ALL THE POWER

What we do, what we move, what we stand for
Energy is life. It is the nervous system of modern industrial society. We, the electricity producers in the RWE Group, do our considerable bit to ensure that the wheels don’t stand still. We produce electricity and heat, and we extract coal – on a secure, economically efficient and environmentally sound basis. We are a global player today, although our roots lie by the Rhine and Ruhr rivers. We have traditionally had close links with the locations where we operate. That is because we have grown with the regions – and the regions with us.

Our commitment rests on this identity. Here, we are talking more than just electricity and heat. As important employers and investors, we underpin economic growth and jobs. In numerous projects and in close partnership with the regions, we support the residents and the economy at our locations.

We assume responsibility for things big and small. So we are just as committed to the environment “on our doorstep” as we are to global climate protection. Being Germany’s biggest electricity producers, we are proactively involved in designing concepts for the energy supply of the future. Our aim: to square the triangle of economic efficiency, security of supplies and environmental compatibility. We provide impetus – with our know-how, innovative technologies and substantial investment in ultra-modern power plants. We are continuously working on making power generation even more efficient, while seeking solutions to the worldwide problem of a rise in energy needs and the growing scarcity of raw materials.

We rely on a diversified energy mix: from hydropower via coal and gas all the way to nuclear energy. With this balanced mix, we can create the best basis for long-term energy security. A workforce of around 17,000 inside and outside Germany give their all for energy supplies in Germany and Europe. With all their power.
POWER FOR EVERY DAY

RWE Power today is setting the scene for a secure supply tomorrow. With a broad-based energy mix. To ensure stable and future-proof supplies for people and the economy: 24/7.
Secure supplies around the clock

It’s the mix that matters: a broad-based energy mix is the best guarantor of a long-term secure supply. This is because no energy carrier can achieve this on its own. Renewables and conventional energies complement one another.

RWE Power is facing up to this challenge. Each and every day. We are backing a large range of energy sources, adopting an ideology-free approach with no tunnel vision. Nuclear energy and lignite from our own open cast mines in the Rhineland ensure the base load, while hard coal, gas and water go into the intermediate and peak loads. In some of our lignite and hard coal-based power plants we also use solid recovered fuel (SRF), a specially treated fuel from waste. It can replace up to 10% of precious raw materials.

Under the umbrella of the Group, RWE Dea extracts oil and natural gas – that, too, makes us more independent of imported energy.

Our power plants, with various output parameters, produce over 180 billion kWh of electricity every year. This enables us to cover some one third of Germany’s electricity needs. With this output, RWE Power is no. 1 at home and no. 3 in Europe among electricity producers. Our know-how in electricity generation, mining and lignite upgrading as well as recultivation is appreciated around the world.

Lignite, an energy carrier that gets by without subsidies and does not depend on imports, stands for a secure and economically efficient energy supply in Germany. Accounting for a good third of installed capacity, it is one of the crucial pillars in RWE Power’s generation portfolio.

With an output of some 100 million tons per annum, RWE Power is the world’s biggest lignite producer. About 90% of the lignite mined in our open cast operations at Garzweiler, Hambach and Inden is used to generate electricity, while the remaining 10% is upgraded to make briquettes, pulverized lignite and coke as well as fluidized-bed coal. Making electricity from lignite is a complex process that places heavy demands on power plant engineering. Our aim: a steady increase in efficiency. This being so, we are investing systematically in plant renewal, in improvements to efficiencies and in research and development.

Hard coal as an energy carrier occupies slot two in Germany’s power generation. Worldwide reserves have a reach of some 140 years, four times as long as oil deposits. In some of our lignite and hard coal-based power plants we also use solid recovered fuel (SRF), a specially treated fuel from waste. It can replace up to 10% of precious raw materials.

We respect the decision to phase out nuclear energy. However, in view of changing conditions on the world’s energy markets and high-flying climate-protection goals, the question must be asked as to how this energy source is to be replaced in the long run. It is against this background, too, that extensions to nuclear energy are being swiftly promoted globally.

Nuclear energy covers some 22% of electricity supplies nationwide. We have a total installed power plant capacity of about 6,200 MW at Biblis, Lingen and Gundremmingen, giving us an 18% contribution from nuclear energy to our electricity generation in 2007. Our nuclear power stations avoided some 30 million tons of carbon dioxide emissions in 2007. That is equivalent to 3.5% of total annual CO2 emissions in Germany.

Secure power supply needs a broad-based energy mix. Which is why we are backing both coal and gas as well as nuclear and hydro.
International deployment
We cross borders to further strengthen our position in international competition. Our aim: to be the best power producer in Europe and do our crucial bit to shape future energy supplies.

The focus of our activities is on Central and Eastern Europe. Since 1996, for example, we have held a majority stake in the Hungarian mining and power plant company Mátra, the country’s second biggest electricity producer. The company operates a lignite-fired power plant with a capacity of over 800 MW that is fed with coal from two opencast mines it owns.

In the space of 10 years, we invested some € 200 million in the plant: in modern flue-gas desulphurization and in optimization measures and efficiency improvements. Today already, Mátra is one of Hungary’s most cost-effective power plants and meets the stringent environmental standards of the European Union.

In order to raise the flexibility and efficiency of the plant even further, we commissioned two 30-MW topping-gas turbines in 2006 and 2007.

These activities in Hungary show how the economy and the people of partner countries reap benefits from our entrepreneurial commitment.

Success factor: human resources
Whether in power plants, opencast mines and factories or at desks: under the RWE Power roof there are over 17,000 employees at work on the energy that Europe needs. Handling hundreds of different jobs, e.g. as excavator or reactor operative, as cutting mechanic or financial clerk. Valuable know-how is an asset we want to maintain and extend. We have always set great store by qualified training. That is why we pinpointedly invest in our workforce. Every year, we give some 850 young people a sound basis for their later launch into working life. And every year, around 13,400 of our employees attend qualified further-training and upskilling events.

Each and every staff member makes a crucial contribution on the job toward the bottom line and the strength of our Company. The basis for this is a solid canon of values: performance, trust, customer centricity, dependability and shaping the future – and, not least, pride in being part of Germany’s biggest electricity producer.
POWER TO RENEW

Progress has a tradition in our Company. RWE Power is continuously investing in modern technologies. And in optimizing existing plants. What drives us? We want to make electricity generation even more efficient and do our bit on behalf of climate protection.
Our engineers have helped make the power plant process even more efficient at many stages, thus developing the best available technology worldwide for converting lignite into electricity. By deploying hi-tech materials and computer-modelled turbine blades, for example, but also by recycling residual heat and by cutting our auxiliary power requirements, we raise the efficiency of the BoA power plant to more than 43%.

With the resulting better utilization of the input lignite, we are making a sustainable contribution toward protecting the climate: the new power plant will emit up to 6 million tons less CO₂ than comparable old systems. In addition, power plant-typical emissions of sulphur dioxide, nitrogen oxide and dust will be lowered by more than 30%. If all power plants around the globe were to work with the BoA technology, we could definitely save over 1 billion tons of CO₂ every year.

More efficiency in converting hard coal into electricity
Making power generation even more efficient – that is what drives us in the case of hard coal as well. As another important module in our power plant renewal programme, therefore, we are erecting a new hard coal-based power station at the Hamm location in Westphalia. The two modern power plant units with a total capacity of 1,600 MW (gross) are to go on stream in 2011.

This latest-generation twin unit will achieve net efficiency of some 46% thanks to the use of the most progressive technology available worldwide. This is about 30% more than for old systems. With the same amount of energy generated, the power plant units thus save approx. 2.5 million tons of CO₂ per year.

RWE Power is heavily involved in this major effort: by 2020 we will have invested a total of € 12 billion in newbuild power plants – an unprecedented amount. This will continue our decades of commitment in the planning and construction of innovative power plants.

BoA: investing in the future
We are building for tomorrow’s energy: since early 2006, two more lignite-fired power plant units with optimized plant engineering (BoA) have been under construction at the Neurath location near Grevenbroich, price tag: € 2.4 billion. This is one of Europe’s biggest construction sites. On terrain measuring 52 hectares, more than a million cubic metres of earth will be shifted for the foundations – equivalent to the excavation pits for 2,500 single-family homes. The basis for the project is the BoA 1 unit which has been in continuous operation since 2003 already at Niederaussem near Cologne.

Next-generation power plants
Investment in sustainable energy supplies is an investment in the future. Rising electricity needs spell huge challenges for the new Europe. Overall, 400,000 MW capacity must be replaced or additionaly erected by 2020. This includes some 170,000 MW in fossil-fired power plants – about half of the existing stations that must be built to reach the CO₂ targets.

To achieve this, utilities need to invest billions – sums which also will be a vital boost to the economy and the labour market.

Many countries are increasingly backing nuclear energy in facing the need to renew their power plants, although efficient coal- and gas-fired power stations, too, play a key role in this respect. With a share of over 45%, they will go on forming the foundation for secure energy supplies in Europe in decades to come.

RWE Power is building the most modern technology for converting lignite into electricity. One of Europe’s biggest power plant building sites: In the BoA 2&3 units at Neurath near Grevenbroich, we are implementing the world’s most modern technology for converting lignite into electricity.

One of Europe’s biggest power plant building sites: In the BoA 2&3 units at Neurath near Grevenbroich, we are implementing the world’s most modern technology for converting lignite into electricity.
In the Netherlands, too, we are planning the construction and operation of a hard-coal twin unit with similar capacity figures. In view of Eemshaven’s coastal location, we will even achieve net efficiencies in excess of 46%. According to the current planning position, construction is set to commence at the start of 2009, with commissioning of the power plant scheduled for 2012/2013.

Fitness programme for our power plant population
Steadily improving our performance is a day-to-day task at RWE Power: like the continuous optimization of existing power plants producing lignite-based electricity. At Weisweiler, we have combined two topping gas turbines with the existing lignite-fired units. Thanks to the meaningful integration of the energy sources coal and gas in one power plant we will in future be able to respond even more flexibly at short notice to rises in electricity demand. For it is thanks to their net capacity of some 190 MW each that the gas turbines can be brought up to trot in a matter of seconds and feed electricity into the grid. With capital spending of € 600 million alone in preparing the large-scale project Garzweiler II. In the extraction field that follows current opencast operations in the Rhenish lignite mining area, a lignite deposit of 1.3 billion tons will be developed until the year 2044 on a surface measuring 48 sq km in all. With an annual output of about 40 million tons, the opencast mine will ensure roughly 20% of the energy supply for North Rhine-Westphalia or 6% of national requirements across the next four decades.

Garzweiler II is thus the cornerstone for a secure and economically efficient energy supply in Germany. The new opencast-mine section will secure the lignite supply for the power plants in the northern mining area during the coming decades.

Biblis nuclear power station:
It is safety first, of course. At our nuclear power stations, too, and especially there: in the south, the biggest power station, Gundremmingen, with 2,800 MW; in the north, the Lingen power station built in 1988 with 1,400 MW. And, in the centre of Germany, the Biblis station with 2,500 MW. All stations are constantly modernized and retrofitted. Safety checks are routine. Each of our plants has up to 3,500 audits in running operations every year. In addition, the units – like all other German reactors – are checked within the scope of regular inspections. Under the supervision of independent appraisers, numerous additional inspections and audits are made. Here, the power station teams are backed by up to 1,000 specialists from all areas of nuclear-energy technology.

Example Biblis: thanks to continuous retrofitting, the nuclear power station is always state-of-the-art. Since 1999, RWE Power has spent € 1 billion on safety-technology optimization, modernization and routine inspections and audits of the two units. Much of the total has flowed into an extensive retrofit programme that includes the refurbishment of the systems to control major accidents, as well as earthquake safety and the existing emergency systems. This has enabled Biblis to reach a safety standard which, in places, exceeds the international levels defined for new stations.

No power plant without fuel
No fuel without investment
We are investing considerable sums in our opencast lignite mines: we expended € 600 million alone in preparing the large-scale project Garzweiler II. In the extraction field that follows current opencast operations in the Rhenish lignite mining area, a lignite deposit of 1.3 billion tons will be developed until the year 2044 on a surface measuring 48 sq km in all. With an annual output of about 40 million tons, the opencast mine will ensure roughly 20% of the energy supply for North Rhine-Westphalia or 6% of national requirements across the next four decades.

We build the first German on-site intermediate storage facility alongside the Emshard nuclear power station at Lingen.

We commission the first lignite-fired power station with optimized plant engineering (BoA) at Niederaussem.

With the relocation of the Inde riverbed, we set standards in sustainable recultivation. The project is unique in Europe.

We develop completely new processes for desulphurizing and denoising lignite-fired power plants and, in the following years, retrofit our power stations with this environmentally sound technology at a cost of billions.

Federal Chancellor Merkel lays the foundation stone for two new, highly efficient hard-coal units at our Hamm power plant location.

Our energy is the driver – for both the national and the regional economy. In the construction of new power plants, in the modernization of existing plants, but also in the opencast mines, for example, we award numerous contracts to companies working in the region. Interested firms can register in an Internet portal specifically set up for this purpose. With our procurement strategy, we not only maintain current operations, servicing and repairs, but also ensure that a considerable portion of the sourcing volume remains in the environs. In this way, we underpin value-add and jobs in the regions.

We implement our large power plants in close alliance with the domestic power station industry. In innovation partnerships, some of which have proved their worth for decades, we realize sophisticated technologies that serve the German mechanical-engineering sector as reference projects. Power plant engineering “made in Germany”, such as we develop along with experienced partners at many locations, is in worldwide demand as an export product and helps strengthen Germany’s international reputation as an industrial location.

We create growth impetus – locally and globally
POWER FOR THE FUTURE

Tomorrow’s electricity generation needs ideas and impetus. Today. So RWE Power is pressing ahead with ambitious national and international research projects. With our own funds. And in an exchange of experience with science and industry.
Technologies of tomorrow: clean coal
In all our research and development projects, we pursue a clear goal: demonstrable benefit – for the environment and the climate and for long-term security of supply. And, not least, for our own competitiveness.

That is why we are harmonizing coal-based electricity generation and climate protection. And why, specifically, we are promoting the expansion of clean-coal technologies. Powered by our competence, our experience and our capital. Because coal will go on playing a central role in tomorrow’s energy mix as well.

Our beacon project: the world’s first major IGCC/CCS power plant
We are planning the world’s first industrial-scale IGCC/CCS power plant with an integrated gasification combined-cycle system (IGCC) and carbon capture, transportation and storage (CCS). Our intention: after separation, the CO₂ is to be hauled off via a pipeline and permanently stored in an underground storage facility in a safe and environmentally compatible manner. If everything goes well, we wish to commission the IGCC/CCS power plant at the Goldenberg site in Hürth near Cologne at the end of 2014/the start of 2015. It is to be fuelled with domestic lignite. For the research and development of CO₂ storage, we have comprehensive competencies in our own Group via RWE Dea. We are also cooperating with renowned independent scientists and authorities.

Implementation of the entire process chain – from power generation with carbon capture, via its transportation, all the way to storage – on this scale is currently unique worldwide. Building the power plant, which will have a gross capacity of 450 MW, is a major challenge. We are tapping international technology leadership and export potentials, thus doing our crucial bit in underpinning Germany’s role as an industrial location.

In parallel, we are trialling options for the environmentally friendly retrofitting of modern coal-based power plants, for instance, using so-called CO₂ scrubbing, which we are further developing for commercial use in power plants: together with BASF and Linde we are building a pilot plant for CO₂ scrubbing at our Coal Innovation Centre in Niederaussem. Along with noted partners, like the Jacobs University Bremen and the Jülich Research Centre, we are investigating options in a pilot algae plant for binding the CO₂ from power plant flue gases to the plant substance. The algae biomass is later harvested and examined to assess its usability as an energy source, say.

WTA technology: demonstration plant at the Coal Innovation Centre in Niederaussem
Our research engineers are working in depth on new technologies designed to increase the efficiency of future lignite-fired power plants by a further 10%. We are perfecting the requisite drying technology in a commercial-scale demonstration plant for so-called fluidized-bed drying with internal waste heat utilization (WTA®). It permits run-of-mine lignite to be dried efficiently before it is deployed. The demonstration plant went on stream at Niederaussem in autumn 2008. It is installed upstream of the BoA 1 lignite-fired power plant and is to replace 20 to 30% of the otherwise necessary raw lignite. The project volume amounts to € 50 million.

Improved technologies in open cast mining operations
Getting better and better - that’s on our agenda in mining and upgrading lignite as well. Here, our scientists and engineers are focussing mainly on progress in mining technology. For operations in opencast mines, this means not only high efficiency and more flexibility, but also and above all less energy consumption.

One important focus of our research activities round and about opencast lignite mining operations is on recultivation. In a specially set up research centre at Jüchen, for example, we are supporting various ecological projects that help create valuable new habitats for domestic flora and fauna in former mining areas.

Driving forward research in nuclear energy
Ever since the early 1960s, RWE Power has been operating nuclear power stations. To ensure safe and smooth operations, we systematically keep our nuclear power stations state-of-the-art – at a standard that is internationally recognized as being exemplary and is set to be improved yet again. That is why we are continuously working on the development of new safety technologies.

We are doing even more: together with our European partners, we are pursuing possible developments in reactor types that are further optimized in their safety technology and economic efficiency. This enables us to influence the next generation of nuclear power stations. And we are making a crucial contribution toward ensuring that Germany does not miss the scientific boat in international developments or lose its top position in this field.
BY THE POWER OF OUR RESPONSIBILITY

Energy means well-being and growth. For people. And for our economy. Starting from this responsibility, RWE Power is working on future-capable energy concepts and seeking an open dialogue with the public.
Energy security: we get involved
The subject of energy security is at the very top of the political agenda. Because both Germany and Europe are hugely dependent on energy imports, especially in the case of oil and natural gas. At times of growing uncertainty in a range of producer countries, questions as to a viable energy concept are no longer discussed merely at national level, but long since across borders as well. We are facing up to this dialogue and getting constructively involved in the public debate. The widest possible energy mix is the best insurance against the risk of extreme developments on international energy markets.

Climate protection is a command
At the G8 summit in Toyako, Japan, the eight most important industrialized countries decided in July 2008 to halve CO₂ emissions by 2050. Beyond this, Germany proposes to make a disproportionately high contribution toward achieving the EU’s target of lowering greenhouse-gas emissions (GHGs) by at least 20% by 2020 compared with 1990. RWE is supporting the federal government in its effort to achieve this target. For our comprehensive climate-protection programme, we will be making available funds running into billions in the coming years.

We are bringing coal-based power generation and climate protection in harmony and, specifically, are driving forward the expansion of clean-coal technologies. Here we are creating the technical prerequisites to ensure that fossil energy sources are used as efficiently as possible, thus sparing the environment. At the core is the world’s first commercial-scale power plant with integrated coal gasification plus carbon capture and storage. But increases in efficiencies and the retrofitting of existing plants, too, will provide relief for our climate.

We are also trailblazers in taking international measures to reduce GHGs. The implementation of ultra-modern technologies for an efficient reduction of climate-harming GHGs in both emerging economies and industrialized countries is an effective and economic climate-protection tool – and, hence, a further element in our climate-protection strategy. RWE Power is now one of the top 10 companies in this sector.

The atmosphere couldn’t care less where in the world greenhouse gas emissions are reduced. So Joint Implementation (JI) and the Clean Development Mechanism (CDM) are available. If the plant concerned is located in a foreign state that has no reduction duty under the Kyoto Protocol – i.e. in a developing country – we speak of Joint Implementation (JI).

Environmental protection is a command
Important industrialized countries decided in July 2008 to halve CO₂ emissions by 2050. Beyond this, we are backing the federal government in its effort to achieve this target. For our comprehensive climate-protection strategy, RWE Power is now one of the top 10 companies in this sector.

Circumspect open-cast-mining operations
Mining lignite in open-cast operations is associated with serious interference in the landscape. So reclamation is a firm planning component in all extraction activities from the very outset. A case in point is the relocation of the Inde riverbed that had become necessary as the Inden open-cast mine progressed. In the process, we implemented a unique Europe-wide reclamation project in which 400,000 trees and shrubs were planted. And in which we invested € 24 million.

We are aware that open-cast mining is a subject with far-reaching implications, especially for the people affected by it, so that our precept is “jointly designed resettlement”. In order to retain grown structures and implement resettlement schemes in a manner that is as socially compatible as possible, we involve citizens in our planning early on and in depth. In close cooperation with those affected, we develop a new living space in which community life can evolve. In planning a new resettlement location, we meet high requirements in the way of urban design – this includes both a modern infrastructure with high living quality as it does environmentally compatible construction. In this way, we ensure the bases for sustainable development of the community.

We back good neighbourly relations
We have ties with the people in the regions where we work, and set great store by confidence- and partnership-based relations with our neighbours and by a frank dialogue with all social groups. For example, we welcome some 100,000 interested citizens every year – at our visitor centres, on tours of our plants or on guided nature tours through the re-cultivated regions.

We are also aware of our obligations as employers and, above all, as instructors. By providing young people with apprenticeships at our operations, we are backing our own future qualified junior staff. In addition, with our initiative “Ich pack’ das!” (Let me tackle that!) we make some 60 youngsters annually fit for entry into vocational training, thus giving them a new perspective. In this, we are doing our bit to provide professional qualifications and underpin jobs in the regions.
POWER AT A GLANCE

FACTS & FIGURES

Power-generation capacity
(33,520 MW)

Installed power plant capacity of RWE Power and its affiliates; position: 31 December 2007

Electricity output
(178.9 bn. kWh)

Electricity output of RWE Power and its affiliates, incl. electricity purchased from third parties; position: 31 December 2007

More info?
Anyone wishing to know more about our Company, our opencast mines and power plants has a wide range of options to get in touch with us. Whether via the HQs in Essen and Cologne, the Internet or directly on the spot. At the information centres at the Lingen, Biblis and Gundremmingen nuclear power stations and at Schloss Paffendorf castle for our lignite activities, too, our staff members are happy to answer any queries of interested guests and visitor groups.

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