Dimensions of Hard Coal as Energy Source for Europe
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- EURACOAL – the voice of coal in Europe
- Coal in a world context
- Coal in Europe
- Coal and the EU Energy Green Paper
- Clean Coal
- Building a sustainable future for coal in Europe
EURACOAL’s Targets and Tasks

- Securing coal’s position in the European energy mix through appropriate regulations
- Cooperating in achieving equilibrium between
  - energy policy requirements,
  - market and
  - environmental policy initiatives (coal mining and coal utilisation)
- The voice of coal in Europe
  - Hard Coal – Lignite – Imported Coal
## EURACOAL Members

- DEBRIV - Deutscher Braunkohlen-Industrie-Verein (GER)
- GVSt - Gesamtverband des deutschen Steinkohlenbergbaus (GER)
- COALPRO - Confederation of the UK Coal Producers (UK)
- CdF - Charbonnages de France (FRA)
- PPC - Public Power Corporation (GR)
- ZPWGK - Polish Hard Coal Employer`s Association (POL)
- CARBUNION - Federation of Spanish Coal Producers (ESP)
- ZSDNP - Czech Confederation of Coal and Oil Producers (CZR)
- PPWB - Confederation of the Polish Lignite Industry (POL)
- Mini Maritza Istok AG (BUL)
- MATRA - Matra Erömu Rt (HUN)
- PATROMIN - Federation of the Romanian Mining Industry (ROM)
- VDKI - Verein der Kohlenimporteure (GER)
- Hornonitrianske Bane Prievidza (SVK)
- Banovici Coal Mine (BOS)
- EPS - Electric Power Industry of Serbia (SER)
- ISSeP - Institut Scientifique de Service Public (BEL)
- University of Nottingham (UK)
- IMCL - International Mining Consultants Ltd. (UK)
- Coaltrans Conferences Limited (UK)
- Euriscoal (BEL)
- Fachverband Bergbaumaschinen im VDMA (GER)
EURACOAL: Contact Point and Interest Representation of Coal in Brussels

European Institutions
Commission, Parliament, Council

EURACOAL

National Coal Associations
Coal Industry

National Institutions
Parliament
Government
Perceptions of coal are changing...

The Economist - July 2002

The Economist - September 2004

Coal-fired electricity
The future is clean

Coal is costly, but coming back into favour—and cleaner
…as they are for gas!

“For us, our contracts are like a Holy Bible”
(Alexander Medvedev, Gazprom Deputy CEO)
Reserves of coal are evenly distributed around the globe.

Global Energy Reserves 2004

- N. America: 123/8/7
- FSU: 117/17/53
- Asia Pacific: 163/6/13
- Europe: 16/2/5
- Middle East: 0/100/66
- S. & Cent. America: 9/14/6
- Africa: 34/15/13

(billion tonnes oil equivalent)

Source: BP Statistical Review of World Energy 2005
World coal consumption is increasing

China, India and the developing world are basing their growth on coal – Europe must help make clean coal part of the solution to climate change

China already dominates world demand…

World Coal Consumption 2005 (including lignite)

Source: IEA
...and most of the world’s coal is produced ‘at home’

Top 8 Global Hard Coal Producers in 2005

Source: IEA
Europe is the world’s third largest consumer of coal behind China and the US

provisional / forecast (Data as per: 03/2006)
*2003/2004
Coal is important in EU power generation...

Power-generation structures in selected EU-25 states

<table>
<thead>
<tr>
<th>Country</th>
<th>EU 25</th>
<th>Poland</th>
<th>Greece</th>
<th>Czech Republic</th>
<th>Germany</th>
<th>UK</th>
<th>Spain</th>
<th>Hungary</th>
<th>Italy</th>
<th>Belgium</th>
<th>France</th>
<th>Bulgaria</th>
<th>Romania</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gross power generation TWh</strong></td>
<td>3,179</td>
<td>154</td>
<td>59</td>
<td>3,179</td>
<td>607</td>
<td>280</td>
<td>396</td>
<td>34</td>
<td>303</td>
<td>85</td>
<td>572</td>
<td>42</td>
<td>57</td>
</tr>
<tr>
<td><strong>Share of Coal in %</strong></td>
<td>29</td>
<td>92</td>
<td>60</td>
<td>29</td>
<td>48</td>
<td>28</td>
<td>33</td>
<td>24</td>
<td>15</td>
<td>11</td>
<td>5</td>
<td>45</td>
<td>38</td>
</tr>
</tbody>
</table>

Data as per: 08/2006
Source: EUROSTAT – Energy / Yearly Statistics 2004

Bochum, 30th October 2006, Figure 13
... with indigenous coal supply making a major contribution

EU25 Solid Fuel Supply 2005 (adjusted for calorific value)

- Lignite production: 26% (399 Mt)
- Hard coal production: 33% (171 Mt)
- Hard coal imports: 41% (215 Mt)

Source: European Commission / Euracoal

Bochum, 30th October 2006, Figure 14
Coal and lignite production is widespread in Europe

Source: IEA

2005 production (adjusted for heat)

Hard Coal

Lignite (Heat Adjusted)

UK
Others
Hungary
Spain
Bulgaria
Romania
Serbia
Czech
Poland
Greece
Germany

Source: IEA
Indigenous coal has clear benefits

- The use of domestic coal deposits reduces import dependence, thereby increasing security of energy supply

- Regional prosperity and employment are created
  - A 500 MW power station operating 7000 h/p.a. and selling electricity for 40 €/MWh anchors 3 bn € in the region over 20 years
  - With indigenous coal, the added value remains in the region

- The additional economic prosperity enables the regions to develop their economic structure without any disruptions, but with a long term vision
New European energy policies are emerging

- Energy Green Paper published March 2006
  - Security – Sustainability – Competitiveness

Consultation

- Strategic Energy Review
- Communication on Sustainable Coal
  - Early 2007
The Green Paper was largely preoccupied with non-coal issues...

“Coal and lignite, for example, presently account for around one third of the EU’s electricity production: climate change means that this is only sustainable if accompanied by commercialised carbon sequestration and clean coal technologies on an EU level”
...but coal responds well to the Green Paper priorities (1)

- Energy for growth and jobs in Europe: completing the internal European electricity and gas markets
  - Coal already has a fully functioning market – aiding competitiveness

- An internal market that guarantees security of supply: solidarity between member states
  - Coal can be safely transported and stored and is not subject to the major foreign policy concerns of oil and gas

- Tackling security and competitiveness of energy supply: towards a more sustainable, efficient and diverse energy mix
  - Coal provides a unique contribution to security of supply
  - Reasonable and relatively stable prices of coal help competitiveness
Coal responds well to the Green Paper priorities (2)

- An integrated approach to tackling Climate Change
  - Continuous modernisation and major efficiency improvements help reduce emissions significantly in the short and medium term
  - Carbon Capture and Storage in coal-fired power plants and geological storage to be developed for 2020 and beyond

- Encouraging innovation: a strategic European energy technology plan
  - The coal industry backs the ZEP and SMR Technology Platforms
  - EURACOAL welcomes planned coal-based pilot and demonstration plants with CO\textsubscript{2} Capture and Storage

- Towards a coherent external energy policy
  - Indigenous coal reduces import dependency
  - Imports are from diverse sources
Clean coal comes in three stages

**Clean coal I**
Retrofit and new-build in line with start of the art, increase in efficiency, reduction of SO₂, NOₓ and dust

**Clean coal II**
Research and development for increase in efficiency to > 50 %

**Clean coal III**
CO₂ capture and storage

Investment in ultra-modern technology

Bochum, 30th October 2006, Figure 21
Continuous modernization and increased efficiency is a pre-requisite to CCS...

Feasible today: 25 - 31%

Possible tomorrow: 31 - 36%

Conceivable day after tomorrow: 40 - 45%

Gradual improvement:

- 1950 - 1970: Δη~+30%
- 1970 - 1990: 40 - 45%
- 1990 - 2010: 45 - >50%
- 2010 - 2020: Δη~+30%
- After 2020: Unit size in MW

The right approach: continuous power plant modernization/renewal

The zero-CO$_2$ power plant

Bochum, 30th October 2006, Figure 22
...ultimately leading to the “hydrogen economy”

Also useable as \( \text{H}_2 \), SNG, Methanol, or fuel generation

Gasification

IGCC*

Gas- and Steam turbine

Electricity

450 MW gross

Hydrogen

Mobility

CO\(_2\)

CO\(_2\) sequestration via pipeline

*IGCC = Integrated Gasification Combined Cycle

Bochum, 30th October 2006, Figure 23
ZEP Technology Platform proposes 10-12 large scale CCS projects

- Several coal projects are already planned
  - RWE (UK and Germany) – E.ON (UK) – GE (Poland)
  - Vattenfall (Germany) – Powerfuel (UK) – etc

- Necessary to provide urgent short and long term commercial incentives for these to go ahead
  - Inclusion in EUETS
  - Clarification of state aid issues
  - Early mover funding mechanisms for pilot projects
  - Long term sustainable mechanisms for full deployment

- Establish robust R&D funding under FP7 and National programmes
Political as well as technological action is needed to make CCS a reality

- EU - Elements of a Directive on CCS
  - Management of the environmental risks associated with CCS
  - Effective and reliable permitting of storage sites
  - Liability for CCS activities

- International maritime and national legal frameworks

- Public Acceptance
  - Less than 10 % heard of CCS – Before explanation only 13 % were positive, after explanation 55 % agreed
  - An early information campaign is necessary to get public support for the large scale implementation of CCS
Coal Industry’s Policy Requirements

- Acknowledge the unique role of coal to security of supply and its contribution to competitiveness

- Further commitment to the vision of CCS including financial support of pilot and demonstration plants

- Support adoption of a legal framework for CO2 storage

- Recognise that increased plant efficiency and continuous modernisation have the potential to preserve resources and reduce CO2 in the short and medium terms

- Acknowledge efficiency increase as a pre-requisite of CCS

Coal as a sustainable part of the EU energy mix
Thank you