Best Practices in Lignite Mining

From the Planning Process to Rehabilitation

Dr Lars Kulik, RWE Power AG

Fossil Fuel Forum – Working Group

Brussels, 21 September 2010

RWE

The energy to lead

Introduction

- The lignite mining sector in the Rhineland has been a reliable partner for a long time – for generations it has made an important and visible contribution to the region's development.
- Municipalities, churches, farmers, trade unions, authorities, NGOs and citizens are shaping the development of the mining sector and of the region.
- This results in specific measures for the Rhenish lignite mining area that cannot simply be transferred to other mining regions.

As a result, lignite mining has a longterm planning reliability and is widely accepted in the Rhineland.

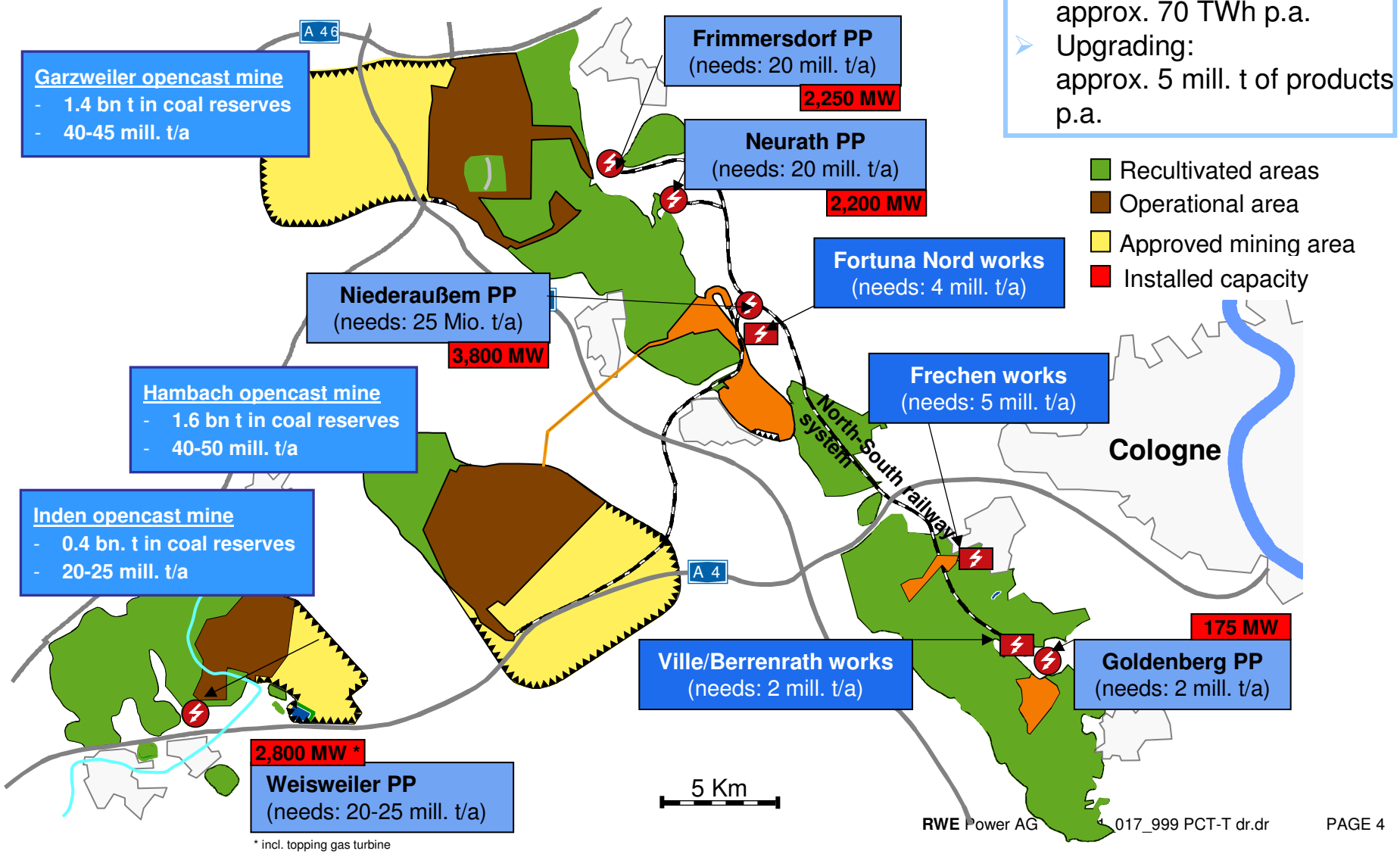
Structure

- The Rhenish lignite mining area
- Sustainable opencast mine planning and mining approval over the entire lifespan
- From planning to practice – Examples of best practices
- Summary

Integrated lignite mining and use concept

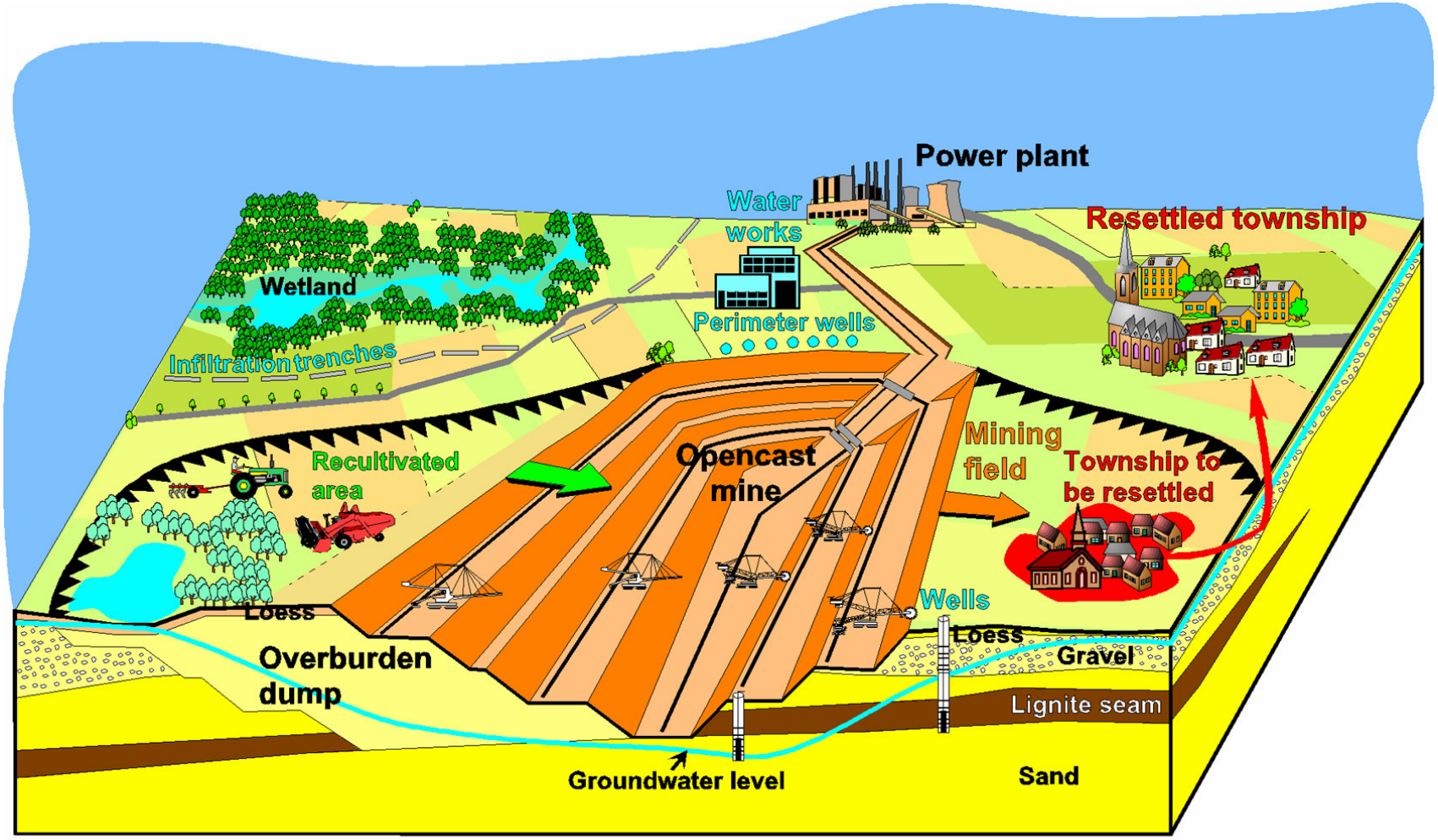
3.4 bn t underpinned by longterm approvals

- Electricity production: approx. 70 TWh p.a.
- Upgrading: approx. 5 mill. t of products p.a.



* incl. topping gas turbine

Schematic diagramm of a lignite opencast mine in the Rhenish mining area

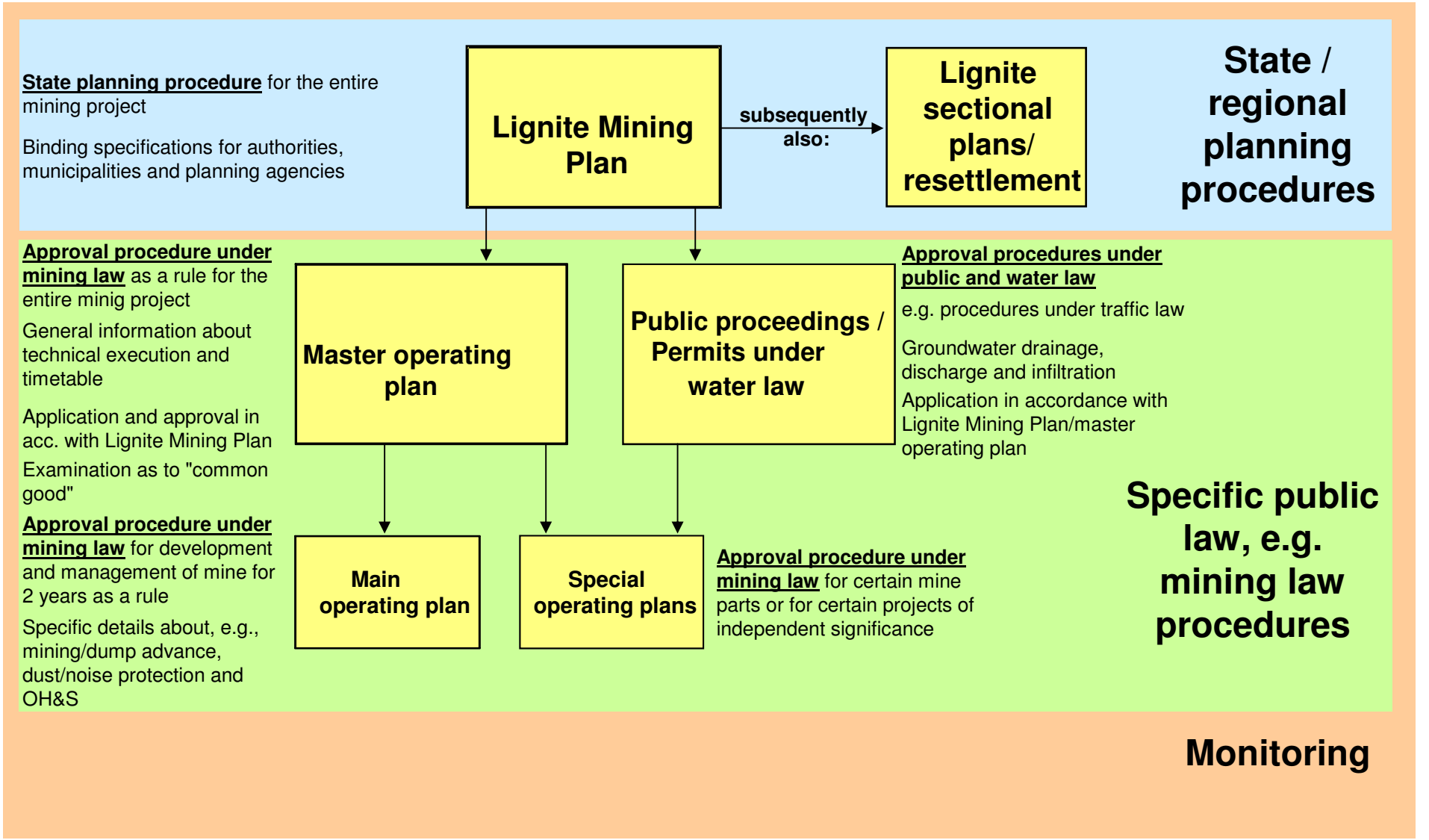


RWE
The energy to lead

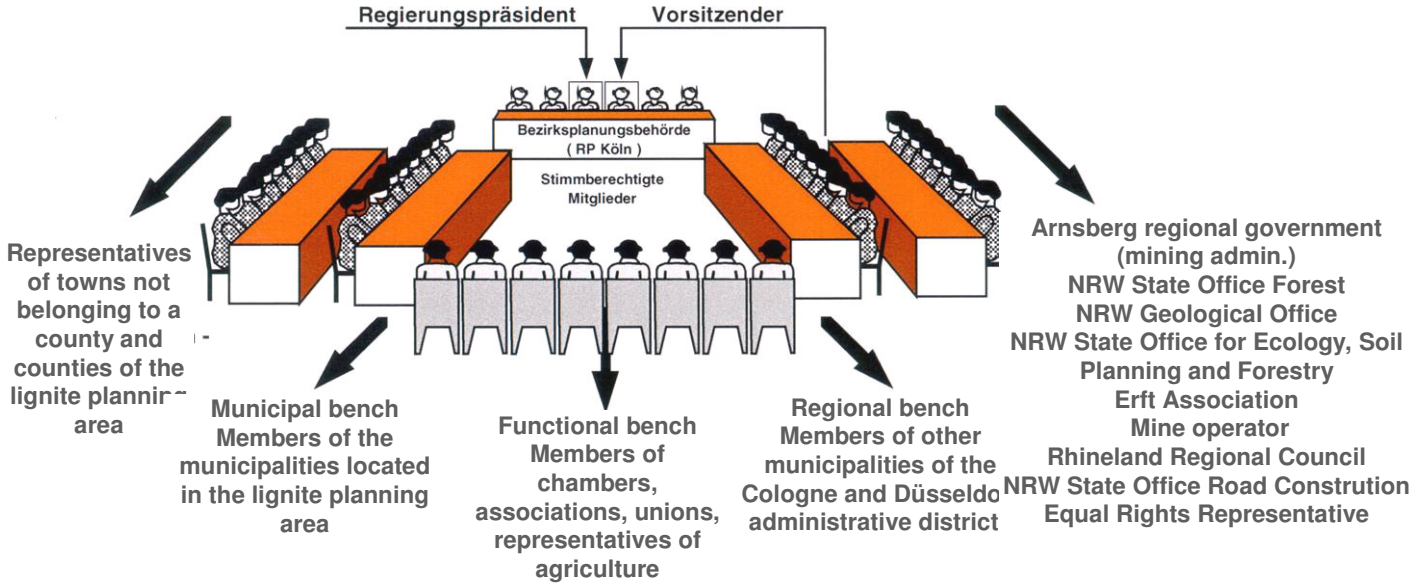
Structure

- The Rhenish lignite mining area
- Sustainable opencast mine planning and mining approval over the entire lifespan
- From planning to practice – Examples of best practices
- Summary

Approval procedure in brief



Lignit Commission as a political and expert committee for entire lignite planning



The Lignite Commission, an NRW regional planning body, acting in collaboration with stakeholders from the region and specialist representatives, draws up a Lignite Mining Plan incl. environmental and social impact assessments

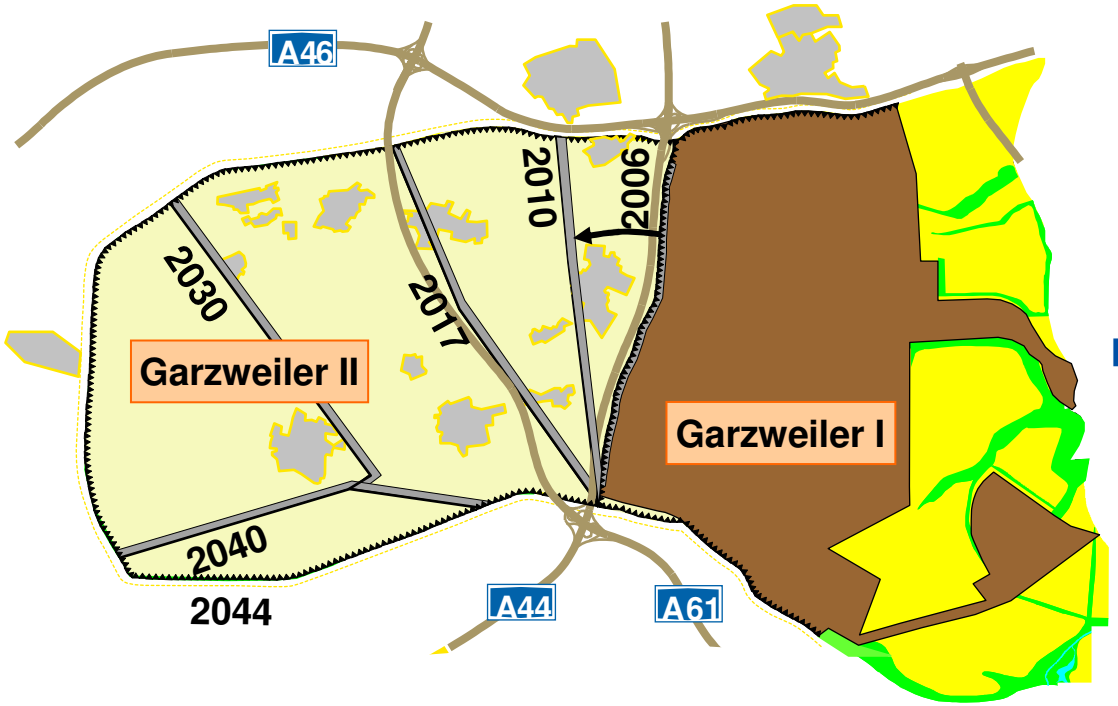
Further individual aspects and details are reviewed in subsequent procedures under mining, water and public law

Jointly developed regional planning decision:

Scope of action for the region AND improved longterm planning and investment reliability for the mining company by committing municipalities

RWE The energy to lead

A consistent mine concept forms the basis for review and approval by regional planning authorities: Example of Garzweiler II



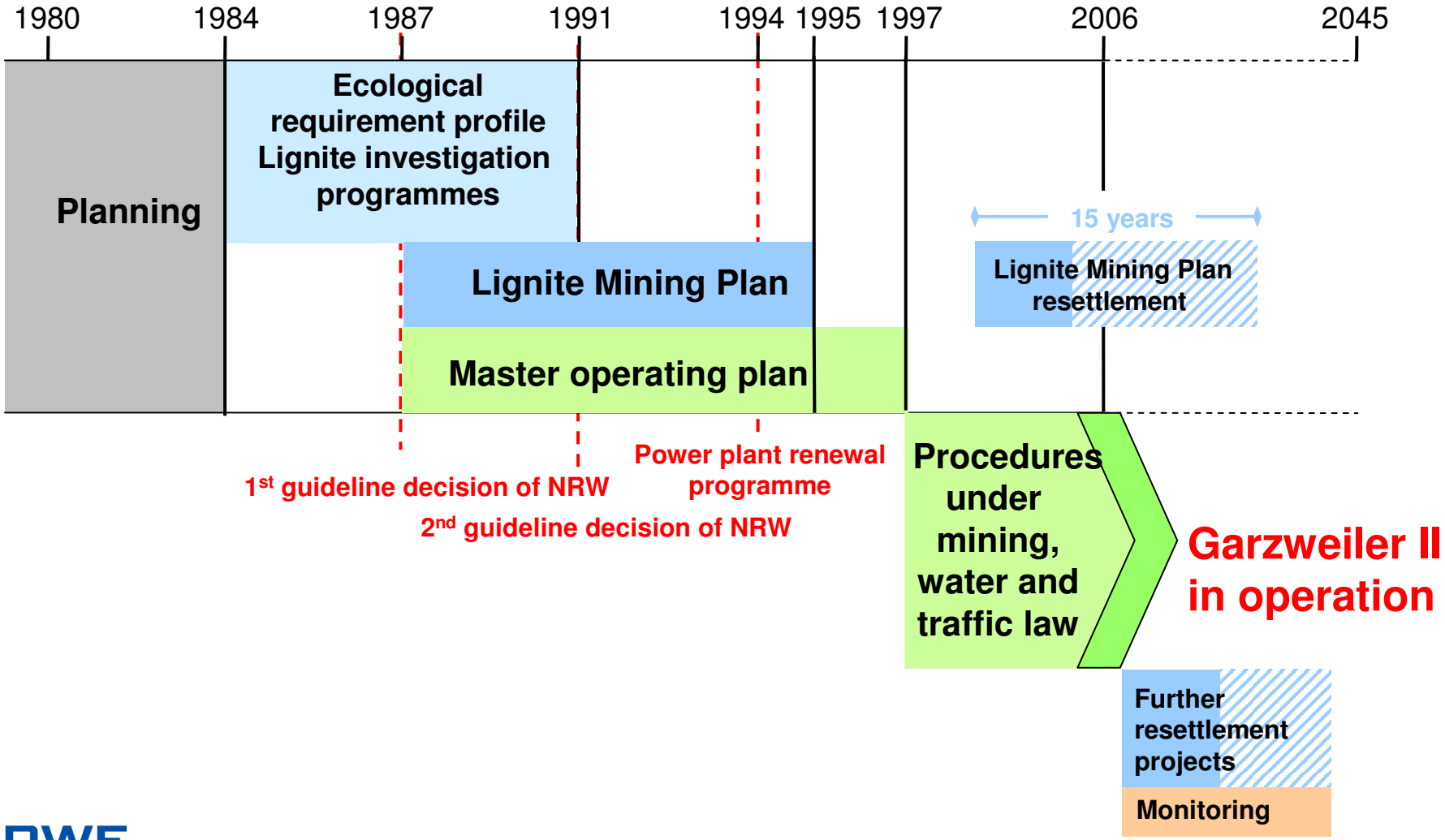
- Lignite deposit:
  - Field size: 48 km²
  - Lignite reserves: 1.3 bn t
  - Stripping ratio: 5 : 1

- Production:
  - Lignite production: 35 - 40 mill. t/a
  - Start of production: 2006

- Resettlement/relocation:
  - People: 7,600
  - Townships: 13

Garzweiler II opencast mine timetable

In the lignite planning procedure for the Garzweiler II opencast mine, the project was extensively examined for over 10 years, balancing the public and private interests concerned



Structure

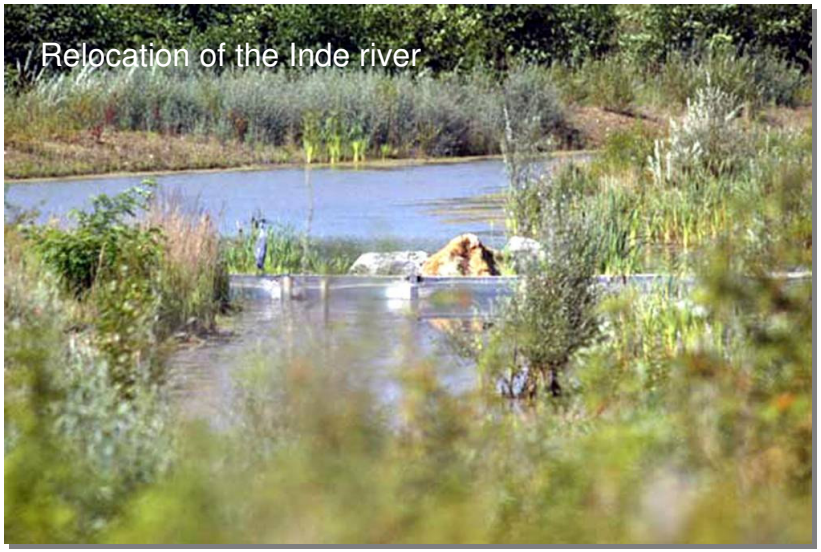
- The Rhenish lignite mining area
- Sustainable opencast mine planning and mining approval over the entire lifespan
- From planning to practice – Examples of best practices
  - Example 1: Rehabilitation
  - Example 2: Nature conservation and preservation of biodiversity
  - Example 3: Water resources management
  - Example 4: Air pollution control and noise abatement
- Summary

Example 1: Recultivation in the Rhenish mining area is considered as examplary worldwide

In the Rhenish minig area, more than 20,000 ha have already been recultivated, including more than 7,700 ha for forests and green corridors.

Compared with the situation prior to the land being used for mining purposes, areas for industry, settlements and roads have been reduced; instead new, attractive recreational areas have been created.

Studies of flora and fauna have identified more than 2,200 animal and over 700 plant species in the recultivated areas, including 429 animal species threatened by extinction.



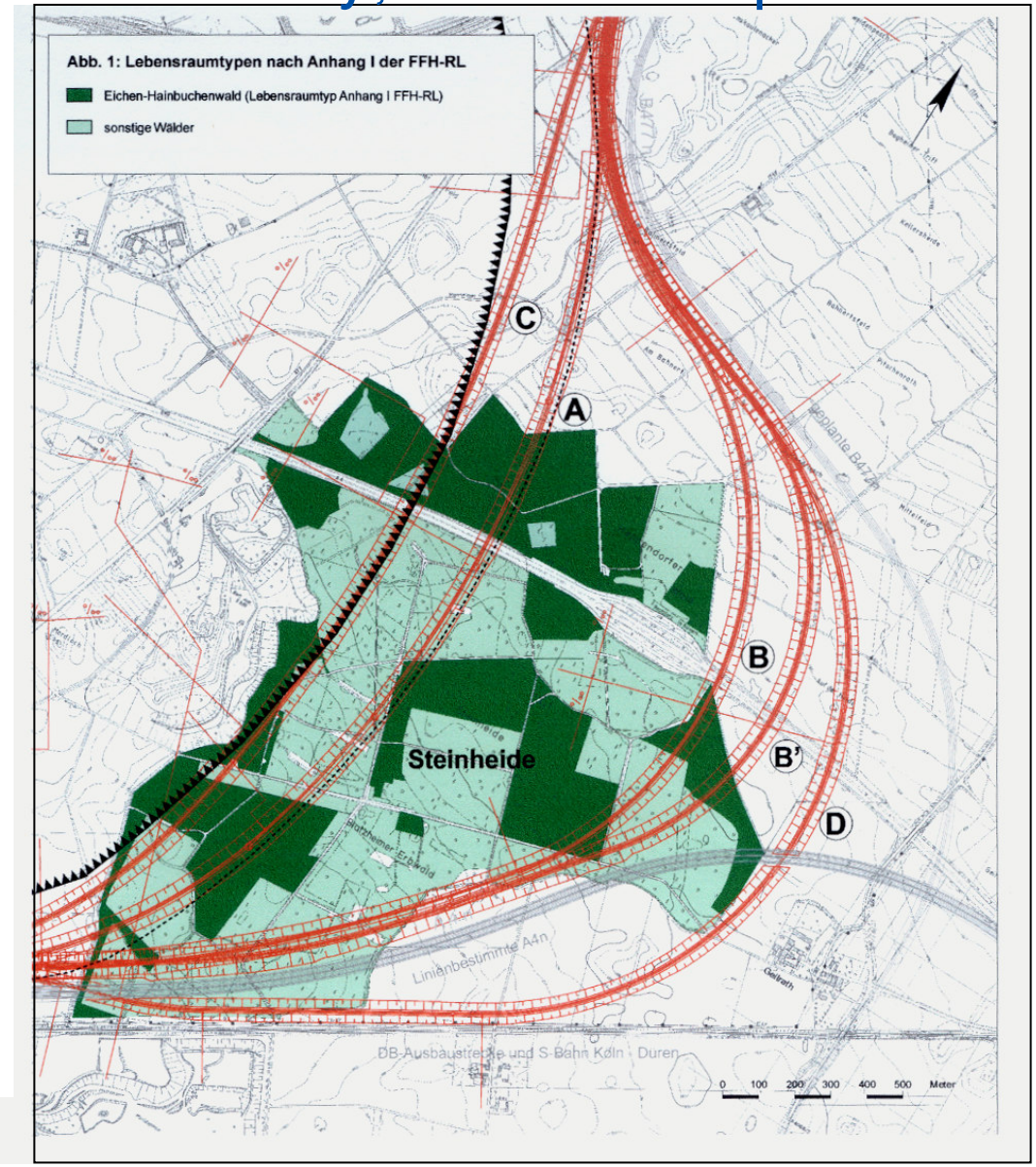
RWE
The energy to lead

Example 1: Temporary land use compensated by near-natural recultivation

- Use of the area shown for mining purposes from 1974 onwards
- The area of the Blausteinsee lake along with the surrounding green corridors was completed by recultivation as an integral part of active opencast mining operations in 1995
- Between areas of farmland, a local recreation area covering some 200 ha with gently sloping surfaces and long green corridors was created
- Following temporary use of land for mining purposes, new landscapes combining different types of use into a stable ecological landscape are created

RWE
The energy to lead

Example 2: Nature conservation and preservation of biodiversity, Hambach opencast mine



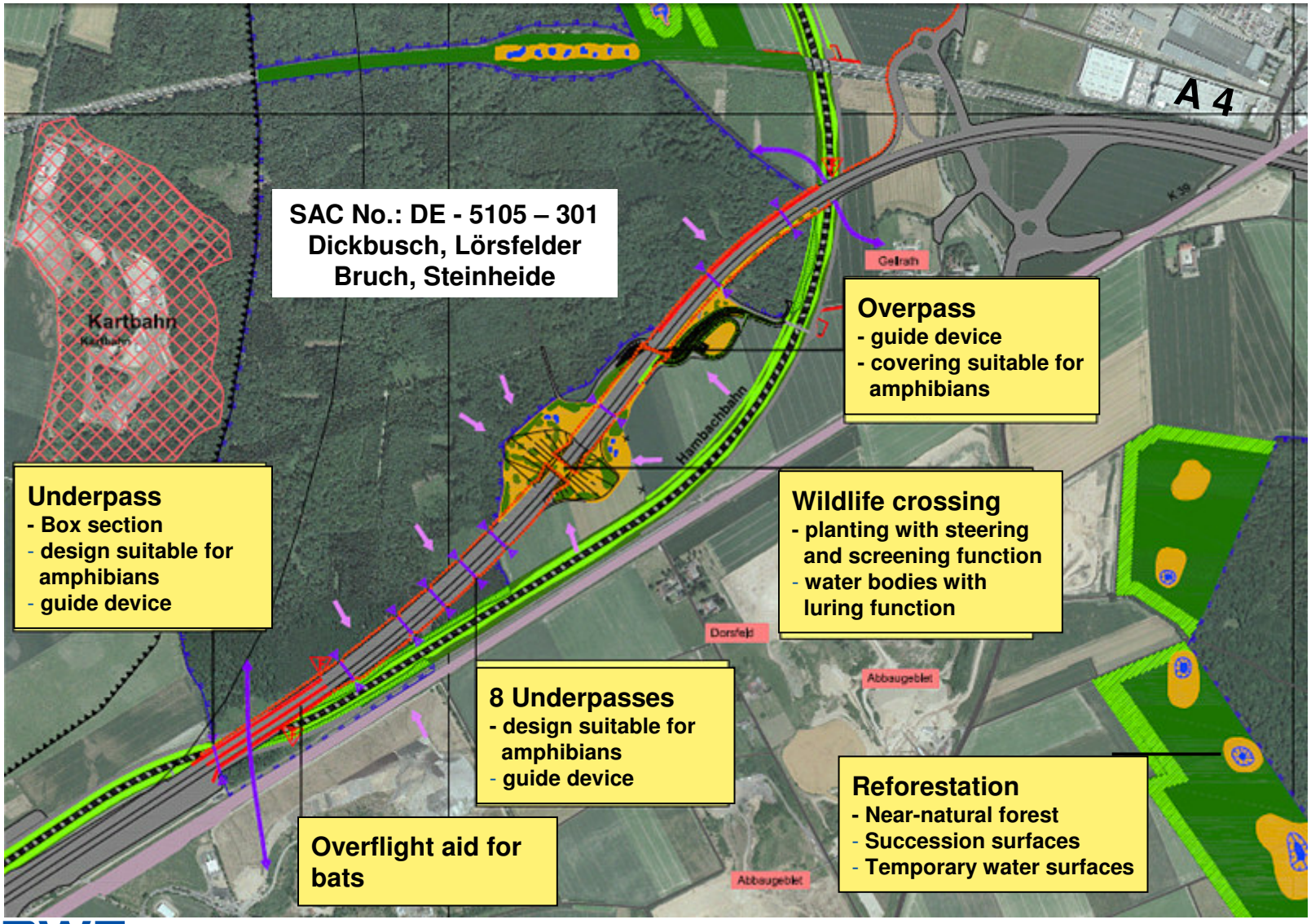
Relocation of Hambach railway

Variants in the Steinheide area

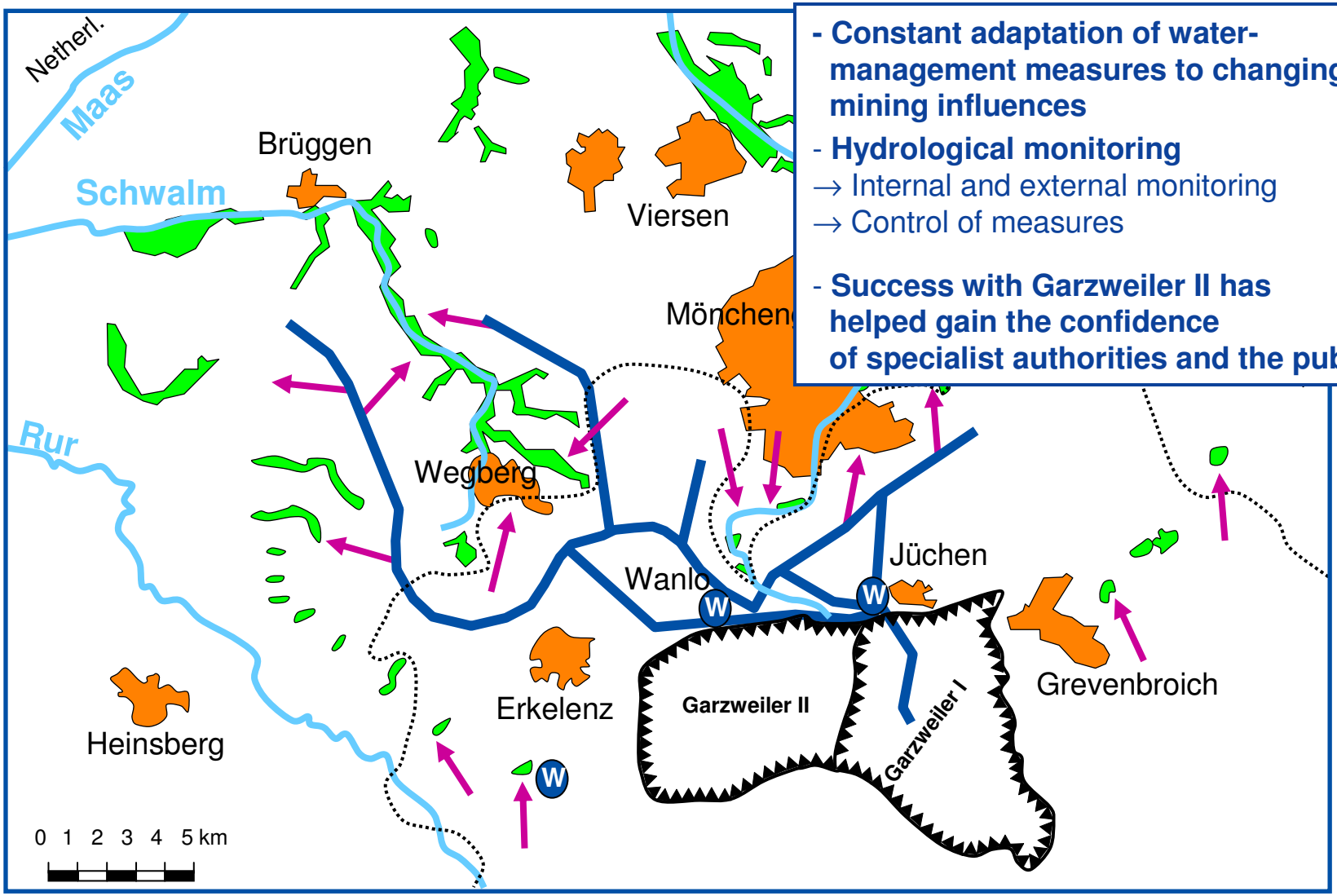
- Variants A – C dissect the Steinheide Special Area of Conservation
- We choose variant D for nature conservation reasons.

Example 2: Nature conservation and preservation of biodiversity, Hambach opencast mine

Measures taken in the Steinheide Special Area of Conservation



Example 3: Water management



- **Constant adaptation of water-management measures to changing mining influences**
- **Hydrological monitoring**
  → Internal and external monitoring
  → Control of measures
- **Success with Garzweiler II has helped gain the confidence of specialist authorities and the public**

Wetland of ecological interest
Boundary of mine drainage operations
Water pipe
Infiltration/direct water introduction
W Waterworks (ecological water)

Example 3: Compensation for groundwater lowering

Modules of groundwater recharge and support of running waters

Completed systems (12/2009)		
3		waterworks
150	km	of pipework
13	km	of swamp ditches
150		bottom sills
57		points of direct water introduction
176		inverted wells
90		infiltration trenches

Amount of infiltrated and introduced water		
2009:		66 mill. m^3
2030:	approx.	100 mill. m^3

Example 4: Pollution control – An integral part of opencast mining operations

- Comprehensive dust and noise prevention measures to protect the surroundings of opencast mines:
  - Use of mobile rotary sprinklers and dust-binding water spray systems
  - Greening of surfaces exposed for quite some time e.g. using compost
  - Erection of planted noise protection dams
  - Encasing of motors and gears to contain noise
- Cause study with in-depth scientific support for improved and even more pinpointed dust control
- Air pollution control and action plans have sustainably improved the fine-dust situation in the Rhenish mining area over recent years

Example 4: Pollution control – An integral part of opencast mining operations

Fine-dust reduction measures

Noise abatement measures

► Reduction of pollution and ensuring of acceptance

Structure

- The Rhenish lignite mining area
- Sustainable opencast mine planning and mining approval over the entire lifespan
- From planning to practice – Examples of best practices
- Summary

Summary

- ✓ State planning permits form the basis for a domestic supply with lignite that is secure in the long term. They are based on extensive consultations – led by the responsible office – with all specialist divisions and political representatives concerned.
- ✓ The operation of the opencast mines is associated with complex and time-consuming environmental/approval procedures; European and national environmental law going beyond this should not have an additional impact on domestic coal mining.
- ✓ Acceptance is ensured in the long term by comprehensive efforts, the provision of assistance in all approval procedures and the implementation of operational measures (best practices).
- ✓ Continuous reporting and monitoring by third parties support the implementation of all agreed measures.

- ► Sustainable lignite mining operations is ensured for longterm even in a densely populated region with landscapes of ecological value.