About the benefits of a CO$_2$ transport and storage infrastructure in Europe

A coal industry perspective

EP Round Table on Coal – 15th September 2010
Stand: 17. August 2010
CO$_2$ infrastructure as location factor

- The utilization of oil, gas and coal, increasingly after 2020 and – as things stand today – only possible at all in 2050, with carbon capture.

- Security of supply in the electricity sector and industrial production are linked with CCS technology in the medium term already.

- A CO$_2$ transport and storage infrastructure will be needed after 2015/2020.

The need for carbon capture and a CO$_2$ transport and storage infrastructure follows from the climate targets and the fact that Central Europe is to remain an industrial region.
CO$_2$-infrastructure provides planning reliability as CO$_2$-prices become calculable (qualitative illustration)

Decision-makers know their costs of capture and are able to estimate the operating expense for transport und storage, if a CO$_2$-transport-storage-infrastructure is available. With the exhaustion of the cheapest mitigation potentials CO$_2$-prices rise slowly over time.
## Major CO₂ sources in Central Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of operations &gt; 10 m t/a</th>
<th>Number of operations 10 – 3 m t/a</th>
<th>Number of operations 3 – 0.35 m t/a</th>
<th>Total CO₂ emissions of selected operations, in m t/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>0</td>
<td>10</td>
<td>33</td>
<td>86</td>
</tr>
<tr>
<td>Belgium</td>
<td>0</td>
<td>5</td>
<td>33</td>
<td>51</td>
</tr>
<tr>
<td>Germany</td>
<td>9</td>
<td>23</td>
<td>153</td>
<td>434</td>
</tr>
<tr>
<td>Poland</td>
<td>2</td>
<td>10</td>
<td>56</td>
<td>162</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>0</td>
<td>8</td>
<td>33</td>
<td>74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
<td><strong>56</strong></td>
<td><strong>308</strong></td>
<td><strong>807</strong></td>
</tr>
</tbody>
</table>

Reducing complexity

- CCS-Demonstration as integrated technological process proves to be difficult; lack of concepts for industrial application

- Separation of tasks in industrial-scale application reasonable:
  - Capture conducted by operator of facility:
    - Technology exists, industrial application needs incentives: three processes available in power generation
  - Setup and operation of CO₂ transport- and storage-infrastructure by specialized companies:
    - CO₂-transport tested, acceptance and regulation needed
    - CO₂-storage needs balance of interests between regions and utilization competition

Government action guarantees non-discriminatory access to a CO₂-infrastructure and ensures sufficiently large capacities in the future
CO$_2$ sources > 3 m t/a and potential storage regions


- CO$_2$ storage formations
- Oil/gas fields
- Focus of CO$_2$ emissions

Source: Bundesverband Braunkohle
Objectives in energy and electricity policies

- **secure**
  - infrastructure
  - Trans-European Network
  - electricity, gas, CO₂?

- **competitive**
  - competition
  - market design, unbundling

- **investment**

- **environmentally compliant**
  - IED – SO₂ – NOₓ, dust
  - ET – CO₂

Who is responsible for “security” of supply in electricity sector?