

We inspire
with energy.



Living the energy turnaround





Dear Readers,

We can look back on a year rich in substance, one shaped by projects we initiated, pressed further ahead with or successfully completed, one characterised by numerous notably more minor topics that are cumulatively moving MVV forward. Everyone in our team played their part with great commitment. And that is why we can now look back on a good year – and forward with a keener view to the future. Find out more about what drove us and about what will be driving us in the years, no decades, ahead.

We wish you an enjoyable read!

Your MVV

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**Living the
energy
turnaround**

Climate neutrality by 2050 – at the latest

Climate protection is and will remain a crucial aspect of our strategic focus and of our responsibility towards society. We are committed to the targets of the Paris Climate Accord and, as a company, aim to achieve climate neutrality by 2050 – at the latest. We have clearly aligned our decisions, our actions and our investments towards this.

We know this is an ambitious target. It will require a clear and wise approach in the years and decades ahead. We will consistently reduce emissions from our conventional generation positions to zero. In parallel, we will press further ahead with expanding renewable energies and reduce the CO₂ intensity of our heating energy generation. Our customers have an important role to play. Our energy efficiency enhancement solutions, our planning and operating activities for renewable energies plants and our innovative services promote climate neutrality at and by our customers.

Taking the transformation as an opportunity

The transformation into the energy system of the future is characterised by the need to decarbonise generation by expanding renewable energies and the associated process of decentralisation. The digitalisation of the energy industry has a central role to play here. After all,

it involves a technological transformation that affects all stages of the value chain and makes new solutions possible. We responded to these trends from the very outset and acted early to invest in renewable energies, energy efficiency, supply reliability and developing forward-looking services and products. A total of Euro 3 billion is available for this programme.

We are creating the new energy world. We – that means around 6,100 employees who are focusing on current and future changes in the market, competition and the energy policy framework and permanently devising new solu-

tions. Their enthusiasm for energy is an inspiration.

Clear targets for the future

The sustainability targets we set in 2016 already represent major milestones as we head towards climate neutrality. They are clearly defined and form an integral component of our corporate strategy. By consistently implementing them we will make a measurable contribution to converting the energy system and protecting the climate and the environment. By 2050, virtually all of Germany's energy should be generated using renewables. These will therefore make a key



We see technological change as an opportunity for new solutions.

» Three developments are shaping the new energy world: decarbonisation, decentralisation and digitalisation. «

contribution towards reaching national climate protection targets. Not least because of this, they are the central focus of our strategic alignment. Back in 2016, we already set two specific sustainability targets in this area and intend to reach these by the end of the 2026 financial year.

Key focus on renewable energies

On the one hand, we will be doubling our proprietary electricity generation from renewable energies. We already managed to increase this by more than one hundred percent – from 200 MW to more than 400 MW – between 2010 and 2016. Further doubling this figure means we will then be able to provide 300,000 households with around 800 MW of sustainably generated energy. To achieve that, we are consistently investing in expanding our proprietary renewable energies generation portfolio. On the other hand, we will be connecting a total

of 10,000 MW of renewable energies to the grid between 2016 and 2026. Here, we will be focusing on onshore wind turbines and photovoltaics systems, and that both in Germany and abroad. Biomass plants and photovoltaics systems on location at customers will make smaller contributions.

Reducing CO₂ emissions throughout the value chain

At the same time, we will be tripling our annual CO₂ savings to 1 million tonnes of CO₂ a year. Here, we account for climate-effective CO₂ savings along the entire value chain. We assess the extent to which all of the new strategic activities, projects and investments at our group of companies impact on their direct and indirect greenhouse gas emissions. Our progress on the way to the target year in 2026 will not follow a linear trajectory. It will depend on the time at which operations are launched at

new plants, the market and the regulatory climate. After all, these factors influence the attractiveness of emission-cutting investments and projects, as well as the speed at which they can be implemented.

District heating has a future

Pipeline-based heating energy is and will remain an indispensable component of any sustainable and forward-looking heating energy supply, especially in large built-up areas. In view of this, we are consistently investing in lower-CO₂ generation. Our current projects range from connecting our waste-powered CHP plant to the district heating grid in Mannheim and the region through to the new gas-powered CHP plant in Kiel. This way, we are continually working on further developing our heating energy vision and concept with the aim of decarbonisation and of integrating renewable energies into heating energy generation.

Investments of Euro

3 billion

100%

extra capacity installed
for our proprietary
electricity generation from
renewable energies

10,000 MW

of new renewable energies
plants developed

Each year

1,000,000

tonnes of net CO₂ savings



A 2019 retrospective

Highlights in 2019

Juwi builds its 1,000th wind turbine

Our Juwi subsidiary has reached a real milestone – it has built its 1,000th onshore wind turbine. The anniversary turbine, with a nominal capacity of 3.6 MW, has been feeding electricity into the grid since August 2019. It is located in Mohlis, close to Gera, and was the first of a total of four turbines at this location. Together, the turbines generate around 50 million kilowatts of climate-friendly electricity each year, equivalent to the annual consumption of more than 16,000 households. This windfarm was one of the first projects awarded to Juwi in 2018 in tenders organised by the Federal Network Agency. With 44 wind turbines and around 130 megawatts of capacity, Juwi was one of the most successful participants in the wind and solar power tenders in 2018.



New gas-powered CHP plant for Kiel

In Kiel, 20 gas motors are taking over the supply of electricity and district heating for around 70,000 households and institutions in the city and the region. Thanks to environmentally-friendly combined heat and power generation and its high level of efficiency, the gas-powered CHP plant is a model example for how the energy turnaround can be implemented intelligently. Its CO₂ emissions are 70 % lower than those at its predecessor. And the new plant also offers other benefits. Find out more on Pages 28 and 29.



We are making heating energy green

By connecting our CHP plant in Mannheim to the district heating grid, we are starting a new chapter in the district heating supply and taking a major step towards green district heating. By using the heating energy generated upon waste incineration for the district heating supply,

we are reducing the primary energy factor by a third to just 0.42. This way, homeowners who use district heating to heat their homes can meet the legal climate protection requirements more easily and reduce their specific CO₂ emissions by 20 %.



Tapping the sun's power



Our Juwi subsidiary has offered the full range of project development and other services for building and operating renewable energies plants for more than 20 years now. Alongside onshore wind turbines, Juwi focuses above all on photovoltaics systems. In its solar power business, it has so far implemented more than 1,700 systems worldwide with capacities of more than 2,500 MW. In 2019, it was awarded the contract to build the largest solar park in South-Eastern Europe. Find out more about the latest photovoltaics projects on Pages 22 and 23.

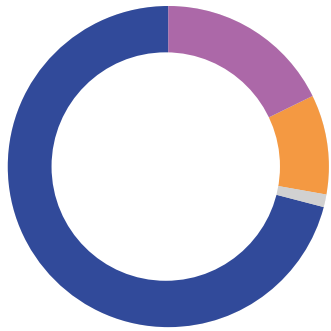
Smart cities – we are shaping the cities of the future

We are already implementing the energy system of the future on conversion areas in the City of Mannheim. We are implementing networked mobility solutions and developing smart areas, as well as commercial and industrial estates. Since the 2019 financial year, we have contributed this expertise to our smart cities activities. As a system partner, we offer networked solutions for the cities of the future. Here, we are building on networks already available on location and, by drawing on new IT technologies such as cloud and edge computing, extending them into the Internet of Things. This way, we enable residents to structure their living space more efficiently and sustainably and improve their quality of life. Find out more on Pages 16 and 17.

Business performance in 2019

Germany is still in the process of making key energy policy decisions to align its energy system to the future. Given challenging conditions in the energy industry and in energy policy, we can look back on a good year. Our conclusion: We are on the right course.

Adjusted sales by reporting segment



CUSTOMER SOLUTIONS
71%

NEW ENERGIES
20%

SUPPLY RELIABILITY
6%

STRATEGIC INVESTMENTS
3%

Euro

3.7

billion |
Adjusted sales

6,113
employees

We had a Group-wide total of 6,113 employees at 30 September 2019, 135 more than one year earlier. A total of 330 young women and men are in training at MVV.



We have been drawing on the opportunities presented by the conversion in the energy system for years now. By making targeted investments, we are creating a basis for MVV to generate sustainable profitable growth.

We are investing in the future

In the 2019 financial year, we initiated, pressed further ahead with or successfully completed numerous smaller and larger-scale projects. Overall, we invested Euro 310 million. One example was the completion of our new gas-powered CHP plant in Kiel, which will secure the supply of district heating to the city. It will commence commercial operations in the current heating period. And in Dundee in Scotland we are currently building what will be one of Europe's most modern ener-

gy from waste plants. This should start operations in 2020. At our Mannheim location, we are connecting our CHP plant to the existing district heating grid. From the 2019/20 heating period, this will enable us to use heat resulting from waste incineration not only to generate electricity and supply steam to neighbouring industry, but also to supply district heating to the region.

Project development business regains momentum

We connected renewable energies plants with capacity of 460 MW to the grid in Germany and international markets in the 2019 financial year. We were awarded the tenders for numerous new projects, particularly in the solar power business.

Efficiency measures consistently upheld

Two key factors in MVV's successful further development involve sustainably boosting our competitiveness and ensuring high process efficiency. That is why we are implementing measures to assess and improve our efficiency and effectiveness across all areas of the company. Here, we benefit in particular from the opportunities offered by digitalisation.

Adjusted sales and adjusted EBIT in line with our expectations

We met the targets we set for adjusted EBIT and for adjusted sales: At Euro 225 million, adjusted EBIT was only 1% down on the previous year, while sales fell by 6%. We are convinced that MVV has the right strategic alignment – and that was also apparent in the 2019 financial year. One aspect of the new climate in which we operate is that our earnings performance has become more volatile overall. We are preparing for that.

Profitable growth expected for 2020

One thing is certain: The tasks that lie ahead are challenging. The climate in which we operate is and will remain dynamic. By taking the right strategic decisions, however, we will further strengthen our business and generate profitable growth. For our 2020 financial year, we expect adjusted EBIT and adjusted sales to slightly exceed the previous year's figure. We will maintain a high level of investment.

Adjusted EBIT by reporting segment



460

MW | concluded development of new renewable energies plants

With our project development business, we connected renewable energies plants with total installed capacity of 460 MW to the grid in the 2019 financial year.

Euro

310

million | investments

We have consistently invested for years now in renewable energies, energy efficiency, supply reliability and the development of innovative services and products – with investments of Euro 310 million in the 2019 financial year alone

63

% | renewables share of our electricity generation

In the 2019 financial year, 63 % of the electricity we generated already came from renewable energy sources. By comparison, in Germany as a whole renewable energies accounted for a 41 % share of gross electricity generation in the first nine months of the 2019 calendar year.

486

thousand tonnes | net CO₂ savings

We achieved climate-effective CO₂ savings of 486 thousand tonnes along the entire value chain in the 2019 financial year. Here, we evaluate the extent to which all of the new strategic activities, projects and investments at our group of companies impact on direct and indirect greenhouse gas emissions.



**Smart
solutions.
For everyone.**

We are partners to our customers

Our experience and expertise enable us to satisfy the various requirements our customers have in us. They can depend on us!

Many of our customers, whether retail, commercial or business customers, are increasingly interested in how they themselves can actively promote climate protection and integrate innovative solutions into their environments. This change in thinking impacts on numerous areas of people's lives and work.

We are the energy partner with the answers to your questions

Our customers each have their own focuses. For some retail customers, investing in an electric car might be more important as a first step than installing their own photovoltaic system on their roof. And for that, they would like to find charging stations available in their own personal area of travel. For others, the priority is to obtain a secure and permanent supply of green electricity, gas or heating energy. Commercial and business customers find it important, for example, to receive exact information about their own energy consumption and how they can structure their own

patterns of consumption or processes more efficiently.

In our Customers Solutions reporting segment, we provide our customers with a broad range of solutions meeting ecological standards – from renewable energies to environmentally-friendly district heating. These also include the products and services we offer to retail, commercial and business customers in connection with self-generated solar power and e-mobility. E-mobility is also an integral component of our smart cities activities, where we act as a system partner to local authorities by offering networked solutions for the city of the future. The key focus of our portfolio of services for business customers is on efficiency enhancement and energy optimisation projects and measures for the industrial, retail and real estate sectors. We pool energy procurement, energy product trading and portfolio management at MVV Trading. This company is also responsible for the renewable energies direct marketing business.

Customer Solutions reporting segment

Euro

2,632
million | adjusted sales

Sales in the Customer Solutions reporting segment fell year-on-year by Euro 187 million. This reduction was mainly due to an amendment made to international accounting standards.

Euro

26
million | adjusted EBIT

At Euro 26 million, earnings in the Customer Solutions reporting segment were Euro 21 million lower than in the previous year. On the one hand, this was because the previous year's earnings performance benefited from positive one-off items. On the other hand, in the year under report we incurred start-up costs for the development of innovative products and services and the launch of new business activities. We partly offset these with positive effects in our sales and energy marketing businesses.



The city of the future

Growing populations in built-up areas are both a challenge and an opportunity: a challenge for urban development, infrastructure and environmental and climate protection and an opportunity for sustainable, forward-looking development – the smart city. The move towards smart cities is a process in which we act as a partner to local authorities and innovative municipal utility companies.

By making smart use of municipal infrastructure, smart cities enable urban space to be shaped along energy-efficient and sustainable lines while also offering high quality of life. To reach that point, we have to network various components and link different objectives. And that requires greater use of new and innovative technologies. We have gained years of experience in implementing smart solutions for sustainable urban development. Specifically, that means we design new urban districts, deploy networked mobility solutions and develop smart areas, as well as commercial and industrial estates, throughout Germany. Those are all key requirements enabling us to act as your partner in implementing smart cities.



Making optimal use of available potential

In developing a sustainable smart city, we start by making smart use of available infrastructure so as to optimally exploit its potential. We have the necessary technology and already deploy it in Mannheim. We have located e-mobility charging stations right next to the inner city, for example. With the help of small transponders in the road surface, we can work out exactly how often and how long they are used for and whether they have the right dimensions. The findings then enable us to act quickly and efficiently to optimise existing infrastructure.

To provide a transparent approach to the highly varied activities involved in smart cities, we have structured our product portfolio in five segments: smart city management, smart energy,

smart mobility, smart infrastructure and smart living.

The future is there to see at FRANKLIN

Together with local authorities, we work out how individual modules can be networked in complex ways in a smart city. We are already doing that at FRANKLIN. This district offers what is a unique combination of heating energy, electricity and mobility together with transparency as to the energy flows involved. On the 1.4 million square metre site, where around 9,000 people will be living by 2025, we already integrated intelligent solutions for smart energy, smart infrastructure and smart mobility into the initial plans. With the “C/sells” project, we are building a networked, interactive energy system with prospects for the future. At FRANKLIN, photovoltaics, power-to-heat systems,

decentralised heating energy storage facilities and charging stations will be interconnected in an energy management system. District residents play a central role by actively influencing the energy flows and making it possible to put the energy to smart use. At the same time, we are helping move towards emission-free mobility by installing a modular mobility concept that enables residents to integrate transport and other forms of movement into their daily lives on a climate-friendly, inexpensive and individual basis.

This way, residents can do without their own cars, or second cars, as the sharing system offers all kinds of mobility: electric cars for transporting larger items can be booked by app, as can charging stations and parking spaces; electric scooters for trips into the great outdoors; delivery bike rentals or local transport tickets – these are all managed on a digital basis.

Yasmin Lachmann

In our day-to-day work, we ask ourselves the question: How can we use the latest technology to make today's cities work better and more efficiently? In our interdisciplinary team we work to find answers to that, and have devised a whole series of solutions making it as easy as possible for cities to head for the future. Electricity, heating energy and water meters are replaced with smart meters and a smart meter gateway. This way, we can make energy flows visible almost in real time. And that is a precondition for optimally coordinating generation and consumption across all sectors. Second-based data offers real added value and creates a basis for various applications such as “Watch your Grandma”. Here, home nursing care services, household service providers and advice centres can network with each other and, based on anomalies in energy consumption volumes, detect whether someone might need help. The recognition of consumer appliances can also help to avoid risks, such as



when systems show unusually prolonged water flows. The opportunities are virtually unlimited in number – and these will make the city of the future more ecological and safer, while also enhancing the quality of life there.

Self-sufficient

Dieter Heissler from Gartenstadt in Mannheim has drawn on a smart energy solution in recent years to make himself more or less self-sufficient in energy terms.

It all began with a research project conducted by MVV on innovative heating systems, something which triggered Dieter Heissler's interest. He volunteered to participate in the project and tested the ever more sophisticated models developed over a five-year period. By the time the trials were successfully complete, a technically convincing fuel cell was available. In 2015, Dieter then decided to buy his own system. Since then, the fuel cell in his cellar has been producing energy using combined heat and power generation. At the Mannheim Maimarkt fair in 2018, he informed himself at MVV's stand about the latest generation of storage facilities, whose modular structure guaranteed easy and problem-free installation. He decided to install a photovoltaics system including a battery storage facility. Today, Dieter Heissler has 16 PV modules on his roof – ten facing east to capture the rising sun and six facing west to feed energy into his storage facility right through to sunset. This overall package, comprising a battery storage facility, a fuel cell for the winter and photovoltaics for the summer, makes him 95 % energy-independent. This way, he can act in line with the changing seasons to save not just cash, but also CO₂.

Private energy system of the future

He monitors the energy flows at his own small “power plant” on his computer using the MVV web portal. That way, he is always informed about how much energy he is generating, how much he is consuming and how much is still available in the storage facility. Surpluses which he does not need flow into the public grid and generate income for him. And he and his family use this information about their consumption in their household on a daily basis. That means that the use of large appliances is coordinated with energy generation. He does not have to do without anything, it just means that the times when appliances are switched on or off are now better synchronised. Asked about what motivated him in recent years to get going with his own energy system of the future, his answer is clear: “The technology is now mature and I can save money and do something to protect the climate.”



Dieter Heissler worked at BASF for 50 years. As well as turning his home into a virtually independent energy system, he is also a driving force at TV 1877 Waldhof. This sports club has now installed a solar system with a battery storage facility on the roof of its tennis clubhouse, a project that was implemented in connection with an MVV campaign.



**Renewable
energies.
Good
for the climate.**

We use renewable energies

Generating energy sustainably and actively contributing to climate protection are part of our responsibility towards society. That is why we are continually investing in generating electricity and heating energy from renewable sources and expanding renewable energies for our customers.



Renewables are already one of Germany's most important sources of energy. Expanding their use represents one key way for the energy industry to reach its climate targets. By replacing fossil energy sources, renewables make an essential contribution to cutting CO₂ emissions. By 2030, they should cover 65 % of the electricity consumed in Germany. The Federal Government has underlined the need for expansion with its 2030 Climate Protection Programme. We have been building on renewables-based energy generation for years now and are consistently expanding their use.

Heading for a climate-neutral future with renewable energies

We draw on a wide range of renewable sources in our New Energies reporting segment, where we pool our extensive competence in putting waste and biomass to ecological use. We work with these materials not only in Germany, but also in the UK. In Plymouth, we operate a state-of-the-art energy from waste plant with heat extraction. Our biomass power plant at Ridham Dock works exclusively with regionally sourced waste timber and non-recyclable timber. In

Dundee in Scotland, we took over an existing energy from waste plant in the 2018 financial year and are now building a new, ultramodern plant in the direct vicinity. In Germany, we also have biogas and biomethane plants. A further focus involves generating electricity from wind and solar power – and that in two respects. On the one hand, we have proprietary wind turbines and photovoltaics systems. On the other hand, we plan, develop and build onshore wind turbines and large photovoltaics systems, as well as managing operations at wind farms and solar parks.

New Energies reporting segment

Euro
734
million | adjusted sales

At Euro 734 million, sales in the New Energies segment were at the previous year's level.

Euro
109
million | adjusted EBIT

Earnings in the New Energies segment rose year-on-year by Euro 19 million. The previous year's earnings were adversely affected by one-off items. Mainly due to a damaged turbine at our plant at Ridham Dock, plant availability in our environmental energy business fell short of the previous year in the 2019 financial year. This effect was offset by positive developments in electricity and biomass prices. Driven in particular by stronger international business our project development business also performed positively.

Say hello to the sun!



We are specialists when it comes to building wind turbines and solar plants and managing their operations. Our subsidiary Juwi is a pioneer in the industry. As the German market for large-scale PV systems virtually collapsed following the 2012 Amendment to the German Renewable Energies Act (EEG), Juwi has in recent years focused on the international solar market. In numerous projects implemented throughout the world, it has contributed its expertise and further extended its own solutions-driven competence. Since March 2019, this has also benefited the German market once again. With a 750 kW solar park close to the town of Gorgast in Brandenburg, Juwi has successfully re-entered the German

market. The next solar project in Germany followed later in the year. Together with the Brandenburg energy group LEAG, Juwi is building and will then also operate a 10 MW photovoltaics system in Welzow, Brandenburg. In future, Juwi will be focusing on larger-scale open-space solar parks throughout Germany.

Sunshine powering the international business

Dimensions are larger in the US state of Colorado. In El Paso County, Juwi is building an 82 MW solar park whose 200,000 solar modules will supply electricity to around 19,000 households. The electricity will be sold by the local energy

supplier Colorado Springs Utilities. Upon completion of the solar park, Juwi will also be responsible for technical operations management. A further project – our largest to date in the US – is set to follow from 2022 onwards in Southern Colorado, where a 123 MW open-space plant will be built on 267-hectare site. From 2023, around 300,000 solar modules will generate renewable electricity for more than 28,000 households.

In Vietnam, Juwi has built no fewer than three solar parks with total capacity of 130 MW. Since the end of June 2019,

these systems have been feeding a total of 200 million kWh of clean electricity into the grid in Vietnam. In the Asia-Pacific region, Juwi has implemented solar projects of more than 1 GW since 2010. In Western Australia, Juwi will now be implementing a 37 MW solar park. This is due to be connected to the grid in 2020 and will cover the energy needs of around 16,300 households.

Mega-solar park on 400 hectares

In April 2019, Juwi was awarded the contract for the largest solar park in its

history. Construction work on the site of more than 400 hectares close to the Greek town of Kozani should be completed by April 2021. The 204 MW solar park should then generate more than 300 million kWh of electricity a year. With this Kozani project, Juwi received nearly half the total volumes awarded for wind and solar projects in Greece. Juwi's local presence has paid off. A small team remained on location in Greece, also during the years of crisis, and was thus able to implement the construction of 50 systems with capacities of 100 MW over the past ten years.

Takis Sarris

As Managing Director of Juwi Hellas in Greece, I am proud of what my team has already accomplished in advance for Kozani Solar Park. Our strategy was professionally prepared and precisely executed. As a result, we now have the opportunity to build what is the largest solar park in our company's history. The area in which the park is being installed is very hilly and that will present us with specific challenges when it comes to levelling off the subsoil. Having said that, we have a great deal of experience with this kind of terrain in Greece. Although the area is already accessible via existing roads, we have designed an extended road network. This will form the basis for the complex logistics involved and ensure that all components can be delivered without difficulty. Not only that, we will be building a 150 kV high-voltage station and around 13 kilometres of high-voltage lines to connect the park to the grid. We still have some



challenging preparations ahead and are tackling these with experienced partners on site. A project as enormous as this takes time – we acquired the project rights in November 2017, were successfully awarded the tender in April 2019 and will complete the solar park in the second quarter of 2021.

Waste: a valuable resource

With our new plant in Dundee in Scotland, we are currently building what will be one of the most modern energy from waste plants of its kind in Europe. Yet again, we are benefiting from our extensive expertise.




More than 300 people have worked on the complex project during the construction phase. Overall, we are investing around Euro 135 million in the location.

With our energy from waste plant in Plymouth and our biomass power plant at Ridham Dock, we have already implemented sustainable energy solutions for the market in Southern England. Now we are contributing our expertise and our experience to the Scottish market as well. Having taken over the existing waste treatment plant, in spring 2018 we already began work on building a new and highly efficient plant in the direct vicinity. Construction work is progressing on progress. Starting in 2020, the new plant will use 110,000 tonnes of waste a year to generate heating energy and electricity. This way, we are also ensuring clean, efficient and sustainable treatment for the non-recyclable waste from the local authority areas of Dundee and Angus. Generating energy from waste is a crucial aspect of any successful recycling-based economy and one key to sustainably protecting resources. Our plant in Dundee will achieve an efficiency rate of 55 %. That means that 55 % of the energy input is converted into electricity and heating energy. That represents a peak figure for plants of its kind. All in all, the plant will generate up to 10 MW of electricity and up to 17 MW of heating energy.

Time and costs on budget

For projects of this scale and complexity it is even more pleasing when the construction work progresses on schedule. And that is the case in Dundee. Smooth progress like this takes a strong team on location, one that faces the challenging tasks on a daily basis and actually makes possible our close cooperation with the municipal and regional partners involved.



**A reliable
energy supply.
And absolutely
secure.**

We assume responsibility for a secure supply

Having enough water, electricity, gas and heating energy every day is a basic need for all of us. We can guarantee this supply even while the energy system is being converted. We stand for a reliable and secure supply of energy.

Supply Reliability reporting segment

Euro

229

million | adjusted sales

Sales in the Supply Reliability reporting segment fell by Euro 27 million, with most of the reduction being due to a change made to international accounting standards.

Euro

69

million | adjusted EBIT

Earnings in the Supply Reliability reporting segment rose by Euro 7 million. In the previous year, earnings were positively influenced by a one-off item. In the 2019 financial year, earnings were negatively affected by follow-up costs for the joint power plant in Kiel (GKK) – the predecessor to the newly built gas-powered CHP plant. This factor was more than offset by higher at-equity income and positive items in the grid businesses. Overall, this led to higher adjusted EBIT.



Today's energy system is made up of a mix of renewable and conventional energies. These have to be smartly combined with each other. That is the right thing to do and the only way to guarantee a secure supply. The growing move away from fossil fuels and resultant reduction in CO₂ can only work if the energy supply conversion is implemented in a secure and forward-looking manner. Until renewable energies can fully replace fossil fuels, numerous fac-

tors will have to be coordinated, such as the volatility of renewables generation in line with weather conditions and the time of day, the interlinking of the various components and consumers' individual needs.

We guarantee a secure supply

As an energy company and distribution grid operator, we ensure that our customers can at all times depend on a secure and reliable supply of energy. We therefore pool our generation with conventional energies using CHP and our grid business in our Supply Reliability reporting segment. We are investing in our conventional generation plants and improving their efficiency and energy yield. One key focus is also on environmentally-friendly district heating. We are not only expanding this but also working to make it increasingly less CO₂-intensive. This way, we are helping to ensure supply reliability while also reducing our CO₂ footprint. High-performance grids equipped to face all future challenges are absolutely crucial for a secure supply of energy and water. To account for this, we are consistently investing in maintaining and modernising our distribution grids.



Kiel's smart energy solution

Kiel has been a “Climate Protection City” since 1995 already and has set ambitious targets in its “100 % Climate Protection Masterplan”. By 2050, the city plans to save 50 % of its end energy consumption and cut 95 % of its greenhouse gas emissions compared with 1990. That puts the state capital of Schleswig-Holstein well on course to become climate-neutral over the next 30 years. The relevant strategy, comprising 250 individual measures, has been in place since 2017. Alongside key players, such as the local population, people from the worlds of business, science and local government are also all called on to consistently channel their energies into achieving this target.

Peak performance in just five minutes

One key component of the strategy is the gas-powered CHP plant at our subsidiary Stadtwerke Kiel. With a total volume of Euro 290 million, this is currently our largest investment. Its modular and flexible structure enables the plant to bring supply reliability in line with the energy turnaround. The gas-powered CHP plant will also secure the supply of district heating to the city. The plant sets entirely new standards in terms of its flexibility, efficiency and sustainability. The basis for this is provided by combined heat and power generation, which leads to high efficiency levels and primary energy use of more than 90 %. Electricity and heating energy are generated by burning gas,

The heating storage facility was fixed on 121 piles drilled into the ground. Based on a spiral procedure, the steel container, including its roof, gradually grew upwards – until it reached its final height of 60 metres. This required the use of rotary lifting equipment. Drawing on 16 tonnes of lifting power per element, the outer shell of the storage facility was simultaneously lifted and rotated. Fixed on rotary elements, the complete shell was pushed forward on its predetermined spiral course. Prior to each turn, a new metal sheet was added in its final position on the shell and then machine-welded.

rather than the hard coal previously used. This reduces CO₂ emissions by 70 % compared with the previous jointly owned power plant (GKK). The 20 gas motors can go from zero to 190 MW electrical capacity in just five minutes. At the same time, the plant can reach heating energy capacity of 192 MW during operations. The previous plant needed at least four hours to achieve this capacity. The extremely short time the plant now needs to start up means it can react quickly and flexibly to varying demand in the volatile energy market.

Thanks to a forward-looking approach, the district heating supply in Kiel will be even more secure and demand from customers can be reliably met: By using a heating energy storage facility and an electrode boiler, the heating energy can also be used at different times from when the electricity is generated.

Flexibility in various scenarios on the energy market

If need be, the electrode boiler can generate district heating using electricity.


That option will be drawn on, for example, when there is excess supply in the electricity grid and transmission grid operators call for negative balancing energy capacity in the energy supply system. More than 1,500 MWh can then be stored in 30,000 cubic metres of water in the 60 metre tall heating energy storage facility. The heating energy stored there is enough to provide 70,000 households with a reliable supply of district heating for eight hours. The plant is expected to launch commercial operations at the end of 2019.

Dr. Jörg Teupen

High efficiency and lower emissions: That is what we are promising to Kiel residents with our gas-powered CHP plant. And those are by no means the only arguments in favour of the newly built plant. Kiel has placed a special focus on climate protection and its heating energy supply harbours especially great potential here. Heating energy accounts for the largest share of energy consumed in Germany, and our city is no exception. That means that the energy turnaround, which we are currently working together to master, also requires a turnaround in heating energy. And that is where the gas-powered CHP plant scores highly. It is economical, sustainable, secure and above all highly flexible. It is our contribution to the energy turnaround. First and foremost, it



forms the basis for supplying environmentally-friendly heating energy to Kiel. We have taken numerous hurdles in the course of this major investment project and are very proud of our plant, the only one of its kind in Europe and a beacon for our company.



District heating is a crucial part of the future energy system

Our heating energy concept is structured to remain modern, innovative and secure in future as well while also taking major steps towards climate neutrality.

Heating energy accounts for around one third of all CO₂ emissions in Germany. To achieve the climate protection target of almost complete decarbonisation by 2050, the heating energy turnaround will have to take on an important, even central role in the energy system conversion. We made district heating a key topic for the future many years ago already. The discussions surrounding climate change and the coal exit have further convinced us that we made the right decision. That is why we are consistently expanding district heating at all of our locations, with measures ranging from expanding our district heating grids to small innovation projects through to major investments. One example: New buildings with a

primary energy factor of 0.0 are due to be built at a previously derelict 18-hectare site on the Hörn. These will be supplied with our green district heating. Starting in 2020, the city of Merseburg will be saving half of its previous CO₂ emissions, corresponding to 12,000 tonnes a year. We are achieving this by linking our energy from waste plant in Leuna to the city's district heating grid via a new connecting pipeline. Our subsidiary ENO, Energienetze Offenbach, is also working on two major urban development projects: Firstly on a large-scale modernisation of residential buildings in Langen and secondly on a newly built housing and commercial estate (Quartier 4.0) in Offenbach. For both these projects, the heating energy supply is

secured with environmentally-friendly heating energy. With a total investment volume of Euro 100 million, our largest district heating project currently involves connecting our CHP plant in Mannheim to the regional district heating grid. This will enable us to start a new chapter in supplying district heating to Mannheim and the region. Regardless of individual projects, we are continually investing in our grid network and our plants. For recurring work needed on our district heating grids, we deliberately use the summer months so as to avoid interruptions to the supply of heating energy in the heating period. After all, ensuring supply reliability for our customers is a key aspect of our business decisions.



Key figures

MVV in figures

	FY 2019	FY 2018	% change
Financial key figures			
Adjusted sales excluding energy taxes (Euro million)	3,683	3,903	-6
Adjusted EBITDA ¹ (Euro million)	409	443	-8
Adjusted EBIT ¹ (Euro million)	225	228	-1
Adjusted annual net income ¹ (Euro million)	115	111	+4
Adjusted annual net income after minority interests ¹ (Euro million)	98	94	+4
Adjusted earnings per share ¹ (Euro)	1.49	1.43	+4
Dividend proposal/dividend per share (Euro)	0.90	0.90	0
Cash flow from operating activities (Euro million)	238	331	-28
Cash flow from operating activities per share (Euro)	3.60	5.03	-28
Adjusted total assets at 30 September ² (Euro million)	4,472	4,152	+8
Adjusted equity at 30 September ² (Euro million)	1,544	1,550	0
Adjusted equity ratio at 30 September ² (%)	34.5	37.3	-8
Net financial debt at 30 September (Euro million)	1,345	1,075	+25
ROCE (%)	7.9	8.5	-7
WACC (%)	6.3	6.3	0
Value spread (%)	1.6	2.2	-27
Capital employed (Euro million)	2,847	2,674	+6
Investments (Euro million)	310	290	+7
Non-financial key figures			
Direct CO ₂ emissions (Scope 1) (tonnes 000s)	1,545	1,547	0
Net CO ₂ savings (tonnes 000s)	486	485	0
Installed renewable energies capacities (MW)	474	467	+1
Share of renewable energies in proprietary electricity generation (%)	63	63	0
Concluded development of new renewable energies plants (MW)	460	1,011	-55
Number of employees at 30 September (headcount)	6,113	5,978	+2
of which women	1,756	1,701	+3
of which men	4,357	4,277	+2
Share of female managers at 30 September (%)	15	14	+7

¹ Excluding non-operating measurement item for financial derivatives, excluding structural adjustment for part-time early retirement, excluding restructuring result and including interest income from finance leases

² Excluding non-operating measurement item for financial derivatives

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