



## RWE TECHNOLOGY

Engineering the Future.

## WHO IS RWE?

RWE is one of Europe's top five electricity and gas suppliers.

The Group's activities include generation, trading, transmission and retail of electricity and gas. Around 70,000 employees supply electricity to more than 16 million customers and gas to over 8 million customers. Its position at the forefront of the European energy market means that the Group is able to make optimum use of its power stations. RWE provides innovative products to meet the requirements of its customers – whether industrial enterprises, municipal utilities or domestic consumers. Climate protection and energy efficiency also play an increasing role in this work.

RWE has real growth ambitions aimed at creating value for investors, customers and employees. With this in mind, it focuses its strategy on profitable,



organic growth combined with value-increasing acquisitions. In addition, the Group invests billions of euros in its assets: for example, in new oil and gas field projects, natural gas pipelines, electricity distribution and significant investments in the modernisation and expansion of its entire portfolio of power stations.

Many major new power plant projects are already in full swing – thanks to the performance of operating companies such as RWE Power, RWE npower and Essent. This ambitious programme is a challenge – even for a company with RWE's experience. That's why, in early 2010, the expertise from the Group companies in Germany, the UK and the Netherlands was combined to form RWE Technology. Since then, RWE Technology has been responsible for project management and power plant construction. With around 600 technology specialists, it is currently building new coal, gas and nuclear power stations as well as biomass and hydropower plants in Germany and internationally.

RWE Technology's headquarters is in Essen, Germany. In Holland it is based in 's-Hertogenbosch, and the British subsidiary, RWE Technology Ltd., is situated in Swindon in the UK.



## SPOTLIGHT ON RWE TECHNOLOGY

RWE Technology is on its way to becoming Europe's leading project-management and engineering company in the power plant field.

Its chief task as an internal service provider is to construct new plants for RWE's power generation companies.

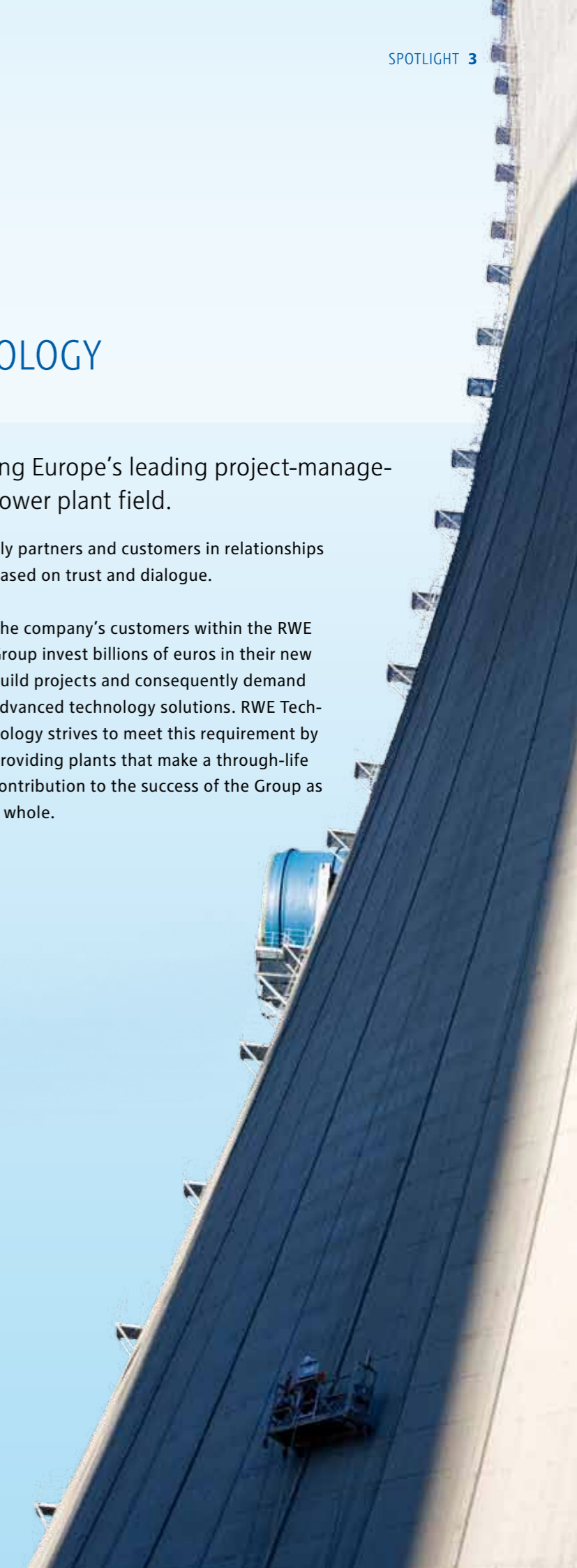
RWE Technology ensures that the RWE Group's new power stations are among the most advanced and cost-efficient in their class – now and in the future. At the same time, RWE Technology takes active steps to fulfil its huge responsibility for health and safety and for environmental protection. It makes sure that the highest standards are met during the construction process and subsequent operation of the new plants.

Like its customers, RWE Technology aims to create the "energy to lead" – both by employing the most appropriate technology in all new build projects and by making continual and systematic improvements in quality, procedures and services. Rather than settling for the latest technology, RWE Technology seeks to benefit its customers by always being one step ahead. So the company's engineers are quick to implement state-of-the-art technology and apply it to their own projects.

RWE Technology acts as the interface between the power station developers and the operating companies. Its engineers, sales staff and legal experts work with their sup-

ply partners and customers in relationships based on trust and dialogue.

The company's customers within the RWE Group invest billions of euros in their new build projects and consequently demand advanced technology solutions. RWE Technology strives to meet this requirement by providing plants that make a through-life contribution to the success of the Group as a whole.



## HOW WE WORK



Responsibility for power station new build and retrofit projects is clearly defined within the RWE Group.

RWE Technology is the competence centre for the entire Group, setting standards for new build projects and carrying out projects on behalf of its customers within the Group. In this role, RWE Technology is the central point of contact for power plant developers, construction companies and construction service providers.

RWE Technology and the RWE Group's power generation and national operating companies work together within a clearly agreed framework. It designs their new plants, plans and supervises

the construction and commissioning process and is responsible for post-commissioning tasks, such as dealing with warranty claims.

The planning and licensing procedures required before construction are the responsibility of the national operating companies or RWE's Business Development department., depending on the nature of the project: they initiate the projects, look after site development and handle the licensing procedure up to the actual investment decision.

## CONCENTRATING OUR EXPERTISE

RWE Technology brings together employees from many disciplines and countries.

It combines a wide range of talents and strengths, specialist knowledge and experience, in a practical team of pragmatic thinkers who focus on overall success. Communication and training are always on the agenda for each member of this specialist team. With its lean organisational structure, RWE Technology delivers its services in a cost-efficient manner to the benefit of its customers.

Around 600 employees work on RWE Technology's international projects from its locations in Essen and Swindon. The

team's input reflects the decades of experience RWE Group companies have amassed in the operation and construction of power stations. They are motivated by the prospect of building power stations that are state-of-the-art in terms of technology. With their capacity and efficiency, these plants will support the growth of the RWE Group and provide safe, cost-efficient and environmentally favourable energy supplies for the future.



## RWE TECHNOLOGY IN ACTION – CURRENT PROJECTS

### Eemshaven power station, Netherlands

This new power station in Eemshaven will generate electricity primarily for the Dutch market. The plant, which can be partially fuelled by biomass, has a gross capacity of 1,600 megawatts. It is scheduled to begin operation in 2013. With an efficiency rating of more than 46%, it will be one of the world's most modern power stations.

The 50-hectare site is located at the coastal port of Eemshaven. The site is well-connected logistically: hard coal, the power station's main fuel, will be delivered via the seaport. Other substances, such as pulverised limestone for flue-gas desulphurisation,

or power station ash, can be transported in and out in an environmentally friendly way via the River Ems. All regulatory air pollution and noise limits can easily be met at Eemshaven. The construction of the power station will secure and create jobs in the manufacturing industry, the construction trade and at local companies. During the main construction phase, some 3,000 people will be working on the building site.



### Westphalia power station, Germany

Two new units are being constructed at the existing power station at Hamm in Westphalia. They will have a total capacity of 1,600 megawatts and will replace the existing facilities. The units will expand the plant capacity at the site with their advanced power plant technology, characterised by optimised processes and a high efficiency rating of up to 46 percent.



The new plant, like the existing one, will be fired by hard coal and petroleum coke. Petroleum coke is a high-carbon residue produced in the oil industry. Its high thermal power has been used in power stations for decades. The plant will initially operate at base load but it can also be operated at mid-merit load or partial load, so it can be used in times of increased

or reduced power requirements. The new twin-unit system has been designed so that it can be fully integrated into the existing power plant site. This means that there is no significant use of additional land outside the power plant. The site's existing facilities and systems will continue to be used and adapted to the requirements of the new units.





#### Units BoA 2 and 3, Germany

Two new lignite-fired power station units with optimised plant technology are being constructed at Grevenbroich-Neurath. The first unit came on stream in Niederaussem in 2003, and in 2006 work began on units 2 and 3 of this power station, which is among the most modern in the world. Optimised plant technology means that efficiency gains have been identified and captured at numerous points in the power plant processes. These efficiency measures include gains from using high-tech materials, computer modelled turbine blades, recycling of residual heat and lower electricity requirements for the station itself. This improved efficiency results in the new units releasing up to six million tonnes of CO<sub>2</sub> less per year compared to the previous plants being replaced. This is due to their improved efficiency rating, which is over 43 percent. This efficiency will result in less lignite being required in future for each kilowatt hour of electricity generated. More than €2.2 billion is being invested in the new units.



#### Denizli power station, Turkey

The construction of a combined cycle gas turbine power plant began in mid 2009 near the western Turkish city of Denizli. By the end of 2012, this will be a modern and innovative 775 MW plant providing an economically efficient, reliable and environmentally friendly energy supply for the region.

Because the energy demand in Turkey is steeply increasing over the long term, there is a major need for expansion and modernisation in electricity generation. The ultra-modern combined cycle plant, with an efficiency rating of more than 55 percent, will significantly contribute to security of supply.

The main power plant components will be supplied during 2011 – two gas turbines and a common

steam turbine. The plant components are manufactured in Germany and are shipped to Turkey. Due to the very high ambient temperature, which averages 40 degrees in summer, a very large air-cooled condenser is required.

International standards for health and safety and for the environment apply on site. An occupational safety team works permanently on site and ensures international compliance.





**Staythorpe power station,  
United Kingdom**

The four units of RWE npower's combined cycle gas turbine power station in Staythorpe went online at the end of 2010 after extensive performance tests. They will be officially commissioned in spring 2011. The state-of-the-art 1,650 MW power station will use the most advanced technology to achieve a high efficiency rating and minimise environmental impact. This compact

industrial plant is located on a brown-field site that housed two previous coal-fired power stations. The Staythorpe power plant near Newark in Nottinghamshire will comprise four generating units, each with a capacity of around 400 MW. This is enough to supply the entire county of Nottinghamshire with electricity.



**Pembroke power station, United Kingdom**

A combined cycle gas turbine power station with a capacity of 2,165 megawatts is currently under construction near Pembroke in South Wales. Pembroke Power Station will be built at a site that housed a previous oil-fired power station from the 1960s.

The new combined cycle plant will comprise five units, each generating 433 MW. The first unit will be fired in the summer of 2011, and the entire power plant will be handed over to the customer – RWE npower – in 2012.



A high efficiency rating, low CO2 emissions and environmental protection all play an especially important role in the project because the facility is being built close to the Pembrokeshire Marine Special Area of Conservation. With just under 140,000 hectares, the marine reserve is the third largest in the UK.

As part of the project, a 4.5 km-long gas pipeline was laid under the seabed – Europe's longest controlled horizontal bore under the ocean floor. The pipeline was laid at a depth of 30 metres to ensure that the ecologically sensitive waterway of Milford Haven was not affected. The pipeline connects the power station to the national power grid and supplies the plant with the gas required to fire the units.

