



MORE GAS AND OIL THROUGH EXPERTISE



RWE DEA WITHIN THE RWE GROUP

RWE Dea is part of the RWE Group, one of Europe's five leading electricity and gas supply companies. The Group is engaged in the generation, trading, transmission and supply of electricity and gas. The Group's workforce of over 70,000 supplies more than 16 million customers with electricity, and around 8 million customers with gas.

RWE is the No. 1 power producer in Germany, No. 2 in the Netherlands and No. 3 in the UK. The market position in Central and South-eastern Europe is being expanded continuously.

Through RWE Dea, the Group is successfully engaged in the upstream oil and gas business in Europe, North Africa and the Caspian region. The company operates large-volume gas storage tanks and, with its geoscientific and technical skills, particularly also supports the Group's various divisions.

RWE AG

Amprion
ThyssenGas
RWE Technology
Internal Services

Germany		Netherlands/ Belgium	UK	Central and Eastern Europe	Renewables	Upstream gas and oil	Trading/ gas midstream
Power generation	Distribution networks Supply energy and gas Energy efficiency/ e-mobility Regional companies	Essent	RWE npower	RWE Hungária RWE Polska VSE Slovakia RWE Transgas Czech Republic RWE Transgas Net Czech Republic	RWE Innogy	RWE Dea	RWE Supply & Trading
REGION				FUNCTION			

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COMPANY AND STRATEGY

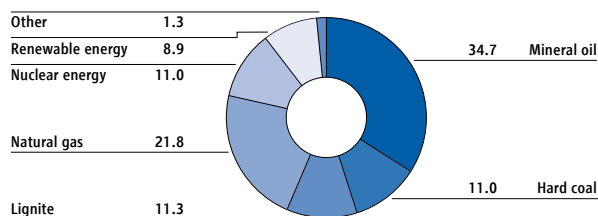
RWE Dea AG is the company in charge of gas and oil exploration and production within the RWE Group. Peak performance in all fields of activity is something that is taken for granted at RWE Dea.

Performance and competence, commitment and responsibility: these are the strengths that give RWE Dea AG its good reputation in the international natural gas and crude oil industry. The production of natural gas plays an increasingly important role for the company in this growing market.

RWE Dea has a proud tradition spanning more than 110 years as a company engaged and experienced in the exploration and production (E+P) of hydrocarbons. A diverse range of professional expertise, including geological and geophysical know-how, as well as state-of-the-art drilling and production technologies make RWE Dea a powerful company engaged in operations at home and abroad. Maintaining the security of energy supply whilst meeting the highest environmental standards represent key strategic objectives of the company. RWE Dea relies on the expertise, initiative and creativity of its employees, who are the guarantors of the company's corporate success.

Consumption of primary energy in Germany for the year 2009

as a percentage; Source: AG Energiebilanzen (Working Group on Energy Balances)



GAS AND OIL FROM DOMESTIC SOURCES

With its activities in the field of exploration and production of natural gas and crude oil, RWE Dea makes an important contribution toward securing Germany's energy supply. This applies particularly to natural gas production in Lower Saxony and crude oil production from Germany's richest oil field at Mittelplate, off the West coast of the state of Schleswig-Holstein.

With domestic natural gas production of more than two billion cubic meters annually, RWE Dea is one of the major natural gas producers in Germany. The company holds stakes in the most productive natural gas fields in Germany.

RWE Dea, as operator, has been producing crude from the Mittelplate oil field without any incident since the start of production in 1987. On today's estimates, some 20-25 million tons of crude remain available for commercial production from this field. The annual production volume of around 1.5 million tons represents more than 50 per cent of Germany's total domestic crude oil production. After many years of successful production, the continued extraction of fossil fuels in Germany is becoming ever more expensive and complex. The challenge today is to maintain production levels from nearly depleted gas and oil fields and to develop fields with less favourable reservoir characteristics through the use of more sophisticated methods and technologies. Maintaining existing production





levels will call for increased technical and capital expenditure in future – especially when it comes to the development of offshore resources still expected.

SUCCESS THROUGH INTERNATIONAL OPERATIONS

In view of the rising global energy demand, RWE Dea is pushing ahead with the internationalisation of its upstream activities. Today the company already generates more than half of its total revenues outside Germany, and almost a third of its workforce is located abroad. In its drive to internationalise operations, RWE Dea relies on specific core regions. As part of the RWE Group strategy, RWE Dea is thus gearing up for an attractive future market.

The core region of North Africa is particularly promising in terms of its potential for strong growth. In recent years, the company made a series of successful gas and oil discoveries, especially in Egypt, but increasingly also in Algeria and Libya. RWE Dea has also acquired stakes in exploration licenses in Mauritania and Morocco in an effort to boost its commitment in North Africa in a targeted manner.

The core regions of Central Europe and the North Sea/Norwegian Sea and Barents Sea represent well-developed production areas where RWE Dea will be able to step up production steadily in the next several years. The company has interesting gas and oil reserves in these areas, operates successful production wells, and is reinforcing its portfolio by participating in further licensing rounds.

One very promising region offering a great deal of potential comprises the countries of the Commonwealth of Independent States, where RWE Dea is concentrating on the Caspian Sea and Black Sea regions. There, it is conducting local talks with a view to engaging in possible exploration activities, entering existing licences and acquiring new ones. Looking forward, direct access to the gas and oil reserves in this region may play a crucial role in ensuring reliable supplies for Europe. RWE Dea has already entered the markets of Azerbaijan and Turkmenistan. RWE Dea is also examining possibilities for new developments in other areas, such as the Middle East and West Africa.

International, interdisciplinary teams of specialists are deployed to tackle the varied tasks that need to be solved in complex projects in which RWE Dea features as an operator or partner.

WELL PREPARED FOR FUTURE TASKS

Innovation is seen as key to success at RWE Dea, and research and development are therefore assigned high priority. RWE Dea participates in numerous national and international research and development projects – frequently working with consortium partners and in cooperation with universities or independent research institutes, both in Germany and abroad. This ensures that the company stays at the leading edge of technological innovations. The institutions with which RWE Dea cooperates in such projects are leaders in their respective areas of specialisation. Thanks to these effective collaborations, the results of the research in which RWE Dea invests can often be applied in the company's day-to-day, routine work activities.

RWE Dea pushes ahead with the internationalisation of its business operations – in core regions located in close proximity to European consumption centres.



RAS BUDRAN PRODUCTION ISLAND, EGYPT

The Ras Budran oil field is located in the Gulf of Suez, four kilometres off the coast of Sinai. It was discovered in the mid-1970s. To develop the field, SUCO was founded as a joint venture between RWE Dea and the Egyptian General Petroleum Corporation (EGPC). Production commenced in the year 1983.



CAVENDISH PRODUCTION ISLAND, GREAT BRITAIN

Natural gas production from the Cavendish field in the British North Sea started in the summer of 2007, with RWE Dea as operator. The development of the Cavendish field was achieved by installing an unmanned platform linked to the Caster-Murdoch System (CMS) operated by ConocoPhillips, via a 47-kilometer, 10-inch pipeline. From there, the gas is pumped to the gas terminal at Theddlethorpe on the coast of England.



EXPLORATION WELL, LIBYA

In Libya, RWE Dea has been actively engaged in the search for crude oil and natural gas by drilling a series of exploration and appraisal wells. The discoveries made in this search are currently being evaluated, and additional geological structures of interest are being tested for oil and gas. Together with its Libyan partner National Oil Corporation (NOC), RWE Dea aims to bring these discoveries on stream.



MELKØYA PRODUCTION ISLAND, NORWAY

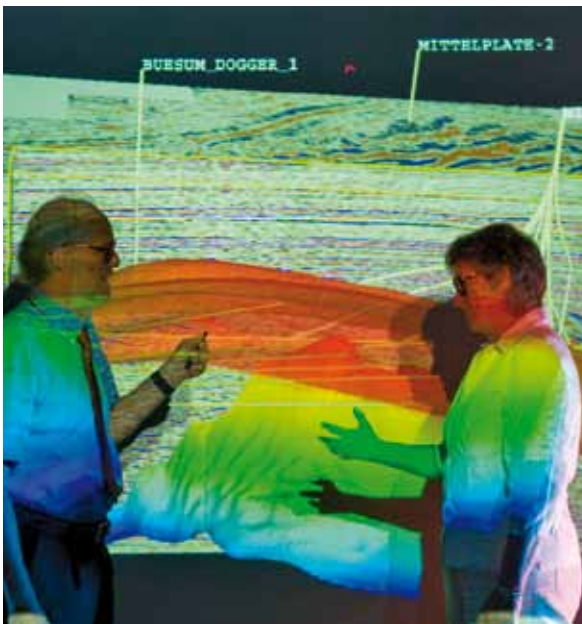
The Snøhvit natural gas field is located in the Barents Sea in the Arctic. The deposit contains about 180 billion cubic meters of natural gas. In Europe's first LNG plant built on Melkøya Island, the natural gas is liquefied in preparation for transportation on board LNG tankers. The CO₂ is extracted from the natural gas and stored underground. RWE Dea holds a 2.81 per cent stake in the Snøhvit development.

COMPETENCE

Exploration and production of crude and gas would be inconceivable without the use of state-of-the-art technologies. The engineering know-how of RWE Dea is based on professional competence and many years' experience as an operator in this field.

EXPLORING FOR HYDROCARBONS

In its search for natural gas and crude oil, RWE Dea deploys state-of-the-art technology to explore the geological formations. To detect these much sought-after hydrocarbons locked up in reservoir rock formations deep below the surface, RWE Dea employs innovative combinations of proven methods both on land and at sea. Among these, reflection seismics



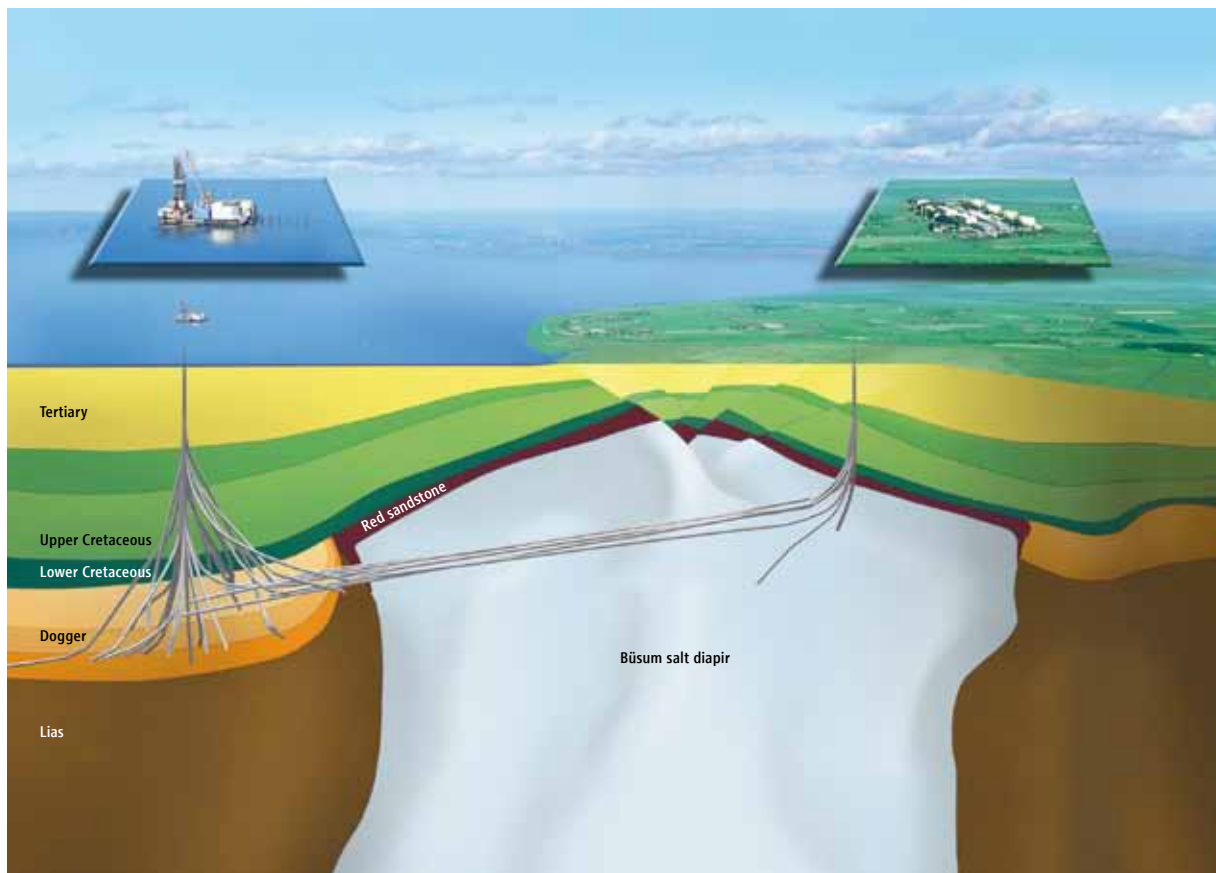
The data acquired in the seismic surveys is converted into three-dimensional models of geological reservoir formations and then interpreted in this 3D space by RWE Dea experts.

is the most important geophysical method in use.

When reflection seismics is deployed on land, seismic waves — generated by small explosive charges or by custom-built all-terrain vehicles fitted with vibrating metal plates — are sent into the subsoil. When exploring at sea, the seismic waves are generated by pulses of compressed air. These seismic waves are reflected with varying intensity by the borders between rock formations underground and travel back to the surface where they are picked up by sensors.

The enormous amount of digitally recorded data generated during this type of seismic campaign is converted to produce complex 3D representations of underground geological structures. This provides geophysicists and geologists with first indications about the depth of these formations, the possible gas or oil content of the pores in the rock formations, and their storage properties. Subsequent, more detailed investigations using geostatic methods and numerical reservoir simulations provide more information about the reservoir characteristics. Measuring techniques to determine electrical conductivity, magnetic properties and the specific mass of the rocks supply additional important indicators. All these methods combine in helping to determine the position of rock formations that may contain oil or natural gas, and in identifying suitable drilling locations.





Horizontal Directional Drilling Technology

Horizontal drilling technology makes it possible to reach reservoirs located several kilometres away from the drilling rig. RWE Dea deployed this technology for the first time in Germany in 1997, as a means to develop a section of Germany's richest oil field at Mittelplate, located below the Wattenmeer tidelands off the coast of the state of Schleswig-Holstein, by drilling directly from the mainland. These wells are among the longest in the world, traversing up to nine kilometres under an ecologically sensitive region. In the course of the development of the Mittelplate oil field, the production consortium commissioned independent research institutes to conduct long-term scientific studies to monitor and assess the effects of crude oil production on the sensitive ecosystem.

Specialised drilling technologies can boost production capacities three-fold: horizontal boreholes allow large areas inside reservoirs to be exploited.

DRILLING TO VENTURE INTO THE DEEP

RWE Dea owns and operates its own state-of-the-art drilling rigs, featuring the most modern equipment and maximum environmental compatibility. These rigs are electrically powered, which results in quiet operation and low emissions. The design, construction and operation of drilling equipment are all carried out with the company's own expertise.

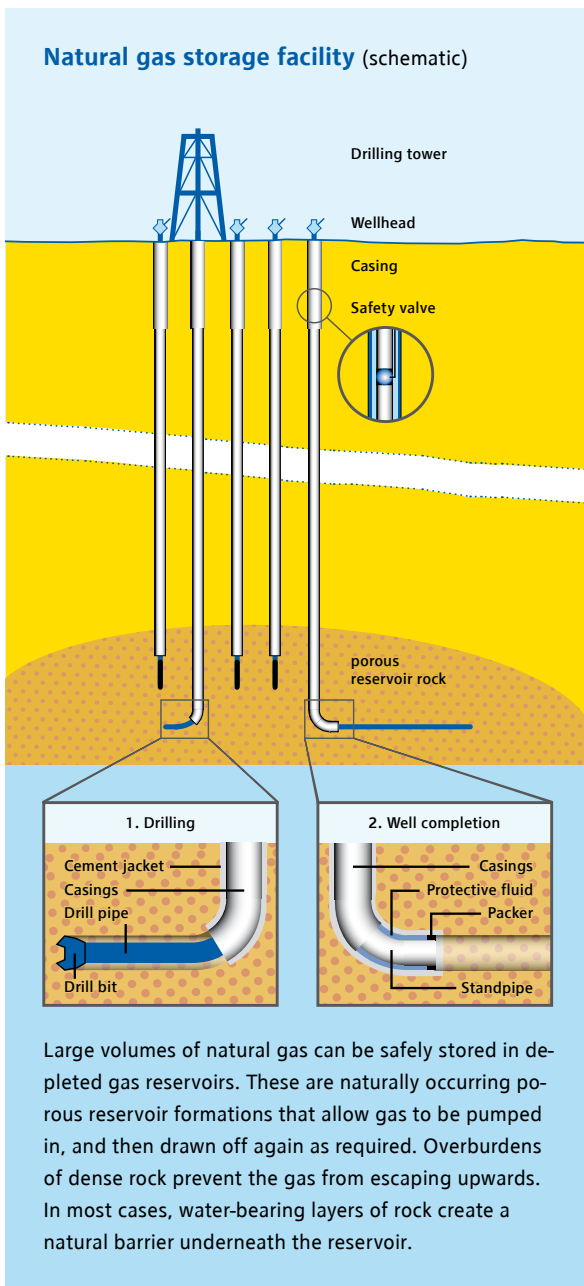
Specialist personnel overcome highly complex physical and geological challenges using leading-edge drilling technology and engineering know-how. This applies to exploration wells probing for potential gas or oil fields as much as it does to production wells drilled as part of field development and expansion projects.

The drilling of very deep extended-reach wells using directional drilling techniques is one of the core activities of RWE Dea. Deviations in the direction of the well are achieved by means of 0.5 to 2 degree bent subs inserted between the drill pipe, the motor and the drill bit or, in the case of a rotating drill pipe, by means of a directional control system rotating along with the pipe.

By deploying the latest technologies, RWE Dea is able to optimise the development and exploitation of the reservoirs on an ongoing basis. For example, the casing-drilling technology does away with the conventional drill pipe, using instead the casing that is destined to stay in place when the well is completed. The multi-lateral technology allows branches to



In the control centre of the T-160 drilling rig: remote directional control guides the drill bit into the reservoir with great accuracy.



be drilled that radiate away from the main borehole, allowing a reservoir to be tapped from one or more locations simultaneously. RWE Dea also employs the so-called solid expandable tubular casing technology. With this method, specially designed pipes are lowered into the well section to be cased and then immediately expanded by means of a cone, resulting in a greater inner diameter.

STORAGE TO WARD OFF THE COLD

RWE Dea operates three large storage facilities in southern Germany which hold considerable volumes of natural gas, making a substantial contribution to the security and stability of supply for consumers. The gas is placed in storage during the summer months when consumption levels are lower, and fed back into the supply network in winter, when the demand for gas rises sharply.

RWE Dea can draw on many years' experience and a great deal of expertise in the construction and operation of natural gas storage facilities. The Wolfersberg gas storage facility has been in operation since 1973, the one in Inzenham-West since 1982, and Breitbrunn/Eggstätt since 1996. The RWE Dea gas storage facilities are depleted natural gas reservoirs that were created millions of years ago and which are particularly suitable for the storage of large volumes of natural gas. The fact that natural gas accumulated in these formations in the past is a guarantee that the overburden acts as a tight seal over the storage formation.

The use of underground natural gas storage is not only safe and environmentally sound; it also makes



the construction of large above-ground gas tanks unnecessary. The processing equipment required for the operation of the underground storage facilities is housed in buildings that blend harmoniously into the surrounding landscape.

CO₂ STORAGE – GIVING CLIMATE PROTECTION A CHANCE

Coal, oil and natural gas will continue to play an important role for energy supplies around the world. Developing climate-friendly means of generating power from these fossil fuels is therefore a high-priority task. For this reason, the RWE Group is working on coal-fired power station technology that causes the carbon dioxide (CO₂) to be captured, liquefied and moved into underground storage facilities via pipelines. This so-called CCS (Carbon Capture and Storage) technology is seen as a vital bridging technology in the effort to eliminate the release of the greenhouse gas CO₂ into the atmosphere.

Within the RWE Group, RWE Dea holds the expertise for the transportation and storage of CO₂. Thanks to its many years' experience in drilling and production as well as in carrying out seismic, geochemical and geomechanical analyses, RWE Dea has the necessary depth of expertise in relation to hydrocarbon storage. Moreover, as an operator of natural gas storage facilities, the company is fully conversant with technologies that are similar to those needed for the storage of carbon dioxide.

Ideas for the utilisation of CCS technology are being accompanied by a host of extensive development

measures, and RWE Dea is participating in numerous scientific and practice-based national and international CO₂ research projects.

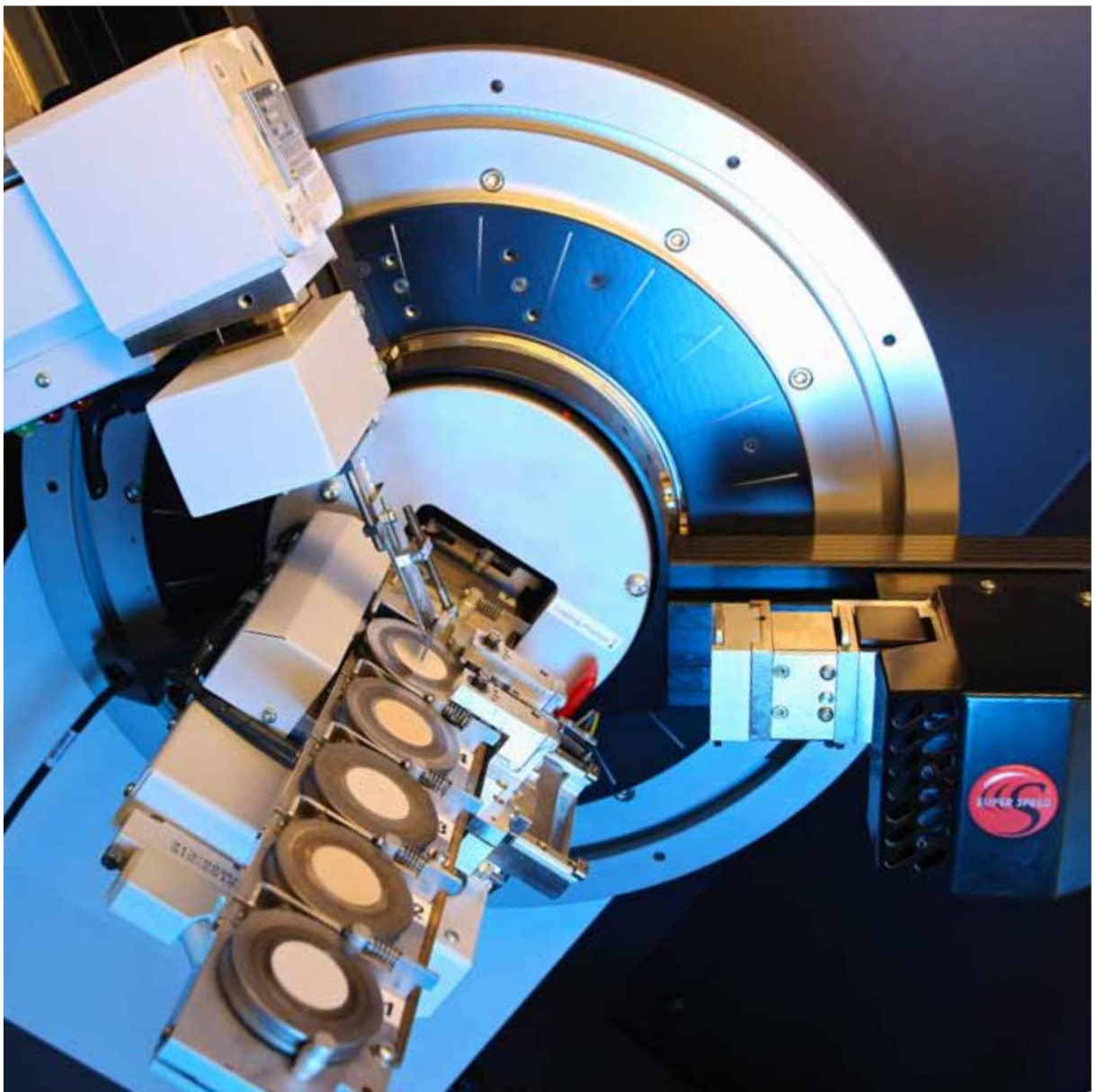
IN THE LEAD THANKS TO INNOVATION

RWE Dea's highly qualified scientists and engineers ensure that the latest technologies and innovative trends are evaluated and implemented in projects currently under way. Pilot applications are frequently used in the investigation and evaluation of reservoirs. The specialists at the Wietze laboratory focus on the details: drill core analyses and series of petrochemical tests constitute some of the main activities carried out here.

Promising technologies and methods are developed further to the point where they are ready for practical



The water content in crude oil is determined by the RWE Dea laboratory with the aid of the Karl-Fischer titrator.



A sample is prepared for analysis under the X-ray diffractometer in the RWE Dea laboratory.

The analytical know-how and competent advice on matters relating to the geosciences and on production engineering provided by the Wietze laboratory in Germany are in great demand throughout the RWE Group.

application and can be made available to operations sites. Detailed studies and analyses provide important insights into the reservoirs. This includes delivering proof of the existence of hydrocarbons in liquid form without the need for expensive down-hole testing, statistical characterisation of oil and gas-bearing geological structures, as well as the simulation of production characteristics in the fields.

In support of the operational business, for instance, investigations are carried out on ways of optimising hydrocarbon production using “frac” technology: a method for artificially creating networks of cracks that reach deep into a storage formation by hydraulic means. This increases the permeability of the rock and so boosts production flows. Among other things, investigations are focusing on the stability of frac fluids under high pressure and high temperature conditions.

In addition to its involvement in technical issues relating to drilling fluids, the RWE Dea laboratory in Lower Saxony also develops solutions for improving the production of natural gas and crude, as well as the storage of natural gas. Sedimentological descriptions of reservoirs are followed by sophisticated reservoir simulations. They serve to optimise production strategies.

For domestic and foreign upstream projects, the RWE Dea laboratory also provides invaluable support and development assistance in the fields of micropalaeontology, sedimentology and drill core analyses.



Photograph: Gerhard Bohmann, Maun, University of Bremen

Gas hydrates – an energy source of the future

Gas hydrates, which have recently been discovered along many continental shelves, are considered a potential source of energy in the future. Gas hydrates are created under high-pressure, low-temperature conditions. They contain methane – i.e. natural gas – in highly concentrated form.

RWE Dea is funding a range of research projects exploring ways of extracting these gas hydrates from rock formations, as well as methods for the commercial exploitation and transportation. Research is also under way into the feasibility of injecting liquid carbon dioxide (CO₂) into these rock formations and then converting them into CO₂ hydrates. If successful, this would allow the CO₂ created in the operation of coal-fired power plants to be safely stored underground, at the same time as extracting a new type of fuel.

RESPONSIBILITY

RWE Dea recognises that it has a special responsibility towards society and the environment. Protection of the environment, health and safety as well as social responsibility are therefore important components of corporate culture and identity.

LEARNING FOR LIFE – LIFELONG LEARNING

Commercial success is contingent on having competent staff at all levels of the company who are prepared to engage in lifelong learning. With this in mind, RWE Dea makes every effort to nurture qualified young talent, by supporting children, youths and young adults in their academic and vocational training. This support can take the form of the company offering a traineeship to young people, or making it possible for them to attend school or university and improve their prospects of entering a profession. Members of staff who make a sustained contribution to the success of RWE Dea through their social and professional competence enjoy the benefits of advanced vocational training tailored to their specific needs, assignments abroad and deployment within the company's interdisciplinary teams.

FAMILY-FRIENDLY CORPORATE POLICY

RWE Dea assigns a high priority to ensuring that its employees are able to enjoy a sound work vs. life balance. Flexi-time, child care support and the provision of services to family members requiring care are just some of the aspects under this policy. In 2008, RWE Dea was awarded the "audit berufundfamilie" ["work & family audit"] certificate in recognition of its family-friendly corporate policy.

SAFETY AND HEALTH

Safety is the primary corporate objective. RWE Dea is fully aware that achieving this objective calls for a sound occupational health and safety culture. RWE Dea sites around the world organise numerous activities in support of this objective. These include driver training courses, special seminars, health awareness campaigns and occupational health and safety campaign days.

WORKING IN A SENSITIVE ENVIRONMENT

As operator of the Mittelplate development, Germany's biggest oil field located in the Wattenmeer tidelands national park in the North Sea off the coast of the state of Schleswig-Holstein, RWE Dea has been the guarantor for environmentally safe crude oil production since 1987. Sophisticated, leading-edge technology, multiple safeguards for all work procedures, and the use of a highly experienced, responsible specialist workforce are indispensable prerequisites in such an endeavour.

RWE Dea developed a safety concept capable of ensuring reliable protection of the sensitive ecosystem in these tidal flats. The most demanding engineering standards developed to guarantee the safe exploration and production of this resource have become



benchmarks for similar projects worldwide. To protect the sensitive ecosystem of the Wattenmeer tidelands, the artificial Mittelplate Drilling and Production Island was constructed in the form of a compact, leak-proof concrete-and-steel basin that is designed to withstand extreme conditions and features a comprehensive closed waste and residue disposal system. The high safety standards developed here are also applied in international projects.

Oil production is constantly being optimised through the ongoing development of geophysical methods and drilling technologies. Starting in mid-2000, crude oil is now also produced from the eastern sections of the Mittelplate field, through wells drilled from the mainland. Since 2005, the crude produced on the drilling and production island is transferred to the treatment plant at the Dieksand Land Station by pipeline, making the operation independent of prevailing weather and tidal conditions.

Throughout the ongoing development of the crude production from the Mittelplate field, independent experts, research institutes and engineering consultants have been conducting investigations at regular intervals to monitor and assess any effects the production operation might have on the sensitive environment. Sophisticated biological, marine geomorphological and sedimentological studies conducted throughout the life of the Mittelplate project are proof that oil can be produced even in ecologically sensitive regions without harmful impact on the environment.

And when a reservoir nears depletion, RWE Dea continues to act responsibly: for example, the complete de-installation of the offshore oil production platforms at Schwedeneck-See in the German Baltic Sea following 16 years' incident-free operation has set new standards worldwide. Both platforms were recycled with all their components.

SOCIAL RESPONSIBILITY AND COMMITMENT

A policy of social responsibility and commitment is an integral part of RWE Dea's corporate culture. After all, in addition to pursuing its core business operations, RWE Dea recognises that it has a special social responsibility in the countries in which the company operates. Its aim is to make a long-term contribution to the social and economic development of a country through carefully selected projects.

Sponsoring schools in Egypt

RWE Dea's operating activities are accompanied by social responsibility of the company in Egypt. The company has supported a wide range of social and community projects for years now. For example, RWE Dea makes funding available to schools in the Cairo region for projects such as the renovation of school buildings and the provision of essential equipment such as school desks and blackboards. By improving the learning environment,



RWE Dea wants to contribute towards better education and hence a better quality of life for Egyptian school-children.



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