The Atmosphere as a Global Commons

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GHG emissions growth between 2000 and 2010 has been larger than in the previous decades.

Based on Figure 1.3
A renaissance of coal drives the global carbonization.

Steckel, Edenhofer and Jakob, in press
Climate Projections and Associated Risks

![Graph showing climate projections and associated risks]

Level of additional risk due to climate change:
- Undetectable
- Moderate
- High
- Very high
Growth vs. temperature

China

Brazil

Germany

LETTER

Global non-linear effect of temperature on economic production

Marshall Burke\textsuperscript{1,2a}, Solomon M. Hsiang\textsuperscript{3,4a} & Edward Miguel\textsuperscript{4,5}

Quelle: Nature, doi:10.1038/nature15725
Risks from climate change depend on cumulative CO$_2$ emissions...
...which in turn depend on annual GHG emissions over the next decades.
The great transformation

CO₂ emissions from fossil fuels

Emissions w/o climate protection

mitigation contributions from different technologies

Luderer et al. (2012)
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 Paris Agreement: INDCs

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

Countries with highest ongoing and planned coal investment
Minimum Carbon Price and Transfers

- Recipient countries
- Donor countries
- Emission reduction implying nationally implemented policy
- Transfer
- Minimum carbon price for a coalition
Global Minimum Carbon Price and Transfers

Ausweg aus der Klima-Sackgasse


26.10.2015, von OTTMAR EDENHOFER UND AXEL OCKENFELS

Source: Frankfurter Allgemeine Zeitung, online, 26.10.2015
“one ton of CO₂ receives, on average, more than 150 US$ in subsidies”
Developing countries face fundamental infrastructure challenges

- **Water**
- **Electricity**
- **Transportation**
- **Telecommunication**
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.