The energy transition in Germany - using lignite to overcome the third industrial revolution

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Agenda

1 **Ensuring supply**

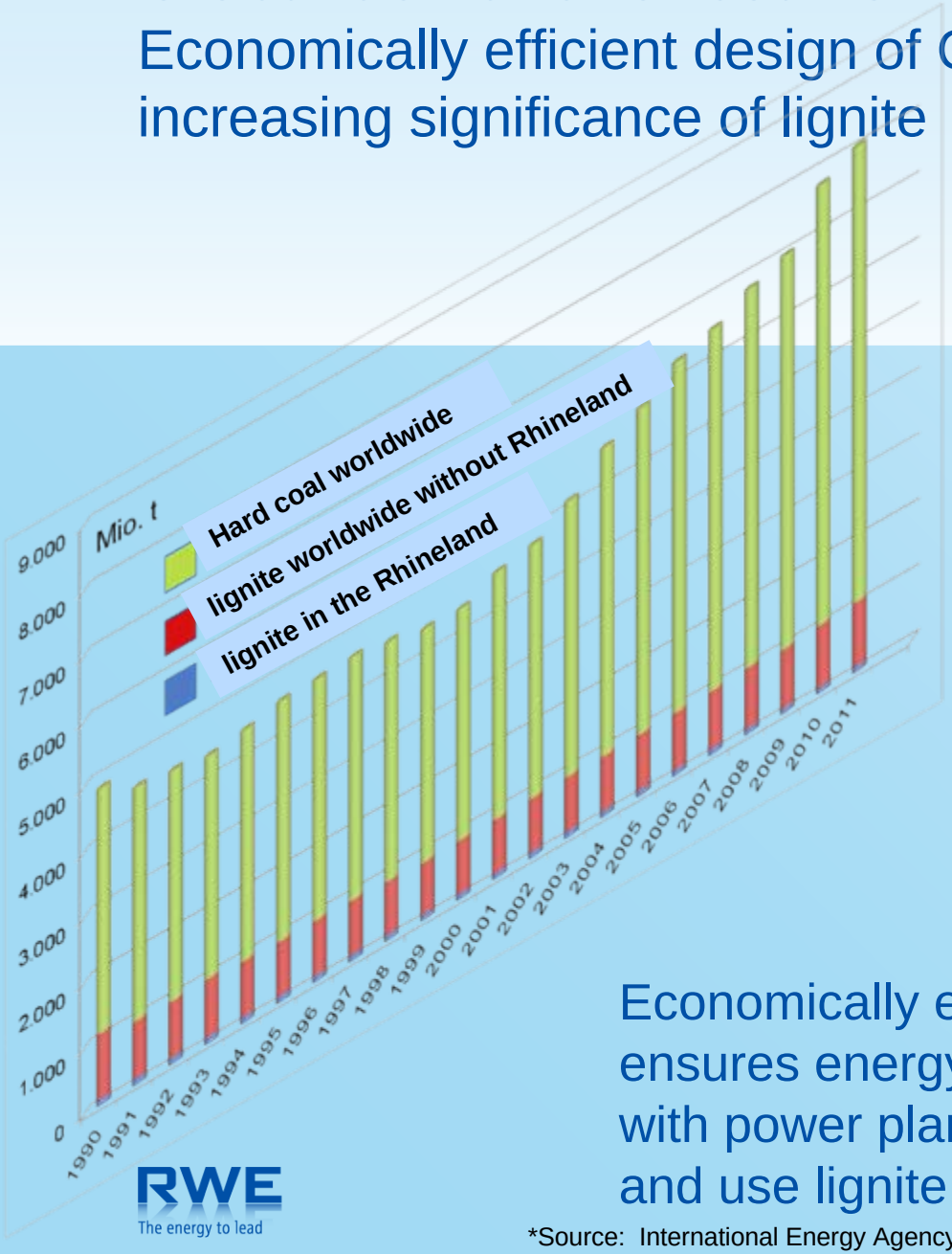
Reconciling expectations 2

3 **Benefiting from interrelations**

Identifying prospects 4

Global demand for coal is increasing

Economically efficient design of CO_2 avoidance; increasing significance of lignite



- Global coal demand continues to increase, +21% by 2035.*
- Rhenish lignite marginal on a global scale, but essential to success of energy turnaround in Germany.
- 1% point efficiency increase in a modern lignite-fired power plant saves 0.2Mt of CO_2 and ensures climate-sparing, safe and affordable energy supply.

Economically efficient CO_2 avoidance alone ensures energy turnaround, thus continue with power plant renewal in the Rhineland and use lignite in the long term

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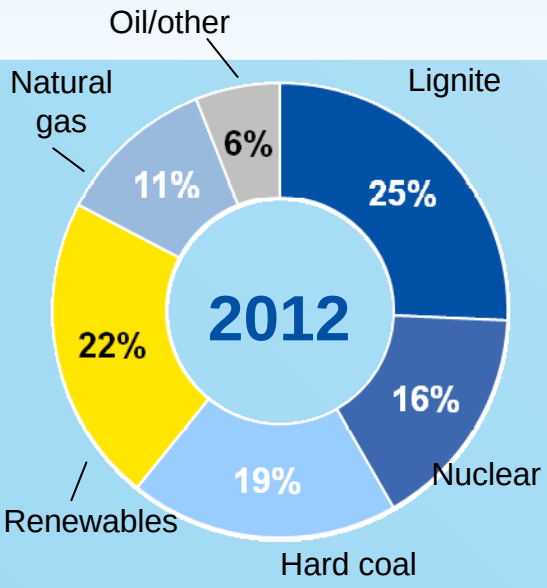
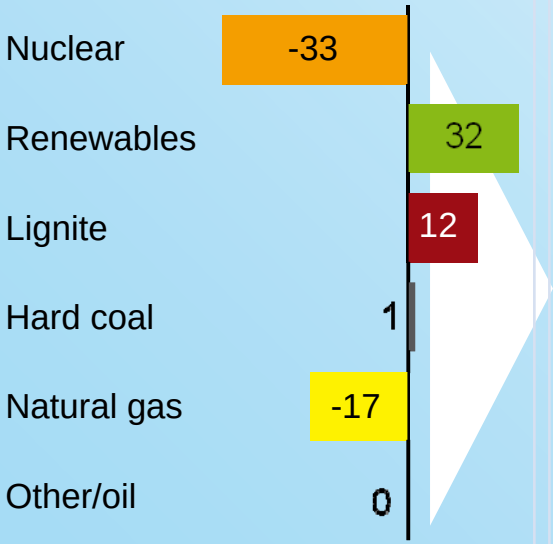
*Source: International Energy Agency, World Energy Outlook 2012, Paris 2012 (New Policies Scenario)

Nuclear phase-out leads to ever-greater responsibility of lignite

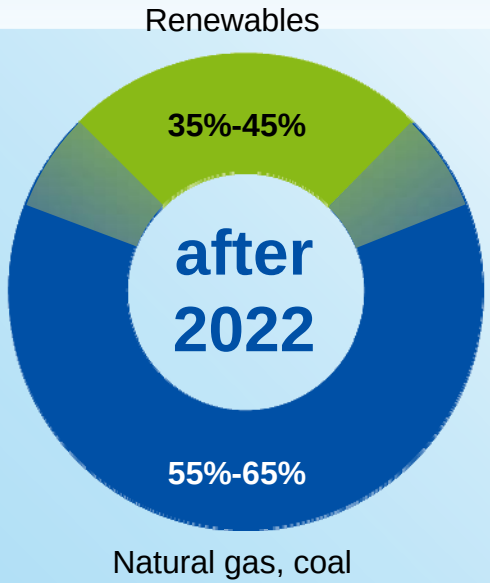
Gross power production in 2012: 617bn kWh



Changes in 2012 in bn kWh



Energy mix after 2022

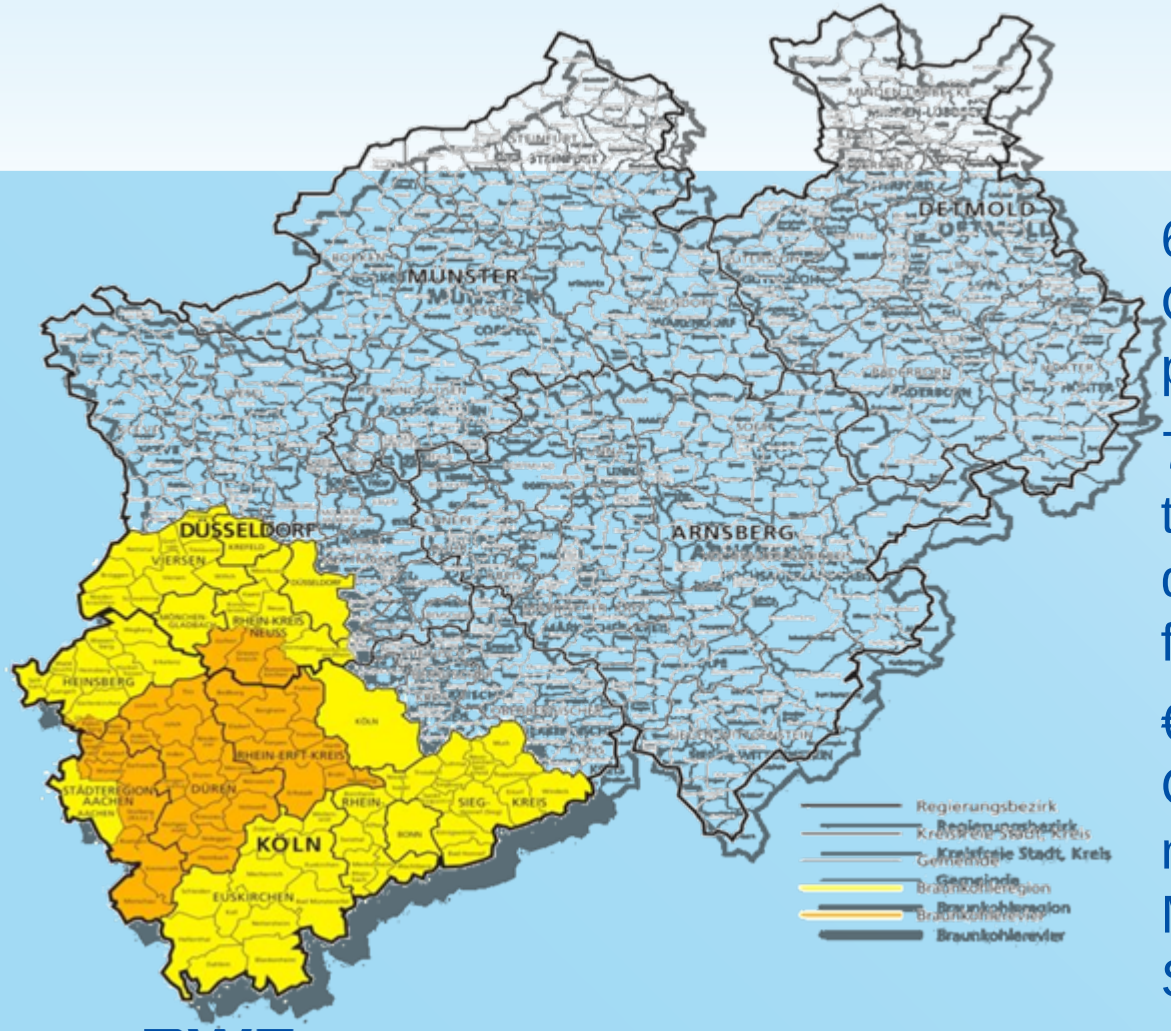


Lignite is an important safety pillar of German electricity supply

Lignite and RES closed the supply gap that developed in 2012

Lignite will continue to be an important pillar in the energy mix of the future

The Rhineland – a highly productive metropolitan area for decades, and yet subject to continual change



6.7 million inhabitants – Germany's most populous region.

712 inhabitants per km² – the higest population density in Germany following the Ruhr area.

€213 billion GNP – Germany's most productive metropolitan area ahead of Munich, Frankfurt and Stuttgart.

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Lignite mining and utilisation – defining for landscape, man and Nature

The overall lignite system today
Three core questions are answered

- What is important to the region?
- What is important to RWE?
- How do we treat each other?

What is important to the region?

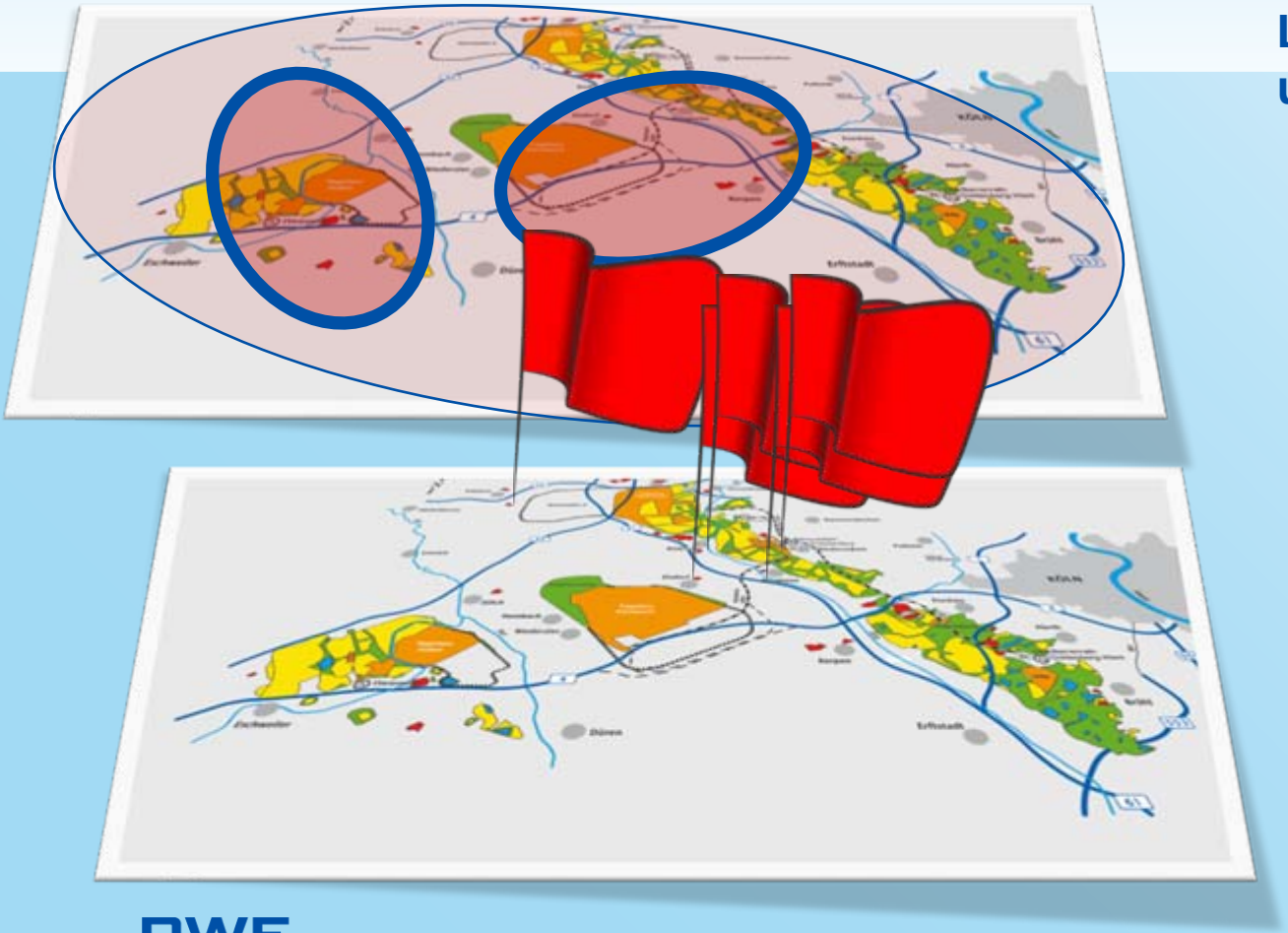
Maintaining and further developing strong structures

What is important to RWE?

High acceptance of sustainable energy supply

- Environmentally compatible mining of approved lignite reserves…
- …for electricity generation, upgrading and other uses.
- Recultivating the landscape in a sustainable manner that allows it to be utilised and experienced in a variety of different ways.
- Offer young people attractive prospects.
- Making use of RWE's abilities in cooperation with the region and further developing lignite by means of dialogue.

Lignite planning area provides the foundation for joint action and shaping of the future



Large-scale initiatives unite the region

- oIRR
- o:terranova,
- o indeland

Individual outline agreements precisely design

- oBedburg
- oBergheim
- oElsdorf
- oErkelenz
- oGrevenbroich
- oJüchen

Cooperative implementation of concrete projects

The region and companies jointly shape…

- Identity and cultural heritage
- Modern power generation
- Research and development
- Structural development
- Urban and rural development
- Education and training
- Landscaping and recultivation; recreation

Collaboration with the region

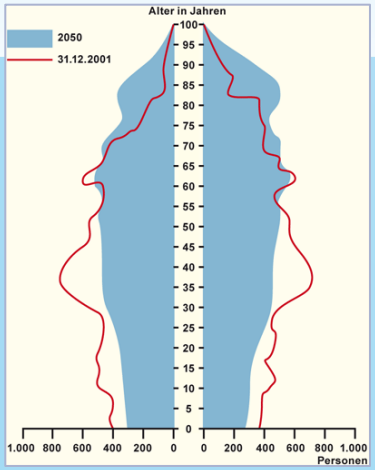
Neighbourly help evolves into project development

Neighbourly help

Project development

Development of collaboration with the region

Tomorrow: future- and theme-geared structural development



Structural development for individual townships…

- Citizen-friendly and practical development concepts for industrial and residential locations
- Cooperative further development of districts with power plant sites
- Grants
- Awarding of contracts

… or whole regions, e.g. Indeland master plan process

The Indeland redevelopment undertaking has been leading the process aimed at shaping the future of the region since-mid 2010:

- Outline plan for the surroundings of the residual lake (2055)
- Master plan for the development of the region up until 2030
- Outline plan for the interim use of the residual lake basin during filling

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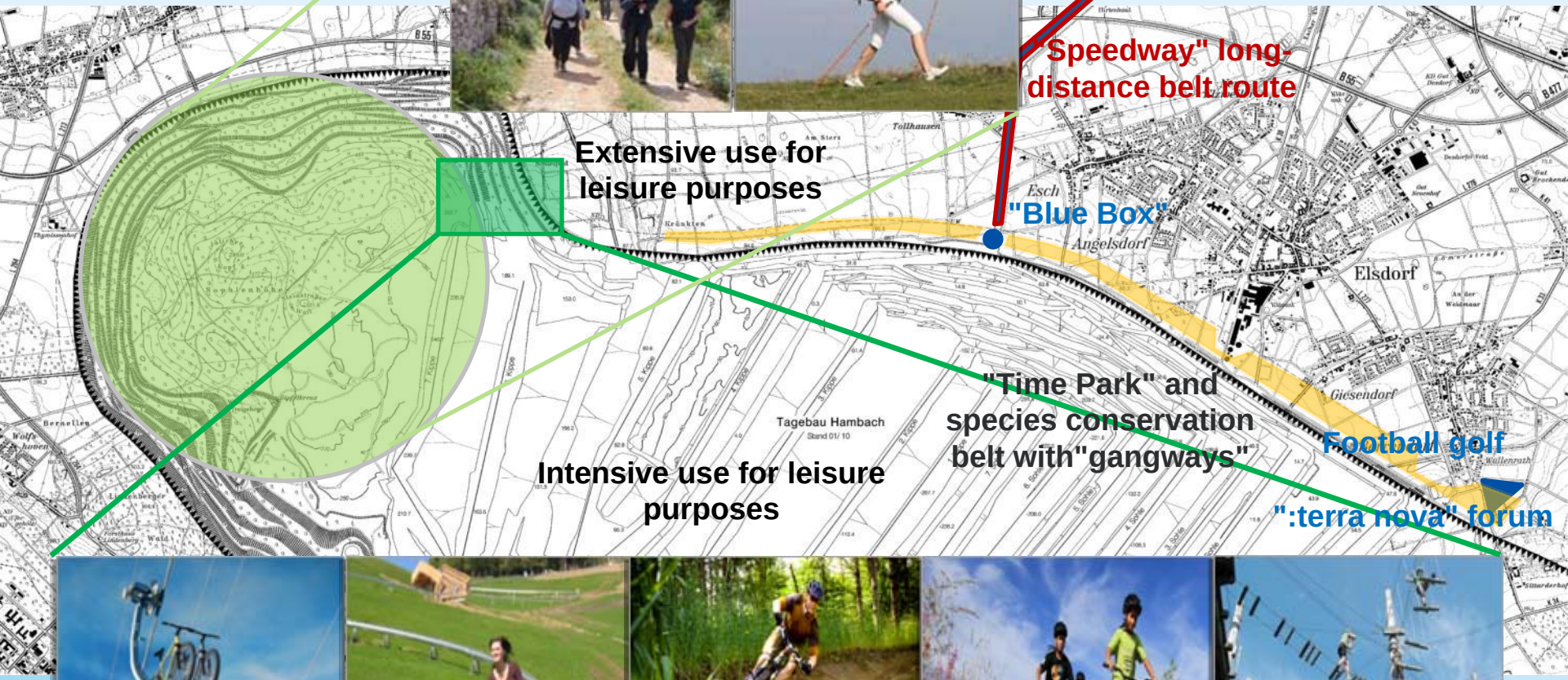
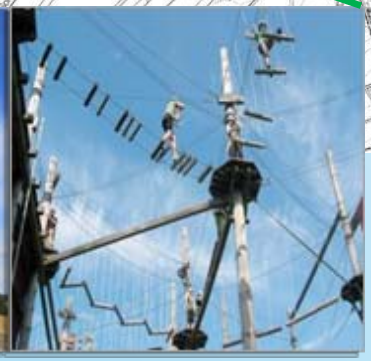
Attractive post-mine landscape

Example – Sophienhöhe mountain landscape





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The expansion of renewables makes an important contribution to CO_2 reduction

In the Rhenish mining area, RWE is pursuing the goal of increasing installed wind power capacity to 150MW+ by 2014. At present, 34MW are in place. Further approval procedures for wind farms have been initiated by agreement with the local authorities or are nearing completion.

As an additional renewable energy form besides wind, RWE is investing in photovoltaics. In 2012, a photovoltaic system covering an area of 17,000 m² was installed on the Kerpen-Buir noise protection dam. Since October 2012, the system has been feeding 2MW into the grid. Further projects are being examined.

Energy, agriculture, and nutrition
Linking interests – promoting acceptance

Agrotherm I – Heating of arable land using warm cooling water as a source of heat.
Combined heat and power generation without power generation loss attains higher fuel utilisation rate and permits earlier harvest.

Agrotherm II – The heating of a 10-ha area for asparagus cultivation with sump water allows earlier harvest. Application to other cultures currently being examined.

The continuation of the power-plant renewal programme with BoA*plus* as the next step…

…is still in the public interest

- **Reduction in carbon emissions by replacing existing plants**
- **Securing of highly fluctuating renewable energy**
- **Important contributation to grid stability**
- **Guaranteeing of security of supply and contribution to independence from energy imports**
- **Cost-efficient energy supply for industry and households in NRW**
- **Strengthening of the region's economic vigour, innovative capacity and job market**

Critical view of raw materials production and use by parts of the society

Protests are legitimate, but criminal offences will not be tolerated

Upshot

In view of the rising demand for energy worldwide, the significance of lignite is increasing. Its stable vlaue-add must be maintained.

But people are nowadays critical of raw materials production and use and sceptical of any major projects.

Thus, exceptional efforts are required to promote acceptance and rootedness in the region.