Climate Policy and Trumponomics

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19 January 2017
Emissions are rising

Data: CDIAC/GCP

CO₂ emissions (Gt CO₂/yr)

Fossil fuels and cement

Land–use change

Global Carbon Project
Cumulative emissions – we are still not on track
What about the renaissance of coal?
A renaissance of coal drives the global carbonization.

Steckel, Edenhofer and Jakob, in press
Climate Projections and Associated Risks
Growth vs. temperature

China

Brazil

Germany

LETTER

Global non-linear effect of temperature on economic production

Marshall Burke¹,², Solomon M. Hsiang³,⁴,⁵ & Edward Miguel⁴,⁵

Quelle: Nature, doi:10.1038/nature15725
Risks from climate change depend on cumulative CO$_2$ emissions...

Based on SYR Figure SPM.10
...which in turn depend on annual GHG emissions over the next decades.
What are the consequences for international energy and climate policy?
The great transformation

CO₂ emissions from fossil fuels

Emissions w/o climate protection

mitigation contributions from different technologies

Luderer et al. (2012)
Global energy system transformation pathways

Baseline

Climate Policy

2°C (50% likelihood)
All regions see radical transformation of their energy system
All regions see radical transformation of their power system

Climate Policy
2°C (50% likelihood)

Electricity

Baseline

EU

USA

China

Geothermal
PV
CSP
Biomass

Hydro

Nuclear

Oil w/o CCS

Coal w/ CCS

Coal w/o CCS
Sectoral Emissions

Based on IPCC AR5 WGIII Figure TS.17
Each Sector has to contribute – The power sector most

450 ppm CO$_2$ eq with Carbon Dioxide Capture and Storage

Based on IPCC AR5 WGIII Figure TS.17
Afforestation becomes important when CCS is not available

450 ppm CO$_2$ eq without Carbon Dioxide Capture and Storage

Based on IPCC AR5 WGIII Figure TS.17
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 2°C budget does not leave any leeway

Edenhofer et al. (2016)
The INDCs are inconsistent

Countries with highest ongoing and planned coal investment
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
Renaissance of Coal
Social Costs vs subsidies

“one ton of CO₂ receives, on average, more than 150 US$ in subsidies”

Source: Science, 18 September 2015, Vol 349, Issue 6254, 1286ff
Climate Policy and Poverty reduction - A contradiction?

- Water availability
- Sanitation
- Telecommunication
- Access to electricity
Carbon pricing revenues to close infrastructure gaps

Revenues invested 2015-2030, 450ppm goal, full technological availability, C&C allocation of emission permits

Source: Jakob et al., in press
CO₂ emissions from power sector stagnate despite increasing deployment of renewables.

- Main reason: emissions from lignite (due to low carbon price in EU ETS)
Germany is not on track.

Source: UBA (2016), Agora calculation * temporary
ETS lacks dynamic cost efficiency.

- Falling CO$_2$ price
- No increase expected before 2020
- Market Stability Reserve will be implemented, but effect might be limited

Source: ICE Futures Europe
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

source: Koch et al. 2016
ETS lacks dynamic cost efficiency.

- The price expectations for 2020 can serve as a benchmark for the evaluation of the dynamical cost efficiency of the ETS.
- There is a gap between expectations and models showing a cost-efficient price of more than 20 €/t CO\(_2\) in 2020.
Introduction of a price corridor

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