Comments on the WEO 2009

Prof. Dr. Ottmar Edenhofer
Dr. Nico Bauer

Haus der Deutschen Wirtschaft
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Climate Protection Implies a Remaining Stock of Emissions

(Meinshausen et al. 2009)
3 stabilisation targets with different probabilities to reach the 2° target: 550ppm-eq, 450ppm-eq, 400ppm-eq

Energy-related CO₂ emissions

- Baseline
- 550ppm-eq
- 450ppm-eq
- 400ppm-eq

- Negative emissions
- ~15% prob.
- ~50% prob.
- ~75% prob.

Knopf, Edenhofer et al. (2009)
WEO 2009 Mitigation Wedges

<table>
<thead>
<tr>
<th></th>
<th>Abatement (Mt CO₂)</th>
<th>Investment ($2008 billion)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
<td>2030</td>
</tr>
<tr>
<td>Efficiency</td>
<td>2,517</td>
<td>7,880</td>
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<tr>
<td>End-use</td>
<td>2,284</td>
<td>7,145</td>
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<tr>
<td>Power plants</td>
<td>233</td>
<td>735</td>
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<tr>
<td>Renewables</td>
<td>680</td>
<td>2,741</td>
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<tr>
<td>Biofuels</td>
<td>57</td>
<td>429</td>
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<tr>
<td>Nuclear</td>
<td>493</td>
<td>1,380</td>
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<tr>
<td>CCS</td>
<td>102</td>
<td>1,410</td>
</tr>
</tbody>
</table>
WEO Up-dated BAU Expectations

- Primary energy mix is expected to shift to coal and renewables
- Hydrocarbons may lose their dominant role
The Climate Challenge

• The growth of „King Coal“ must be contained

• Oil and gas grow slightly; low-carbon technologies must boom!
The Supply-side of Global Warming

Cumulative historic carbon consumption (1750-2004), estimated carbon stocks in the ground, and estimated future consumption (2005-2100) for business-as-usual (BAU) and ambitious 400-ppm-CO₂-eq. scenario.

Source: Kalkuhl, Edenhofer and Lessmann 2009
The Economics of Climate Mitigation

Issuing of permits in accordance with the remaining atmospheric deposit:

1) Dividing the global budget into national budgets by international negotiations

2) International and intersectoral permit trade for a cost-effective achieving of the budget

3) Long-term credibility of the budget

Resource extraction:
> 11,000 GtC in the ground

Remaining atmospheric deposit:
330 GtC within 21st century
Additional Investments in 450ppm Scenario
A Potential Copenhagen Deal

Set carbon budget consistent with +2°C planet (ca. 800 -1000 GtCO₂ for 21st century)

Outline roadmap for subsequent negotiations on budget allocation

Outline roadmap for implementation of global carbon market