CCS – An emerging business opportunity?
Agenda

► CO2/CCS Market
► CCS Potential
► Austrian CCS Market
► CCS Competitors
► CCS value chain
► Legal issues
► Business barriers & strategies for breakthrough
CO2/CCS Market – a global one?

Not ratified

Ratified
together 44,2% 1,6%

Exploration & Production
OMV
The European CO2/CCS Market?

- EU15 obliged to reduce CO2 by 329 MMto (ETS-sector 143 MMto CO2)
- 1.830 MMto CO2 within ETS-sector in 2003
- Certificates for 1.790 MMto CO2 – Reduction 40 MMto CO2
# CCS Potential

<table>
<thead>
<tr>
<th>Storage Location</th>
<th>Global Capacity [$10^9$ t CO2]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depleted oil fields</td>
<td>100</td>
</tr>
<tr>
<td>Depleted gas fields</td>
<td>400</td>
</tr>
<tr>
<td>Saline aquifers</td>
<td>&gt;1,000</td>
</tr>
<tr>
<td>Coal beds</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>&gt;1,500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage Location</th>
<th>European Capacity [$10^9$ t CO2]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On shore</td>
</tr>
<tr>
<td>Depleted oil fields</td>
<td>0,22</td>
</tr>
<tr>
<td>Depleted gas fields</td>
<td>12,5</td>
</tr>
<tr>
<td>Saline aquifers</td>
<td>57</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
</tr>
</tbody>
</table>
CCS Market Austria – Emitters & prospective Customers

CO2 Emissions in Austria [2002]

Industry
- Production & processing of ferrous metal
- Mineral industry
- Pulp & paper production

Energy supply

Legend:
- Industry
- Traffic
- Energy Supply
- Households
- Farming
- Others
CCS Market Austria – Emitters & prospective Customers

Industry
- Production & processing of ferrous metal
- Mineral industry
- Pulp & paper production

Energy supply
**CCS Market – A business opportunity for E&P-companies?**

**Up to now CO2-emission were free of charge, but now every ton gets a value and a market for CO2-Reduction techniques arises!**

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Know how &amp; experience about storage</td>
<td>Less knowledge about capture</td>
</tr>
<tr>
<td>Close to core business</td>
<td>Locally bound</td>
</tr>
<tr>
<td>(existing) Infrastructure &amp; facilities</td>
<td>Global competition</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Opportunities</strong></th>
<th><strong>Threats</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>New business for mature industry</td>
<td>Demand &amp; price</td>
</tr>
<tr>
<td>Upselling potential to fuel supply</td>
<td>Legislation (e.g. approved CO2 reduction technique)</td>
</tr>
<tr>
<td>Internal benefits (EOR)</td>
<td>Image</td>
</tr>
<tr>
<td>Positive image driver</td>
<td></td>
</tr>
</tbody>
</table>
CCS Market – Competition

**Direct competitors**
- Outsourcing the problem
- Own process not changed

**Indirect competitors**
- Internal action & solution
- Own process changed or modified

CO2/ CCS Market

CDM, JI, Fuel switch, Efficiency Inc.
CCS Market – Competition

Additional criteria:
- Risks & Uncertainties
- Flexibility
- Sustainability
- Image
- (Local) availability
CCS Market – Competition drivers

CCS as a product

Local bound – global competition

perceived customer value
(marginal cost?)

Avoid - use - dispose

Single or dual benefit
(e.g. +EOR)

Image

How can CCS compete successfully?

? Price ?
CCS value chain

Capture 45-65%  Transportation 5-15%  Storage 20-50%

core competency
CCS business – legal issues

Major questions:
- CO2 a waste?
- CO2 stored or disposed?
- Long term ownership of CO2 & liability?
- Monitoring and verifying storage?

EU supports sequestration!
2004/156/EG

As CDM or JI Projects CCS cannot create certificates
UN-basis

¿ Legislation spheres?

Only the storage of hydrocarbons is regulated
MinRoG, AUT

OMV Austria Exploration & Production, Gerhard Nocker, CCS Meeting 17.11.2004
Business barriers for CCS

- Local disparity
- Costs
- Image
- Legislation
- Uncertainties

Customers
CCS business strategies

- Costs
- Image
- Local disparity
- Legislation
- Uncertainties

Key customers

Partners/alliances

Up selling/added value
Questions