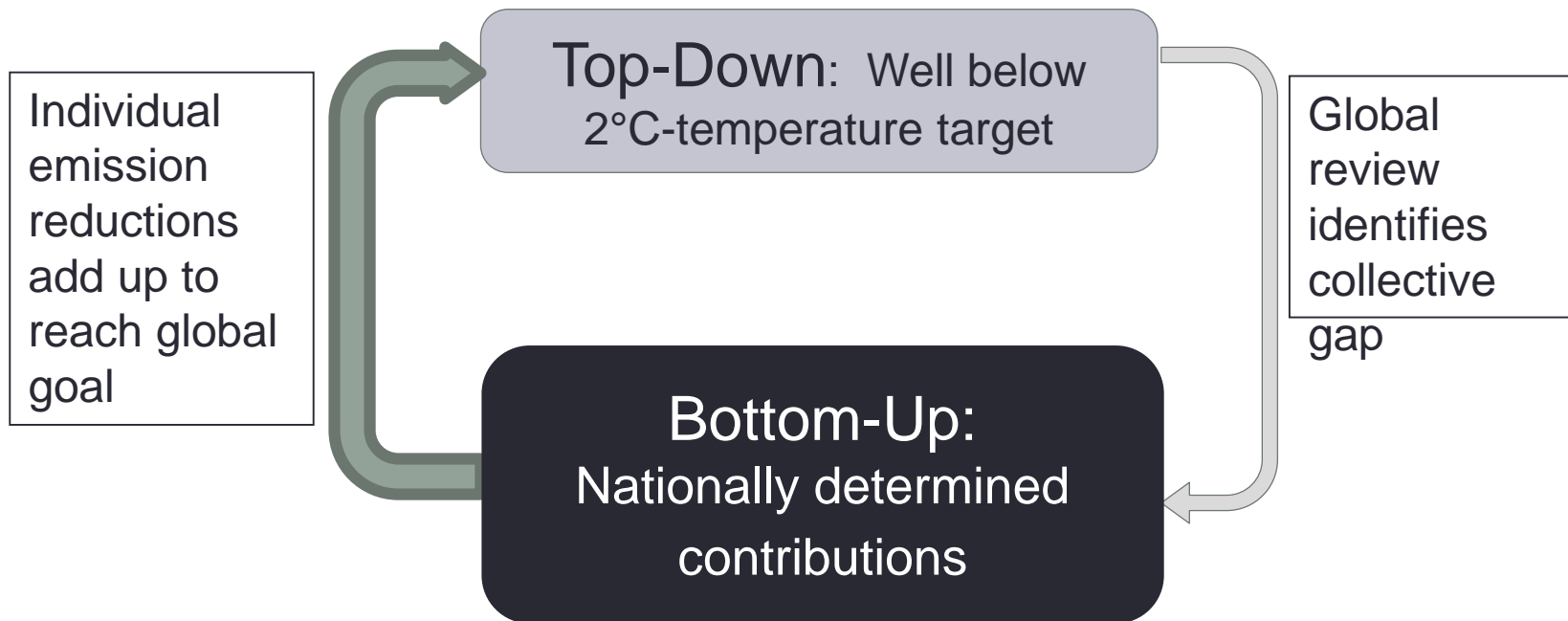
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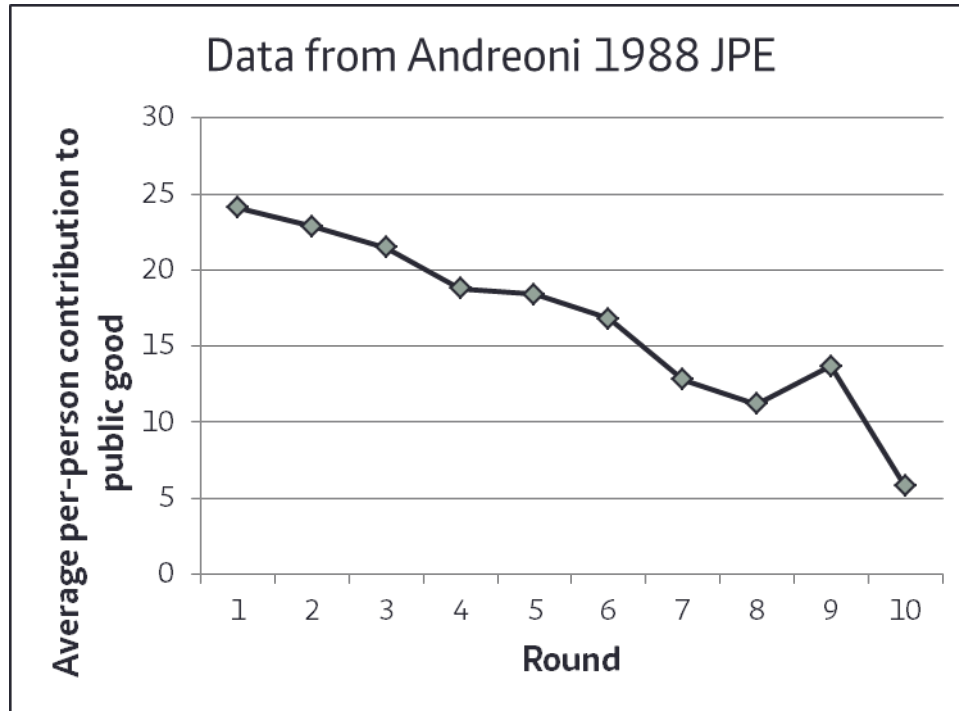
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The NDC-Process of the agreement

- Voluntary contributions to 2°C-temperature objective
- Only informal mechanisms as punishment/incentives
- Can voluntary contributions do the job?

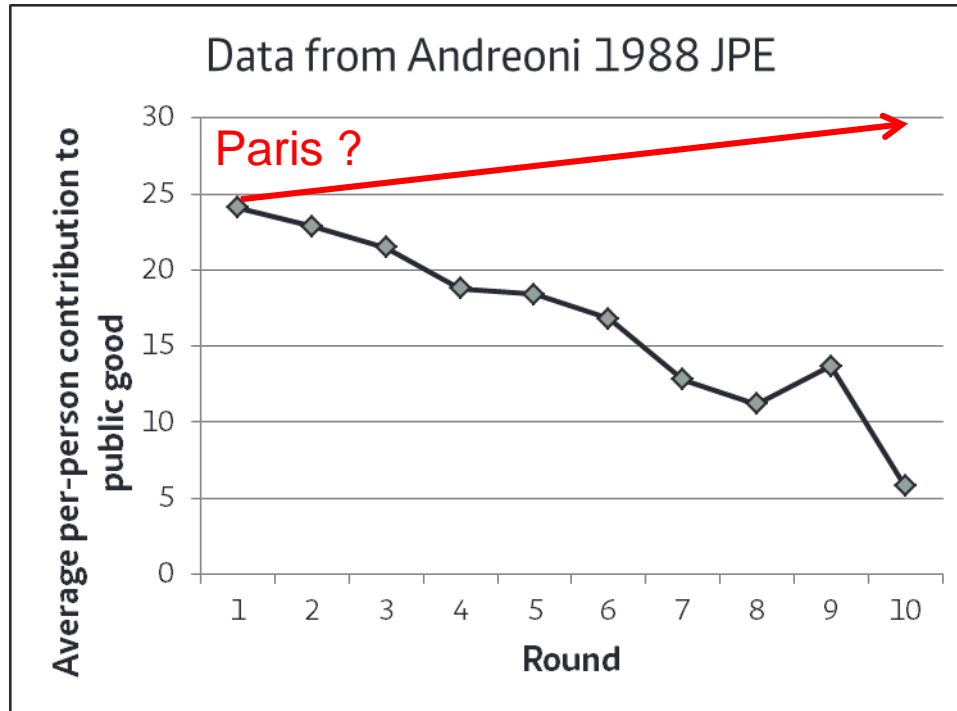


The public goods game and the Paris Agreement



- Large group of people are willing to cooperate when others also cooperate – „I cooperate when you cooperate“
- People start out by giving something
- Contribution drops, when free-riding is observed
- How to sustain conditional cooperation for climate change mitigation?

The public goods game and the Paris Agreement



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The public goods game with strategic transfers

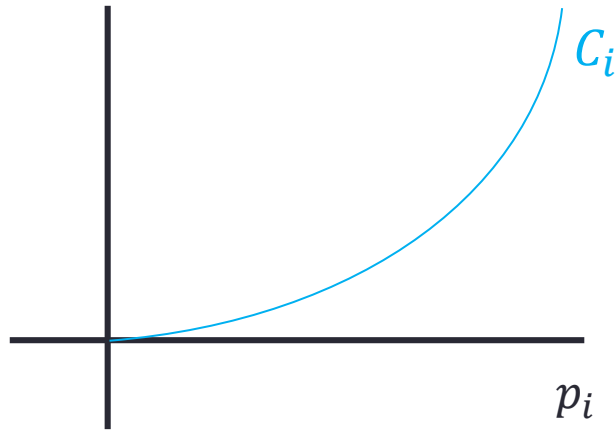


- How to ensure that countries reduce emissions?
- Introduction of carbon pricing:

$$p_i = MC_i (q_i)$$

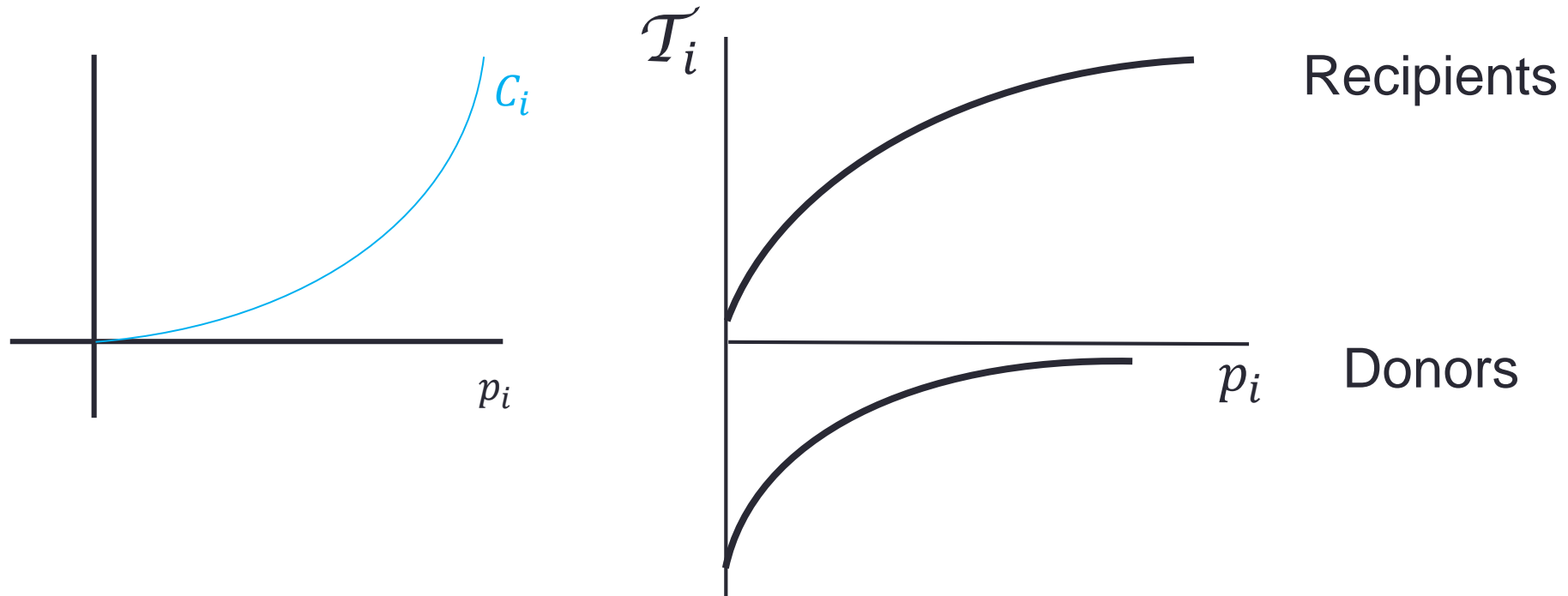
- Leads to national, cost-efficient reductions q_i
- Measure for ambition of country

The public goods game with strategic transfers



- Costs rise with national price → Incentive not to reduce emissions

The public goods game with strategic transfers



- Strategic climate finance: transfers increase with national ambition

$$\frac{\partial}{\partial p_i} \mathcal{T}_i \geq 0$$

$$\sum_{k \in S} \mathcal{T}_k = 0$$

- Countries have an additional incentive to put a positive price on emissions

The public goods game with strategic transfers



- Implementation of strategic transfer through a compensation fund:

$$\mathcal{T}_i = \underbrace{T \cdot size_i}_{\text{Magnitude of compensation}} \cdot \left(\frac{c_i}{size_i} - \frac{1}{\sum size_j} \sum c_j \right)$$

Magnitude of
compensation

The public goods game with strategic transfers



- Implementation of strategic transfer through a compensation fund:

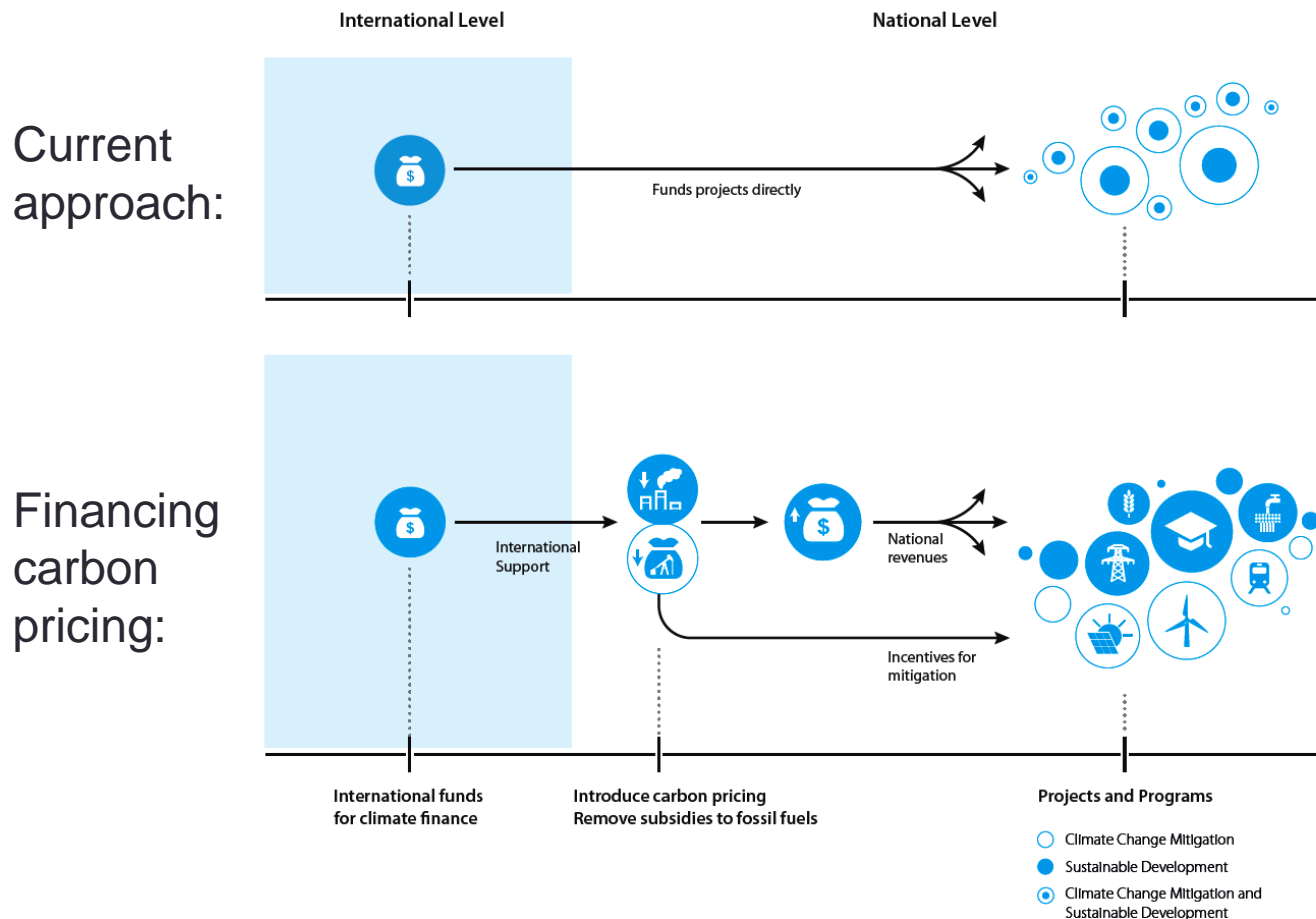
$$\mathcal{T}_i = T \cdot size_i \cdot \left(\frac{C_i}{size_i} - \frac{1}{\sum size_j} \sum C_j \right)$$

- Strategic transfers enhance cooperation:
 1. Increased incentive to reduce as countries anticipate that they only have to pay a fraction of their increase in mitigation costs
 2. Countries either contribute through reducing emissions or through compensatory payments

- Paris promised 100 bln USD from 2020 on
- Multilateral funds for the Paris agreement:
 - Green Climate fund: 9.9 bln of 10.3 bln pledged resources
 - Global Environmental Facility: 4.4 bln for climate and other environmental issue areas
- Other key players: World Bank, KfW, ...
- Current approach: mostly project based disbursement of funds
 - Additionality?
 - Effectiveness for decarbonization?

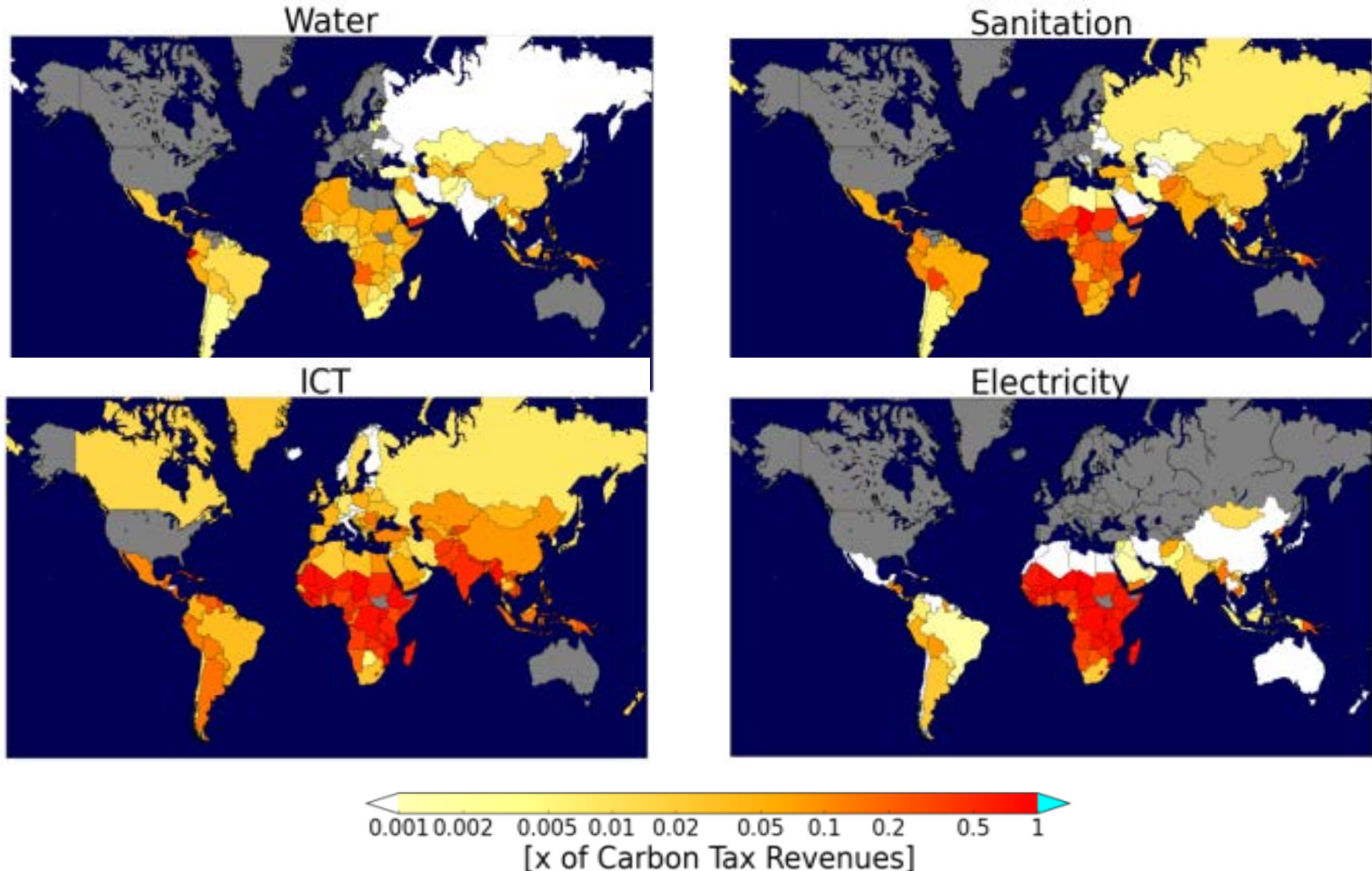
Climate Finance and the Paris agreement

- Alternatively financing of policy packages
- Establish some form of carbon pricing
 - Use climate finance to: build capacity, provide compensation for incremental costs and adverse distributional consequences



Steckel et al 2016

Climate Finance and the Paris agreement



Conclusions



- Nationally determined contributions establish price on carbon
- Coordination of price levels can help to establish conditional cooperation
- Strategic transfers payments can ratchet up ambition of price levels
- Basing transfers on compensating differences in incremental mitigation costs is ideal
 - Depending on heterogeneity, full cooperation can be established

Thank you for your attention!