RWE

RWE Technology International

Green Know-how!

Transition by Engineering: from operators for operators!







Who we are and what we can do

RWE Technology International GmbH is a subsidiary of the RWE Group. With a successful history spanning more than 125 years, the RWE Group is a leading provider of energy from renewables worldwide.

The expertise of **RWE Technology International** goes beyond just delivering energy projects. To ensure that our clients' plants and projects achieve maximum performance, we offer customised, innovative solutions across the entire life cycle.

Through our deep understanding of **plant design, construction, operation and optimisation**, we minimise risks and total costs for our clients and increase their return. We work as a **strategic business partner**, helping you optimise **profit and risk** in your business.

We support companies and organisations worldwide in their energy transition activities. With our engineering, we deliver tailor-made, client-specific solutions for renewable energy sources, efficient mining, conventional generation and grid stabilisation across the entire value chain of a project.

We offer decades of experience with extensive expertise in **engineering services and technical consulting**, backed by the **operating experience of the RWE Group.**

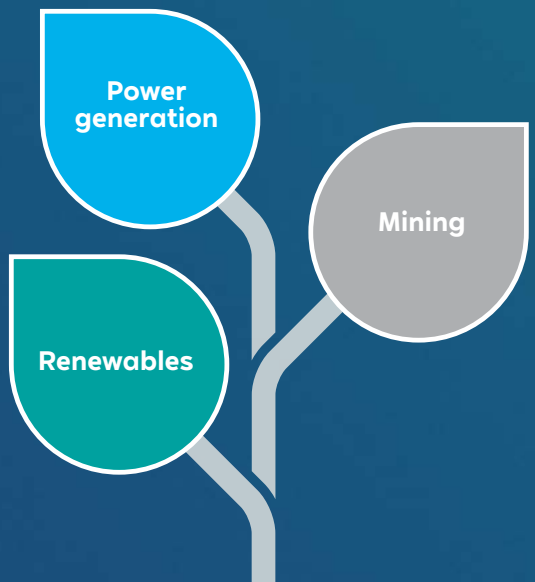
We have over 400 engineers with in-depth **operating experience at B-to-B level** and broad expertise across the energy sector and opencast mining. This enables us to offer our clients independent technical consulting services as well as operational and maintenance advice.

We are your **strategic business partner** with a mission to support you in **reducing your CO_2 footprint** and improving your security, profitability and sustainability in the energy and mining sectors.

Benefit from our experience: from operators for operators!

Our service portfolio

We can apply our broad engineering and service range in a wide range of industries – especially energy-intensive ones.



Our expertise: Renewables

Renewable energy sources are the key to the energy transition. RWE is one of the world's largest providers of energy from renewables and is playing a key role in the energy transition. RWE generates electricity and heat from sunlight, onshore and offshore wind, water and biomass produced from waste wood, leaving no CO_2 footprint and creating the basis for a green future.

Hydrogen is playing a key role in decarbonising energy-intensive sectors and industries. In addition to reducing CO_2 emissions in industrial plants, hydrogen can become a sustainable fuel for the transport sector as well as a clean fuel for heat supply in the medium term. Green hydrogen produced by renewable energy plays a key role in achieving Net Zero. In order to achieve climate goals and decarbonise the chemical and steel industries in particular, the use of green molecules – in the form of hydrogen, **ammonia or methanol** – will become more important. RWE has started to develop a globally diversified portfolio of projects and purchase agreements for hydrogen and its derivatives.

RWE is working towards making **solar energy** more competitive. This means reducing investment, operating and maintenance costs. The solar market is a central component of the energy transition and will see above-average growth in the coming years. More and more agri-PV systems are being installed. They reduce land consumption, optimise agricultural harvests and provide farmers with additional income.

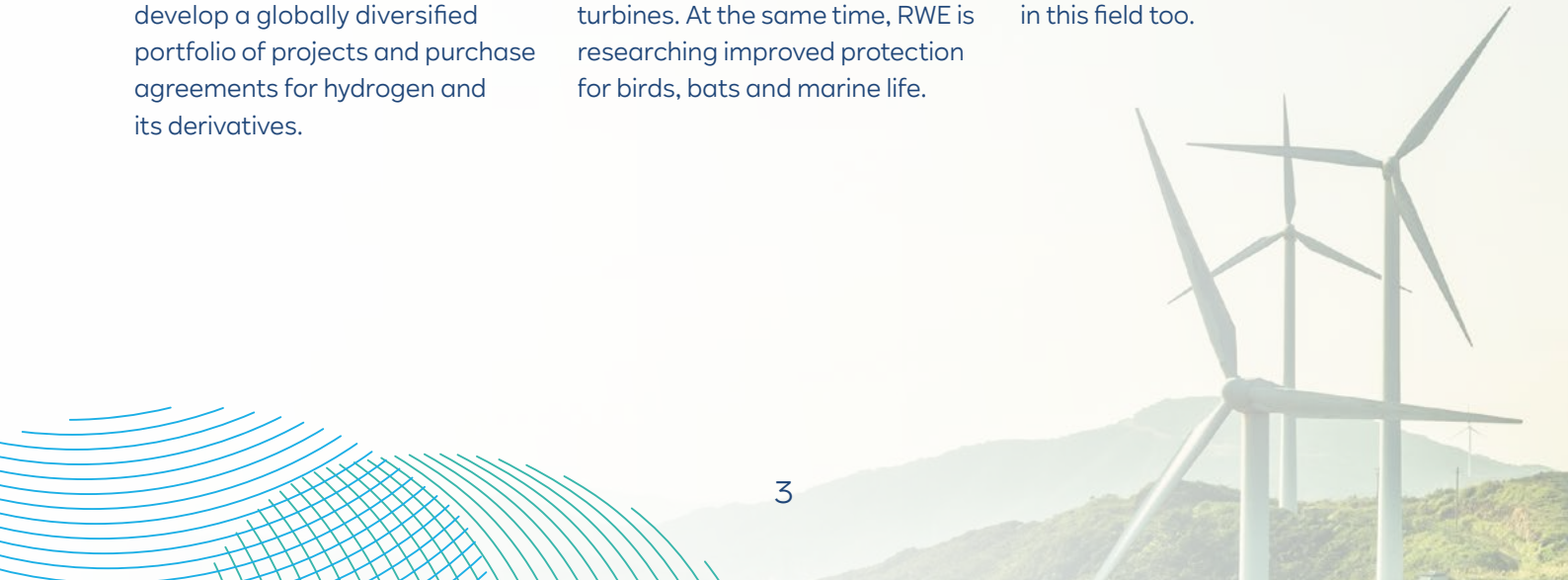
Elevated PV modules, e.g. above orchards, protect the fruit and convert solar energy into electricity at the same time.

Together with solar energy, **wind power** answers the question of what energy supply will look like in the future. The past two decades have seen wind power become the most efficient renewable energy source. Both the number of wind turbines and their efficiency have increased massively. As a responsible wind turbine operator, RWE invests heavily in reducing the negative environmental impact of its turbines. At the same time, RWE is researching improved protection for birds, bats and marine life.

The growth of intermittent renewable energy is making **battery systems** increasingly important. These store electricity when there is excess production from renewable resources and make it available again when it is needed. In addition to ensuring a continuous power supply, they play a key role in grid stabilisation.

The global energy crisis and rising energy costs have sharpened the focus on **energy recovery** in many industrial production processes. There is still enormous savings potential here: around two thirds of final energy use in industry is accounted for by process heat in production. Due to high gas prices and the need to decarbonise, companies are increasingly considering to switch to renewable energy sources and electrifying their process heat.

Thermal energy storage, large heat pumps and **electrode boilers** play an important role in implementing sustainable production in an economically profitable way. And RWE is active in this field too.



Our expertise: Power generation

The industrial and commercial society of today has many lifelines: data networks, mobility, competitive industries and building infrastructure. They all have one thing in common: the need for electricity – the most important form of energy of our time. Our society faces the huge challenge of meeting the increasing demand for power while protecting the climate at the same time. Electricity suppliers in particular bear a huge responsibility and face immense challenges.

As an operator of a diversified **power plant portfolio** with **gas, coal, hydropower, waste** and **biomass** for over 100 years, the RWE Group has **decades of expertise in optimising the operation of both individual plants and entire plant portfolios** in several countries and electricity markets. With this, RWE is building the bridge to the age of renewable energy sources while ensuring stable, reliable and affordable electricity supply. In order to reduce global emissions from electricity and heat production and provide continuous electricity at the same time, step-by-step measures to convert fossil-fuel power plants are required in parallel to the development of wind power and photovoltaics.

In addition to making coal and gas-fired power plants more efficient, increasing plant operation flexibility plays an important role in the first step of the conversion process. Here, existing thermal power plants are adapted so that they are available at short notice during the expansion of intermittent renewable energy sources, a wind lull or poor solar radiation. However, this measure must still ensure secure, cost-efficient operation.

Depending on the respective electricity market regulations, converting fossil-fuel power plants to carbon-neutral energy sources plays an important role in the next step. In the case of coal power plants, replacing coal with biomass or ammonia is an effective option for reducing carbon emissions. Depending on the specific plant technology and plant age, high CO_2 savings can be achieved here with comparatively low investment costs. **'Carbon Capture, Utilisation and Storage'**, or **CCUS** for short, is a technology to either store captured carbon dioxide underground for the long term, thus removing it from the atmosphere, or to prevent the emission of additional carbon by using it in chemical products such as methanol and e-fuels.

A wide range of funding initiatives consider this to be a possible tool to combat global warming. RWE is also dealing with this topic at project level, because CCUS projects could secure stable power generation capacities in the future and prevent millions of tonnes of CO_2 emissions.

Although the combustion of natural gas produces fewer CO_2 emissions than that of coal, in order to achieve RWE's climate goals, we have to **replace natural gas in power generation** in the medium term as well. RWE's declared goal is to gradually increase the **hydrogen** content of the natural gas used in gas turbines until 100 % conversion has been achieved. Due to differences in the energy density and other chemical and physical properties of the two gases, the volume flows, combustion parameters and material requirements change. As a power plant operator, RWE and its engineers and specialists are involved in various new developments with different plant manufacturers for this purpose and have already made the first investment decisions for the new generation of gas turbines.

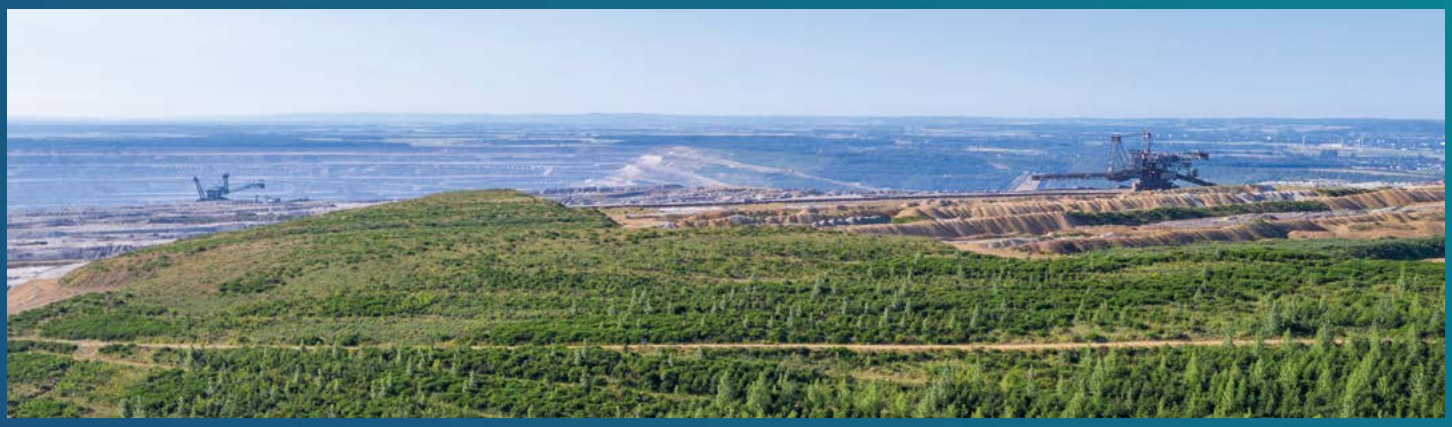
Our expertise: Mining

The mineral resources available to us on earth are limited. Nevertheless, iron, copper, gold, nickel, lithium and other mineral resources are needed across many industries and will play a key role in the energy transition. Making the mining and extraction of these mineral resources as environmentally friendly and resource-efficient as possible is an important task, and awareness of this is increasing worldwide. Thanks to decades of experience in the profitable operation of Europe's largest opencast mines – in the middle of densely populated areas and alongside agricultural land, industrial plants and nature conservation – RWE has the necessary processes, measures and technologies at its disposal. These are now in demand worldwide, with some even required by law.

In addition to the goal of decarbonising mining, dust and noise reduction, water protection, natural habitat restoration and thus the socially acceptable treatment of local residents affected by mining activities are important. With the **97 % electrification** of opencast mining operations, RWE has been demonstrating impressively for decades that a **significant reduction in direct CO_2 emissions** is possible, even for very large opencast mines.

At RWE, this is achieved by transporting the mined material exclusively by conveyor belts and electrified railways. Where the use of this technology is not possible, e.g. due to local geological and geographical conditions, RWE uses its unique expertise as an opencast mine operator and electricity producer to develop customised solutions. Whether it's large batteries, overhead line technology or even hydrogen and its derivatives: RWE has operational experience with all technologies. The stringent legal requirements and comparably high costs in Europe prompted RWE to develop solutions for efficient dust protection in opencast mining operations. The highly **efficient use of water** is just one of several proven possibilities that are becoming increasingly relevant for mine operators, especially in arid regions. According to the motto **'Rehabilitation is what remains'**, RWE assumes its social responsibility with the issue of **opencast mine closure** with the aim of long-term use for the benefit of the public. RWE has been operating opencast mines in the Rhenish mining area for over 100 years, and successful mine rehabilitation is part of what it is judged on. This achieves a high level of acceptance among the population and the authorities and enables long-term economic operation.

The rehabilitation process also includes the long-term **stable and safe construction of large overburden dumps,** which are among the largest in the world. In the process, RWE developed a unique method of combining materials with different characteristics (wet/dry, stable/unstable) in such a way that they are permanently safe even in extreme weather conditions and are available for forestry and recreational activities after the end of operations. The construction of the dumps takes place directly parallel to the mining process in a cost-optimised manner. To protect and **increase biodiversity** in the vicinity of the opencast mines, RWE develops protection and relocation concepts as early as the mine planning stage. In addition to the active movement of animals and plants, biodiversity corridors are also created. These enable the independent but consciously guided movement of animals such as bats and insects. Through the professional implementation of these measures, RWE has succeeded in reintroducing flora and fauna that had died out in the vicinity of the opencast mines. The consistently integrative approach to mining, processing and rehabilitation that RWE has pursued as an opencast mine operator for many decades has proven very profitable and also generated increased acceptance in the surrounding communities.



Would you like to learn more about these topics?
Please get in touch and benefit from our experience
from numerous projects worldwide.

Benefit from our experience: from operators for operators!

The RWE Group is proactively committed to a green energy transition with its **'Growing Green'** vision: A transition from fossil fuel consumption to renewable energy sources, such as wind and solar, combined with a drastic reduction in carbon emissions.

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