2.1 Strategy

In November 2021, we informed the public about our growth and earnings targets for this decade and received very positive feedback. By 2030, we intend to invest €50 billion in renewables, battery storage, gas-fired power stations and electrolysers. Including proceeds from selling stakes in projects, we foresee net investments of €30 billion. This will double our generation capacity in these technologies to 50 GW by 2030. At the same time, we are successively phasing out electricity generated from coal and setting the stage for RWE to be carbon neutral by no later than 2040. This will not only make RWE greener, but also more profitable. Our 2030 goal is to achieve an adjusted EBITDA in our core business segments of €5 billion. This would represent an increase of around 80 % compared to 2021.

Who we are and what we do. RWE is a leading international energy company headquartered in Essen, Germany, with a focus on power generation. Energy sources such as wind and solar are an increasingly important part of our business. Our core activities also include the storage of electricity and natural gas, the hydrogen business, trading of energy-related commodities and innovative energy solutions for industrial customers. We generated revenues of €24.5 billion in fiscal 2021. Our key markets are Germany, the United Kingdom, the Netherlands and the USA. In the field of renewables, we are also active in a whole host of other countries, for example in Poland, Spain, Italy, Sweden and Australia. We intend to position ourselves even more broadly geographically in our renewables business. For example, we are stepping up our efforts to win offshore wind projects in new markets such as Norway, Japan, South Korea and Taiwan.

Carbon-neutral energy – the great challenge of our time. In most industrial countries, energy policy is shaped by climate change. In the past, the main objective was to provide a reliable, affordable supply of electricity and fuel, whereas nowadays – more so than ever before – our energy consumption should not be to the detriment of the Earth's temperature. Most industrialised countries where we do business want to minimise their emissions of greenhouse gases generated by the use of fossil fuels. Over the long run, the goal is to achieve climate neutrality, i. e. a state in which humankind zeroes out its net emissions of greenhouse gases into the atmosphere. The European Union and the UK want to be climate neutral by 2050, while Germany wishes to reach this goal by 2045. Both these objectives call for the fundamental restructuring of the way in which companies and households consume energy. This transformation has many aspects. For the energy industry, the following issues need to be addressed:

- **Decarbonising electricity generation.** The energy transition is basically about abandoning electricity generation from fossil fuels and embracing renewables. Coal and natural gas are finite resources, the use of which leads to the emission of greenhouse gases. By contrast, wind, solar and hydro are energy sources which do not generate CO_2 emissions, are available in abundance and thus form the foundation for a sustainable supply of electricity and heat. The EU has set the goal of covering at least 32 % of final energy consumption from renewable sources by 2030. At present, work is under way on a directive which calls for an even higher proportion of at least 40 %. Numerous countries both inside and outside the EU have specific plans to phase out the use of coal and ambitiously expand renewables.

- **Creating storage and backup capacities.** Electricity generation using renewable sources depends on the weather conditions as well as the time of day and the season. Sometimes, renewables can only cover a fraction of demand, while at other times, their generation exceeds local needs so much that production actually has to be throttled. Consequently, as energy supply becomes increasingly reliant on wind and solar farms, power storage systems become ever more important for stabilising the power grids. Furthermore, we need more environmentally-friendly, flexible generation assets, which can reliably produce power when there is no wind and no sunshine. Modern gas-fired power stations that can be retrofitted to run on carbon-free fuels like hydrogen will be well-positioned for this task, once the necessary volumes of such fuels are available.

- **Replacing fossil fuels with green power.** Simply reducing emissions in the power generation sector is not enough to achieve climate neutrality. At present, over 70 % of European energy consumption is still covered by oil, coal and natural gas. Electrification – in other words switching energy consumption to electricity produced with carbon-neutral methods, e. g. by using heat pumps instead of oil and gas heating systems – also enables significant emission reductions in the manufacturing, heat and transportation sectors. Thus, over the long run, demand for electricity in our markets will expand significantly.

- **Establishing the hydrogen economy.** The economy can only be completely decarbonised if solutions are also found for applications where direct electrification is not an option. Examples of this are the production of steel and fertilisers as well as aviation and shipping. In the near future, hydrogen produced with zero-carbon methods would be a solution. Taking a longer-term perspective, using hydrogen as a storage medium will also be a key component of a climate-neutral energy system. According to the European Commission, by 2030 the EU should have electrolysers with a total capacity of at least 40 GW capable of producing 10 million metric tons of hydrogen annually. Germany is looking to expand its electrolysis capacity to 10 GW by the end of the decade, as recently announced by the new coalition government comprising the SPD, the Greens and the FDP.

We're driving the energy transition. RWE is well positioned to contribute to transforming the energy sector and the broader economy in all of the areas discussed above. And that is precisely what we are doing, by investing billions of euros in wind power, photovoltaics, battery storage and green hydrogen, phasing out coal-based generation, building environmentally friendly backup capacities and helping industrial customers optimise their energy consumption. These activities make us a driving force in the energy transition and allow us to support the countries where we do business in their efforts to achieve climate protection targets. Our commitment in this regard is reflected by our own ambitious plans: we want to be carbon neutral by 2040 at the latest, ten years earlier than the EU. Not only does this apply to our own greenhouse gas emissions (referred to as Scope 1), it also covers the upstream and downstream value chain (Scope 2 and Scope 3). We have also set ourselves ambitious goals for the current decade: by 2030, we want to reduce our emissions by 50 % (Scope 1 and 2) and 30 % (Scope 3) compared to 2019. At the Paris Climate Conference in 2015, the global community committed to limiting the increase in average global temperatures to well below two degrees Celsius compared to pre-industrial levels. Our actions are in line with this target, as was officially confirmed by the independent Science Based Targets initiative at the end of 2020. However, our ambitions do not end there. Moving forward, we have also set our sights on ensuring we adhere to the target of 1.5 degrees Celsius established at the Paris Climate Conference.

Sustainability – at the heart of our corporate culture. A sustainable business involves far more than cutting greenhouse gas emissions. Sustainability is measured in a myriad of ways. The expression is generally used in relation to the environment, society and governance (ESG). Last year, we reassessed our approach to the topic of sustainability. Working together with internal and external experts, we defined the fields of action that are of most significance to RWE and what we want to achieve in these areas. In addition to reducing greenhouse gas emissions, one of our most important environmental efforts is preserving biodiversity at the sites where we operate. In particular, this involves the recultivation of mining areas, as well as the erection, operation and decommissioning of wind farms. We want to reduce the use of natural resources and significantly boost our recycling ratio at the same time.

As a company, we take great responsibility in the communities where we do business. We want to live up to this responsibility across all our sites. In the Rhenish lignite mining region, we are acutely aware of our prime-aged employees who are losing their jobs due to the coal phaseout, and are in the process of securing socially acceptable solutions to this issue. Occupational health and safety is another key concern of ours. Our aim is to ensure that the employees at our sites leave work at the end of each day as healthy as when they arrived. We also advocate for a diverse, inclusive corporate culture. Diversity has many facets. One is gender equality when filling leadership roles within the company. In our core business, which covers all Group activities with the exception of Coal / Nuclear, the share of women in executive positions was 19 % at the end of 2021. We aim to reach 30 % by 2030.

Our mission statement 'Our energy for a sustainable life' truly encompasses our purpose as a company and confirms that sustainability is a principle that guides our actions. Our commitment in this regard is made tangible by the fact that achievement of ESG targets has a direct impact on the level of Executive Board remuneration. Further information on our ESG goals and accomplishments can be found in our Sustainability Report and in the separate Non-financial Report in accordance with Section 315b, Paragraph 3 of the German Commercial Code. The reports for fiscal 2021 will be published in April 2022 and will be accessible at www.rwe.com/responsibility-and-sustainability. Our website also has further information on how independent rating agencies assess our sustainability strategy at www.rwe.com/ratings-and-rankings.

Growing Green – our strategic roadmap to 2030. In mid-November 2021, we informed the public about the strategy and goals for our business activities during the current decade at our Capital Market Day event. An ambitious growth programme in our green core business forms the centrepiece of our strategy, which is entitled 'Growing Green'. In the 10-year period from 2021 to the end of 2030, we intend to invest approximately €50 billion in new wind farms, photovoltaic assets, battery storage, gas-fired power plants and electrolysers.

This capital expenditure will be divided up roughly four ways between Germany, the United Kingdom, the USA and our other markets. In net terms, i. e. taking into account cash flows from divestments, we expect that our investments will total around €30 billion. We will use these funds to massively expand our climate-friendly generation capabilities. Including battery storage and electrolysers, we intend to have a generation capacity of around 50 GW by 2030. This target is a pro-rata figure, meaning we state our capacity according to our shareholding ratios. In order to reach 50 GW, we will have to build approx. 25 GW. At 21 GW, the majority of this capacity will come from wind farms, solar assets and battery storage. It will be supplemented by flexible gas-fired power stations and electrolysers with a total installed capacity of 2 GW each. Our adjusted EBITDA will also rise sharply in conjunction with our generation capacities. For 2030, we project a level of €5 billion, generated solely from our green core business. By comparison, in fiscal 2021 we posted adjusted EBITDA of €2.8 billion from our core activities.

Turning to the individual components of our growth programme:

- **Offshore Wind.** We have been active in offshore wind for 20 years now, making us a world leader in this field. At the end of 2021, our offshore wind power portfolio had a total pro-rata capacity of 2.4 GW. This figure is expected to hit 8 GW by 2030. We currently operate wind farms in the coastal waters of the United Kingdom, Germany, Belgium, Sweden and Denmark. Europe is our most important region in terms of growth. Examples for this include projects such as Sofia (UK / 1,400 MW), Kaskasi (Germany / 342 MW), Thor (Denmark / 1,000 MW) and F. E. W. Baltic II (Poland / 350 MW). We are also looking to markets outside of Europe: together with local partners, we are working on offshore wind projects in the USA, Japan, Taiwan and South Korea. But we are interested in more than just regional opportunities, as we want to tap into new technological options as well. In order to realise the full potential of offshore wind, we will also be operating wind turbines on floating platforms in the future. Together with our partners, we are exploring which types of foundations are best suited for this (see page 30 et seq.). The first prototype co-engineered by RWE – the TetraSpar Demonstrator off the coast of Norway – started operating in autumn 2021.

- **Onshore Wind / Solar.** We also have more than two decades of experience in onshore wind and rank among the global leaders, with pro-rata generation capacity of 7 GW. We intend to boost this figure to 12 GW by 2030. In terms of solar, where our capacity currently stands at 0.5 GW, we are still in the start phase. However, we aim for a steep expansion curve towards 8 GW by the end of the decade. We are concentrating our onshore wind and solar efforts on North America and Europe, where we are looking to diversify geographically. For instance, we have partnered with Public Power Corporation (PPC), Greece's largest energy group, to position ourselves as a solar power producer in its home market. In the United States, we are also expanding into new territories. Evidence of this can be found at Scioto Ridge, our first wind farm in Ohio, which started operating in May 2021. Our main focus in terms of growth ventures rests on countries and market segments harbouring potential for more than one technology, e. g. for photovoltaics plus wind energy and / or electricity storage.

- **Battery storage.** Demand for electricity storage is increasing as power generation shifts to wind and solar assets. RWE has been involved in the development, construction and operation of battery storage systems for many years now. For this decade, we are targeting an installed capacity of 3 GW, compared to 47 MW in late-2021. We are currently rolling out a key battery project in Hickory Park, which is located in the south of Georgia, USA. This site will be home to a 196 MW solar farm coupled to a 40 MW battery storage system. This combination will enable electricity feed-ins into the local grid to be optimised, significantly improving the solar array's yield. Future photovoltaic projects will largely follow this approach. We are also building battery storage to provide grid services. Two examples of this are the massive batteries with storage capacities of 72 MW and 45 MW, which we are currently installing at our German power plant sites in Werne and Lingen.

- **Flexible gas-fired power plants.** The supply gap caused by the coal phaseout cannot be resolved by energy storage solutions alone. We need to build low-carbon backup capacities that can balance out the fluctuations in power generation from solar and wind. This presents growth opportunities, particularly for established power generators such as RWE. Gas-fired power plants play a key role in this regard. With an installed capacity of 14.1 GW, our fleet of gas-fired stations is the second largest in Europe, and we want to build another 2 GW of capacity by 2030. We see a need for investment in Germany in particular, where the coal exit is coinciding with the nuclear phaseout. Nevertheless, the construction of new assets in Germany involves a high degree of political and economic uncertainty, unless the plants receive guaranteed remuneration based on the Combined Heat and Power Act or via capacity auctions held by the grid operator. In one such auction, we won the right to construct a 300 MW grid stabilisation unit at our Biblis site, which is scheduled to start operation in 2022.

  The Institute of Energy Economics at the University of Cologne (EWI) estimates that Germany needs to add gas-fired plants with a total capacity of 23 GW by 2030 if the country is set on phasing out coal over that same period. We are prepared to play our part. Not only does RWE have the necessary expertise, it also has a number of favourably situated sites. That said, we can only make these investments if the necessary incentives are provided for, which could include capacity payments for example. New assets would then receive remuneration for being online and thus ensuring security of supply. This would ensure economic viability even with low capacity utilisation. Furthermore, conditions must be in place for us to operate our gas-fired power stations using green hydrogen over the longer term. We are planning the necessary retrofits for our existing gas-fired assets and have already finalised the relevant strategies. Power plants that do not run on hydrogen, could separate CO_2 from the flue gas and store it underground. For political reasons, however, this option can only be considered outside Germany for the time being.

- **Hydrogen.** The hydrogen economy is a crucial part of the energy transition and a perfect complement to our business model. We want to be active along the entire value chain, from green electricity generation and hydrogen production by electrolysis to hydrogen trading and storage and the conclusion of individual supply agreements with major industrial customers. Our regional focus in these activities is on Germany, the United Kingdom and the Netherlands. In recent years, we have forged a range of partnerships with businesses and research institutes seeking to work closely with us to develop a comprehensive hydrogen infrastructure. Noteworthy projects include the German initiatives GET H2 and AquaVentus, the Dutch projects Eemshydrogen and NortH2 and our partnership with Shell, which was formed at the end of 2021. At present, we are participating in around 30 hydrogen projects. By 2030, we intend on developing electrolysis capacities totalling 2 GW. We are designing facilities that allow for industrial-scale production. Examples of this include the three electrolysers slated to start production at the Lingen power station in the period from 2024 to 2026. With capacities of 100 MW each, these units will be among the largest of their kind in Europe. More information on our hydrogen strategy and our major projects can be found at www.rwe.com/hydrogen.

Energy trading and customer solutions. In addition to power generation, we are also focused on energy trading as one of our core competencies. It is managed by the Group company RWE Supply & Trading, which acts as our window into the energy markets. Around 200 RWE specialists trade electricity, fuel and emission rights around the clock. RWE Supply & Trading also markets the electricity from our power stations and procures the fuel and emission allowances required to produce it. The objective here is to limit price risks. On top of that, the company is in charge of the commercial optimisation of our power plant dispatch, the earnings of which go to our generation companies. Companies outside of the RWE Group can also benefit from the expertise of our trading subsidiary. They are offered a wide range of products and services, running the gamut from traditional energy supply contracts and comprehensive energy management solutions to sophisticated risk management concepts.

Above and beyond this, RWE Supply & Trading has established itself as an intermediary for pipeline gas and liquefied natural gas (LNG). Thus, in addition to meeting the needs of our Group companies, it also serves numerous industrial customers around the world. To this end, it enters into long-term supply agreements with producers, organises gas transportation by booking pipelines or LNG tankers and optimises the timing of deliveries using leased gas storage facilities. In this regard, the greater the size and diversification of the procurement and supply portfolios, the better the chances to commercially optimise them. The gas business also opens up opportunities for activities in the field of hydrogen. One example in this regard is the long-term partnership between RWE Supply & Trading and Australian LNG producer Woodside. We intend to purchase liquefied natural gas from Woodside as of 2025 and collaborate on investigating the potential to market hydrogen to RWE's customer base in Asia and Europe. Another example that relates to the development of the hydrogen economy is the planned Brunsbüttel LNG terminal near Hamburg, which RWE Supply & Trading is helping to realise. In future, green ammonia could also be imported to Germany via the terminal and converted into hydrogen in the port area.

Socially-acceptable phaseout of coal-fired generation. Our growth programme is flanked by a rapid coal exit. In the United Kingdom and Germany, we already phased out hard-coal-fired power generation in 2019 and 2021, respectively. We are currently only using hard coal in our Dutch stations Amer 9 and Eemshaven, where biomass is co-fired. From 2025 and 2030, respectively, we will no longer be using hard coal in these plants. For RWE, the phaseout of lignite, which is produced and turned into electricity in the Rhenish mining region to the west of Cologne, is much more complex and difficult in terms of the social ramifications. In early 2022, we still operated lignite-fired power stations with a total capacity of 7.6 GW, a third less than in 2015. This year, we will also be shutting down another 1.6 GW of capacity. Pursuant to current legislation, the last unit will go offline in 2038. However, the new German government has already announced that they are looking to accelerate the phaseout of coal in Germany and are working towards a deadline of 2030.

RWE supports the Federal government's climate protection ambitions. If it were possible to provide for the necessary framework conditions in pursuit of accelerating the coal exit, we would be able to progress more quickly on our path of reducing emissions. At the same time, this would also be associated with significant additional financial burdens for us. The present legal phaseout roadmap already presents us with tremendous challenges – from operational, financial and social standpoints. At the end of 2019, before the Coal Phaseout Act entered into force, some 10,000 people were employed in the Rhenish mining region; in 2030 less than 4,000 will work there. Although the personnel affected by job losses will receive state support, such as an adjustment allowance, we will also pay for redundancy measures ourselves. In August 2020, we concluded the 'Coal Exit' tariff agreement with ver.di, Germany's United Services Trade Union, and IG BCE, the country's Industrial Mining, Chemicals and Energy Trade Union. It defines what benefits RWE will provide above and beyond the state-guaranteed payments. Early retirement plans will apply to most of those affected. Younger employees will be reassigned to new positions within the Group, or – where that is not possible – will be offered severance packages.

Our responsibility to the people in the Rhenish coal region does not end at the factory gates: we want to do our part to ensure that the region remains structurally resilient and integrated within the energy sector, despite the coal phaseout. By 2030, we want to invest €4 billion in renewables, gas-fired power plants and electrolysers in North Rhine-Westphalia, with no less than 500 MW of wind and solar capacities being built in the Rhenish region alone. Some recultivated land is very well suited for these plans, and three RWE wind farms are already located there. We also want to further develop our power plant sites. For example, there are plans to build an innovation, technology and commercial park in Frimmersdorf and the surrounding area. At the Weisweiler site, within the scope of an EU project, we are looking into the possibility of capturing geothermal heat, which could be fed into the district heating network of the greater Aachen area. In addition, we are researching power-to-gas technology at the Niederaussem Innovation Centre. This is where, since 2013, we have used hydrogen and carbon dioxide made by electrolysis to produce fuel and feedstock for the chemical industry for research purposes.

Nuclear power: Our focus is on safe and efficient decommissioning. Germany's phaseout of nuclear power will soon be completed. RWE's Gundremmingen C power plant and two units belonging to other companies were taken offline at the end of 2021, leaving just three regional sites to produce electricity, of which one is run by RWE. At the end of 2022, these will also cease generation. After that, our nuclear power operations will be focused exclusively on the safe and efficient decommissioning of the plants. Moreover, we are making efforts to ensure that the sites continue to be used for energy-related purposes, as illustrated by the example of the grid stabilisation unit at Biblis.

RWE AG's management system. Our management system is geared towards sustainable growth that creates value and is based on RWE's strategic guidelines. To determine these guidelines, we analyse the market environment and competitiveness of our segment activities, identify growth potential and weigh up the opportunities and risks involved. Which projects are ultimately realised is at the discretion of the management of the Group company concerned. Larger investments are approved by the Executive Board of RWE AG. It also determines the allocation of capital, the long-term portfolio development and the type of financing.

To operationally manage the Group's activities, RWE AG deploys a groupwide planning and controlling system, which ensures that resources are used efficiently, and provides timely, detailed insight into the current and prospective development of the company's assets, financial position and net earnings. Based on the targets set by the Executive Board and management's expectations regarding the development of the business, once a year we formulate our medium-term and long-term plans, in which we forecast the development of key financial indicators. The medium-term plan contains the budget figures for the following fiscal year and planned figures for the two years thereafter. The Executive Board submits the plan to the Supervisory Board, which reviews and approves it. During the respective current fiscal year, we produce internal forecasts based on the budget. Members of the Executive Board of RWE AG and the main operating companies meet regularly to analyse the interim and annual financial statements and update the forecasts. In the event that the forecast figures deviate significantly from the budget figures during a fiscal year, we analyse the underlying reasons and take countermeasures if necessary. We also immediately notify the capital market if published forecasts need to be modified.

Key earnings indicators. Among other things, we use key earnings indicators such as EBITDA, EBIT and net income to manage our business; however, we adjust these indicators by removing special items. EBITDA is defined as earnings before interest, taxes, depreciation and amortisation. In order to improve its explanatory power in relation to the development of ordinary activities, we remove non-operating or aperiodic effects and present these in the non-operating result. This applies to capital gains or losses, temporary effects from the fair valuation of derivatives, goodwill impairments and other material special items. Subtracting operating depreciation and amortisation from adjusted EBITDA yields adjusted EBIT. Adjusted net income is another key operating indicator for us. We calculate it by correcting net income to exclude the non-operating result, and material special items in the financial result. Instead of the actual tax rate, which reflects one-off effects, we apply the budgeted rates of 15 % (until 2022) and 20 % (from 2023), which we have derived in consideration of the earnings in our core markets, the tax rates applicable there and the utilisation of loss carryforwards.

Expected minimum return on investments. We primarily use the internal rate of return (IRR) to evaluate the attractiveness of investment projects. We only undertake projects if – at the time of the investment decision – the expected IRR stays within a defined minimum threshold, which is determined on the basis of the weighted average cost of capital (WACC). The WACC is augmented with project-specific risk premiums, which usually range from 100 to 300 basis points, depending on the technology or region. Using this approach, we have set lower limits which vary from 5 % to 9 % for offshore wind projects. Minimum returns of 4 % to 7 % are applied to projects involving the construction of onshore wind farms, solar assets or batteries in Europe or the USA. The thresholds for new gas-fired power plants or hydrogen activities are set between 6 % and 11 %.

Safeguarding our financial strength and creditworthiness. The RWE Group's financial position is analysed using cash flows from operating activities, amongst other things. We also attach special importance to the development of free cash flow, which is derived by deducting capital expenditure from cash flows from operating activities and adding proceeds from divestments and asset disposals. Net debt is another indicator of RWE's financial strength: it is calculated by adding provisions for pensions and similar obligations, for the dismantling of wind farms and for nuclear waste management to RWE's net financial position. Conversely, mining provisions, our 15 % stake in E.ON and compensation for the German lignite exit, as confirmed by the German government, are disregarded.

In managing our indebtedness, we orientate ourselves towards the leverage factor, i. e. the ratio of net debt to adjusted EBITDA in our core business. Given that we recorded positive net assets rather than net debt as of 31 December 2021, the leverage factor was below zero. For the coming years, we expect net debt to trend upward, as we will partially finance our growth investments with debt capital. Over the medium term, however the leverage factor should not exceed 3.0, as we wish to maintain our financial flexibility. For the period after 2025 we believe that an upper limit of 3.5 is reasonable, as the expansion of renewables will enhance our financial stability and our political risk exposure will decline with the gradual phaseout of coal-based power generation.

Attractive dividend of at least €0.90 per share. Despite the significant funds needed for capital expenditure, RWE will remain an attractive dividend stock in the future. We will propose a dividend of €0.90 per share to the Annual General Meeting on 28 April 2022 for fiscal 2021. This will also constitute the minimum payout for the coming years. Over the long term, we plan to distribute 50 % to 60 % of adjusted net income to our shareholders.

2.2 Innovation

The success of the energy transition doesn't simply hinge on the dedication with which we implement it. It is also the degree of innovation deployed to fuel these strategies that is decisive. Whether it's expanding renewable energy capacities, transitioning to a hydrogen economy or opting for environmentally friendly carbon recycling methods, technical challenges lurk behind every turn, waiting for solutions to address them. In 2021, RWE worked on close to 200 research and development projects in collaboration with partners from industry and science. All these projects share one common goal: to overcome hurdles on the road to an environmentally friendly, stable and sustainable energy world.

Solutions for a sustainable energy system. RWE is innovative in many ways. We are motivated both by a desire to remain competitive in an ever-changing environment as well as a passion to be a driving force of this change. Our innovation projects are dedicated to developing solutions that help us advance the utilisation of renewable energy, expand electricity storage and become involved in large-scale hydrogen production. We also want to help build a circular economy in which sensible use is made of carbon dioxide.

Our more than 964 patents and patent applications, based on about 241 inventions, speak volumes about RWE's capability for innovation. The Group's various activities in the field of research and development (R&D) are also testimony for this expertise. Last year, we worked on 196 R&D projects. Around 400 RWE employees were solely dedicated to these activities or contributed to them in addition to performing their normal tasks. Such ventures often entail working with other companies or research institutions and we could not implement many of these projects without their valuable insights. These collaborations are also financially advantageous, as costs are shouldered by many stakeholders. This limits operating R&D spending, which in 2021 amounted to €22 million (previous year: €20 million).

On the following pages, we present a small selection of our current innovation projects. They illustrate the breadth and variety of the challenges we face in light of the energy transition and demonstrate the creativity with which we are tackling these issues.

How we are using new technologies for offshore wind expansion. There are currently 170 offshore wind farms operating around the world. All are located in shallow coastal waters with turbines firmly anchored to the seabed. Coastal regions with greater water depths have – until recently – been off-limits to offshore wind farms. After all, the deeper the water, the more expensive the foundation. Wind power projects generally become uneconomical at depths of over 60 metres. According to WindEurope, the European wind industry association, in about 80% of all coastal sea areas where wind speeds are suitable for electricity generation, the ocean is simply too deep for conventional foundation designs. However, in order to harness the potential of wind energy more effectively, companies are turning their efforts to concepts for floating wind turbines. The units are mounted on floating platforms made of steel or concrete, which are secured to the seabed using mooring lines and anchors. This opens up the possibility of deploying wind turbines in deeper waters, e.g. coastal areas in Asia, the Americas and the Mediterranean region as well as in parts of the North Sea. RWE has taken a leading role in the development of these new foundations. We are currently involved in three demonstration projects, researching the pros and cons of the various floating foundations. Our aim is to identify which technology is the most viable for the respective wind power initiative.

The **DemoSATH** project is a partnership with Spanish company Saitec Offshore Technologies that aims to develop and construct a floating platform for a 2 MW wind turbine. The project relies on Saitec's SATH (swinging around twin hull) technology, which is a catamaran-like floating platform made of tensioned concrete elements. This design allows the floating platform to rotate freely around a single point of mooring, depending on wind

and wave directions. We have commissioned a prototype, DemoSATH, which will be assembled on a quayside in the port of Bilbao, in northern Spain. Once complete, tugs will move the floating wind turbine to a mooring point three kilometres from the Basque coast, where it will start generating electricity before the end of the year.

The **New England Aqua Ventus** project is a collaboration with the University of Maine and Diamond Offshore Wind, a subsidiary of Mitsubishi Corporation. The unit will feature a technology developed by the University of Maine, where the floating platform consists of modular concrete components with glued joints – a construction technique seen in bridges. We aim to have built an 11 MW prototype by 2024, which will be deployed in the Gulf of Maine on the eastern coast of the USA. This testing process will provide us with valuable technical learnings, as well as helping us to understand how best to limit potential for friction between the plant and local fisheries.

TetraSpar Demonstrator is our most advanced project. It is a collaboration with Shell, Japanese utility TEPCO and Danish company Stiesdal Offshore Technologies, and involves a floating platform comprising two sections that are cost-effectively prefabricated across various locations. A keel below the platform is used to keep the steel top section stable in the water – similar to a ship. We assembled the sections in the Port of Grenaa in Denmark. A 3.6 MW wind turbine was then mounted on the floating platform. In summer 2021, we towed the structure to a test site 10 kilometres off the Norwegian coast, near Stavanger. Once on site, it was attached to the seabed 200 metres below using mooring lines and anchor chains, before being connected to the Norwegian power grid. The floating turbine has been operating since November. We have fitted a number of sensors to measure whether real-life performance matches up to forecasts created using calculations and tests.

How we are improving the sustainability of wind power facilities. In essence, a wind turbine consists of a tower, a nacelle and three rotor blades. To ensure it doesn't just produce green electricity but is also entirely environmentally friendly, a turbine should be completely recyclable once it reaches the end of its service life. Although tried-and-tested recycling methods for the tower and components of the nacelle already exist, it's a different story when it comes to the rotor blades. These components are made using composite materials that are almost impossible to separate, due to the glass fibre-reinforced epoxy resin that becomes completely solid once hardened. In a ground-breaking project, we are now helping to identify end-to-end recycling solutions at our Kaskasi wind farm, off the coast of Heligoland. A number of the 38 wind turbines being erected there this year will be fitted with special recyclable rotor blades. Our supplier Siemens Gamesa is manufacturing them using a new type of resin with a chemical structure that allows for the different materials to be separated, preserving their properties. This makes it possible to reuse the individual components once the rotor blade has reached the end of its lifetime. We will test these sustainable rotor blades in real-life settings over the coming years. Should they prove effective, then resin solutions of this nature could become standard for future RWE wind farms.

How we are forging ahead with green hydrogen production. Zero-carbon hydrogen has the potential to be used for multiple processes within the context of the energy transition. Not only is it suitable for storing electricity, it could also be used to decarbonise industrial processes and modes of transport that either cannot be electrified or where electrification has proven to be prohibitively expensive or arduous. Most of our hydrogen projects focus on decarbonising industrial applications. RWE is working with partners on around 30 such initiatives with a geographical focus on Germany, the Netherlands and the United Kingdom. Several have a good chance of being classified as 'Important Projects of Common European Interest' (IPCEI) by the EU. This means they would qualify for national subsidies. Our HyTechHafen Rostock project as well as parts of the GET H2 and AquaVentus collaborative initiatives backed by RWE all made it onto the shortlist of the Federal Ministry of Economics. In the following pages, we will take a closer look at the undertakings.

GET H2 was launched in 2019, making it one of the first hydrogen initiatives involving several industries in Germany. A host of companies and scientific institutions including RWE, BASF, BP, Evonik, Nowega, OGE and ThyssenGas are participating in the project. GET H2 spans the entire hydrogen value chain, from production and transport to industrial usage. The long-term objective is to build a nationwide hydrogen infrastructure in Germany. As part of the initiative, we joined forces with four partners at our Lingen power plant in 2020 to launch the GET H2 Nukleus project. By 2026, three electrolysis plants are to be built on site, each with a capacity of 100 MW. The aim is to use electrolysis technology on a larger scale to bring it to series production and unlock cost cutting potential. The green hydrogen produced in Lingen will be transported using repurposed natural gas pipelines to the northern Ruhr region, where it will be used in the BP refinery in Gelsenkirchen. This would form the heart of the public hydrogen infrastructure. The IPCEI funding application also envisages that the hydrogen grid be expanded towards Salzgitter, Duisburg, and the Netherlands. Furthermore, the first German H_2 cavern storage facility is expected to be connected to the hydrogen grid in Gronau-Epe.

Another initiative with substantial potential is **AquaVentus**. The idea behind it is to produce hydrogen at sea using electricity from offshore wind farms and transport it via pipelines to demand hotspots on land. The island of Heligoland will act as a hub. In a first step, the plan is to transport the hydrogen there via pipelines to cover demand on the island itself. Once production volumes increase, hydrogen in ever greater volumes will then be forwarded to the mainland, initially by tanker and later via a collector pipeline. Our AquaVentus partners include the island of Heligoland, Gascade, Gasunie, Shell and Siemens. A pilot project is being conducted to build two 14 MW wind turbines in the coastal waters of Heligoland and integrate an electrolyser in each of their bases. If the project stays on schedule, the turbines could become operational in 2026. But this is only the beginning. By 2035, electrolysers with a total capacity of 10 GW could be installed in the North Sea. This would be enough to produce up to 1 million metric tons of green hydrogen every year.

Our **HyTechHafen Rostock** project is dedicated to harnessing the potentials of the port of Rostock as a promising location for the hydrogen economy, not least due to its industrial infrastructure. Together with our partners, port operator Rostock Port and energy providers RheinEnergie and EnBW, we will initially focus on constructing 100 MW of electrolysis capacity. The unit will be built next to a power plant operated by RheinEnergie and EnBW in the vicinity of the port and the green hydrogen generated on site will be delivered to local industrial customers via pipelines. Going forward, the infrastructure could also be used for road, rail and sea traffic. If the project stays on schedule and the framework is suitable, the port area could one day boast up to 1 GW of electrolysis capacity, as the site grows to become a hydrogen hub.

How we are preparing to generate electricity with green hydrogen. The more we rely on wind and solar power for our electricity supply, the more crucial it will be to have ample energy storage facilities to ensure a reliable, weather-independent supply of electricity that satisfies demand. Battery-based solutions and green hydrogen for electricity generation are promising concepts. This is why we want to build flexible gas-fired power stations with a total capacity of 2 GW as part of our 'Growing Green' strategy. In the long-term, the plants will run on green hydrogen, once supplies are sufficient. To improve the technical conditions for this, we have joined forces with one of the world's leading turbine manufacturers, Kawasaki Heavy Industries. The aim of this partnership is to trial a hydrogen-capable gas turbine. It is due to be built at our Lingen power plant, have a capacity of 34 MW and become operational in 2024. The turbine will be the largest gas turbine in the world that can be operated using 100 % H_2. It would also be possible to use the turbine to co-fire natural gas and hydrogen in any desired ratio. This flexibility is a massive plus, for as long as the hydrogen industry is in its infancy, the average available volume of H_2 will probably not suffice to exploit the turbine's capacity to the desired extent.

What we are doing to support carbon-neutral economic cycles. Many experts believe that human intervention in the climate can only be limited effectively if the global economic system successfully makes the shift to closed carbon cycles. Ideally, only as much carbon enters the atmosphere, by way of greenhouse gas emissions such as CO_2 or methane, as is bound by other processes at the same time. The transition to a circular carbon economy is a Herculean task, that hinges on innovation. For more than ten years now, RWE has been developing techniques that use CO_2 in an ecologically meaningful way. Within the context of this work, we collaborate with universities and research institutes, with whom we seek to contribute to the creation of the necessary technical and systemic conditions for carbon-neutral economic cycles.

A key process in transitioning to the circular carbon economy is thermal conversion. Here, heat is applied to carbonaceous materials, converting them into synthesis gas, which largely consists of hydrogen and carbon and can be used as a basic raw material in the production of fuels, plastics and fine chemicals. At the RWE Niederaussem Innovation Centre, we are dedicated to developing a high-temperature process to thermally convert different materials, and thus reuse basic resources in manufacturing. We have partnered with the Fraunhofer Institute for Environmental, Safety and Energy Technology (Fraunhofer UMSICHT) and Bochum Ruhr University for this purpose.

In mid-2021, we took a **multi-fuel-conversion plant** online in Niederaussem, which we intend to use to test whether phosphorus can be reclaimed from sewage sludge using high-temperature conversion. The process works as follows: by heating the sewage sludge to up to 1,500 degrees Celsius, we achieve gasification of the phosphorus, hydrogen and carbon contained therein. The phosphorus can then be separated from this gas and used to produce fertiliser, for example. Additional process steps can then be taken to convert the remaining gas mixture of hydrogen and carbon back into chemical raw materials or fuels. We should have the first test results back by late-2022. However, the potential of the multi-fuel-conversion technology is by no means likely to be exhausted. In future, we also want to apply this technology to other waste streams and biomass.

Another project dedicated to the use of carbonaceous waste materials launched in June 2021. The **NRW-Revier-Power-to-BioJetFuel** study we are conducting together with BP Europe and the Jülich Research Centre is assessing the prerequisites for manufacturing carbon-neutral aviation fuel on an industrial scale. This research focuses on questions such as: 'What kind of regulatory framework is necessary to ensure the economic viability of plans to operate a demonstration plant for deriving synthetic fuels from alternative carbon sources (e. g. sewage sludge, biomass or power plant flue gas) at an RWE site in the Rhenish region?' We are also determining to what extent the resulting fuels could be further processed and used for industry in the Ruhr region. If the results are promising, project development for the construction of a demonstration plant could start as early as this year.

2.3 Business environment

All signs point to more stringent climate protection measures in Europe. Last year, the EU upped its greenhouse gas reduction goal for 2030 from 40 % to 55 %. The baseline year is 1990. Germany has set its sights even higher: the largest economy in Europe has increased its target from 55 % to 65 %. We welcome this change, as it encourages the rapid expansion of renewable energy. The economic environment also presents us with opportunities. Soaring natural gas and emission allowance prices have caused prices on electricity markets to skyrocket. This favours climate-friendly generation assets in particular. Given that most of our power production had already been sold forward, the increased price levels had little impact on our earnings in 2021. In 2022, however, we expect margins to improve notably.

Regulatory environment

Emission reduction target for 2030: EU adopts stricter benchmark of 55 %. The European climate law came into force on 29 July 2021, under which the EU and its member states are obligated to decrease their net greenhouse gas emissions to zero by 2050. There had been some initial disagreement, in particular with regard to the emission reduction goal for 2030. The Commission had suggested an increase from 40 % to 55 % versus 1990. The European Council (Council of Ministers) had also voted in favour of this change, while the European Parliament had backed a reduction of as much as 60 %. Following a number of trilateral meetings, representatives of the individual institutions ultimately agreed on 55 %. They also approved the formation of a panel known as the European Scientific Advisory Board on Climate Change. The 15 senior scientific experts on this advisory board will be responsible for delivering a greenhouse gas budget, which can be used to determine an intermediate target for 2040.

The European Commission specified the instruments that would be necessary to achieve its new climate protection target for 2030 in the 'Fit for 55' legislative package. The package was made public on 14 July 2021, and includes proposals for a number of measures that will, for example, improve energy efficiency, cut carbon emissions in transport, construction and agriculture, bring the taxation of energy products in line with current objectives, expand natural carbon sinks and cushion the social implications of climate protection. Renewables are due to be scaled up rapidly and should cover at least 40 % of primary energy consumption in the EU by 2030. A goal which, until now, had been set at 32 %. Furthermore, the Commission wants to adapt the EU Emissions Trading System (ETS). The aim here is to decrease the total number of emission allowances placed on the market. At present, companies in the energy, industry and aviation sectors are participating in the ETS. In future, there is likely to be a similar system for heating and all other transport. In addition, the Commission plans to introduce a carbon border adjustment mechanism to ensure products manufactured in the EU are not subjected to higher carbon prices than imports. This is to prevent domestic companies suffering a competitive disadvantage and thus relocating their production sites to countries outside the EU. The 'Fit for 55' package is being debated by member states and in the European Parliament. Draft laws have already been submitted for most of the legislative initiatives. However, Parliament and the Council of Ministers are expected to go through a lengthy process to establish their positions and reach an agreement.

EU taxonomy: Commission defines conditions for 'green' economic activity. In a delegated act published in mid-2021, the European Commission defined technical screening criteria to determine whether economic activity is mitigating or adapting to climate change. Most renewable energy assets are likely to meet the criteria. The act formalises the provisions of the Taxonomy Regulation, introduced by the European Parliament and the Council of Ministers in mid-2020. The Regulation is designed as a tool to help determine when to classify economic activity as sustainable. The EU is taking this stance to improve transparency for investors and channel capital flows into environmentally friendly activities.

To be recognised as taxonomy-aligned, an economic activity must contribute to at least one of the following environmental objectives, without significantly harming any of the others: (1) climate change mitigation, (2) climate change adaptation, (3) sustainable use and protection of water and marine resources, (4) transition to a circular economy, (5) pollution prevention and control and (6) protection and restoration of biodiversity and ecosystems. The Commission's first delegated act was concerned with defining the criteria for the first two objectives, with the remaining targets to be delivered over the course of the coming year.

In February 2022, the Commission passed a supplementary delegated act which formalises the taxonomy criteria for new gas and nuclear power stations. It states that gas-fired power plants which are approved before 2030, can be classed as sustainable even if they exceed the upper emissions limit of 100 g CO_2 / kWh, provided they replace more carbon-intensive assets and are fully operated using climate-friendly gases like hydrogen no later than 2036. There will also be a cap on CO_2 emissions. The act mentions two upper limits, of which one has to be complied with, namely 270 g CO_2 / kWh or – alternatively – 550 kg CO_2 / kW as an annual average over a period of 20 years. The standards imposed are ambitious, but can be met given the right framework conditions. These include the rapid expansion of hydrogen infrastructure. The delegated act does not require formal approval from the European Parliament or Council of Ministers. However, both authorities have veto powers: they can reject an act entirely within six months of its passage by the Commission.

The Taxonomy Regulation has also introduced new transparency obligations. Players on the financial market, e. g. investment funds that label a financial product as environmentally sustainable, now have to disclose the share of green assets in their portfolio. Listed companies will also have to observe stricter disclosure requirements. Under the new requirements, businesses that are already obliged to prepare non-financial reports will now have to disclose what percentage of their capital expenditure, revenue and operational expenditure are classed as sustainable in accordance with EU taxonomy regulations. This obligation applies to all annual reports published on or after 1 January 2022.

In the first year of reporting, companies are allowed to follow a simplified process, whereby disclosure is limited to whether taxonomy criteria exist for a given economic activity and not whether the applicable conditions for said activity have been met. Activities for which taxonomy criteria exist are classed as 'taxonomy-eligible'. Up to 88 % of our capital expenditure in 2021 met this requirement. It should be noted that taxonomy-relevant capital expenditure (€6.0 billion) is not defined in the same way as the figure shown on pages 58 et seq. (€3.8 billion) and also cover, for example, additions from mergers of companies. In the past year, 18 % of revenue (€24.5 billion) was taxonomy-eligible along with 25 % of operational expenditure (€1.6 billion). From 1 January 2023, we will report what percentage of our economic activities actually meet the technical screening criteria and is thus considered 'taxonomy-aligned'. We have set ourselves the target of ensuring that more than 90 % of our investments are dedicated to such activities in future.

New climate law: Germany seeks to become carbon neutral by 2045. On 24 June 2021, the German Upper House passed a reform of the climate law, imposing a stricter greenhouse gas reduction target, which was greenlit by the Lower House one day later. Germany has now set its sights firmly on being carbon neutral by 2045 – five years ahead of the climate law's original schedule, drawn up in 2019. By 2030, greenhouse gas emissions are to be reduced by 65 % compared to 1990. The original target was 55 %. It is also the first time that an emission reduction target for 2040 has been set: it amounts to 88 %. The law also specifies targets for individual sectors, with the energy industry shouldering the majority of additional emissions cuts: in 2030, the sector is limited to emitting 108 million metric tons of carbon. The original emissions threshold had been set at 175 million metric tons.

These legislative amendments were seen as a reaction to a decision handed down by the German Constitutional Court and published in April 2021. The judges in Karlsruhe had found the Climate Protection Act of 2019 to be insufficient and had called for more concrete regulations for the period after 2030. They highlighted the enormous burden that irreversibly delaying considerable emission reductions would place on future generations.

How exactly these additional emission reductions will be achieved is now down to the new government coalition between Germany's Social Democrats, Greens and Free Democrats. A range of measures have already been announced, such as further expediting the phaseout of coal, which is ideally to be achieved by 2030. The German government is also looking to move up a gear in other areas, including expanding renewable capacities and scaling up the hydrogen economy.

Germany imposes stricter emissions limits for air pollutants. At the eleventh hour, Germany transposed the new EU requirements for limiting air pollutant emissions from power plants into national law. Midway through 2021, an amendment to the 13th German Emission Control Act and new co-firing requirements in the 17th German Emission Control Act entered into force, introducing more stringent limits on nitrogen oxides and mercury, in particular. To ensure compliance, we have optimised the nitrogen oxide reduction processes in all our lignite-fired power plants and equipped our three most state-of-the-art units with additional mercury removal systems. Gas-fired stations are also affected by the stricter regulations. Existing plants and those under construction are marginally compliant with the current nitrogen oxide thresholds, without having to rely on retrofits. However, future power stations must be fitted with catalytic exhaust gas purification systems, which will increase costs significantly.

German government establishes new system for nuclear phaseout compensation. The 18th Amendment to the German Nuclear Energy Act entered into force on 31 October 2021. It governs remuneration for German nuclear power plant operators impacted by the accelerated nuclear phaseout. RWE was entitled to €880 million in compensation. We received the funds at the end of November. It had been necessary to readdress the issue of remuneration in light of the German Constitutional Court's findings that the regulations drawn up in 2018 had never entered into force and were, moreover, unconstitutional. We provided additional context on this matter on page 39 of the 2020 Annual Report. The new law is flanked by an associated public-law contract between the Federal Republic of Germany and the power plant operators, which was signed by the contracting parties in March 2021.

United Kingdom launches national emissions trading system. The new British trading system for carbon emission allowances entered into force in early 2021. On 19 May, the first 6.1 million certificates (UK Allowances, or UKAs for short) were auctioned off, each entitling the holder to emit one metric ton of carbon. At £44 (€51), the price was twice as high as the lower regulatory limit. Additional auctions followed every two weeks. In 2021, around 83 million emission allowances were auctioned off in total, and around 38 million were allocated free of charge. The UK sought to establish its own emissions trading system as a result of leaving the EU. Britain has not participated in European emissions trading since the end of 2020. Until now, both systems have been kept strictly separate, i. e. it has not been possible to use EU Allowances (EUAs) in the UK nor has using UKAs been permissible in the EU. This can give rise to price discrepancies (see page 38). In addition to a number of renewable energy assets, our UK power generation portfolio includes ten gas-fired power plants with a total capacity of 7 GW. The carbon emitted by these facilities amounted to 12.8 million metric tons in 2021.

Netherlands limits use of coal in power plants. The Dutch parliament and senate have passed an amendment to the country's legislation on the Coal Phaseout Act, which places additional restrictions on the use of coal for electricity generation. Under the new law, annual CO_2 emissions from coal use may in future not exceed 35 % of the level that is theoretically possible in the respective plant. The regulation will apply from 2022 to 2024. Plant operators are to be compensated, however this is yet to be approved under state aid law by the EU Commission. RWE operates two hard coal power plants in the Netherlands, Amer 9 and Eemshaven. Amer 9 runs on 80 % biomass and is therefore not affected by the upper limit. Eemshaven, on the other hand, will be severely impacted by the law as it only uses 15 % biomass.

Poland establishes funding framework for offshore wind. The Polish government has finalised the legal framework for offshore wind farm subsidies, with the Polish parliament passing a corresponding law in January 2021. Poland intends to increase the share of renewables in its power generation portfolio to 32 % in 2030; in 2020 this figure stood at 16 %. At the moment, there are no wind farms off the coast of Poland. However, turbines with a total capacity of 10.9 GW should be in development, under construction or in operation by as early as 2027. Wind farms with a total capacity of 5.9 GW will be able to take part in the first round of subsidies. Plant operators will be awarded contracts for difference which guarantee a fixed payment for 100,000 full load hours. The maximum subsidy period is set at 25 years. RWE succeeded in securing a contract of this nature for its F. E. W. Baltic II project, on which we report in detail on page 41.

The US government plans to extend tax benefits for renewables. Shortly after his inauguration, US president Joe Biden presented an ambitious investment package to subsidise infrastructure, social care and climate protection initiatives, which envisages an extension to renewables tax benefits. New power stations are to continue to receive Production Tax Credits (PTCs) or Investment Tax Credits (ITCs). The aim is to grant PTCs in the amount of US$25 per MWh for a period of ten years, while ITCs are to account for up to 30 % of the investment costs. In future, it should be possible to subsidise hydrogen and electricity storage projects in addition to wind power and solar systems.

Before it is enshrined in law, the investment package must first pass through the Senate and the House of Representatives. The Democrats hold the necessary majorities in both houses. In November, the House of Representatives greenlit the proposal. One single Democratic senator, however, has so far prevented it from passing through the Senate. Points of contention include the overall cost of the package and individual social measures. Commentators expect a new package to be tabled, which includes tax incentives for investing in climate protection and is capable of achieving a majority in both houses. However, time is of the essence here given the pending Senate elections in November 2022. Should the Democrats lose their narrow majority, then the Republicans could block legislative proposals from the US government.

Market environment

Strong economic output in all of RWE's core markets. In 2021, global output made a strong recovery, following the economic downturn witnessed during the pandemic. Initial estimates put increased economic performance at 6 % year on year. While the USA saw a similar level of growth, the Eurozone fell behind by approximately one percentage point. In Germany and the Netherlands, our two most important markets within the currency union, current data suggests a rise of 3 % and 5 %, respectively. The UK economy is centred around the service industry and was therefore hit much harder by the pandemic. However, figures suggest the nation's economy could have since rebounded by 7 %. The global economic recovery was reflected in the significant rise in demand for commodities, which led to a notable increase in prices. There were also supply shortages and project delays, which have only affected RWE to a minimal extent so far.

German power consumption up by 3 % versus prior year. In the past year, demand for electricity has risen across all RWE markets. This was largely attributable to the economic upswing. Preliminary data from the German Association of Energy and Water Industries (BDEW) indicates that German electricity consumption was up 3 % on 2020. For the USA, experts estimate a rise of similar proportions, while the Netherlands (1 %) and the UK (2 %), will most likely have fallen short of this mark.

Low wind speeds across the majority of RWE locations. Utilisation and profitability of renewables assets are largely weather-dependent. This is why we monitor wind speeds carefully. In 2021, these were lower than the long-term average across most of our production sites in Europe and North America. A year-on-year comparison also revealed an unfavourable development: most RWE wind farms were underutilised versus 2020 due to weather conditions. Only pockets of southern Europe were able to benefit from higher wind volumes. The utilisation of run-of-river power stations depends on precipitation and melt water volumes. In Germany, where most of the RWE Group's hydroelectric plants are located, these volumes were a little below the long-term average. They were, however, higher than in 2020.

Average RWE wind farm utilisation	Onshore		Offshore	
%	2021	2020	2021	2020
Germany	17	20	35	40
United Kingdom	27	34	35	42
Netherlands	30	30	–	–
Poland	27	29	–	–
Spain	24	23	–	–
Italy	24	21	–	–
Sweden	29	33	47	56
USA	32	33	–	–

Natural gas prices skyrocket. The utilisation and earnings of our conventional power plants are heavily dependent on how electricity, fuel and emission allowance markets perform. Natural gas, our most important energy source for producing electricity, became increasingly expensive in the year under review. In the first quarter of 2021, quotations at the Dutch Title Transfer Facility (TTF), Continental Europe's lead market, were still largely priced between €15 / MWh and €20 / MWh, but by the fourth quarter they intermittently exceeded levels far above €100. In 2021, the average spot price of €48 / MWh was more than five times as high as in 2020 (€9 / MWh). This drastic price hike for natural gas is partially attributable to increased demand for energy due to the global economic upturn. In addition, colder weather across large parts of Europe meant that more gas was needed for heating compared to 2020. Geopolitical tensions and uncertainty surrounding the approval of the Russian-German Nord Stream 2 gas pipeline contributed to the price increase. Due to the aforementioned factors, forward quotations rose considerably. The 2022 forward hit a record high of well above €100 / MWh in December. On average, it was quoted at €34 / MWh. By way of comparison, in the previous year the 2021 TTF forward cost €13 / MWh on average.

Increased demand from China boosts hard coal prices. Prices for hard coal used in power plants (steam coal) also rose notably in the year under review. Deliveries to ARA ports (ARA = Amsterdam, Rotterdam, Antwerp) including freight and insurance were settled for an average of US$122 / metric ton (€104) in 2021, as opposed to US$50 / metric ton the previous year. This notable rise can, in part, be traced back to increased demand from China, where the local economy recovered quickly from the economic fallout of the pandemic. The same trend was also reflected in the development of hard coal forward prices: in the year under review, the 2022 forward (API 2 Index) was quoted at an average of US$95 / metric ton (€81). This is US$37 more than was paid for the 2021 forward in 2020.

CO_2 emissions trading: More ambitious EU climate protection target pushes prices up. An increasingly important price factor for fossil fuel-fired power plants is the procurement of CO_2 emission allowances. An EU Allowance (EUA), entitling the holder to emit one metric ton of carbon dioxide, was traded at an average of €54 in 2021 – almost twice the price in 2020. This figure is based on contracts for delivery that mature in December of the following year. Once the EUA price curve had exceeded €30 in late 2020, there was only one way things could go, and that was up. As 2021 drew to a close, allowance prices were already closing in on the €80 figure. The considerable price hikes were primarily the result of the introduction of a stricter European greenhouse gas reduction target for 2030. To meet this goal, the EU needs to vastly decrease the number of emission allowances available to companies. Many market participants anticipated this, making early purchases of EUAs. The increase in energy consumption driven by the economy contributed to the rise in prices because it also drove up greenhouse gas emissions and demand for emission allowances.

As explained on page 36, the United Kingdom launched its own CO_2 emissions trading system when it left the EU. UK Allowances (UKAs) have been traded on the secondary market since the first auction in May 2021. In the seven and a half months to the end of the year, UKAs were quoted above EUAs. The average price during this time was £57 (€67).

Surge in fuel and emissions allowance prices impacts cost of electricity. The incredible rise in the price of fuel and emission allowances shaped the trajectory of our most important wholesale electricity markets in Europe. The low wind energy output, due to poor weather, and maintenance-related outages at French nuclear power plants also came to bear to some extent. In Germany, the average annual spot price for base-load electricity more than tripled compared to 2020, rising from €30 / MWh to €97 / MWh. The changes were on a similar scale in the United Kingdom and the Netherlands, where quotations rose from £35 / MWh to £118 / MWh (€138) and from €32 / MWh to €103 / MWh, respectively. Electricity forward markets also witnessed a drastic upward curve. An average of €89 / MWh was paid for the 2022 base-load forward in Germany and the Netherlands. In the preceding year, this figure stood at €40 in both countries. The price of the British one-year forward increased from £44 / MWh to £92 / MWh (€108).

Once-in-a-century snowstorm sees electricity spot prices in Texas hit record high. The North American electricity market is geographically divided into multiple sub-systems, each of which is governed by an independent system operator. The most important market region for RWE is Texas, where most of our wind farms in the USA are connected to the grid and the system operator is the Electric Reliability Council of Texas (ERCOT). Spot prices on the ERCOT market briefly peaked at US$9,000 / MWh in February 2021 due to supply shortages and regulatory interventions. This was due to an exceptionally harsh cold spell, which led to outages at several power plants. Electricity forward prices saw no long-term effects from this event. Last year, a one-year forward contract in the ERCOT market cost on average US$37 / MWh (€31), US$7 more than in 2020. Higher natural gas prices were decisive in this regard. The more moderate electricity price level compared to Europe can be explained by the fact that gas prices in the USA remain relatively low, despite the recent hike. In addition, Texan electricity producers do not need to purchase carbon emission allowances.

Higher margins on electricity forward markets. In order to mitigate the risk of short-term sales and price fluctuations, we sell most of our electricity forward, whilst also hedging the prices for necessary fuels and emission allowances. Our revenue for the period under review was thus influenced by the conditions of forward contracts for 2021, which were concluded in previous years. These forward sales are largely conducted with a lead time of up to three years for power production in our lignite and nuclear plants, which are mainly used to cover base-load needs. On average, we were able to achieve higher prices and margins from these assets for 2021 than for 2020. Sales of electricity from our gas-fired stations were subject to a shorter lead time. Margins realised from these transactions were higher than the previous year. A portion of our renewables portfolio is also subject to forward contracts.

We do, however, still sell some of the generated power at spot market prices valid at the time of sale. The margins we achieved for these transactions were higher than in 2020. Furthermore, price spikes on the spot market contributed to additional income from the short-term optimisation of our power plant dispatch.

The rise in the price of electricity will have a more notable impact on margins in 2022. This concerns generation assets that had not yet fully or had only partially sold their electricity forward when prices began to climb. European wind farms, in particular, where electricity revenue depends on market prices, now enjoy improved earnings forecasts. However, a portion of our conventional power plant portfolio also stands to benefit from the price trend.

2.4 Major events

In 2021, we showed just how committed we are to green growth. We secured the rights to build and operate offshore wind projects in the United Kingdom, Denmark, Poland and Germany with a capacity of up to 5 GW. Furthermore, we forged strong partnerships for joint wind and solar activities in new markets. In the hydrogen business, we formalised a partnership with Shell, which we expect to deliver substantial synergies. RWE's green transition strategy comprises the phaseout of coal-fired power. Here too, we took massive strides in 2021 by decommissioning our two remaining German hard coal-fired power stations and five lignite units. In this chapter, we present the main events that took place in 2021 and the beginning of 2022, focusing on those which are not outlined in more detail elsewhere in the review of operations.

Events in the fiscal year

RWE wins rights to develop new offshore wind power sites in the British North Sea. At an auction held in February 2021, RWE secured the rights to build wind turbines with a total capacity of 3,000 MW across two neighbouring locations in the UK North Sea. In return, we will pay an annual option fee of £82,552 / MW (plus inflation adjustment) until we make a final investment decision. The area is situated on a sandbank in shallow waters known as Dogger Bank. The Sofia wind farm is also being built in the vicinity. After the auction, an official plan-level Habitats Regulations Assessment (HRA) was initiated, which is expected to be finalised in 2022. Only after this is completed will the option fee period commence. In accordance with applicable regulations, however, we had to pay an annual fee in advance in 2021. As soon as all permits for the new wind farms have been obtained, we will participate in an auction for a subsidy contract, after which we will make a final investment decision. Then the option fee will be replaced by a much lower lease payment. If connected to the grid in time, the wind farms could be commissioned as early as the end of this decade.

The Crown Estate's tender process allocated development rights to a total of six sites on which offshore wind farms with a total capacity of up to 7,980 MW can be built. A number of the participants, which also secured option rights, submitted significantly higher bids than us. RWE will pay the lowest average annual option fee per megawatt of all successful bidders.

Danish Energy Agency awards large offshore wind project to RWE. In Denmark, we have been granted the rights to build and operate the Thor offshore wind project in the North Sea. We had taken part in an auction along with five other bidders: all participants submitted minimum bids of DKK 0.1 / MWh. On 1 December 2021, we won the auction and shortly afterwards signed a concession agreement with the Danish Energy Agency, which entitles us to build the wind farm and operate it for 30 years. Thor will be constructed about 20 kilometres off the coast of west Denmark and will be the country's largest offshore wind farm to date, with a capacity of approximately 1,000 MW. It is scheduled for full commissioning in 2027. Due to our minimum bid, we will not receive state subsidies for the electricity generated by Thor. In the early years, we will have to transfer our proceeds to the Danish government until they total DKK 2.8 billion (€377 million) plus annual inflation. We expect our investment for the wind farm and the grid connection to amount to €2.1 billion. In Denmark, RWE already operates the Rødsand 2 offshore wind farm, which is located south of the island of Lolland and has an installed capacity of 207 MW.

RWE secures two offshore wind farm sites in the German North Sea. In Germany too, we laid the groundwork for new offshore wind farms. Last year, we secured the usage rights to two sites in the German North Sea. We were allocated one of the sites, officially referred to as N-3.7, during an auction held by the German Network Agency in September 2021. This confers us the right to build a wind farm on site with a capacity of 225 MW. To give us the best chance of winning the auction, we submitted a zero-cent bid, which means the electricity generated by the wind farm is not subject to a minimum price guaranteed by the state. We were granted usage rights to the second site, referred to as N-3.8, following the September auction, allowing us to build a wind farm with an installed capacity of 433 MW. Originally, the winning bid had been placed by French energy group EDF, but it had to pass on the usage rights to a joint venture between Northland Power and RWE. This is because we had pre-developed the site together with our Canadian partner and therefore had a step-in right. Now we must deliver the project at the conditions in EDF's winning bid; the company submitted a zero-cent bid.

Support secured for offshore wind project in Poland. We have also made good progress in relation to our first wind energy project in the Polish Baltic Sea. In April 2021, the government in Warsaw made a preliminary commitment to subsidise our F. E. W. Baltic II project. It is envisaged that the wind farm be built on the Słupsk sandbank and have a capacity of 350 MW. It was not until January 2021 that the Polish government established the legal framework for subsidising offshore wind power. We were granted environmental clearance for F. E. W. Baltic II in December and will receive the final subsidy approval in 2022, at which time the regulator will also decide on the level of the funding. The support will be granted in the form of two-sided contracts for difference which guarantee that we receive a fixed price per megawatt hour for the generation volume of 100,000 full load hours. If the realised market price is lower than this amount, the state pays the difference. If it is higher, the operators are obliged to make a payment. The subsidy period is limited to 25 years.

RWE becomes majority shareholder in Rampion offshore wind farm. As of 1 April 2021, we acquired a 20 % interest in the UK Rampion offshore wind farm from E.ON. The purchase price was paid in December 2020. As a result of the transaction, we now own 50.1 % of the 400 MW wind farm and can consolidate it fully. The other owners are a consortium led by Macquarie (25 %) and Canadian energy group Enbridge (24.9 %). Rampion is located in the English Channel off the coast of Sussex and has been operating commercially since 2018.

TCP investor consortium acquires Rampion's grid connection. In November, investor consortium Transmission Capital Partners (TCP) purchased Rampion's grid connection, for which it paid a total of £279.5 million. The transaction included the offshore and onshore export cables as well as the substations at sea and on land. The sale was a regulatory requirement. In the United Kingdom, construction of offshore wind farms and the associated grid connection is managed under one umbrella. The grid connection must subsequently be sold to an independent third party under the supervision of UK regulator Ofgem.

Go-ahead for construction of Sofia wind farm in the North Sea. In the spring of 2021, RWE made the final investment decision to build the Sofia wind farm in the UK North Sea, one of the largest offshore wind projects in the world. We hold a 100 % stake in the project. Sofia will be located almost 200 kilometres off the coast of North East England. It will consist of 100 turbines with a total installed capacity of 1,400 MW, and will be capable of supplying green electricity to approximately 1.2 million homes in the UK. June 2021 saw the start of onshore construction, with offshore work scheduled to begin in 2023. According to current plans, Sofia is set to take its full capacity online by 2026. We will be contractually remunerated for electricity generated by the wind farm in the amount of £39.65 / MWh. This amount is based on the 2012 price level and will be subject to an upward adjustment for inflation. We anticipate investing about £3 billion in Sofia. This includes expenditure for the grid connection, which we will sell on completion.

Alliances to expand offshore wind forged. We have joined forces with foreign partners to improve our growth opportunities in the offshore wind business. The following is a brief overview of some of the most recent collaborations.

- In May 2021, we agreed with UK-based National Grid Ventures that we would jointly participate in the New York Bight seabed lease auctions. In February 2022, we secured a site in a tender process with the potential for about 3 GW in generation capacity (see page 45).

- Also in May, we signed an agreement with Equinor and Hydro to develop a wind energy project in the Sørlige Nordsjø II area in the Norwegian North Sea. The site neighbours Danish waters and has excellent wind conditions. The favourable location should allow us to sell electricity both within and outside of Norway.

- In September, we forged a further alliance with Norwegian partners. Together with NTE and Havfram, we plan to participate in auctions for floating wind farms. The Norwegian Ministry of Petroleum and Energy has earmarked an area known as Utsira Nord off the country's southern coast for this purpose. The site can accommodate wind turbines with a total capacity of up to 1.5 GW.

- Floating wind farms are also the focus of a partnership in South Korea, which we finalised with the port city of Ulsan in November. Together with our local partner, our objective is to implement projects to create up to 1.5 GW in generation capacity off the coast of the country. South Korea is aiming for 12 GW in offshore wind capacity by 2030 and wants to be climate neutral by 2050.

- In February 2022 we joined forces with Tata Power, India's largest power generator, to develop offshore wind projects along the country's 7,600-kilometre coastline. India has also set ambitious renewables expansion targets, and aims to have 30 GW in offshore capacity by 2030.

Three major US wind farms start commercial operation. We completed three onshore wind projects in the USA in 2021. In the spring, Scioto Ridge went online commercially after about two-and-a-half years of construction. It is our first wind farm in the state of Ohio and has a total capacity of 250 MW. In the summer, we completed two further large-scale wind farms: West Raymond in Texas and Cassadaga in the US state of New York. The wind farms have capacities of 240 MW and 125 MW, respectively. A total of more than €800 million was invested in the three projects.

Stakes in four Texan wind farms sold. To increase our financial strength and better balance our generation portfolio, we sold shares in four Texan wind farms: Stella (201 MW), Cranell (220 MW), East Raymond (200 MW), and West Raymond, which was mentioned earlier. The buyers are a subsidiary of Canadian energy utility Algonquin Power & Utilities and UK investor Greencoat, which took an interest of 51 % and 24 % in the wind farms. RWE is therefore only a minority shareholder but is staying on as the operator of these assets. We no longer fully consolidate them in our financial reporting and instead account for them using the equity method. The sale was agreed in December 2020 and was completed in January (Stella / Cranell / East Raymond) and August 2021 (West Raymond).

Australian Limondale solar farm is officially connected to the grid. In autumn 2021, our Limondale solar farm went online in the Australian state of New South Wales. With a capacity of 249 MW, the photovoltaic system is one of the largest in the country. It consists of approximately 872,000 solar panels, spread over a 900-hectare site. Construction started in 2018. Our capital expenditure on Limondale amounted to approximately €330 million.

RWE sets the stage to expand solar power in Greece. In October, we set up a joint venture with energy group Public Power Corporation (PPC) to realise solar projects in Greece. RWE and PPC own 51 % and 49 % of the new company, respectively. Our partner is the country's largest power utility and will contribute photovoltaic projects with up to 940 MW of capacity to the joint venture. RWE will bring a project pipeline of a similar size to the table. The undertakings are in various stages of development. Based on current plans, the first farms will be commissioned in 2023.

Belectric Group solar services business sold. In December, the Dutch energy service provider Elevion acquired parts of the Belectric Group from RWE. Assets affected by the transaction were companies in Europe and Israel which provide services relating to the construction, operation and maintenance of solar farms. Elevion is part of ČEZ, the Czech Republic's largest energy utility. Belectric's battery business remains within the RWE Group. It was transferred to RWE Battery Solutions in 2020.

RWE sells small hydropower plants to KELAG. Austrian energy utility KELAG acquired twelve French and seven Portuguese hydro assets from us, which have a total installed capacity of 62 MW (RWE's pro-rata share). We also sold a number of small wind turbines in Portugal with a combined capacity of 3 MW to KELAG. A corresponding agreement was reached at the end of 2020. We transferred the French plants in April 2021, and the Portuguese assets followed in September. KELAG is a leading hydropower producer. We currently hold a 37.9 % stake in the company.

Green light for the construction of two mega batteries in Germany. We will contribute to safeguarding security of supply in the future with two high-capacity batteries at our power plant sites in Werne and Lingen. This decision was taken in June. We expect the battery storage units to have outputs of 72 MW (Werne) and 45 MW (Lingen) as well as storage capacities of 79 MWh and 49 MWh, respectively. They are due to go online at the end of 2022. We intend to invest some €50 million in total.

Partnership with Shell on hydrogen projects. In November, we reached an agreement with Shell to intensify our collaborative efforts to build a European hydrogen economy. Working together with the British energy group, we will develop projects to produce, use and sell hydrogen. RWE and Shell are already partners in the trailblazing hydrogen projects AquaVentus in Germany (see page 32) and NortH2 in the Netherlands. RWE and Shell intend to take the next step and initiate large-scale projects in the United Kingdom for the production of green hydrogen using offshore wind energy. The partnership also encompasses measures to decarbonise gas and biomass-fired power stations within the RWE Group. To this end, we will explore the following alternatives: carbon capture and storage as well as retrofitting stations to use environmentally friendly hydrogen.

Success in British capacity market auction. In March 2021, RWE assets totalling 6,544 MW in secured generation capacity – primarily gas-fired power stations – qualified for a payment at a capacity market auction in Great Britain. The bidding process related to the period from 1 October 2024 to 30 September 2025. Stations with a total capacity of 40.8 GW won a contract. These assets will be remunerated for being online and contributing to electricity supply in the aforementioned period. The auction cleared at £18.00 / kW (plus inflation adjustment).

Once-in-a-century Texan cold snap weighs heavily on earnings. In February 2021, an extraordinary cold front in parts of the USA curtailed energy supply substantially (see page 39). Winter storms and freezing rain forced RWE wind farms to go offline for several days. We had sold forward a portion of the generation of these assets and therefore had to conduct short-term spot purchases in order to meet our supply obligations. Due to the tight supply situation and regulatory price interventions, we had to pay up to US$9,000 / MWh for these electricity purchases. This reduced the adjusted EBITDA in the Onshore Wind / Solar segment by approximately €400 million.

Group sites affected by catastrophic floods in western Germany. In mid-July, severe weather events in parts of Germany led to disastrous floods resulting in a large number of fatalities and substantial damage to property. Rhineland-Palatinate and the south of North Rhine-Westphalia were the most devastated regions. The extreme weather also affected our company and its employees. In the Rhenish lignite mining area, water ingress at the Inden opencast mine brought production to a temporary halt. We are deeply saddened that an employee of a partner company was swept away in the floods and could not be saved despite a major rescue operation. In Erftstadt-Blessem, located near Cologne, the Erft river burst its banks, flooding a gravel pit operated by a subsidiary of RWE Power. Nearly all RWE-operated run-of-river power plants in the Eifel and on the Mosel, Saar and Ruhr rivers were forced to interrupt operations due to the floodwaters. Within a few days, however, these stations and the Inden mines were available once more. Our financial burdens resulting from the disastrous flooding will total a figure in the low two-digit million euro range. RWE provided about €2 million to an emergency relief programme, one quarter of which was donated by our staff.

RWE stops generating electricity from hard coal in Germany. In the middle of last year, our last German hard coal units, Westfalen E at Hamm (764 MW) and Ibbenbüren B (794 MW), were closed for good. At the end of 2020, we successfully participated in the first nationwide shutdown auction for hard coal-fired power plants with these assets. We received €216 million in compensation for their early decommissioning. In the first half of 2021, we were forbidden from selling electricity generated by these assets, but were obligated to keep them on standby to ensure security of supply. During this period, Westfalen E went online 13 times at the request of the transmission system operator. The station is envisaged to continue to contribute to security of supply, albeit without using hard coal. As the German Network Agency has classified the power plant as system-relevant, we will convert the generator to a rotary phase shifter to produce reactive power to maintain voltage levels, an important element in stabilising the electricity grid. Conversely, Ibbenbüren B has not been deemed to be system-relevant and will be fully decommissioned.

Further lignite-fired power stations taken offline. During the year under review we closed five 300 MW power plant units in the Rhenish lignite mining region. To comply with the German Coal Phaseout Act, we took Neurath B (294 MW), Niederaussem C (295 MW) and Weisweiler E (321 MW) offline at the end of December. The Frimmersdorf lignite power plant was shut down three months earlier. The station's last two units P (284 MW) and Q (278 MW) had been placed on security stand-by on 1 October 2017. This meant that they were forbidden by law from participating in the market, but had to remain available as a safeguard to ensure security of supply when necessary. They were shut down for good on expiry of the security stand-by period. Most employees affected by the lignite exit will retire. Younger staff members will transfer to other areas within the Group or will receive severance packages.

Gundremmingen C nuclear power station stops operating. Also at the end of 2021, we took Unit C of the Gundremmingen nuclear power plant offline. The plant was commissioned in 1984 and had a net installed capacity of 1,288 MW. Its closure and current dismantling are a result of the roadmap dictated by the German nuclear phaseout. We took Unit B of the Gundremmingen nuclear power station offline at the end of 2017. Now electricity generation at the site has stopped entirely. About 540 people were working there as of 31 December 2021. This number will likely drop to about 440 by the end of 2022. We will implement further socially acceptable redundancies in the years thereafter.

Events after the close of the fiscal year

RWE enters US offshore wind market. At the end of February 2022, we were successful in an auction of seabed leases for offshore wind sites in the New York Bight. A joint venture between RWE and National Grid Ventures secured an area for US$1.1 billion. About 3 GW of generation capacity can be built at the site, which would be capable of producing enough electricity to power 1.1 million US homes. The auction included six lease sites, with bidders only being allowed to secure one each. Every successful bid conferred the right to develop a site and participate in upcoming offtake auctions in the states of New York and New Jersey. If the project progresses as planned, our offshore wind farm in the New York Bight will be commissioned before the end of the decade.

Wind joint venture with Northland Power launched. In January 2022, RWE and Northland Power formed a joint venture for the development of wind energy projects in the German North Sea. We expect this partnership to deliver substantial synergies, resulting in cost savings in the development, construction and operation of the assets. RWE owns 51 % and our Canadian partner owns 49 % of the joint venture, which encompasses three offshore wind projects aiming to develop a total capacity of 1.3 GW. The sites of the future wind farms are located north of the island of Juist. Before forging the joint venture, we had already worked with Northland Power on two of the three projects. One project is focused on a 433 MW wind farm on a site officially called N-3.8, which we secured via a step-in right following an invitation to tender in 2021 (see page 41). The other initiative involved the construction and operation of a 420 MW wind farm, which we hope to build on the N-3.5 site. We also have a step-in right for this area, but have not exercised it yet. RWE initially only held a 15 % share of both projects and had originally developed the third joint venture project alone. It is centred around a 480 MW wind farm at the N-3.6 site, for which we also hold a step-in right which has not yet been made use of. The auctions for the sites N-3.5 and N-3.6 should be held in 2023. In the event that other companies are successful, we can exercise our step-in rights.

RWE once again successful in British capacity market auctions. Another auction, relating to the delivery period from 1 October 2025 to 30 September 2026, was held for the British capacity market on 22 February. We secured a payment for all participating RWE power stations, including two small new-builds. Altogether, these assets have a secured capacity of 6,647 MW. At £30.59 / kW per annum (plus inflation adjustment). A total of 42.4 GW in generation capacity qualified for a payment at the auction.

Huge uncertainty after Russia attacks Ukraine. Russian troops marched into Ukraine at the end of February. As an invasion under international law, it prompted outrage and consternation around the globe. Many countries including the USA, EU member states and the United Kingdom imposed economic sanctions on Russia. Uncertainty concerning commodity deliveries from Russia to Europe has caused a significant increase in gas and electricity trading quotations. In some European countries, including Germany, governments are working on measures to reduce dependency on Russian oil and gas imports. When this review of operations was prepared in early March 2022, it was impossible to predict the development of the Ukraine conflict or its consequences. Although RWE does not have business activities in Russia or Ukraine, further escalation of the conflict and discontinuation of supply relationships with Russian companies could have notable effects on our assets, liabilities, financial position and profit or loss. More detailed information can be found in the chapter entitled 'Development of risks and opportunities', which starts on page 70.

2.5 Commentary on reporting

In our financial reporting, the RWE Group is broken down into five segments, which we present in detail in this chapter. Renewable energy, gas-fired power plants, energy storage, our hydrogen business and energy trading are distributed among the first four segments. They play a key role in the energy transition and therefore make up our core business. The fifth segment covers power generation from coal and nuclear energy, which will increasingly lose importance due to legally mandated phaseout roadmaps.

Group structure features five segments. We distinguish between five segments when reporting our business performance. The first four form our core business. Our segments are defined as follows:

- **Offshore Wind:** We present our business relating to offshore wind here. It is overseen by our Group company RWE Renewables.
- **Onshore Wind / Solar:** This is the segment in which we pool our onshore wind and solar business as well as parts of our battery storage activities. Here again, responsibility lies with RWE Renewables.
- **Hydro / Biomass / Gas:** Generation from our run-of-river, pumped storage, biomass and gas power stations is pooled here. The segment also includes the Dutch Amer 9 and Eemshaven power plants, which run on biomass and hard coal, as well as individual battery storage systems. The project management and engineering consulting company RWE Technology International and our 37.9 % stake in Austrian energy utility KELAG are also allocated to this segment. The activities are overseen by RWE Generation. In addition, since 2021, this management company has been responsible for designing and implementing our hydrogen strategy.
- **Supply & Trading:** Proprietary trading of energy commodities is at the core of this segment and is overseen by RWE Supply & Trading. The company also acts as an intermediary for gas, supplies key accounts with energy, and undertakes a number of additional trading-related activities. Our German and Czech gas storage facilities also form part of this segment.
- **Coal / Nuclear:** This is where we report on the activities which are not part of our core business as their importance is declining due to the course set by the energy policy in our domestic market, Germany. First and foremost, these consist of our German electricity generation from coal and nuclear fuel as well as our lignite production in the Rhenish mining region to the west of Cologne. This is also where we report our investments in Dutch nuclear power plant operator EPZ (30 %) and Germany-based URANIT (50 %), which holds a 33 % stake in uranium enrichment specialist Urenco. Most of the aforementioned activities and investments are overseen by RWE Power. RWE Generation is responsible for our German hard coal-fired power plants; we shut down the last two stations in mid-2021.

Group companies with cross-segment tasks, such as the Group holding company RWE AG, are stated as part of the core business under the 'other, consolidation' line item. This also applies to our stakes of 25.1 % in German transmission system operator Amprion and 15 % in E.ON. However, the dividends we receive from E.ON are recognised in the financial result. Furthermore, 'other, consolidation' contains consolidation effects.

Changed recognition of tax benefits for renewables in the USA. At the start of fiscal 2021, we changed the way in which we account for tax benefits received for US wind and solar projects. Renewable energy is subsidised largely via tax credits in the USA. Furthermore, plant operators can benefit from accelerated depreciation, referred to as tax benefits. Until 2020, they were recognised in taxes on income, whereas the benefits of tax credits were considered in other operating income. For the sake of consistency, we have also been recognising tax benefits since 2021. It has a positive impact on adjusted EBITDA. To ensure comparability, we restated the prior-year figures. More information can be found in the Notes on pages 108 et seq.

Forward-looking statements. This report contains forward-looking statements regarding the future development of the RWE Group and its companies as well as economic and political developments. These statements are assessments that we have made based on information available to us at the time this document was prepared. Despite this, actual developments can deviate from the prognoses, for instance if underlying assumptions do not materialise or unforeseen risks arise. Therefore, we cannot assume responsibility for the correctness of forward-looking statements.

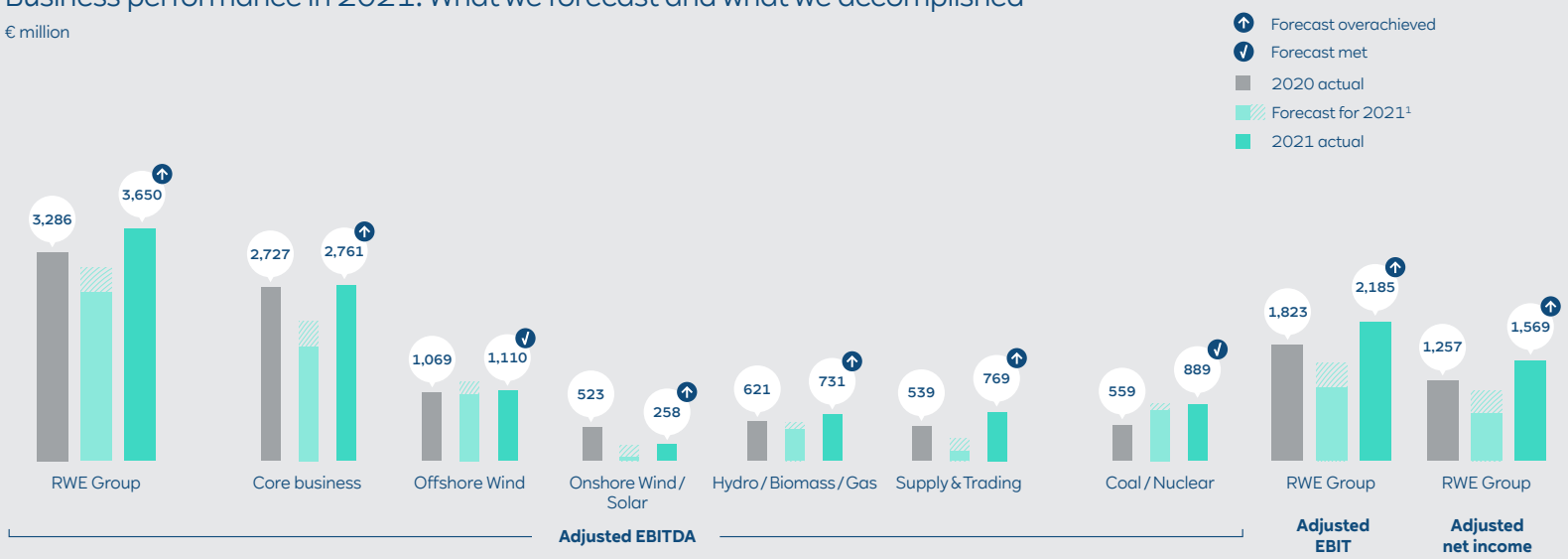
References. The contents of web pages and publications to which we refer in this chapter are not part of the Review of operations and merely provide additional information.

2.6 Business performance

Fiscal 2021 was a very successful year for RWE, despite getting off to a lacklustre start. In February, extreme weather in Texas led to outages at wind farms and a significant financial loss due to power purchases. However, we more than offset the earnings shortfalls as the year progressed, thanks to an exceptional energy trading performance. Improved generation margins provided additional income. This enabled us to increase the Group's adjusted EBITDA by 11 % compared to the previous year. We clearly exceeded the earnings forecast for 2021 which we published after the events in Texas.

Business performance in 2021: What we forecast and what we accomplished

€ million



1 See pages 67 et seq. of the 2020 Annual Report. The hatched portion reflects the forecast range.

Power generation[1]	Renewables		Pumped storage, batteries		Gas		Lignite		Hard coal		Nuclear		Total[2]	
GWh	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
Offshore Wind	7,564	7,009	–	–	–	–	–	–	–	–	–	–	7,564	7,009
Onshore Wind / Solar	16,709	16,762	–	–	–	–	–	–	–	–	–	–	16,709	16,762
Hydro / Biomass / Gas	7,899	5,832	41	80	52,257	46,894	–	–	6,952	3,584	–	–	67,321	56,600
of which:														
Germany	1,645	1,546	41	80	5,988	8,576	–	–	–	–	–	–	7,846	10,412
United Kingdom	493	573[3]	–	–	35,263	25,138	–	–	–	–	–	–	35,756	25,711
Netherlands	5,725	3,679	–	–	6,647	8,899	–	–	6,952	3,584	–	–	19,324	16,162
Turkey	–	–	–	–	4,359	4,281	–	–	–	–	–	–	4,359	4,281
Coal / Nuclear	18	19	–	–	147	726	45,916	36,649	188	2,549	22,704	20,682	69,179	60,833
RWE Group	**32,190**	**29,622**	**41**	**80**	**52,404**	**47,620**	**45,916**	**36,649**	**7,140**	**6,133**	**22,704**	**20,682**	**160,773**	**141,204**

1 No longer considers power purchases from generation assets in which RWE does not own the majority, but which we have long-term usage rights to. Prior-year figures adjusted accordingly.
2 Including production volumes not attributable to any of the energy sources mentioned (e. g. electricity from waste-to-energy plants).
3 Adjusted figure.

Electricity production 14 % up on prior year. In the fiscal year that just came to a close, the RWE Group produced 160,773 GWh of electricity. Deviating from the former recognition method, this figure does not include power purchases from generation assets in which we do not own the majority, even if we have long-term usage rights to them. Prior-year figures including the purchases have been adjusted accordingly. Our electricity generation grew by 14 % compared to 2020. The most significant increases were recorded by our German lignite power stations, which benefited from favourable market conditions. Contributing factors were the rise in electricity consumption compared to the previous year thanks to the economic recovery, as well as the weather-induced drop in wind energy fed into the system. For these reasons and despite a significant hike in fuel costs, our UK gas-fired power stations were also utilised more than in 2020, whereas generation from gas was down in Germany and the Netherlands. Our Dutch power plants Amer 9 and Eemshaven, which run on biomass and hard coal, stepped up production considerably. The rise at Eemshaven was due to the station's return to nearly full availability after fire damage in the preceding year. Our German nuclear power stations also posted a substantial rise, because there were fewer maintenance outages. A counteracting effect was felt from the German coal phaseout. At the end of 2020, we ceased commercial operation of the Ibbenbüren B (794 MW) and Westfalen E (764 MW) hard coal-fired power plants and shut down the Niederaussem D (297 MW) lignite unit.

Power generation from renewables[1]	Offshore Wind		Onshore Wind		Solar		Hydro		Biomass		Total	
GWh	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
Germany	1,811	2,082	939	1,168	3	3	1,645	1,483	–	4	4,398	4,740
United Kingdom	5,557	4,690	1,719	2,134	–	–	189	231[2]	304	342	7,769	7,397
Netherlands	–	–	727	768	17	7	27	14	5,697	3,665	6,468	4,454
Poland	–	–	1,245	997	1	1	–	–	–	–	1,246	998
Spain	–	–	934	890	96	51	29	29	–	–	1,059	970
Italy	–	–	1,008	882	–	–	–	–	–	–	1,008	882
Sweden	196	237	293	339	–	–	–	–	–	–	489	576
USA	–	–	8,961	9,059	354	271	–	–	–	–	9,315	9,330
Australia	–	–	–	–	245	65	–	–	–	–	245	65
Rest of the world	–	–	41	30	81	34	71	146	–	–	193	210
RWE Group	**7,564**	**7,009**	**15,867**	**16,267**	**797**	**432**	**1,961**	**1,903**	**6,001**	**4,011**	**32,190**	**29,622**

1 No longer considers power purchases from generation assets in which RWE does not own the majority, but which we have long-term usage rights to. Prior-year figures adjusted accordingly.
2 Adjusted figure.

Production from our wind farms was roughly on a par year on year. A positive effect was felt from the increase in our stake in the Rampion offshore wind farm (400 MW) in the UK as of 1 April 2021 from 30.1 % to 50.1 % and the full consolidation of Rampion since then. Furthermore, we commissioned the Scioto Ridge (250 MW) and Cassadaga (125 MW) wind farms in the USA and started feeding electricity from the Triton Knoll offshore wind farm (857 MW) in the UK into the grid. Opposing effects were felt from lower wind speeds and the sale of majority stakes in wind farms in Texas (see page 42).

In addition to our in-house generation, we procure electricity from suppliers outside of the Group. In the year being reviewed, these purchases totalled 48,131 GWh. In-house production and power purchases combined for 208,904 GWh (previous year: 200,715 GWh).

Lower generation capacity due to coal power plant closures. At the end of 2021, we had an installed power production capacity of 36.1 GW. This figure does not include our three German lignite units, which are in legally mandated security standby and will be shut down for good in 2022 / 2023. Certain assets, where we are not the majority owner and which generate electricity that we can completely or partially use on the basis of long-term usage agreements, are also disregarded. In the past, we included the capacities of these stations in the figures if we were entitled to the associated generation. Prior-year figures were adjusted.

Our generation capacity declined by 1.6 GW compared to 2020. In line with the German coal phaseout, we decommissioned the Niederaussem C (295 MW), Neurath B (294 MW) and Weisweiler E (321 MW) lignite units as of 31 December 2021. The legal lifetime of the Gundremmingen C (1,288 MW) nuclear power station ended on the same day. By contrast, we increased production capacity from renewables by 0.6 GW in part as a result of our fully consolidating the Rampion offshore wind farm for the first time. Furthermore, we completed the Limondale (249 MW) solar farm in Australia as well as the Scioto Ridge and Cassadaga wind farms in the USA, whereas the sale of majority stakes in the Texan wind farms Stella (201 MW), Cranell (220 MW) and East Raymond (200 MW) had a counteracting effect.

In terms of generation capacity, gas is our main energy source, accounting for a share of 40 % at the close of 2021. Renewables take second place, with a share of 30 %. Our biggest source of renewable energy is wind (8.9 GW), followed by biomass (0.8 GW), hydro (0.5 GW) and solar (0.5 GW).

The geographic focus of our generation business is Germany, where 42 % of our installed capacity is located. The United Kingdom and the Netherlands follow, accounting for shares of 27 % and 14 %, respectively. The USA comes in fourth: about half of our onshore wind capacity is situated there, a large portion of which is in Texas.

Installed capacity[1]	Renewables		Pumped storage, batteries		Gas		Lignite		Hard coal		Nuclear		Total[2]	
As of 31 December, MW	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
Offshore Wind	2,318	1,918	–	–	–	–	–	–	–	–	–	–	2,318	1,918
Onshore Wind / Solar	7,082	6,858	28	20	–	–	–	–	–	–	–	–	7,110	6,877
Hydro / Biomass / Gas	1,285	1,319	168	172	13,901	13,901	–	–	1,469	1,474	–	–	17,115	17,158
of which:														
Germany	393	389	168	172	3,807	3,807	–	–	–	–	–	–	4,407	4,407
United Kingdom	139	137	–	–	6,984	6,984	–	–	–	–	–	–	7,376	7,374
Netherlands / Belgium	753	748	–	–	2,323	2,323	–	–	1,469	1,474	–	–	4,545	4,545
Turkey	–	–	–	–	787	787	–	–	–	–	–	–	787	787
Coal / Nuclear	12	7	–	–	400	400	7,638	8,548	–	–	1,482	2,770	9,559	11,752
RWE Group[3]	**10,697**	**10,102**	**199**	**194**	**14,301**	**14,301**	**7,638**	**8,548**	**1,469**	**1,474**	**1,482**	**2,770**	**36,104**	**37,708**

1 No longer considers power plants taken offline as of 31 December. Assets scheduled for decommissioning are excluded from the capacity overview once they stop producing electricity. They include our lignite units in legally mandated security standby. No longer considers generation assets in which RWE does not own the majority, but which we have long-term usage rights to. Prior-year figures adjusted accordingly. Commercial rounding can result in inaccurate sum totals.
2 Including production volumes not attributable to any of the energy sources mentioned (e. g. electricity from waste-to-energy plants).
3 Including insignificant capacity at RWE Supply & Trading.

Installed capacity based on renewables[1]	Offshore wind		Onshore wind		Solar		Hydro		Biomass		Total	
As of 31 December, MW	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
Germany	598	598	637	666	3	3	393	389	–	–	1,630	1,655
United Kingdom	1,672	1,272	803	707	–	–	84	82	55	55	2,615	2,117
Netherlands	–	–	331	268	17	–	11	11	742	737	1,100	1,016
Poland	–	–	425	385	1	1	–	–	–	–	426	386
Spain	–	–	447	447	45	45	12	12	–	–	504	504
Italy	–	–	488	475	–	–	–	–	–	–	488	475
Sweden	48	48	116	116	–	–	–	–	–	–	164	164
USA	–	–	3,313	3,543	125	125	–	–	–	–	3,438	3,668
Australia	–	–	–	–	249	–	–	–	–	–	249	–
Rest of the world	–	–	36	10	47	47	–	61	–	–	83	118
RWE Group	**2,318**	**1,918**	**6,596**	**6,616**	**486**	**220**	**500**	**556**	**797**	**792**	**10,697**	**10,102**

1 No longer considers power purchases from generation assets in which RWE does not own the majority, but which we have long-term usage rights to. Prior-year figures adjusted accordingly. Commercial rounding can result in inaccurate sum totals.

CO_2 emissions rise due to low wind speeds. Last year, our power stations emitted 80.9 million metric tons of carbon dioxide, 13.9 million metric tons more than in 2020. This represents the first increase after eight years of emissions reductions totalling 62 %, and despite the fact that we closed further coal power plants. In 2021, a series of factors drove up usage of our lignite-fired power stations: besides a recovery of demand for electricity, lower generation volumes from wind farms also played a part. In addition, gas-fired power plants were less competitive, due to soaring fuel costs. We expect to return back to our ambitious emission reduction path in 2022.

Our specific emissions, i. e. the amount of carbon dioxide emitted per megawatt hour of electricity generated, amounted to 0.50 metric tons in the fiscal year that just came to a close. The previous year's figure stood at 0.47 metric tons.

CO_2 emissions of our power stations[1] Million metric tons	2021	2020	+/–
Hydro / Biomass / Gas	25.0	20.3	4.7
of which:			
Germany	2.6	3.5	– 0.9
United Kingdom	12.8	9.1	3.7
Netherlands	8.0	6.1	1.9
Turkey	1.6	1.6	–
Coal / Nuclear	55.9	46.7	9.2
RWE Group	**80.9**	**67.0**	**13.9**

1 No longer considers CO_2 emissions from generation assets in which RWE does not own the majority, but which we have long-term usage rights to. Prior-year figures adjusted accordingly.

62.6 million metric tons of lignite produced. Our generation companies procure the fuel they need either directly on the market or via RWE Supply & Trading, except for lignite, which we source from proprietary opencast mines. In our Rhenish mining area west of Cologne, we produced 62.6 million metric tons of lignite last year. This was 11.2 million metric tons more than in the preceding year, owing to the higher utilisation of our power plants. We used the lion's share, or 53.2 million metric tons, of lignite to generate electricity. The remainder was used to manufacture refined products (e.g. lignite powder, hearth furnace coke and briquettes) and, to a limited extent, to generate process steam and district heat.

Electricity and gas sales 4% and 25% higher year on year. Last year, we sold 203,101 GWh of electricity and 45,721 GWh of gas. These transactions were largely carried out by the Supply & Trading segment. We sold 4% more of our main product, electricity. This growth can be traced back to the rise in generation from our power stations, which we usually sell externally via our Group company RWE Supply & Trading. Gas deliveries were up 25%. One contributing factor was that RWE Supply & Trading won new key accounts, most notably municipal utilities. In addition, existing customers increased their gas purchases from us.

External revenue 79% up on 2020. Revenue from external customers (excluding natural gas tax and electricity tax) totalled €24,526 million in 2021. This represents a 79% increase over the previous year. Electricity revenue grew by 75% to €20,476 million, primarily due to the steep rise in the price of electricity last year. Price effects were also the main reason why our gas revenue quadrupled to €2,142 million. Additional information on the development of commodity quotations can be found on pages 38 et seq.

One key performance indicator that is of particular interest to Sustainability investors is the portion of our revenue accounted for by coal-fired generation and other coal products. In the fiscal year that just ended, this share was 22% (previous year: 23%).

External revenue € million	2021	2020	+/–
Offshore Wind	688	332	356
Onshore Wind / Solar	2,324	1,855	469
Hydro / Biomass / Gas	1,315	1,056	259
Supply & Trading	19,296	9,597	9,699
Other	4	9	–5
Core business	**23,627**	**12,849**	**10,778**
Coal / Nuclear	899	839	60
RWE Group (excluding natural gas tax / electricity tax)	**24,526**	**13,688**	**10,838**
Natural gas tax / electricity tax	235	208	27
RWE Group	**24,761**	**13,896**	**10,865**

External revenue by product € million	2021	2020	+/–
Electricity revenue	**20,476**	**11,701**	**8,775**
of which:			
Offshore Wind	688	332	356
Onshore Wind / Solar	2,107	1,676	431
Hydro / Biomass / Gas	877	684	193
Supply & Trading	16,540	8,775	7,765
Core business	**20,212**	**11,468**	**8,744**
Coal / Nuclear	264	233	31
Gas revenue	**2,142**	**534**	**1,608**
of which: Supply & Trading	2,142	529	1,613
Other revenue	**1,908**	**1,453**	**455**
RWE Group (excluding natural gas tax / electricity tax)	**24,526**	**13,688**	**10,838**

Adjusted EBITDA[1] € million	2021	2020	+/–
Offshore Wind	1,110	1,069	41
Onshore Wind / Solar	258	523	–265
Hydro / Biomass / Gas	731	621	110
Supply & Trading	769	539	230
Other, consolidation	–107	–25	–82
Core business	**2,761**	**2,727**	**34**
Coal / Nuclear	889	559	330
RWE Group	**3,650**	**3,286**	**364**

1 Some prior-year figures restated due to a change in the recognition of tax benefits to subsidise renewable energy in the USA (see commentary on page 47).

Adjusted EBITDA of €3,650 million clearly exceeds expectations. Our adjusted earnings before interest, taxes, depreciation and amortisation (adjusted EBITDA) amounted to €3,650 million. This is far above our March 2021 forecast. The outlook we published on pages 67 et seq. of the 2020 Annual Report envisaged a range of €2,650 million to €3,050 million. Adjusted EBITDA from our core business was also significantly better than originally expected, totalling €2,761 million. We had anticipated a figure between €1,800 million and €2,200 million. The fact that we easily exceeded our forecast was predominantly thanks to an outstanding energy trading performance. We also closed the fiscal year above the forecast ranges in the Onshore Wind / Solar and Hydro / Biomass / Gas segments.

Our adjusted EBITDA was 11 % up on the prior year. In addition to the exceptional trading performance, improved margins of our lignite and nuclear power stations came to bear in particular. This was contrasted by significant charges in our US wind energy business. As set out on page 43, in early 2021, the worst cold snap in a century in Texas led to unscheduled plant outages, forcing us to fulfil existing electricity supply commitments with expensive power purchases on the market.

The following developments were observed in the segments:

- **Offshore Wind:** Adjusted EBITDA posted here amounted to €1,110 million. We had forecast a range of €1,050 million to €1,250 million. We recorded a gain of 4 % compared to 2020 (€1,069 million). One contributing factor was that we took a majority interest in the Rampion offshore wind farm in the UK as of 1 April 2021 and have fully consolidated this stake since then. Furthermore, we benefited from the partial commissioning of the Triton Knoll offshore wind farm. This was contrasted by earnings shortfalls caused by the reduced utilisation of our assets due to the weather.

- **Onshore Wind / Solar:** In this segment, adjusted EBITDA totalled €258 million. We were therefore slightly above the targeted range of €50 million to €250 million. Improved margins resulting from the recent significant increase in wholesale electricity prices were the main driver. Compared to the previous year (€523 million) however, adjusted EBITDA dropped considerably. This was primarily due to about €400 million in lost earnings caused by the severe cold snap in Texas in February 2021. Besides this exceptional effect, lower wind speeds also came to bear. By contrast, we benefited from the commissioning of new generation assets and capital gains on the sale of stakes in the US wind farms Stella, Cranell, East Raymond and West Raymond.

- **Hydro / Biomass / Gas:** Here, adjusted EBITDA came in at €731 million. This clearly exceeded the forecast range of €500 million to €600 million. Our outlook was based on the assumption that income from the commercial optimisation of our power plant dispatch would fall short of the high level achieved in 2020. In fact, however, it rose, especially in the fourth quarter. This is why we also exceeded adjusted EBITDA registered in the prior year (€621 million). The markedly improved availability of the Eemshaven power station also played a role.

- **Supply & Trading:** Our performance in the trading business was exceptional. This led to €769 million in adjusted EBITDA, which clearly surpassed the envisaged range of €150 million to €350 million. We also exceeded the previous year's figure, which was very high (€539 million). In addition to the strong trading performance, improved earnings in the gas business also came to bear.

- **Coal / Nuclear:** Adjusted EBITDA recorded in this segment amounted to €889 million, which was within the anticipated range of €800 million to €900 million. This represents strong growth compared to the preceding year (€559 million). The main reason for this was that we realised higher wholesale prices for electricity generated by our lignite-fired and nuclear power plants than in 2020. We had already sold forward nearly all of the production of these stations in earlier years. Income from the commercial optimisation of power plant dispatch also rose. Furthermore, we benefited from the improved availability of our nuclear power stations. This was contrasted by earnings shortfalls caused by extensive maintenance at lignite-fired power plants. Further burdens stemmed from the implementation of the German Coal Phaseout Act and the floods in the Rhenish lignite mining region, on which we report on page 44.

Reconciliation to net income[1] € million	2021	2020	+/–
Adjusted EBITDA	**3,650**	**3,286**	**364**
Operating depreciation, amortisation and impairment losses	–1,465	–1,463	–2
Adjusted EBIT	**2,185**	**1,823**	**362**
Non-operating result	–650	–104	–546
Financial result	–13	–454	441
Income from continuing operations before taxes	**1,522**	**1,265**	**257**
Taxes on income	–690	–376	–314
Income from continuing operations	**832**	**889**	**–57**
Income from discontinued operations	–	221	–221
Income	**832**	**1,110**	**–278**
of which:			
Non-controlling interests	111	59	52
Net income / income attributable to RWE AG shareholders	**721**	**1,051**	**–330**

1 Some prior-year figures restated due to a change in the recognition of tax benefits to subsidise renewable energy in the USA (see commentary on page 47).

Reconciliation to net income: Exceptional effects overshadow operating development. The reconciliation from adjusted EBITDA to net income was greatly affected by one-off effects, which had a negative impact in net terms. The following is an overview of the changes to the items of the reconciliation statement.

Adjusted EBIT[1] € million	2021	2020	+/–
Offshore Wind	636	697	–61
Onshore Wind / Solar	–145	138	–283
Hydro / Biomass / Gas	418	283	135
Supply & Trading	721	496	225
Other, consolidation	–106	–25	–81
Core business	**1,524**	**1,589**	**–65**
Coal / Nuclear	661	234	427
RWE Group	**2,185**	**1,823**	**362**

1 Some prior-year figures restated due to a change in the recognition of tax benefits to subsidise renewable energy in the USA (see commentary on page 47).

The RWE Group's adjusted EBIT rose by 20 % to €2,185 million, exceeding the range of €1,150 million to €1,550 million forecast in March 2021. This growth was driven by the same factors that bolstered adjusted EBITDA. The difference between these two key figures is that operating depreciation and amortisation, which at €1,465 million was basically on a par with the previous year's level (€1,463 million), is included in adjusted EBIT, but not in adjusted EBITDA.

Non-operating result[1] € million	2021	2020	+/–
Disposal result	21	13	8
Effects on income from the valuation of derivatives	–503	1,886	–2,389
Other	–168	–2,003	1,835
Non-operating result	**–650**	**–104**	**–546**

1 Some prior-year figures restated due to a change in the recognition of tax benefits to subsidise renewable energy in the USA (see commentary on page 47).

The non-operating result, in which we recognise certain items which are not related to operations or the period being reviewed, amounted to –€650 million as opposed to –€104 million in the preceding fiscal year. Its components developed as follows:

- At €21 million, income from the disposal of investments and assets was essentially immaterial, as in the previous year (€13 million). It largely resulted from the sale of small run-of-river power stations in France and Portugal (see page 43).
- Effects from the valuation of derivatives reduced earnings by €503 million, after increasing them by €1,886 million in the preceding year. Such impacts are only temporary and are primarily due to the fact that, pursuant to IFRS, financial instruments used to hedge price risks are accounted for at fair value at the corresponding balance-sheet date, whereas the hedged underlying transactions are only recognised as a profit or loss when they are realised.
- In the 'other' line item, we reported a loss of €168 million, which was much smaller than in the previous year (€2,003 million). Income in 2020 was curtailed by about €1.8 billion in impairments recognised for power plants and opencast lignite mines. Impairments relating to our lignite business were also recognised in the year being reviewed. They amounted to €780 million and are explained in more detail in the Notes on pages 112 et seq. Income benefited from the €880 million compensation for the nuclear phaseout in Germany we received from the government in November 2021.

Financial result € million	2021	2020	+/–
Interest income	260	283	–23
of which: E.ON dividend	186	182	4
Interest expenses	–340	–296	–44
Net interest	**–80**	**–13**	**–67**
Interest accretion to non-current provisions	–138	–255	117
of which: interest accretion to mining provisions	–121	–186	65
Other financial result	205	–186	391
Financial result	**–13**	**–454**	**441**

Our financial result improved by €441 million to – €13 million. Its components changed as follows:

- Net interest dropped by €67 million to – €80 million, in part due to higher interest expenses in connection with currency hedges and higher costs incurred to pledge collateral in energy trading. Net interest includes the dividend on our 15 % stake in E.ON, which totalled €186 million (previous year: €182 million).

- The interest accretion to non-current provisions reduced income by €138 million. In the previous year, the decline was more substantial (€255 million) because we had lowered the discount rate applied when calculating our mining provisions and the resulting increase in the present value of the obligations had in part been recognised as an expense in the interest accretion.

- The other financial result rose by €391 million to €205 million. The main reason for the increase was a one-off effect of interest claims in relation to a tax refund for earlier assessment periods. Furthermore, a charge incurred in the prior year did not recur: in March 2020, we suffered substantial losses on security holdings owing to the turmoil on financial markets caused by the COVID-19 pandemic.

Income from continuing operations before tax grew by €257 million to €1,522 million. At 45 %, our effective tax rate was unusually high. One contributing factor was that we wrote off or did not recognise deferred tax assets in RWE AG's tax group, because we are unlikely to be able to use the deferred tax claims in the foreseeable future. Furthermore, an increase in the UK corporation tax rate effective as of 2023 drove up deferred tax liabilities. By contrast, the aforementioned tax refund for earlier years provided some relief.

In the fiscal year being reviewed, there was no income from discontinued operations. In the preceding year, this figure amounted to €221 million. It stemmed from the stake in Slovak energy utility VSE, which we sold to E.ON in August 2020.

Non-controlling interests in income rose by €52 million to €111 million. This is because we started fully consolidating Rampion in April 2021 and reduced our stake in the Humber Gateway wind farm in the UK North Sea (219 MW) from 100 % to 51 % at the end of 2020. Consequently, we now state non-controlling interests of the co-owners of these wind farms. A counteracting effect was felt from the sale of VSE: in 2020, a profit of €34 million had been assigned to the company's co-shareholders.

The RWE Group's net income amounted to €721 million (previous year: €1,051 million). This resulted in earnings per share of €1.07 (previous year: €1.65). The number of RWE shares outstanding used to calculate this indicator totalled 676.2 million compared to 637.3 million in the previous year. These figures are annual averages. In August 2020, we issued 61.5 million new RWE shares via a capital increase.

Reconciliation to adjusted net income 2021 € million	Original figures	Adjustment	Adjusted figures
Adjusted EBIT	**2,185**	**–**	**2,185**
Non-operating result	–650	650	–
Financial result	–13	–196	–209
Taxes on income	–690	394	–296
Income	**832**	**848**	**1,680**
of which:			
Non-controlling interests	111	–	111
Net income / income attributable to RWE AG shareholders	**721**	**848**	**1,569**

Adjusted net income higher than expected. Adjusted net income amounted to €1,569 million. Due to the unexpectedly positive development of operating earnings, it was well above the guided range of €750 million to €1,100 million. The prior-year figure of €1,257 million was also clearly exceeded. To calculate adjusted net income, we corrected net income according to IFRS by deducting the non-operating result and major special items in the financial result from it. Instead of the actual tax rate, we applied a rate of 15%, which reflects the tax level net of one-off effects that can theoretically be expected.

Capital expenditure on property, plant and equipment and on intangible assets[1] € million	2021	2020	+/–
Offshore Wind	1,683	756	927
Onshore Wind / Solar	1,404	1,154	250
Hydro / Biomass / Gas	294	153	141
Supply & Trading	47	43	4
Other, consolidation	2	–	2
Core business	**3,430**	**2,106**	**1,324**
Coal / Nuclear	259	183	76
RWE Group	**3,689**	**2,285**[2]	**1,404**

1 Table only shows cash investments.
2 Including a –€4 million consolidation effect between the core business and the Coal / Nuclear segment.

Capital expenditure on financial assets[1] € million	2021	2020	+/–
Offshore Wind	27	520	–493
Onshore Wind / Solar	27	408	–381
Hydro / Biomass / Gas	6	115	–109
Supply & Trading	20	18	2
Other, consolidation	–	11	–11
Core business	**80**	**1,072**	**–992**
Coal / Nuclear	–	1	–1
RWE Group	**80**	**1,073**	**–993**

1 Table only shows cash investments.

Marked increase in capital expenditure on renewable energy. In the past fiscal year, our capital spending totalled €3,769 million, 12% more than in 2020 (€3,358 million). The lion's share of the funds was dedicated to the Offshore Wind (45%) and Onshore Wind / Solar (38%) segments.

Our capital expenditure on property, plant and equipment and intangible assets amounted to €3,689 million (previous year: €2,285 million). The Triton Knoll wind farm in the UK North Sea received the biggest share of investments. Significant sums were also spent to build the Sofia wind farm off the eastern coast of England (1,400 MW), the Kaskasi wind farm near Heligoland (342 MW), the Blackjack Creek (240 MW) and El Algodon Alto (200 MW) onshore wind farms in Texas, and the Hickory Park solar farm in the US state of Georgia (196 MW plus battery storage). In addition, we made advance payments for the rights we secured in an auction in February 2021 to develop new offshore wind areas in the UK North Sea (see page 40).

At €80 million, capital expenditure on financial assets was much lower than the high figure registered in the prior year (€1,073 million), which included our acquisitions of the 20% stake in the Rampion offshore wind farm and Nordex's European development business (see page 43 of the 2020 Annual Report).

Workforce[1]	31 Dec 2021	31 Dec 2020	+/–
Offshore Wind	1,277	1,119	158
Onshore Wind / Solar	2,146	2,402	–256
Hydro / Biomass / Gas	2,606	2,667	–61
Supply & Trading	1,804	1,790	14
Other[2]	467	425	42
Core business	**8,300**	**8,403**	**–103**
Coal / Nuclear	9,946	11,095	–1,149
RWE Group	**18,246**	**19,498**	**–1,252**

1 Converted to full-time positions.
2 This item exclusively comprises employees of the holding company RWE AG.

Headcount significantly down year on year. As of 31 December 2021, the RWE Group had 18,246 people on its payroll, of which 13,585 were employed in Germany and 4,661 worked abroad. Part-time positions were considered in these numbers on a pro-rata basis. Personnel figures were down markedly compared to the end of 2020 (– 1,252). We recorded a significant decline (– 1,149) in the Coal / Nuclear segment where many employees accepted early retirement offers as part of the German coal phaseout. Although we created a large number of jobs by expanding renewable energy, headcount in our core business declined somewhat. The main reason for this was that we sold large parts of the Belectric Group.

Staff figures do not include apprentices or trainees. At the end of 2021, 785 young adults were learning a profession at RWE, compared to 750 in the previous year.

2.7 Financial position and net worth

Our financial position and net worth continued to improve in 2021. Even though we invested billions in the expansion of renewables, our net debt fell to less than zero. As of the balance-sheet date, the RWE Group posted net assets of €360 million. This pleasing development was particularly thanks to our strong cash flow from operating activities. Our robust credit ratings also underline how strong our financial position is. The agencies Moody's and Fitch raised RWE's credit rating by one notch last year. Our current long-term ratings are investment grade, at Baa2 and BBB+ respectively.

RWE AG bears responsibility for procuring funds. Responsibility for Group financing is centralised at RWE AG. As the parent company, RWE AG is responsible for acquiring funds from banks or the financial markets. Subsidiaries only raise debt capital directly in specific cases, for example if it is advantageous economically to make use of local credit and capital markets. RWE AG also acts as a co-ordinator when subsidiaries assume contingent liabilities. This allows us to manage and monitor financial risks centrally. Moreover, it strengthens our position when negotiating with banks, business partners, suppliers and customers.

Tools for raising debt capital. We cover most of our financing needs with earnings from our operating activities. In addition, we have a wide range of tools to procure debt capital:

- Our Debt Issuance Programme (DIP) gives us latitude in raising debt capital for the long term. Our current DIP allows us to issue bonds with a total face value of up to €10 billion. By issuing three green bonds, we exercised this financing option in 2021 for the first time in six years.
- For short-term refinancing, we have a Commercial Paper Programme, which was updated in 2021. It allows us to raise funds equivalent to up to €5 billion on the money market. During the past fiscal year, we accessed a large portion of this funding volume: at times, a total of up to €3 billion in commercial paper was outstanding.
- To secure our liquidity, we also have access to a €5 billion syndicated credit line extended by a consortium of 27 international banks. It consists of two tranches: one of €2 billion, which expires in April 2022, and one of €3 billion, which is available through to April 2026. At our initiative, sustainability criteria were added to the conditions of the second tranche last year. Among other things, the conditions now depend on the development of the following three indicators: the share of renewables in RWE's generation portfolio, the CO_2 intensity of our plants and the percentage of our capex that is classified as sustainable in accordance with the EU taxonomy regulation. We have set goals for all three of these criteria. If we do not achieve the targets, we will have to pay higher interest and commitment fees. Half of the additional expenses would be directed to non-profit organisations. This new structure for the credit line underlines our commitment to our emissions reduction strategy.

Green bonds worth €1,850 million issued. For the first time ever, RWE AG issued green bonds in 2021. In June, we placed a 10-year bond with a nominal volume of €500 million and an annual coupon of 0.625%, followed by two issues in November: a 7-year bond of €750 million and a 12-year bond of €600 million, with annual coupons of 0.5% and 1.0%, respectively. Additional information on these three debt securities can be found on page 21. The proceeds of green bonds are tied to specific purposes. We will use these funds exclusively for wind and solar projects.

Bond volume rises to €2.4 billion. RWE bonds with a total face value equivalent to €2.4 billion were outstanding at the end of 2021, versus €0.6 billion in the previous year. The significant increase was due to the aforementioned issues. Along with the three green bonds, RWE still has two outstanding hybrid bonds: one of €282 million with a 3.5 % coupon and one of US$317 million with a 6.625 % coupon. Due to early buybacks in October 2017, the outstanding amounts are below the issuance volumes of €550 million and US$500 million. The earliest redemption dates for the two hybrid bonds are in April 2025 and March 2026, respectively.

Credit rating of RWE AG	Moody's		Fitch	
As of March 2022	Current	Previous	Current	Previous
Long-term debt				
Senior debt	Baa2	Baa3	BBB+	BBB
Subordinated debt (hybrid bonds)	Ba1	Ba2	BBB-	BB+
Short-term debt	P-2	P-3	F1	F2
Outlook	Stable	Positive	Stable	Stable

Solid investment grade rating. The conditions at which we can raise debt largely depend on rating agencies' assessment of our creditworthiness. Moody's and Fitch make such evaluations on request from us. In the past year, both agencies raised their credit rating for RWE by one notch. RWE's long-term creditworthiness is now rated Baa2 (Moody's) and BBB+ (Fitch), both with a stable outlook. These are investment grade ratings. The ratings for our hybrid bonds and current financial liabilities are now also one level higher (see table above). Moody's and Fitch cited RWE's transformation into a leading renewables company as the reason for the rating improvement. This business is characterised by attractive and relatively stable earnings.

Cash flow statement[1] € million	2021	2020	+/-
Funds from operations	7,103	4,108	2,995
Change in working capital	171	17	154
Cash flows from operating activities of continuing operations	**7,274**	**4,125**	**3,149**
Cash flows from investing activities of continuing operations	**-7,738**	**-4,278**	**-3,460**
Cash flows from financing activities of continuing operations	**1,457**	**1,769**	**-312**
Effects of changes in foreign exchange rates and other changes in value on cash and cash equivalents	58	-34	92
Total net changes in cash and cash equivalents	**1,051**	**1,582**	**-531**
Cash flows from operating activities of continuing operations	7,274	4,125	3,149
Minus capital expenditure	-3,769	-3,358	-411
Plus proceeds from divestitures / asset disposals	1,057	365	692
Free cash flow	**4,562**	**1,132**	**3,430**

1 All items solely relate to continuing operations; some prior-year figures restated due to a change in the recognition of tax benefits to subsidise renewables in the USA (see commentary on page 47).

Robust improvement in operating cash flow. Our cash flows from operating activities of continuing operations amounted to €7,274 million, clearly exceeding the prior-year figure (€4,125 million). The good earnings situation and the compensation paid to us in November 2021 by the German Federal government for the phaseout of nuclear energy had positive effects. The main reason for the increase, however, were high margin payments for forward contracts for electricity, fuel and CO_2 certificates. RWE concludes contracts of this kind to reduce earnings risk exposure. For exchange-traded derivatives, we first have to provide an initial margin. Additionally, over the term of the contract, we receive or pay variation margins, depending on how the market value of the derivative changes. So-called collateral has to be provided for over-the-counter derivative transactions.

During the year under review, we received a high amount of variation margins, which are included in cash flow from our operating activities. This was contrasted against significant outflows of funds for initial margins and collaterals, which we reported in cash flows from financing activities.

Investing activities of continuing operations led to a cash outflow of €7,738 million (previous year: €4,278 million). €3,769 million of this sum stemmed from our capital expenditure on property, plant and equipment and financial assets. Moreover, we made significant investments in securities and an extraordinary increase of the assets used to meet pension obligations in the amount of €1,092 million. This was contrasted by revenues from the sale of business activities and shareholdings of €1,057 million. The most important transactions were the sale of our stakes in the US wind farms Stella, Cranell, East Raymond and West Raymond as well as the disposal of the grid connection for the Rampion offshore wind farm in the UK (see page 41).

Financing activities of continuing operations produced cash inflows of €1,457 million (previous year: €1,769 million). In 2021, we recorded high income from bank loans taken out, the issuance of commercial paper and the three green bonds we issued, which are discussed on page 60. However, we also had to make substantial payments for initial margins and collaterals. Outflows of funds were also registered due to dividend payments to RWE shareholders and minority shareholders.

On balance, the aforementioned cash flows from operating, investing and financing activities increased our cash and cash equivalents by €1,051 million.

Cash flows from operating activities, less capital expenditures, plus proceeds from divestments and asset disposals, results in free cash flow. This amounted to €4,562 million, up substantially on the prior-year figure (€1,132 million).

Net assets / net debt[1] € million	31 Dec 2021	31 Dec 2020	+/–
Cash and cash equivalents	5,825	4,774	1,051
Marketable securities	8,347	4,517	3,830
Other financial assets	12,403	2,507	9,896
Financial assets	**26,575**	**11,798**	**14,777**
Bonds, other notes payable, bank debt, commercial paper	–10,704	–2,160	–8,544
Hedging of bond currency risk	–9	–31	22
Other financial liabilities	–7,090	–3,038	–4,052
Financial liabilities	**–17,803**	**–5,229**	**–12,574**
Plus 50% of the hybrid capital stated as debt	290	278	12
Net financial assets (including correction of hybrid capital)	**9,062**	**6,847**	**2,215**
Provisions for pensions and similar obligations	–1,934	–3,864	1,930
Surplus of plan assets over benefit obligations	459	172	287
Provisions for nuclear waste management	–6,029	–6,451	422
Provisions for dismantling wind farms	–1,198	–1,136	–62
Net assets (+) / net debt (–)	**360**	**–4,432**	**4,792**

1 Mining provisions are not included in net debt. The same holds true for the assets which we attribute to them. At present, this includes our 15% stake in E.ON and our claim for state compensation for the German lignite phaseout in the amount of €2.6 billion.

Net assets of €360 million. Our net debt declined by €4,792 million versus the previous year (€4,432 million). As a result of this, we posted a net asset position of €360 million as of 31 December 2021. The main reason for this was the excellent free cash flow. The market-driven increase in the discount rates we use to calculate the present value of pension obligations also played a role, as it resulted in a decline in provisions for pensions. A similar effect was exerted by the income generated from managing the plan assets for our pension obligations. While the aforementioned extraordinary funding of these assets in the amount of €1,092 million caused provisions to decline, it was coupled with a corresponding outflow of funds and thus did not result in a reduction of debt. Dividend payments lowered our net financial position by €730 million.

Leverage factor below zero. One of our key management parameters is the ratio of net debt to the adjusted EBITDA of the core business, also referred to as the leverage factor. This figure is more indicative than total liabilities, as it also reflects earning power and therefore our ability to meet our debt obligations. We set the upper limit for the leverage factor at 3.0 in order to secure our financial flexibility. As the RWE Group did not have any net debt as of the balance-sheet date and posted a net asset position, this indicator was below zero. However, the leverage factor should increase in the medium term, above all due to growth investments in our green core business, which we will also finance using debt capital.

Moderate decline in off-balance-sheet fuel purchase obligations. Net debt does not include our off-balance-sheet obligations, which largely stem from long-term purchase agreements for fuel and electricity. As of the balance-sheet date, our payment obligations from material fuel procurement contracts amounted to €22.3 billion (previous year: €23.6 billion). In relation to electricity procurement, they amounted to €7.1 billion and were thus as high as in 2020. The figures are based on assumptions regarding the prospective development of commodity prices. Our purchase commitments rose from €2.1 billion to €5.6 billion over the course of the year. Further off-balance-sheet obligations result, inter alia, from liabilities for pension commitments that employees of our former subsidiary innogy had earned at RWE up to its IPO in 2016.

Sharp increase in balance-sheet total due to temporary effects from commodity derivatives. At 31 December 2021, the Group balance sheet was strongly influenced by changes in commodity derivatives. They rose by €56.4 billion on the assets side and €68.2 billion on the liabilities side. This was driven by the extreme increase in prices of electricity and natural gas. The increase in these derivatives was the main reason that the balance-sheet total of €142.3 billion was more than twice as high as in 2020 (€61.6 billion). Another reason for this development was that we raised a large amount of debt capital. Among other things, the funds were used to collateralise derivative transactions, which resulted in a corresponding build-up of receivables. At €17.0 billion, our equity was slightly below last year's level. The equity ratio amounted to 11.9%. Due to the increase in the balance-sheet total, this figure was significantly lower compared to 2020 (28.7%).

Financial position and net worth

Group balance sheet structure[1]	31 Dec 2021		31 Dec 2020	
	€ million	%	€ million	%
Assets				
Non-current assets	38,863	27.3	34,418	55.8
of which:				
Intangible assets	5,884	4.1	4,899	7.9
Property, plant and equipment	19,984	14.0	17,902	29.0
Current assets	103,446	72.7	27,224	44.2
of which:				
Trade accounts receivable	6,470	4.5	3,007	4.9
Receivables and other assets	79,626	56.0	12,531	20.3
Marketable securities	8,040	5.6	4,219	6.8
Assets held for sale	657	0.5	1,061	1.7
Total	**142,309**	**100.0**	**61,642**	**100.0**

	31 Dec 2021		31 Dec 2020	
	€ million	%	€ million	%
Equity and liabilities				
Equity	16,996	11.9	17,706	28.7
Non-current liabilities	28,306	19.9	27,435	44.5
of which:				
Provisions	16,943	11.9	19,470	31.6
Financial liabilities	6,798	4.8	3,951	6.4
Current liabilities	97,007	68.2	16,501	26.8
of which:				
Provisions	4,268	3.0	3,004	4.9
Financial liabilities	10,996	7.7	1,247	2.0
Trade accounts payable	4,428	3.1	2,387	3.9
Other liabilities	77,315	54.4	9,282	15.1
Liabilities held for sale	–	–	581	0.9
Total	**142,309**	**100.0**	**61,642**	**100.0**

1 Some prior-year figures restated due to a retroactive change in the recognition of tax benefits to subsidise renewables in the USA (see page 47) and retroactive adjustments to the first-time consolidation of operations which RWE acquired from Nordex in 2020 (see page 95).

2.8 Notes to the financial statements of RWE AG (holding company)

The financial statements of RWE AG are significantly influenced by the business performance of its subsidiaries. In sum, the profit transfers of these companies recorded an increase in 2021. This was contrasted by an impairment recognised for a subsidiary. We posted positive developments in other income and expenses as well as in net interest. Overall, RWE AG's earnings position has therefore improved: at €1,108 million, RWE AG's net profit was substantially higher than in 2020. We intend to raise the dividend and will therefore propose a payment of €0.90 per share to the Annual General Meeting taking place in April 2022. This constitutes an increase of €0.05 versus last year.

Balance sheet of RWE AG (abridged) € million	31 Dec 2021	31 Dec 2020	+/–
Assets			
Financial assets	17,866	20,524	–2,658
Accounts receivable from affiliated companies	7,922	2,094	5,828
Other accounts receivable and other assets	616	519	97
Marketable securities and cash and cash equivalents	11,709	6,664	5,045
Total assets	**38,113**	**29,801**	**8,312**
Equity and liabilities			
Equity	8,359	7,826	533
Provisions	2,245	1,996	249
Accounts payable to affiliated companies	18,743	18,905	–162
Other liabilities	8,766	1,074	7,692
Total equity and liabilities	**38,113**	**29,801**	**8,312**

Income statement of RWE AG (abridged) € million	2021	2020	+/–
Income from financial assets	378	1,114	–736
Net interest	318	–72	390
Other income and expenses	132	–712	844
Taxes on income	280	250	30
Net profit	**1,108**	**580**	**528**
Transfer to other retained earnings	–499	–5	–494
Distributable profit	**609**	**575**	**34**

Financial statements in accordance with German commercial law. RWE AG prepares its financial statements in compliance with the rules set out in the German Commercial Code and the German Stock Corporation Act. The financial statements are submitted to Bundesanzeiger Verlag GmbH, located in Cologne, Germany, which publishes them in the Federal Gazette. They are available on the internet at www.rwe.com/financial-reports.

Assets. RWE AG had €38.1 billion in total assets as of 31 December 2021 (previous year: €29.8 billion). Accounts receivable from affiliated companies registered a significant rise. This was mainly because we made cash and cash equivalents available to our subsidiary RWE Supply & Trading as collateral for commodity forward transactions. We also posted significant increases in 'marketable securities and cash and cash equivalents' and 'other liabilities'. In the year under review, we increased our liabilities significantly by way of bank loans, commercial paper and green bonds. These funds were, inter alia, used to secure liquidity, with a portion thereof, e. g. the proceeds generated by bonds issued, earmarked for growth investments. RWE AG's equity rose by €533 million to €8,359 million. However, the equity ratio decreased from 26.3 % to 21.9 %, due to the increase in the balance sheet total.

Financial position. RWE AG is set up solidly in economic terms with high levels of cash and cash equivalents and a number of financing tools at its disposal that it can use flexibly. Accordingly, rating agencies Moody's and Fitch classify our creditworthiness as 'investment grade'. Last year, they both raised our respective credit rating by one level to Baa2 (Moody's) and BBB+ (Fitch). You can find detailed information on RWE's financial situation and on our financing activities in the year under review on pages 60 et seqq.

Earnings position. RWE AG's earnings position improved compared to 2020. The main items on the income statement developed as follows:

- Income from financial assets dropped by €736 million to €378 million. One reason for this was an impairment loss recognised in relation to our stake in RWE Power. However, this company's profit transfer was higher than in 2020, which was attributable to improved generation margins and lower charges resulting from impairments, depreciation and amortisation. RWE Nuclear also gained considerable ground. This was due to the compensation we received from the German government for the nuclear phaseout (see page 36). By contrast, income from our stake in RWE Supply & Trading decreased.

- Net interest increased by €390 million to €318 million. This was in part due to a rise in capital gains from the management of plan assets used to cover our pension obligations and was further boosted by interest claims relating to tax refunds for earlier assessment periods.

- The 'other income and expenses' line item improved by €844 million to €132 million. In the year under review, we recognised write-backs for financial accounts receivable from a Dutch subsidiary. This reversed impairments in previous years to some extent.

- In 2021, we recorded tax income of €280 million (previous year: €250 million). This is largely due to the aforementioned tax refunds for earlier assessment periods.

- Versus 2020 (€580 million), the presented earnings figures led to a considerably higher net profit of €1,108 million.

- The distributable profit of €609 million corresponds to the planned payment of a dividend of €0.90 per share to our shareholders.

Outlook for 2022. RWE AG's earnings prospects will largely depend on the business performance of its subsidiaries. Our current assessment makes us confident that we will achieve a net profit in 2022 that offers the necessary margins for the intended dividend of €0.90. However, it is unlikely to match the level achieved in 2021.

Corporate governance declaration in accordance with Sections 289f and 315d of the German Commercial Code. On 15 February 2022, the Executive Board and the Supervisory Board of RWE AG issued its Corporate Governance Declaration in accordance with Sections 289f and 315d of the German Commercial Code. The declaration contains the Corporate Governance Report and has been published at www.rwe.com/corporate-governance-declaration.

2.9 Outlook

We are confident of being able to pick up where we left off last year in terms of our earnings position. As things stand, we anticipate adjusted EBITDA of €3.6 billion to €4.0 billion. Our core business is expected to close fiscal 2022 up on last year's earnings, which had been heavily impacted by the extreme weather conditions in Texas. The commissioning of new generation capacities is set to have a positive effect. We also expect to see improved electricity margins and better wind conditions. After last year's extraordinarily successful energy trading performance, we anticipate income to normalise. Not yet included in our forecast is the fallout of the Ukraine conflict, which is difficult to assess. How events unfold and how sanctions against Russia affect European energy supply may have a significant impact on our business.

Ukraine crisis puts economic growth at risk. Forecasts concerning the economic development in our core markets are linked to considerable uncertainties related to the Ukraine conflict. Estimates available when the combined review of operations was written had been compiled before the war broke out. Based on these figures, world economic output could increase by about 4 % in 2022. Growth rates forecast for the Eurozone, Germany and the USA are of a similar order, while those for the United Kingdom and the Netherlands are expected to reach 3 %. Should energy prices remain extremely high due to the Ukraine conflict, then the economy may well prove to be less dynamic.

Rise in electricity consumption anticipated. Higher economic output is generally associated with additional demand for electricity. However, this is contrasted by continued energy savings which will probably have a slightly dampening effect. Provided the aforementioned economic prognoses prove to be accurate, demand for electricity in our key markets Germany, the Netherlands, the UK and the USA should be between 1 % and 3 % higher than in 2021.

Our power production for 2022 has already largely been sold forward. Wholesale electricity prices rose considerably last year, surging again in early 2022 due to the Ukraine conflict. Their development during the current year is impossible to predict, but market fluctuations would only have a moderate impact on this year's generation margins as we have already largely sold forward our electricity production for 2022 and hedged the prices of the required fuel and CO_2 emission allowances. These transactions have been concluded up to three years ahead, and already reflect the rise in electricity prices in 2021 to a limited extent. A large portion of electricity generated by RWE wind farms, where revenue is market-dependant, has also already been sold forward.

Forecast € million	2021 actual	Outlook for 2022
Adjusted EBITDA	3,650	3,600–4,000
of which:		
Core business	2,761	2,900–3,300
of which:		
Offshore Wind	1,110	1,350–1,600
Onshore Wind / Solar	258	650–800
Hydro / Biomass / Gas	731	700–900
Supply & Trading	769	150–350
Coal / Nuclear	889	650–750
Adjusted EBIT	2,185	2,000–2,400
Adjusted net income	1,569	1,300–1,700

2022 adjusted EBITDA of €3.6 billion to €4.0 billion expected. Subject to the risks associated with the Ukraine conflict, which are difficult to gauge, we expect this year's business performance to pick up where we left off in terms of our good operating result in 2021. We forecast adjusted EBITDA for the Group of €3,600 million to €4,000 million (previous year: €3,650 million) for 2022 and envisage a range of €2,900 million to €3,300 million in the core business, thus exceeding last year's figure (€2,761 million) which had been heavily burdened by an extreme cold snap in Texas in February 2021. We assume the commissioning of new wind and solar farms and higher electricity margins to have a positive effect on earnings. Moreover, we expect to see average wind speeds, which would improve the utilisation of our wind farms compared to 2021, which was a low-wind year. By contrast, we may well fall short of the very good result achieved in the energy trading business last year. We anticipate a decline in EBITDA outside of the core business, i.e. in the Coal / Nuclear segment, due to decommissioning of generation capacities, in particular the closure of the Gundremmingen C nuclear power station as of 31 December 2021.

Based on anticipated operating depreciation and amortisation of approximately €1,600 million, adjusted EBIT should range between €2,000 million and €2,400 million (last year: €2,185 million). Net income, which excludes major exceptional effects, is expected to total between €1,300 million and €1,700 million (last year: €1,569 million). We explain how this key figure is calculated on page 58.

Our outlook broken down by segment is as follows:

- **Offshore Wind:** Adjusted EBITDA in this business is forecast to total between €1,350 million and €1,600 million (last year: €1,110 million). We expect the full commissioning of the Triton Knoll wind farm to play an important part. In addition, the first full consolidation of the Rampion wind farm for the year as a whole is also likely to have a positive effect. Furthermore, we anticipate higher margins than last year and expect utilisation of our assets to improve due to the weather.
- **Onshore Wind / Solar:** Our prognosis for this segment is adjusted EBITDA of €650 million to €800 million, clearly surpassing last year's level (€258 million). The main contributing factor will be the non-recurrence of the one-off burden due to the cold snap in Texas in 2021. In addition, we anticipate higher generation volumes due to the commissioning of new generation capacity and more favourable wind conditions. Higher generation margins will also help earnings to rise. This will be contrasted by an increase in expenditure on the development of growth projects. Furthermore, last year's result included capital gains on the sale of majority stakes in Texan wind farms, which will not recur.
- **Hydro / Biomass / Gas:** Here, we forecast adjusted EBITDA of €700 million to €900 million. Therefore, the segment stands a good chance of closing 2022 up on last year's figure (€731 million). Higher margins on electricity forward sales will play a significant role. Moreover, we expect capital gains from the sale of a former power plant site in the United Kingdom. Conversely, income from the commercial optimisation of power plant dispatch may well fall short of the high level achieved in 2021. Payments from the British capacity market will also decline. An unscheduled outage at the Dutch Claus C gas-fired power station is also expected to have a negative effect.
- **Supply & Trading:** Earnings in this segment are difficult to predict due to the high volatility of the trading business. Assuming that business develops normally, adjusted EBITDA should range between €150 million and €350 million. In this case, it would be substantially below the unusually high level recorded last year (€769 million).
- **Coal / Nuclear:** Here, we anticipate a decrease in adjusted EBITDA to between €650 million and €750 million (last year: €889 million). The main reason for this is the closure of the Gundremmingen C nuclear power station and five lignite units in 2021. This will be contrasted by positive effects stemming from cost savings.

Capital expenditure on property, plant and equipment markedly up on last year. In comparison to 2021 (€3,689 million), we plan on substantially increasing our property, plant and equipment and intangible asset investments. Considerable funds will be allocated to building the Kaskasi and Sofia offshore wind farms near Heligoland and in the UK North Sea, respectively. Further investments will be made in wind, solar and battery projects in the USA and Europe as well as the construction of a gas-fired power station at Biblis, which is needed to stabilise the electricity grid. Outside of the core business, in the Coal / Nuclear segment, we plan to spend about €200 million on property, plant and equipment, mainly to maintain our power stations and opencast mines.

Leverage factor to stay below upper limit of 3.0. One of our key management parameters is the ratio of net debt to adjusted EBITDA of the core business, also referred to as the leverage factor. As explained on page 63, the leverage factor fell below zero in 2021. However, it will probably rise again in the long run. This is largely on account of our planned growth investments, a portion of which we will finance by raising debt capital. It is virtually impossible to make leverage factor forecasts for individual years primarily due to the significant liquidity fluctuations that can result from the collateralisation of commodity forward transactions. Nevertheless in 2022, we anticipate this key performance indicator to be clearly below 3.0, i. e. the cap we have set for it.

Dividend for fiscal 2022. The Executive Board of RWE AG aims to pay a dividend of €0.90 per share for the 2022 financial year. This corresponds to the dividend that we intend to propose to the Annual General Meeting on 28 April 2022 for fiscal 2021.

2.10 Development of risks and opportunities

RWE's transformation into a growth company in the green economy has improved our risk-opportunity profile. Thanks to the predominantly high, stable revenues that can be generated with renewables, not only are we more profitable, we are also more resilient. However, Russia's invasion of Ukraine has given rise to new uncertainties. What this conflict will mean for the energy industry and the development of RWE's business is impossible to predict. The German government's plans to accelerate the phaseout of coal-based power generation also pose a risk and could be associated with significant financial burdens for RWE. However, if framework conditions prove favourable, they also offer us the chance to proceed more quickly towards climate neutrality.

Distribution of risk management tasks at RWE. Responsibility for Group risk management lies with the parent company RWE AG. Its Executive Board monitors and manages the Group's overall risk. In addition, it determines the general risk appetite of RWE and defines upper limits for single risk positions. At the level below the Executive Board, the Controlling & Risk Management Department has the task of applying and constantly refining the risk management system. It derives detailed limits for the individual business fields and operating units from the risk caps set by the Executive Board. Its tasks also include checking the identified risks for completeness and plausibility and aggregating them. In so doing, it receives support from the Risk Management Committee, which is composed of the heads of the following five RWE AG departments: (1) Controlling & Risk Management (Chair), (2) Finance & Credit Risk, (3) Accounting, (4) Legal, Compliance & Insurance, and (5) Strategy & Sustainability. The Controlling & Risk Management Department provides the Executive Board and the Supervisory Board of RWE AG with regular reports on the company's risk exposure.

A number of additional organisational units and committees have been entrusted with risk management tasks:

- Financial risks and credit risks are managed by the Finance & Credit Risk Department of RWE AG.
- The Accounting Department ensures that financial reporting is free of material misstatements. It has an accounting-related internal control system for this purpose. A committee consisting of officers from Accounting and other departments of relevance to accounting assists in securing the quality of financial reporting. More detailed information can be found on page 79.
- Risks from changes in commodity prices are monitored by RWE Supply & Trading in so far as they relate to the conventional electricity generation, energy trading and gas businesses. Where these risks relate to the renewable energy business, they are managed by RWE Renewables.
- Strategies to limit market risks in conventional electricity generation must be approved by the Commodity Management Committee. This expert panel consists of the CFO of RWE AG, members of the Board of Directors of RWE Supply & Trading and a representative of the Controlling & Risk Management Department.
- We also have a committee tasked with mitigating market risks associated with the renewable energy business. The Renewables Commodity Management Committee consists of the CFO of RWE AG, members of the management of RWE Renewables and a representative of the Controlling & Risk Management Department.

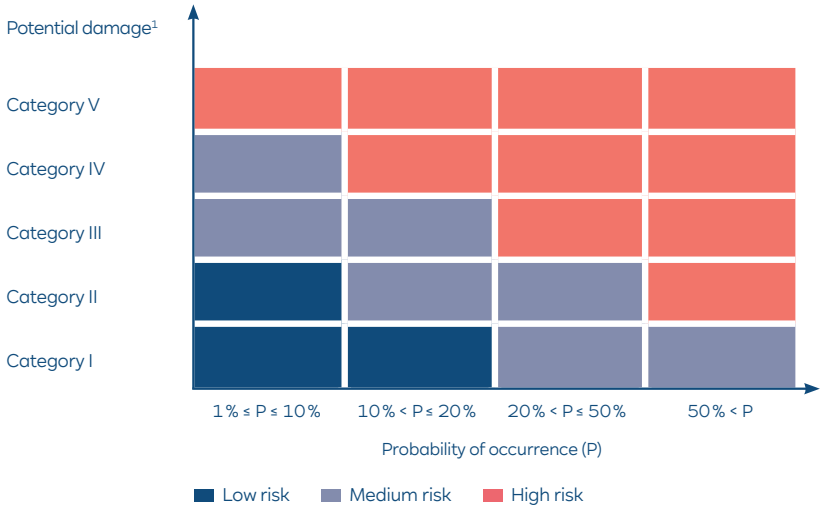
Under the expert management of the aforementioned organisational units, RWE AG and its subsidiaries are responsible for identifying risks early, assessing them correctly and managing them in compliance with corporate standards. Internal Audit regularly verifies the quality and functionality of our risk management system. The Executive Board formally establishes the Group's risk bearing capacity. This took place by way of a resolution dated 23 November 2021.

Risk identification and assessment. Risks and opportunities are defined as negative or positive deviations from expected figures. Their management is an integral and continuous part of operating processes. We assess risks every six months, using a bottom-up analysis. We also monitor risk exposure between the regular survey dates. The Executive Board of RWE AG is immediately notified of any material changes. Our executive and supervisory bodies are updated on the Group's risks once a quarter.

Our risk analysis normally covers the three-year horizon of our medium-term plan, but can extend beyond that in individual cases. We measure the potential damage based on the possible effects on net income, liquidity, net debt and/or equity. In doing so, we take hedges into account. We define the potential damage as the deviation from the budgeted figure in question, aggregated over the planning horizon.

We display the material risks using a matrix (see chart on the right) in which they are categorised by potential damage and probability of occurrence. Risks that share the same cause are aggregated to a single risk, if possible. To clearly assign them to the matrix fields, we have established damage potential thresholds, which are oriented towards the RWE Group's ability to bear risks. They are presented in the table below the matrix. Depending on their position in the matrix, we distinguish between low, medium and high risks. Based on this systematic risk identification, we determine whether there is a need for action and initiate measures to mitigate the risks if necessary.

RWE AG risk matrix



Potential damage[1] € million	**Earnings risks** Potential impact on net income (X)	**Indebtedness / equity risks** Potential impact on liquidity, net debt and / or equity (Y)
Category V	8,000 ≤ X	8,000 ≤ Y
Category IV	1,500 ≤ X < 8,000	4,000 ≤ Y < 8,000
Category III	600 ≤ X < 1,500	2,000 ≤ Y < 4,000
Category II	300 ≤ X < 600	1,000 ≤ Y < 2,000
Category I	X < 300	Y < 1,000

1 Aggregated over the planning horizon.

Risk classes	Classification of the highest single risk	
	31 Dec 2021	31 Dec 2020
Market risks	Medium	Medium
Regulatory and political risks	High	Medium
Legal risks	Low	Low
Operational risks	Medium	Medium
Financial risks	Medium	Medium
Creditworthiness of business partners	Medium	Medium
Other risks	Low	Medium

Main risks for the RWE Group. Depending on their causes, our risks can be divided into seven classes, which are shown in the table. The highest individual risk determines the classification of the risk of the entire risk class. Our classification of risks reflects the situation in early March 2022. It was not possible to predict the impact of the Ukraine conflict at this time. The following changes have been made versus last year's risk classification:

- We adjusted the classification of our regulatory and political risks upwards from 'medium' to 'high'. One reason for this is the plan of the new government coalition, made up of the Social Democrats, the Green Party and the Free Democrats, to accelerate the German coal phaseout without granting the affected companies compensation. Far-reaching EU sanctions against Russia could also have a significant impact on our business.

- We reclassified our 'other risks' from 'medium' to 'low' because the economic impact of the coronavirus pandemic has become more manageable. Previously, we believed our single-largest other risk was that a reduction in demand for energy caused by the pandemic would cause electricity prices to drop over the long term and we would thus have to recognise impairments for generation assets. Now we feel that this is unlikely.

As set out earlier, the focus of the risk analysis described in this chapter lies on the three-year horizon of our medium-term plan. In 2017, the Task Force on Climate-related Financial Disclosures (TCFD), a panel of experts, recommended that companies consider time horizons that go far above and beyond this when identifying and assessing climate-related risks. RWE implements the TCFD proposals. We explain how we do this in our 2021 Sustainability Report, which will be published in April 2022 and will then be available at www.rwe.com/sustainability-report.

In this section, we provide commentary on the main risks and opportunities we have identified for this and the next two years and explain what measures have been taken to counter the threat of negative developments.

- **Market risks.** In most of the countries in which we are active, the energy sector is characterised by the free formation of prices. This presents both opportunities and risks. Over the course of the past year, prices quoted in our key European electricity forward markets hit an all-time high. As a result, the earnings prospects of our generation assets became considerably more favourable. If limits are placed on Russian natural gas imports in the long term due to the Ukraine conflict, then energy prices should remain at a high level. However, there is a possibility that the economy will fall into a recession and that electricity prices will drop again.

  With regard to power and gas purchase agreements, if the conditions are not coupled to the development of wholesale prices, there is a risk of having to pay more for the product than we can earn when selling it. This may force us to form provisions to cover this risk. We have identified such a risk inherent in the two contracts we concluded to purchase electricity from the Datteln 4 hard coal-fired power plant in 2005 and 2006. The station was commissioned by energy group Uniper in mid-2020, ten years later than planned. We were unsuccessful in taking legal recourse against the continuation of the agreements. A further legal dispute regarding certain contractual provisions with Uniper is still pending.

RWE has a long-term gas purchase agreement with Russian energy group Gazprom. What the Ukraine crisis will mean for this contract remains to be seen. We have the option to negotiate contractual changes depending on market conditions during price reviews, should it remain effective. In the past, this has enabled us to mitigate our earnings risk exposure from the contract.

We assess the price risks to which we are exposed on the procurement and supply markets taking account of current forward prices and expected volatility. For our power plants and parts of our renewable energy portfolio, we limit the earnings risks by selling a large portion of the electricity forward. Whenever we need fuel and CO_2 emission allowances to produce power, we secure the respective prices when we sell the electricity. This makes it easier for us to plan generation margins in coming years. However, if we sell too much electricity forward, we run the risk of having to make expensive purchases on the market to fulfil supply commitments in the event of production outages. An example of such a situation was the extreme cold snap in Texas in February 2021, on which we report on page 43. The consequences of this weather event prompted us to review and optimise our hedging strategy.

We also use financial instruments to hedge our commodity positions. In the consolidated financial statements, these instruments are inter alia presented through the statement of on-balance-sheet hedges. The same applies to financial instruments serving the purpose of limiting interest rate and currency risks. More detailed information on this can be found on pages 105 and 158 et seqq. in the Notes.

RWE Supply & Trading plays a central role when it comes to managing commodity price risks. It functions as the Group's interface to the global wholesale markets for electricity and energy commodities. On behalf of our power plant companies, RWE Supply & Trading markets large portions of our electricity output and purchases the necessary fuel and CO_2 certificates. Since RWE Supply & Trading acts as the internal transaction partner it is easier for us to limit the risks associated with price volatility on energy markets. However, the trading transactions are not exclusively intended to reduce risks. In compliance with risk thresholds, the company also takes commodity positions to achieve a profit.

Our risk management system for energy trading is firmly aligned with best practice as applied to the trading businesses of banks. As part of this, transactions with third parties are concluded only if the associated risks are within approved limits. There are guidelines governing the treatment of commodity price risks and associated credit risks. Our subsidiaries constantly monitor their commodity positions. Risks associated with trades conducted by RWE Supply & Trading for its own account are monitored daily.

The Value at Risk (VaR) is of central importance for risk measurement in trading. It specifies the maximum loss from a risk position not exceeded with a predetermined probability over a predefined period of time. The RWE Group's VaR figures are generally based on a confidence interval of 95 % and a holding period of one day. This means that, with a probability of 95 %, the daily loss will not exceed the VaR.

The VaR for the price risks of commodity positions in the trading business should not exceed a certain daily cap. In the past, this upper limit was initially set at €40 million, but was increased by €10 million at the beginning of 2021 and again in early 2022. In the period under review, the actual amounts averaged €32 million. The daily maximum was €50 million. In addition, limits derived from the respective VaR thresholds have been set for every trading desk. Furthermore, we develop extreme scenarios and factor them into stress tests, determine their impact on earnings, and take countermeasures if we deem the risks to be too high.

The management of our gas portfolio and the liquefied natural gas (LNG) business is pooled in a dedicated organisational unit at RWE Supply & Trading. During the past year, the daily VaR cap for these activities was raised from €14 million to €25 million. We used a maximum of €22 million of this headroom. The average VaR for the year was €8 million.

The massive price spikes recently observed in energy trading could continue due to the Ukraine conflict. Nevertheless, our market risks remain unchanged in the 'medium' category.

- **Regulatory and political risks.** Most countries in which we are active have set their sights on ambitious climate protection goals. A number of them, including Germany, have recently introduced more stringent objectives. To meet these targets, they will need to continue to improve the framework for renewable energy and green hydrogen. For companies such as RWE, which have designed their business model around the energy transition, this is associated with opportunities for growth. At the same time, our ambitious carbon-reduction strategy has meant that regulatory interventions to improve climate protection are no longer associated with such high risks.

  Nevertheless, changes to political and regulatory frameworks can severely impact us. The Ukraine crisis, in particular, is currently associated with risks. For example, there is the possibility that Russian commodities suppliers are no longer able to meet their obligations due to the sanctions against Russia, forcing us to procure these commodities on the market at high prices. It cannot be ruled out that contractual partners become insolvent because of the sanctions. Moreover, in core markets such as Germany, politicians could intervene with regulatory measures to secure energy supply and stabilise consumer prices. It is not yet possible to foresee what effects this could have on RWE.

  A core component of Germany's climate protection strategy is reducing coal-fired electricity generation to zero by 2038. In exchange for closing our lignite assets early, we are due €2.6 billion in compensation, which is still pending approval under EU state aid law. There is now talk of the exit roadmap being expedited. Germany's new government has announced that it ideally wants electricity generation from coal to end as early as 2030 and that it does not intend to grant affected companies any additional compensation. This would impose considerable financial burdens on RWE. However, the accelerated coal phaseout also presents us with opportunities as it presupposes more favourable framework conditions for the construction of environmentally friendly replacement plants, while the expansion of renewables would also have to be ramped up. This would benefit the implementation of our growth strategy. Moreover, the government might pay us compensation after all.

  We are also exposed to risks associated with the coal phaseout in the Netherlands, where a law was passed in 2019 that prevents us from using hard coal in Amer 9 and Eemshaven as of 2025 and 2030, respectively. There are no plans to offer compensation. We accept the coal phaseout, but do not believe it is just that the law does not provide for any remuneration for this intervention in companies' property rights. Given the lack of concessions by Dutch policymakers, we have submitted an application for arbitration proceedings in accordance with the Energy Charter Treaty with the International Centre for Settlement of Investment Disputes in Washington. We hope this will give us the opportunity to receive financial compensation. In addition to the coal phaseout, the Netherlands introduced a cap on coal firing in power plants, which will apply from 2022 to 2024. We are likely to be awarded compensation in relation to this measure, however it is not yet clear how much it will be. Furthermore, the EU Commission will still need to approve it under state aid law.

  Although the renewable energy business is characterised by fairly stable framework conditions and wide public acceptance, political uncertainties exist in this area as well. Adjustments to state subsidy schemes may result in reductions in payments and new projects losing their appeal. This can lead to investment undertakings being broken off. It is also conceivable that firmly pledged state payments may be cut retrospectively. In the dialogue we maintain with policymakers, we point out that companies which invest in building sustainable, climate-friendly energy infrastructure need reliable framework conditions.

  Even in the present regulatory environment, we are exposed to risks associated with, for instance, approvals for constructing and operating production facilities. This particularly affects our opencast mines, power stations and wind farms. The danger here is that approvals are granted late or not at all and that granted approvals are withdrawn temporarily or for good. Furthermore, it cannot be ruled out that the courts will legislatively prohibit the transfer of land that has been assigned to us in the vicinity of our opencast mines.

Producers in Germany benefit from lower tax rates on in-house electricity, gas and oil consumption. RWE also utilises this financial mechanism. The Federal government, however, intends to reform the legal basis for these benefits in accordance with the EU's guidelines on climate and environmental protection and state aid for energy. There is a risk that the new rules will be more restrictive and that we will possibly either receive lower discounts from 2023, or none at all.

Certain statutory regulations to which we must adhere can be interpreted in various ways and are therefore in need of legal clarification. One example is the regulation which exempts us from paying an apportionment under the Renewable Energy Act (EEG) for electricity that we consume ourselves in our German power stations and opencast mines. However, the legal situation surrounding the regulation is vague, for example with regard to the EEG exemption of leased assets. There is a danger that using this exemption may be limited by Germany's highest court and that back payments may even have to be made for previous years.

As set out earlier, we have adjusted the assessment of our regulatory and political risks from 'medium' to 'high', which is due to the uncertainties associated with the Ukraine conflict and Germany's coal exit.

- **Legal risks.** Individual RWE Group companies are involved in litigation and arbitration proceedings due to their operations or M & A transactions. Out-of-court claims have been filed against some of them. Furthermore, Group companies are directly involved in various procedures with public authorities or are at least affected by their outcomes. To the extent necessary, we have accrued provisions for possible losses resulting from pending proceedings before ordinary courts and arbitration courts.

  Risks may also result from exemptions and warranties that we granted in connection with the sale of assets. Exemptions ensure that the seller covers the risks that are identified within the scope of due diligence, the probability of occurrence of which is, however, uncertain. In contrast, warranties cover risks that are unknown at the time of sale.

  These hedging instruments are standard practice in sales of companies and equity holdings.

  We currently have low exposure to legal risks. This assessment did not change compared to the previous year.

- **Operational risks.** RWE operates technologically complex, interconnected generation assets. Damage and outages can weigh heavily on earnings, as seen in 2021 during the severe cold snap in the US state of Texas (see page 43). The recent sharp rise in electricity prices is associated with a higher risk of earnings losses but also presents opportunities should the utilisation of our assets be higher than anticipated. To mitigate these risks, we ensure that our supply commitments are not too high, as we may be forced to buy electricity at a high cost to meet these obligations in case of production outages, for example. Furthermore, we also regularly maintain our facilities and take out insurance policies if economically viable.

  When production facilities are built and modernised, delays and cost increases can occur, for example due to logistical bottlenecks or inadequate services provided by suppliers. The coronavirus pandemic and international trade conflicts have recently proven to be risk factors. Project delays can cause costs to rise and earnings to be delayed. Furthermore, delays of renewable energy projects can be disadvantageous to the level of subsidies they receive. We counter these risks through circumspect planning and diligent project management.

  The COVID-19 pandemic, which has persisted for two years now, continues to expose us to risks, albeit to a manageable extent. As before, deliveries can be delayed. Theoretically, it is also conceivable that the reliable operation of our plants may be jeopardised if a large number of employees goes on sick leave. Thanks to comprehensive preventive measures and forward-looking emergency plans, so far we have been able to keep all major operational processes up and running, and we are confident that we can continue doing so.

RWE has ambitious growth targets and has increased its investment budgets significantly. We take care to ensure that our new-build projects and acquisitions satisfy our return requirements. If positive market developments occur after an investment decision has been made, electricity revenue and thus also returns can exceed expectations. However, it is also possible that income achieved through our projects falls short of forecasts and that prices paid for acquisitions prove to be too high retrospectively. We prepare our investment decisions by conducting extensive analyses to try and map the financial and strategic effects as realistically as possible before taking investment decisions. Moreover, RWE has specific accountability provisions and approval processes in place to prepare and implement the decisions.

Our business processes are supported by secure data processing systems. Nevertheless, it is not possible to rule out a lack of availability of IT infrastructure or a breach in data security. There is also a risk of cyber attacks. The Ukraine crisis may trigger a rise in these sorts of attacks. We limit our IT risks with high security standards, and groupwide cyber security training programmes are designed to mitigate them. In addition, we regularly invest in hardware and software upgrades.

As in the previous year, we classify our operational risks as 'medium'.

- **Financial risks.** Interest rates, foreign exchange rates, securities prices and rates of inflation are subject to fluctuations, which can be difficult to predict and can have a major impact on our net worth and earnings.

  Changes in interest rates give rise to risks and opportunities in several respects. Market interest rates, for example, can impact our provisions, as they are the point of reference for the discount rates used for determining the net present values of obligations. This means that, all other things being equal, provisions decrease when market interest rates rise and increase when market interest rates fall. On pages 144 et seq. of the Notes, we present the effects of changes in interest rates on the net present values of our pension obligations and on the nuclear and mining provisions.

  Rises in market interest rates can lead to reductions in the prices of the securities we hold and vice versa. This primarily relates to fixed-interest bonds. In 2021, we started measuring the price risk using a sensitivity analysis. As of the balance-sheet date, an increase in market interest rates of 100 basis points would have lowered the value of the bonds on our books by €28 million.

  Moreover, interest rates also determine our financing costs. We measure the possible impact using the Cash Flow at Risk (CFaR), applying a confidence level of 95 % and a holding period of one year. The average CFaR at RWE AG in 2021 was €8 million.

  Changes to the general price level can also give rise to risks and opportunities. Rising inflation can force us to increase the value of our future obligations and raise provisions. Price increases are particularly detrimental when they are above average in sectors from which we procure products and services for nuclear waste disposal and recultivating opencast mine areas.

  With our focus on the global expansion of renewables, changes in exchange rates may increasingly impact our earnings. Companies which are overseen by RWE AG have their currency risks managed by the parent company. These risks are aggregated to a net financial position for each currency and hedged using currency derivatives if necessary. Our foreign currency risks are measured using sensitivity analyses. In the course of such, we calculate how a 10 % change in the exchange rate would affect the value of the respective foreign currency position. As of the balance-sheet date, the sum total of the sensitivities amounted to €0.3 million.

  Security price fluctuations can have a considerable impact on RWE's financial assets and pension funds. In case of a stock market crisis, for example due to the conflict in Ukraine, we would possibly need to significantly increase our pension provisions in order to compensate our fund assets potentially losing value. We are also exposed to share price risks in relation to our 15 % stake in E.ON, which had a fair value of €4.8 billion at the end of 2021.

Risks and opportunities from changes in the price of securities are controlled by a professional fund management system. Range of action, responsibilities and controls are set out in internal guidelines which the Group companies are obliged to adhere to when concluding financial transactions. All financial transactions are recorded using special software and are monitored by RWE AG.

Collateral pledged for forward transactions also harbours a risk. The amount of the payments – variation margins in the case of exchange transactions – depends on the extent to which the contractually agreed prices deviate from market quotations as of the respective cut-off date. If differences are substantial, then they may weigh heavily on our liquidity. As set out on page 38 et seq., wholesale prices of electricity, natural gas and CO_2 emission allowances spiked substantially in 2021. This forced us to pay unusually high variation margins for electricity forward sales. Thanks to our robust financial position and use of financing instruments at our disposal, we were always able to provide the required funds. Another positive factor was that we received significant margin payments in relation to forward sales of commodities, in particular of CO_2 emission allowances.

The conditions at which we finance our debt capital are in part dependent on the credit ratings we receive from independent rating agencies. As set out on page 61, Moody's and Fitch place our creditworthiness in the investment grade category. If our rating deteriorates, we may incur additional costs if we have to raise debt capital. This would probably also increase the liquidity requirement when pledging collateral for forward transactions. However, we believe that such a scenario is unlikely. Just last year, Moody's and Fitch raised our credit score by one notch to Baa2 and BBB+, respectively, both with a stable outlook. In doing so, they rewarded us for our transformation into a leading renewable energy company through which we have become more financially robust.

The assessment of our creditworthiness by rating agencies, banks and capital investors depends in part on the level of our net debt. Our goal is to ensure that, in the medium term, it does not exceed three times the adjusted EBITDA of our core business.

Despite this, net debt could temporarily be above budget, for instance if we have to pay high variation margins. Nevertheless, we are confident that we can keep our indebtedness below the cap.

Despite the significant increase in volatility on commodity markets, we continue to classify our financial risks as 'medium'.

- **Creditworthiness of business partners.** Our business relations with key accounts, suppliers, trading partners and financial institutions expose us to credit risks. Therefore, we track the creditworthiness of our partners closely and assess their credit standing based on internal and external ratings, both before and during the business relationship. Transactions that exceed a certain size and all trading transactions are subject to credit limits, which we determine before the transaction is concluded and adjust if necessary, for instance in the event of a change in the business partner's creditworthiness. At times, we request cash collateral or bank guarantees. In the trading and financing business, credit risks and the utilisation of the limits are measured daily. We agree on collateral when concluding over-the-counter trading transactions. Furthermore, we enter into framework agreements, e. g. those of the European Federation of Energy Traders. For financial derivatives, we make use of the German master agreement for forward financial transactions or the master agreement of the International Swaps and Derivatives Association.

The significant price spikes on commodity markets have increased the danger of transaction partners being unable to meet their obligations. The Ukraine crisis has further exacerbated this risk, in particular in relation to trading with Russian commodities producers. This exposes us to substantial financial losses especially with regard to contracts that are particularly valuable to us. We are monitoring the default risks closely and are assessing counterbalancing measures.

Although our risks stemming from the creditworthiness of our business partners have increased overall, they still do not exceed the 'medium' category.

- **Other risks.** This is the class in which we record the potential effects of damage to our reputation, compliance infringements and criminal acts. The risk of a COVID-19-driven decrease in electricity prices which may force us to recognise impairments for generation assets has also been recorded in this category. However, we now believe it is very unlikely that this will come to pass. Therefore, we have lowered the category of other risks from 'medium' to 'low'.

RWE's risks and opportunities: General assessment by management. Shifting our generation portfolio from fossil fuels to renewables has improved RWE's opportunity-risk profile. By aiming to be carbon neutral by 2040, we are demonstrating that we want to expedite the decarbonisation of the energy sector, thereby increasing our acceptance among politicians, capital lenders, customers and other stakeholder groups. At the same time, our solid financial management ensures that our company remains on a safe course. By analysing the effects of risks on our liquidity and pursuing a conservative financing strategy, we ensure that we can meet our payment obligations punctually. We have considerable liquid funds and great leeway in terms of debt financing, thanks to the Debt Issuance Programme, the Commercial Paper Programme and the syndicated credit line (see page 60). We budget our liquidity with foresight, based on the short, medium and long-term financing needs of our Group companies, and always hold a significant amount of minimum liquidity.

As shown by the commentary in this chapter, we consider unfavourable changes to the political and regulatory framework to be our biggest risk. Due to the war in Ukraine, developments are conceivable that could have a considerable negative impact on us. We are monitoring events closely as they unfold and are trying to limit these risks as much as possible. We could also become exposed to significant financial burdens due to the accelerated coal phaseout. We therefore class the political and regulatory risks as 'high'. In the previous year, we had classed them as 'medium'. That being said, we also see opportunities here. For example, we are confident that an earlier German coal exit would be associated with improved framework conditions for the expansion of renewables and for the creation of environmentally friendly backup assets. The additional investments and the steeper climb towards reducing emissions should again increase our acceptance among capital lenders and customers. It is also possible that the government may offer fair compensation regulations, contrary to early statements.

The booming commodity markets presents us with opportunities. If wholesale electricity prices remain high, renewable energy assets that do not receive fixed payments will achieve additional revenue. This also holds true for our conventional power stations as long as additional earnings are not offset by higher costs of fuel and CO_2 allowances. However, high electricity prices also increase the potential for greater earnings shortfalls in the event of unscheduled plant outages. Price hikes on the energy markets could also see the funds needed to collateralise forward contracts rise at short notice. The same applies to income generated by these contracts. As a result, standards on our liquidity management would become stricter and the risk of our contracting parties being unable to make payments would rise.

RWE has been affected by COVID-19 to a limited extent so far, and we are confident that this will not change. Projects may still be delayed owing to the pandemic. However, the risk of a sustained COVID-19-induced economic crisis resulting in a reduction in electricity prices and impairments to power stations has not materialised. In view of the latest economic recovery and the record energy prices, we now find that such a scenario is unlikely.

Thanks to the measures for safeguarding our financial and earning power over the long term and our comprehensive risk management system, we are confident that we can manage our current risks. At the same time, we are establishing the prerequisites for ensuring that this remains the case in the future. Overall, we do not currently foresee any risks that would undermine the viability of RWE AG or the RWE Group.

Accounting-related internal control system: Statements in accordance with Sec. 289, Para. 4, and Sec. 315, Para. 4 of the German Commercial Code. Our financial reporting is exposed to the risk of misrepresentations that could have a significant influence on the decisions made by their addressees. For example, stated earnings that are too high can cause capital investors to invest in a company. Capital market law regulations and RWE's Code of Conduct require that we inform the public of our business performance and important company specific events completely, objectively, accurately, clearly and in a timely manner. We use a series of tools to meet this ambition. Examples of this are our IFRS accounting regulation and the high minimum standards to which we subject the IT systems used to record and process accounting-related data. Furthermore, we use an accounting-related Internal Control System (ICS) for quality assurance purposes. The ICS aims to detect potential errors and misrepresentations that result from non-compliance with accounting standards. The Accounting Department of RWE AG is responsible for designing the ICS and reviewing its effectiveness. In doing so, it applies groupwide rules. In addition, it receives assistance from the ICS Committee, the objective of which is to ensure that the ICS is applied throughout the Group following uniform principles and meeting high ambitions in terms of correctness and transparency. The Committee consists of representatives from the Accounting, Controlling & Risk Management and Internal Audit & Security Departments, along with officers from the human resources, procurement, trading, finance, taxes and IT functions, which are highly relevant to accounting.

We subject the ICS to a comprehensive review every year. First, we examine whether the risk situation is presented appropriately and whether suitable controls are in place for the identified risks. Then, we test the effectiveness of the controls. If the ICS reviews pertain to accounting-related processes, e. g., to the preparation of financial statements or to consolidation, they are conducted by employees from the Accounting Department. When it comes to processes handled by service centres on our behalf, for example invoice processing, an auditor certifies the appropriateness and effectiveness of the controls. The representatives of the finance, human resources, procurement, trading, and IT functions document whether the agreed ICS quality standards are adhered to by their respective areas. Our Internal Audit & Compliance Department also oversees the ICS reviews. The results of the reviews are documented in a report to the Executive Board of RWE AG. The review conducted in 2021 once again demonstrated that the ICS is effective.

Within the scope of external reporting, the members of the Executive Board of RWE AG take an initial half-year and a full-year balance-sheet oath, confirming that the prescribed accounting standards have been adhered to and that the financial statements give a true and fair view of the net worth, financial position and earnings. When in session, the Supervisory Board's Audit Committee regularly concerns itself with the effectiveness of the ICS. Once a year, the Executive Board of RWE AG submits a report on this to the Committee.

2.11 Disclosure relating to German takeover law

The following disclosure is in accordance with Sections 315a and 289a of the German Commercial Code as well as with Section 176, Paragraph 1, Sentence 1 of the German Stock Corporation Act. The information relates to company-specific regulations, for example relating to adjustments to the capital structure by the Executive Board or a change of control of the company. At RWE, these provisions are in line with the standards of German listed companies.

Composition of subscribed capital. RWE AG's capital stock amounts to €1,731,123,322.88. It is divided among 676,220,048 no-par-value bearer shares.

Limitation of voting rights or share transfers and employee share schemes. One share grants one vote at the Annual General Meeting and determines the proportion of the company's profit to which the shareholder is entitled. This does not apply to RWE AG's treasury stock, which does not confer any rights to the company. Voting rights are excluded by law in cases where Section 136 of the German Stock Corporation Act applies.

Within the scope of an employee share plan, we issued 288,624 RWE shares to our employees in Germany in the financial year that just ended. The beneficiaries may only freely dispose of the shares after 31 December 2022.

RWE also has employee share schemes in the United Kingdom. Participating companies are RWE Generation UK plc, RWE Supply & Trading GmbH UK Branch and RWE Technology UK Limited. In 2021, employees purchased a total of 23,181 RWE shares under the UK schemes. These shares are also subject to a restriction on disposal, which lasts five years from the grant date.

Employees can exercise the control rights conferred on them from the employee shares in the same manner as other shareholders can whilst in compliance with statutory regulations and the provisions of the Articles of Incorporation.

Shares in capital accounting for more than 10% of voting rights and special rights with control powers. As of 31 December 2021, no holding in RWE AG exceeded 10% of the voting rights. There are no RWE shares with special rights that confer control powers.

Appointment and dismissal of Executive Board members / amendments to the Articles of Incorporation. Executive Board members are appointed and dismissed in accordance with Sections 84 et seq. of the German Stock Corporation Act in conjunction with Section 31 of the German Co-Determination Act. Amendments to the Articles of Incorporation are made pursuant to Sections 179 et seqq. of the German Stock Corporation Act in conjunction with Article 16, Paragraph 5 of the Articles of Incorporation of RWE AG. According to the aforementioned provision in the Articles of Incorporation, unless otherwise required by law or the Articles of Incorporation, the Annual General Meeting shall adopt all resolutions by a simple majority of the votes cast or – if a capital majority is required – by the simple majority of the capital stock represented when the resolution is passed. Pursuant to Article 10, Paragraph 9 of the Articles of Incorporation, the Supervisory Board is authorised to pass resolutions in favour of amendments to the Articles of Incorporation that only concern formal matters, without having a material impact on the content.

Executive Board authorisation to implement issuances and buybacks of RWE shares. On 28 April 2021, the Annual General Meeting authorised the Executive Board to increase the company's capital stock subject to the approval of the Supervisory Board by up to €346,224,663.04 through the issuance of up to 135,244,009 bearer shares (authorised capital). The authorisation is limited to five years and expires on 27 April 2026.

On 28 April 2021, the Annual General Meeting further authorised the Executive Board until 27 April 2026, subject to Supervisory Board approval, to issue bearer convertible and / or option bonds with a total face value of up to €5,000,000,000 with or without a limited maturity and to grant the bondholders convertible or option rights to bearer shares in the company. To enable the issuance of shares to holders of convertible and / or option bonds, the Annual General Meeting of 28 April 2021 conditionally increased the company's capital stock by up to €173,112,330.24, divided into up to 67,622,004 registered or bearer shares (conditional capital).

New shares from authorised capital and the aforementioned bonds may be issued in exchange for contributions in cash or in kind. These shares must generally be tendered to the shareholders for subscription. However, the Executive Board is authorised, subject to Supervisory Board approval, to waive subscription rights in the following cases:

- to avoid fractions of shares resulting from the subscription rate;
- if the issuance is conducted in exchange for contributions in kind;
- to provide protection from dilution in connection with convertible and / or option bonds that have already been issued; and
- if the issue price of the new shares or bonds is not significantly below their quotation or their theoretical fair value calculated by generally accepted methods of quantitative finance and if waived subscription rights are limited to no more than 10 % of the capital stock.

In sum, shares issued from authorised capital with a waiver of subscription rights and in connection with convertible or option bonds may not exceed 10 % of the capital stock. The aforementioned upper limit is defined by the amount of capital stock at the time the resolution providing the authorisation is adopted or when the authorisation is exercised, if the capital stock is lower. Other measures taken waiving subscription rights count towards the upper limit.

The Annual General Meeting of 26 April 2018 authorised the Executive Board of RWE AG, subject to Supervisory Board approval, to purchase shares in the company accounting for up to 10 % of the capital stock when the resolution is passed or when the authorisation is exercised, if the latter is lower at that time. At the Executive Board's discretion, the purchase can be made on the stock exchange or via a public offer.

Shares acquired in this manner may be used for all purposes described in the authorisation. Shareholder subscription rights may be waived depending on the purpose for which the shares are used.

Effects of a change of control on debt financing. Our debt financing instruments often contain clauses that take effect in the event of a change of control. Such a provision is in place e. g. in respect of our €5 billion syndicated credit line, and essentially means that in the event of a change of control or majority at RWE AG, drawings are suspended until further notice. The lenders shall enter into negotiations with us on a continuation of the credit line. The time limit for doing this is 30 days from the notification of the change of control. On expiry of the time limit, lenders who are not satisfied with the outcome of the negotiations may revoke their loan commitment or cancel the loan if it has already been paid out, requesting immediate repayment.

The green bonds issued in 2021 (see page 60) are also subject to change-of-control clauses. In the event that a change of control is announced or implemented, investors may request that their bonds be redeemed by a certain deadline, if RWE's long-term credit rating falls below investment grade due to the change of control or the rating agencies stop issuing us a credit rating. A similar rule applies to the senior bond that matures in 2037, a small portion of which remained on our books as it could not be fully transferred to innogy in 2016.

In the event of a change of control, we can redeem our two subordinated hybrid bonds with volumes of €282 million and US$317 million within the determined change-of-control period. If they are not redeemed and our long-term credit rating also falls below investment grade or credit ratings are no longer issued, their annual yield rises by 500 basis points.

Compensation agreement with the Executive Board and employees in the event of a takeover offer. The current version of the German Corporate Governance Code dated 16 December 2019 recommends that no commitments to additional benefits be made in the event that Executive Board members terminate their employment contract early due to a change of control. We fully adhere to this principle, meaning that we have not included clauses envisaging a special right of termination or rights to severance subject to a change of control in any of the current employment contracts of the members of the Executive Board of RWE AG.

Share-based payments made to the Executive Board members and executives are subject to the following provisions: in the event of a change of control, RWE will pay out all the performance shares that have been finally granted, but have not been paid out yet on expiry of the holding period. Performance shares granted on a preliminary basis on the date of a change of control are valued based on the degree to which the targets have been achieved up to that point in time. Performance shares granted on a preliminary basis in the year of the change of control lapse. They are replaced by a new plan of equal value for the Executive Board members and executives for the fiscal year in which the change of control occurs and the following years.