



ENERGY FOR THE FUTURE

The new Westfalen power plant



NEW ENERGY FOR THE WESTFALEN LOCATION

At Hamm/Germany, RWE Power is building one of the world's most modern hard coal-fired power plants at a cost of some € 2 billion – in a joint effort involving 23 municipal partners who will have power-generation capacities of their own thanks to this cooperation.

RWE Power, Germany's biggest electricity producer and one of the leading companies extracting energy raw materials, proposes to have a crucial say in shaping Germany's future energy supply. The Company secures 30% of Germany's and 9% of Europe's electricity supply. In doing so, RWE Power backs a diversified primary-energy mix consisting of lignite and hard coal, nuclear energy, gas and hydropower. This reduces the dependence on imports and underpins a reliable energy supply. The deployment of ultra-modern technologies ensures a sparing approach to nature and her resources.

The Company is a dependable partner anxious to ensure a fair distribution of burdens. With some 17,500 employees and a healthy financial base, RWE Power is the ideal partner for maintaining the Westfalen energy location in the long term.

Future-gearred and responsible solutions form part of our corporate philosophy, as does an utmost in the way of environmental protection. This being so, the hard coal-fired power plant at Hamm is being equipped with technology that sets standards in matters of efficiency and the handling of valuable resources.



ULTRA-MODERN TECHNOLOGY FOR MAXIMUM EFFICIENCY



The two new units, Westfalen D and E, will partially replace the existing power-generation capacities at Westfalen; and significantly expand them thanks to ultra-modern technology.

The construction of the Westfalen D and E units creates the world's most modern hard coal-based power plant. The electrical efficiency of the new plant, at 46%, reaches the optimum possible with today's technology. The space required is available at the location. This means that the power station needs some 20% less hard coal to generate the same amount of electricity and – compared with old systems – emits 2.5 million tons less CO₂ into the atmosphere, making an effective contribution toward preventing climate change.

The plant can be retrofitted with a CO₂ flue-gas scrubber for capturing and storing the carbon dioxide after combustion. RWE Power is driving this technology forward in its research and development programmes – including construction of a pilot near Cologne. The process could be available in series in 2020.

Energy and raw materials

The two 800-MW units can be operated using hard coal and petroleum coke. Hard coal is sufficiently available on the world market and is imported. Petcoke is a fuel that has been recognized for years now. It is a by-product of petroleum processing.

Building the new power-plant units will take about four years. They will probably go on stream in 2011. Units A and B, which went into service in 1962/63 with a capacity of 160 MW each, will go off stream after 2011.

State-of-the-art energy generation

A team of over 60 engineers from RWE Power and other specialist firms is responsible for the project planning and construction of the new units. The team is able to benefit from RWE's great experience, e.g. as power-plant operator.

For the planned twin unit, the power-plant engineering has been optimized so as to obtain 46% efficiency. The existing units weigh in at 34 and 36%. The higher efficiency is made possible by advanced plant engineering, which permits particularly high steam temperatures and pressures, and by optimized component technology. These combine to save 20% coal for an unchanged amount of electricity generated.

It is the thermal optimization of the water-steam process, which also uses high-quality new materials, that makes power generation from the fuel much more efficient – and the specific emissions fall. The classic substances sulphur dioxide, nitrogen oxide, dust and carbon monoxide remain below the legally permissible thresholds thanks to the highly effective precipitators and scrubbers employed. Using an officially recognized measuring and monitoring system, all relevant emissions are transmitted to the supervisory authority online during operations.

To permit later use in district heating or as process steam, planning calls for steam to be extracted in the new units. So RWE is actively backing the tapping of economically and ecologically sensible energy potentials close to the power-plant site.



TAKING TOMORROW'S DECISIONS TODAY: THE ENERGY-POLICY ASPECTS



Without energy, our modern life is unthinkable. Covering the energy needs of our society requires a forward-looking energy supply. It must take balanced account of aspects like security of supply, economic efficiency and environmental compatibility. This adds up to an urgent need for new, efficient power plants.

Many power stations in Germany will have to be replaced for reasons of age in the coming years. Many stations are now between 30 and 45 years old. According to the plans of the European Union and the federal government, renewable resources are to have a share of over 20% in power generation by 2020. Most electricity will still be produced from coal, nuclear energy or gas.

Distributed micro-plants alone cannot guarantee security of supply. That is why big new power plants will go on being indispensable. This is important for households, but also for handicrafts, trades and, specifically, for industry, some of which has huge energy needs. Electricity imports are no solution for an independent energy supply in Germany.

Hard coal has a future

Hard coal today accounts for over 22% of power generation in Germany. That is why it is important for us to increase considerably the efficiency and environmental compatibility of hard coal-fired power plants by employing new technologies.

Only firms pioneering climate protection by building and operating ultra-modern plants at home can credibly show others how the efficiency of new power plants can be enhanced and, hence, how CO₂ can be saved. In this way, environmental protection and economic efficiency go hand in hand. As RWE sees it, a broad mix of conventional and renewable energy sources is the best prerequisite for a secure, clean and economic energy supply. In this mix, hard coal has its firm place.

A good location for a secure energy supply

Hamm has been proving its worth as an energy location for many years now. Well-trained specialists in the region, competent service providers on the spot as well as the great experience of the workforce at the existing plant are the big advantages this location has to offer. With its own harbour and good links to the railway and highway network and with the grid infrastructure already in place, Hamm is an ideal location.

A contribution to climate protection:

Twenty percent less CO₂

Anyone wishing to do something for the climate must act today. Which is why Hamm is using ultra-modern technology. The new power plant utilizes the hard coal much better and produces lower-cost electricity than the old systems which it will be replacing in the German power-plant fleet. Specifically: with the same amount of coal, it produces 20% more power. Conversely: per kilowatt hour of electricity, much fewer greenhouse gases are released – year after year 2.5 million tons: an important contribution to climate protection.

Prepared for CO₂ capture

RWE Power is committed to the energy and climate targets as set. This being so, the Company is investing all its energy in research into power generation from coal without CO₂ emissions. For this, the Company is spending a sum well in excess of € 1 billion. The results will benefit the Hamm power plant as well. The two new units are already designed to be fit for later retrofitting with a so-called CO₂ flue-gas scrubber. Here, the carbon dioxide is captured after combustion and then stored underground.

BETTER FOR THE ENVIRONMENT

Thanks to its much higher efficiency, the new plant at Hamm also makes environmental-policy sense. Deployment of the latest technologies ensures the greatest possible fall in pollution – and, hence, in many cases a significant undercutting of what are ambitious statutory thresholds anyhow.

Low pollution level

The protection of humans and nature from industrial pollutants has never been better than it is today. In 2004, the federal government tightened up the statutory provisions for large-scale power plants and, in doing so, even exceeded the demanding specifications of the European Union. The new power station in Hamm meets all of these requirements. Thanks to a costly environmental-management system and multi-stage scrubbing processes, the statutory thresholds for substances are not only observed, but also substantially undercut in many respects.

Hardly any impact on air quality

The results of a model calculation by an independent expert (e.g. TÜV Nord technical inspection agency) show that the new power plant's emissions will have only a miniscule impact on air quality. On the assumption that the emission thresholds permitted by statute are fully exhausted at all times, the expert established the additional pollution to be expected. This is the so-called pollution forecast. Here, a first step has established today's level of air pollutants in the region at several measuring points. Next, the theoretical extra pollution from the power plant is added to this measured existing level. Statutory stipulations are met if the overall result is below the legal thresholds.

In reality, actual emissions will be much lower, since the model calculation on which this method is based assumes uninterrupted full-load operation of the power station, i.e. 24 hours on 365 days a year. This expert model calculation and the measurement of the initial pollution level are scrutinized in the approval procedure by a further expert appointed by the environment ministry.

No health hazards from emissions

With the expert opinion in the approval application, RWE Power has proved that, in view of the extremely low additional pollution from the new power station, no health hazards need be feared, neither for children nor for adults. Precisely this issue is the focus of the approval procedure based on Germany's Federal Act on Air Pollution Control and Noise Abatement (BImSchG). In Germany, this act and its implementing provisions protect humans, animals and nature against health hazards from emissions. This also applies to Hamm and the region.



Technical measures against fine dust

The two new plants will cause virtually no fine-dust emissions. This is because modern, multi-stage precipitator and scrubbing systems separate even the finest particles more or less completely from the flue gases. The highest dust amount by far is separated in the power station's electrostatic precipitator. The rest then reaches the scrubbers of the flue-gas desulphurization system where it is precipitated almost entirely in the atomized spray of lime slurry.

The fact is that the fine-dust level in a region is a result of many different sources. The main causes are traffic or industry. Natural sources, too, like dust from the Sahara, have a high share, scientific findings tell us. Power plants, with just 5%, play a subordinate role.

Heavy-metal emissions below threshold

The new units at Hamm have a highly modern environmental-management system which continuously monitors the gas and dust emissions. By nature, hard coal has only a very low share of heavy metals. Most pass to the ash when the coal is burned so that they are not released into the air. In the precipitator and scrubbing systems, any residual amounts are washed out close to the detection limit, removed

from the waste water and disposed of in an environmentally compatible manner.

Relief for Lippe river

The power-plant processes are designed so efficiently that water from the Lippe can be reused in a permanent cycle. Only the water losses from this cycle, which are mainly caused by evaporation in the cooling tower, are withdrawn from the Lippe. So the two new units need to withdraw much less water from the river.

IMPORTANT IMPETUS FOR THE REGION'S LABOUR MARKET AND ECONOMY

The project in Hamm is giving a considerable boost to the region's labour market, is a clear commitment to the location, and will add considerably to the local economy.

Secure jobs

The commissioning of the new units secures jobs at the Westfalen power-plant location. Of the total investment volume of € 2 billion, more than € 200 million remain in the direct vicinity. At peak times in the construction phase, over 3,000 people will be employed at one time. This, too, strengthens the region's spending power.

Order books filled long-term

The core workforce of the new Westfalen power plant will ensure day-to-day operations as their focus. For the maintenance and repair of the plants – e.g. on the occasion of the regular inspections/overhauls – competent service providers and suppliers are needed, many of whom are based in the region and whose employees settle on the spot. Experience of other locations has shown that nearly € 20 million must be spent on these tasks annually. Orders placed with component suppliers and the spending power of the workforce will thus secure further, indirect jobs in the power plant's vicinity.

Initiative for regional economy

Building a power station is a lot of work. And that's good. RWE Power is keen to have regional companies participate in the project, so that it is looking for suppliers from the region. Since not all orders are placed by RWE Power directly, the Company imposes a duty on its suppliers to give preference to

regional firms – naturally always subject to the condition that they submit competitive quotes.

Partner of the region

The Company cultivates a dialogue with the people at the locations and with their official representatives, because it feels it shares the responsibility for developments and social life in the region. It takes its discussion partners seriously and is keen to help ensure a fair balance of arguments and interests. Driven by the same motivation, the Company, in and around all its locations, is committed in a high degree to projects concerned with youth/education/future. In this way, it is assuming social responsibility on the ground.

Further information

If you care to know more about our Company or wish to visit the Westfalen power plant, please contact:
RWE Power AG, Kraftwerk Westfalen, Siegenbeckstrasse 10, D-59071 Hamm,
T: +49 (0)2388/7 23 10, +49 (0)2388/7 22 18.
Current information on the location and on the Westfalen D/E project may be found in the RWE Power area of RWE's Internet portal www.rwe.com.
Useful general sources include (mostly in German) www.bdew.de, www.ag-energiebilanzen.de, www.gvst.de and www.hamm.de.



Strong partners for the new Westfalen power-plant:

The RWE Group has agreed a 25-year cooperation scheme with 23 municipal partners from North Rhine-Westphalia, Hesse, Lower Saxony and Rhineland-Palatinate: the municipal utilities have a share of about 23% in the construction and operation. They are investing over € 450 million and will have a 350-MW share in the output of the new units. Thanks to the power plant at Hamm, the municipal partners will have their own base-load-capable power-generation capacities. This makes their electricity procurement more independent of price developments on the exchanges and enhances the security of their energy supplies.

- Dortmunder Energie- und Wasserversorgung GmbH
- Energie-Nordeifel GmbH & Co. KG
- Energieversorgung Beckum GmbH & Co. KG
- Energieversorgung Leverkusen GmbH & Co. KG
- Energieversorgung Limburg GmbH
- Lister- und Lennekraftwerke GmbH
- Niederrheinische Versorgung und Verkehr AG
- Stadtwerke Attendorn GmbH
- Stadtwerke Bochum GmbH
- Stadtwerke Coesfeld GmbH
- Stadtwerke Emmerich GmbH
- Stadtwerke Geldern GmbH
- Stadtwerke Goch GmbH
- Stadtwerke Hamm GmbH
- Stadtwerke Herne AG
- Stadtwerke Münster GmbH
- Stadtwerke Osnabrück AG
- Stadtwerke Radevormwald GmbH
- Stadtwerke Schüttorf GmbH
- Stadtwerke Trier Versorgungs-GmbH
- Stadtwerke Troisdorf GmbH
- Stadtwerke Willich GmbH
- SWK Energie GmbH

