Lignite, a major part of the energy landscape today and tomorrow

Meeting with European Commission members on 23 September 2011

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RWE Power AG, Cologne
Global primary energy consumption will rise significantly

in billion toe

New Policies Scenario (main scenario)

Considers political pledges made and plans announced to reduce greenhouse gas emissions and improve security of supply

Coal in Europe

Lignite production, hard coal production and imports in Mt in 2010

- Lignite production
- Hard coal production
- Hard coal imports

Sources: EURACOAL, national statistics, BGR partly preliminary figures
*2009
Data as at 03/2011
Germany has the second largest lignite reserves worldwide (40 billion tons)

- Global lignite reserves amount to approx. 270 bn t (~ 100 bn tce)
- Global lignite resources amount to approx. 4,100 bn t (~ 1,300 bn tce)
- Most of the deposits are located in politically stable regions

Map showing the world's ten largest lignite-producing countries

Lignite: 10 countries have a share of some 77% in global production. Germany's share amounts to approx. 19%.

Source: Germany's Federal Institute for Geosciences and Natural Resources (BGR)
Germany has considerable lignite reserves – even by international standards

Total production: 170 mt

Use
- Utility power plants
- Upgrading, industrial heat and power generation, other

Total reserves:* 41 bn t lasting for more than 200 years
Approved and developed opencast mines: 6 bn t lasting for approx. 35 years

* economically minable, before coal extraction

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Overview of the Rhenish lignite mining area
3.3 bn t of approved deposit reserves provide reliable base for long-term energy supply

- Output: approx. 100 mt/a
- Electricity production: approx. 70 TWh p.a.
  (40% NRW or 13% D)

Operational area
Agricultural recultivation
Forestry recultivation
Water surfaces
Lignite-fired power plants
Upgrading plants
Approved mine boundaries
Towns, villages

G Garzweiler opencast mine
H Hambach opencast mine
I Inden opencast mine
Performance figures of RWE Power AG in the Rhenish lignite mining area

<table>
<thead>
<tr>
<th>Opencast mines: 90 - 100 mt of lignite p.a</th>
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<tbody>
<tr>
<td>Garzweiler</td>
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<tr>
<td>35 - 40 mt p.a</td>
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<tr>
<td>Hambach</td>
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<tr>
<td>35 - 40 mt p.a</td>
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<tr>
<td>Inden</td>
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<td>20 - 25 mt p.a</td>
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| Power plants: over 10,000 MW\textsubscript{n}; ~70 TWh/a\textsubscript{n} |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Frimmersdorf               | Neurath                     | Nieder-                     |
| 2,000 MW                   | 2,050 MW                    | aussem (incl. TGT)          |
|                            |                             | 3,500 MW                    |
|                            |                             | 2,600 MW                    |
|                            |                             | 150 MW                      |
|                            |                             | MESC* - Goldenberg PP       |

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<th>Factories: ~5 mt of upgrading products p.a.</th>
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<tr>
<td>Fortuna-Nord</td>
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<tr>
<td>Frechen</td>
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<td>Ville/Berrenrath</td>
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- Total of ~11,600 employees incl. 740 apprentices and trainees
- Contracts worth ~€1.1 billion awarded to 3,500 companies in the region

*Multi-Energy Service Centre*
**Holistic opencast mining concept**

**Mining engineering and recultivation**

...from start ...to finish

Worldwide leading recultivation today based on decades of experience

**Water management, environmental protection in practice**

Water infiltration and discharge measures support the ground-water regime and protect wetlands

**Traffic infrastructure projects strengthen the region**

- Traffic infrastructure deficits that existed prior to mining operations are eliminated.
- Improved connection of townships to the superordinate road network strengthens the region.
Socially compatible resettlement by close cooperation with the affected municipalities and citizens

**Joint resettlement**
- Ensures the preservation of the village community
- Ensures the preservation of assets
- Extensive opportunities for information and participation
- Reduces strains by needs-based offers

**Transparency**
- Transparent presentation of processes and services within the course of the resettlements.
- Analysis of individual compensation claim based on transparent criteria
- General framework for compensation for owner-occupied properties, applied for the entire mining area.

**Location-specific rules**
- Individual soil assessment
- Extensive information and advice on site
RWE Power, firmly rooted in the Rhenish mining area

Recultivation of the long-distance conveyor belt route:
"Time Park" opencast mine rim with forum building:

"INKA" [inter-municipal competence area]
:terra nova

:terra nova science at the Niederaußem power plant

Indeland is...
- an alliance between local authorities, policy-makers, RWE Power and the Kathy Beys Foundation

Indeland means...
- developing projects to advance the region's economic structure
- refining and updating the Indeland master plan for the residual lake Inden in a broad-based cooperative process
- setting priorities to implement different types of use for the lake's edge area
Recultivation in the Rhenish lignite mining area focused on agriculture and forestry

- Recultivated area
- Operational area
- Approved operational area
- Power plants

**Map Overview:****

- **Königshovener Höhe**
- **Garzweiler**
- **Grevenbroich**
- **Operational area**
- **Recultivated area**
- **Jülich Bergheim**
- **Bedburg**
- **Hambach**
- **Frechen**
- **Inden**
- **Eschweiler**
- **Blaustein lake**
- **Southern area**
- **Cologne**
- **RWE Power**

**Key Locations:**

- **Königshovener Höhe**
- **Garzweiler**
- **Blaustein lake**
- **Southern area**
- **Operational area**
- **Recultivated area**

**Power Plants:**

- **Hambach**
- **Frechen**
- **Inden**
- **Blaustein lake**

**Recultivation Projects:**

- **Fortuna mine**
- **Sophienhöhe outside dump**

**Additional Features:**

- **New Inde River**
- **Bleibtreu lake**
Typical recultivation e.g. of the Frimmersdorf mine

- Typical recultivation in the Rhenish lignite mining area creates a richly structured post-mine landscape.
- All traces of mining operations are erased.
- The landscape is visually adapted to the surroundings and to the status prior to the land being used for mining purposes.
- The creation of agricultural land is given preference over reforested areas and water surfaces.

The medieval town centre of Kaster:
1975 and 2000
One thing applies to all mining measures: We never lose sight of Nature

Bat and woodpecker populations – examples of environmental protection challenges

The world's leading recultivation concepts thanks to continuous further development

Sophienhöhe outside dump

Succession surface

Development of protective measures by accredited experts in collaboration with specialist authorities ensures the conservation of animal populations

Studies of flora and fauna have identified more than 2,200 animal and over 700 plant species in the recultivated areas
Value-add on site: The lignite mining sector safeguards more than 26,000 jobs in the region.

Employment effects of lignite mining sector
Number of employees (rounded)

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<tr>
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<th>Region</th>
<th>NRW</th>
<th>Bundes-gebiet</th>
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<tr>
<td>Direct</td>
<td>26,300</td>
<td>34,000</td>
<td>41,800</td>
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<tr>
<td>Indirect</td>
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In 2009, RWE Power paid €169 m in trade tax in NRW.

From 2005 to 2013, the construction of BoA 2/3 will safeguard approx. 2,450 jobs in NRW.

In 2009, RWE Power provided a direct demand stimulus of €1.9 bn.

We award most contracts to competent firms in the vicinity of our mines and plants.

RWE Power as a strong partner of the region, with a focus on industry

| Energy landscape | Erection of 4 wind energy plants by RWE Innogy GmbH  
|                  | Total capacity: 13.6 MW  
|                  | To be implemented as of 2012 |

| Municipality development | Location of businesses for general basic and local supply  
|                         | Investment volume: approx. EUR 4.1 m |

| Industrial estates | Erection of building machinery works with 600 jobs  
|                   | Opening of works on 20 June 2011 |

| Gardenlands | 30 ha of area under glass are heated using low-temperature heat  
|            | Option of CO₂ manuring |
Lignite mining in the Rhenish area

3 opencast mines
18 bucket-wheel excavators
17 spreaders
235 km of belt conveyors
300 km of railway tracks

Production capacity is geared to 100 million tons of lignite per year
Development of Garzweiler opencast mine

- **A 44 n ( — — — )**: 
  - Route prepared across a length of 2.5 km
  - Plan approval has been granted
- **Resettlement**
  - **1st section** Holz, Otzenrath and Spenrath is completed
  - **2nd section** Immerath, Lützerath, Pesch and Borschemich going according to plan
  - **3rd section** Keyenberg, Kuckum, Oberwestrich, Unterwestrich and Berverath: lignite mining plan procedure started after lignite commission's decision was taken at meeting of 21 December 2010.

Operations are dominated by routing for A44n
Power plant fleet renewal and further development of power plant technology and use options as contribution to the reduction of carbon emissions