Challenges for the Post-Paris Process

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The Paris Agreement: INDCs

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

Data sources: Le Quere et al. (2015), Rogelj et al. (2015), Luderer et al. (2015); Fig. adapted from Jan Minx 2016
The Paris Agreement: INDCs

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The INDCs are inconsistent

Countries with highest ongoing and planned coal investment
A renaissance of coal drives the global carbonization.

Steckel, Edenhofer and Jakob, in press
Global energy system transformation pathways

Baseline

Primary Energy

Climate Policy

2°C (50% likelihood)

Electricity
The climate problem at a glance

Resources and reserves to remain underground until 2100 (median values compared to BAU, AR5 Database)

<table>
<thead>
<tr>
<th></th>
<th>Until 2100</th>
<th>With CCS [%]</th>
<th>No CCS [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>70</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>35</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>32</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>

Source: Bauer et al. (2014); Jakob, Hilaire (2015)
The public goods game and conditional cooperators

- 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?
Minimum Carbon Price and Transfers

Emission reduction implying nationally implemented policy

Recipient countries

Minimum carbon price for a coalition

Donor countries

Transfer
The public goods game with strategic transfers

- Implementation of strategic transfer through a compensation fund:

\[ T_i = T \cdot size_i \cdot \left( \frac{C_i}{size_i} - \frac{1}{\sum size_j} \sum C_j \right) \]

Compensation between countries based on differences in per-size \((size = gdp, pop)\) and mitigation costs \(C_i\).
The public goods game with strategic transfers

- Implementation of strategic transfer through a compensation fund:

\[
T_i = T \cdot \text{size}_i \cdot \left( \frac{C_i}{\text{size}_i} - \frac{1}{\sum \text{size}_j} \sum C_j \right)
\]

Magnitude of compensation
The public goods game with strategic transfers

• Implementation of strategic transfer through a compensation fund:

\[ T_i = T \cdot \text{size}_i \cdot \left( \frac{C_i}{\text{size}_i} - \frac{1}{\sum \text{size}_j} \sum C_j \right) \]

• 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
Developing countries face fundamental infrastructure challenges

- Water
- Electricity
- Transportation
- Telecommunication
Reasonable policy and financing instruments are needed

- User charges
- Land rent taxation
- Private finance
- CO₂ prices
- Reduction of subsidies
- Public debt
Carbon pricing revenues with redistribution are sufficient to finance universal access to infrastructure...

Except for roads where Africa’s & Latin America’s cost still partially exceed revenues
ETS lack dynamical cost efficiency

- Falling CO₂ price
- No increase expected before 2020
- Market Stability Reserve will be implemented, but effect might be limited
Empirical evidence: demand shock

- Consensus that carbon prices are driven to *certain extent* by demand-side fundamentals related to abatement cost (Hintermann 2010)
- But: EUA price dynamics cannot be solely explained by demand-side fundamentals (Koch et al. 2014)
EU ETS betting shop for political decisions

Koch et al. (2016)
Introduction of a price corridor

- Reliable environment for investment decisions
- Instrument: Introduction of an auction reserve price