



Sustainability Report 2019

We inspire
with energy.

MVV in Figures


Select key sustainability figures at MVV (fully consolidated companies)


		FY 2019	FY 2018	% change
Ecological	Direct CO ₂ emissions (Scope 1) (tonnes 000s)	1,545	1,547	0
	Indirect CO ₂ emissions (Scope 2 and 3) (tonnes 000s)	6,354	8,393	- 24
	Net CO ₂ savings (tonnes 000s)	486	485	0
	Share of renewable energies in proprietary electricity generation (%)	63	63	0
Economic	Value added (Euro million)	895	881	+ 2
	Concluded development of new renewable energies plants (MW)	460	1,011	- 55
	Electricity generation volumes (kWh million)	1,745	1,836	- 5
	Investments (Euro million)	310	290	+ 7
Social	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
	Lost time injury frequency (LTIF) rate	7.7	6.7	+ 15
Energy operations	Average fuel efficiency rate (%)	57	57	0
	Installed renewable energies capacities (MW _e)	474	467	+ 1





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 Reference to other information contained in this report.

 Reference to other information on the internet.

 **GRI** Reference to a sentence or paragraph that contains disclosures in accordance with the Sustainability Report Guidelines of the Global Reporting Initiative.

 **GRI** If underlined, the reference indicates a section.

 Externally audited.



DEAR LADIES AND GENTLEMEN,

The progress made by the energy industry in implementing the energy turnaround is clearly apparent. It will probably be the only sector in Germany to meet its climate protection targets for 2020. Ambitious tasks nevertheless still lie ahead. These include raising the renewable share of the electricity supply to 65 percent by 2030 and, now that the relevant resolutions have been adopted, actually establishing a CO₂ pricing regime for those sectors that have not participated in European emissions trading to date, and in particular for the transport and building sectors. Necessary infrastructure measures, above all for generation and grids, also have to be implemented in the near future. Achieving our targets is and will remain the common challenge facing the worlds of politics, (the energy) business and society as a whole.

Climate neutrality by 2050 at the latest

For MVV, climate protection is and will remain a key pillar of our strategy. We are unreservedly committed to the objectives of the Paris Climate Accord. We will reduce emissions from our proprietary conventional generation positions and thus become climate neutral by 2050 at the latest. We are looking into technologies to reduce, use or offset unavoidable residual emissions. Our long-term vision is to build a recycling-based economy that is as self-contained as possible and powered by renewable energies.

On our course towards climate neutrality, the sustainability targets we adopted in 2016 represent major milestones that we intend to reach by 2026: We will double our proprietary renewables-based electricity generation to more than 800 megawatts and, to this end, continue to invest in expanding our portfolio. In our project development activities, we will newly connect a total of 10,000 megawatts of renewable energies to the grid. Here, we will focus on onshore wind power and solar plants, as well as on generating energy from waste, biomass and biogas. At the same time, we will triple our annual CO₂ savings to one million tonnes a year. As a competent and experienced partner, we support our customers as they themselves head for climate neutrality. Here, we offer them solutions to enhance their energy efficiency, improve their CO₂ balance sheets and expand their proprietary energy generation, as well as a range of innovative services.

Renewable energies are the way forward

Renewable energies are the only way for us to meet our national and international climate protection targets. MVV is promoting this expansion in two key ways. Firstly, we are changing our own generation portfolio. In the 2019 financial year, 63 percent of our electricity generation already came from renewable energy sources. Secondly, we are planning and building renewable energies plants for others. In the year under report, we connected a total of 460 megawatts to the grid.

Focus on supply reliability

The energy supply has to be secure at all times throughout the transformation. We therefore need smart ways to back up renewable energies. Here, the new gas-fired combined heat and power plant at Stadtwerke Kiel is an outstanding example. It secures the environmentally-friendly supply of heating energy to the state capital of Schleswig-Holstein and can be adjusted flexibly in line with electricity generation that is greener, more volatile and thus less controllable. Its 20 gas motors can go from zero to full capacity in just five minutes. Not only that, the associated heat storage facility and electrode boiler can react to supply and demand signals in the electricity and heating energy markets.

Pioneering the energy turnaround

For MVV, 2019 was a busy year, and one we concluded on a pleasing note. We achieved a great deal in implementing our sustainability-based strategy and thus also laid foundations for our future growth. The energy which drives us comes from our employees, whom I would like to thank on behalf of all members of the Executive Board. Their commitment and experience are making MVV a pioneer of the energy turnaround.

Yours faithfully,



Dr. Georg Müller
CEO

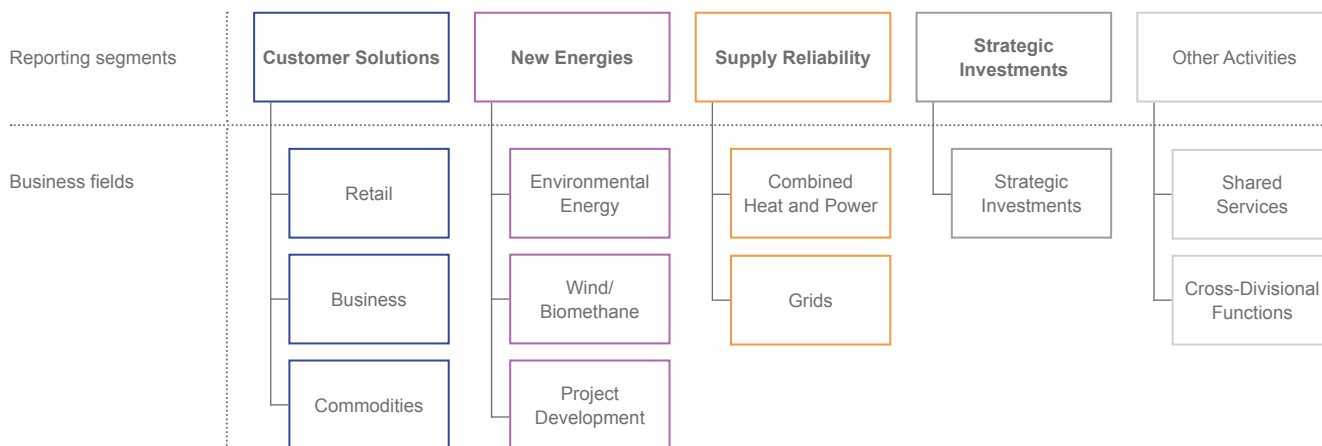
We are Shaping the Future

Our Business Model

We are one of Germany's leading energy companies and cover all major stages of the energy industry value chain: from energy generation, energy trading, energy distribution via proprietary distribution grid companies through to sales activities for energy solutions and our environmental energy business.

We also produce and distribute water. Renewable energies are a particular focus of our business model. Here, our activities include project development and operations management for windfarms and solar parks, as well as biomass power plants.

Reporting segments and business fields



Our Strategy

Sustainability has been a fixed component of our strategy for years now. During this time, our companies, the environment in which we operate and the understanding of corporate sustainability have all developed further.

For us, corporate responsibility involves:

- Maintaining a balance between profitable growth and social responsibility
- Consistently developing our business model further and thus securing our long-term economic success
- Being aware of the ecological and social implications of our own business activities and reducing our impact on the natural world
- Creating and retaining sustainable jobs and training positions for our employees
- Making a measurable contribution to converting the energy industry and to protecting the climate and the environment.

This way, we are making an active contribution to tackling the ecological and social challenges of our times.

The future has already begun. With us.

The new energy world is currently being shaped by three key developments: Alongside the need for further decarbonisation by expanding renewable energies and the related process of decentralisation, the digitalisation of the energy industry is playing a key role. This is promoting a process of technological change that affects all stages of the value chain and makes new solutions possible. With our investments in renewable energies, energy efficiency, supply reliability and developing innovative services and products enabling our customers to participate directly in the energy turnaround, we are actively addressing these trends and seizing them as an opportunity for the further development of our group of companies.

📄 www.mvv.de/GB2019.pdf, Pages 19 – 21

We are aware that our current generation portfolio and our range of products and services are not yet fully consistent with long-term ecological sustainability targets. After all, by using limited natural resources our economic activities have an impact on the natural world. Not only that, we have an adverse impact on our environment by using land and by directly and indirectly emitting pollutants. We bear and accept our responsibility for these activities. We must and will reduce our resource use, greenhouse gas emissions and unavoidable residual emissions in the long term.

Climate neutrality by 2050 at the latest

Protecting the climate is an indispensable aspect of our strategic alignment and thus part of our responsibility towards society. We are committed to the targets agreed in the Paris Climate Accord: Our aim is to be climate neutral as a company by 2050 at the latest.

Specifically, this means that we will:


- Reduce the emissions from our conventional generation positions to zero by 2050 at the latest
- Continue to press consistently ahead with expanding renewable energies
- Gradually reduce the CO₂ intensity of our heating energy generation
- Promote climate neutrality as achieved at and by our customers by implementing energy efficiency measures, planning and operating renewable energies plants and offering innovative services
- Look into new technologies facilitating the climate-neutral management of unavoidable remaining emissions.

Our sustainability targets represent major milestones as we head for climate neutrality.

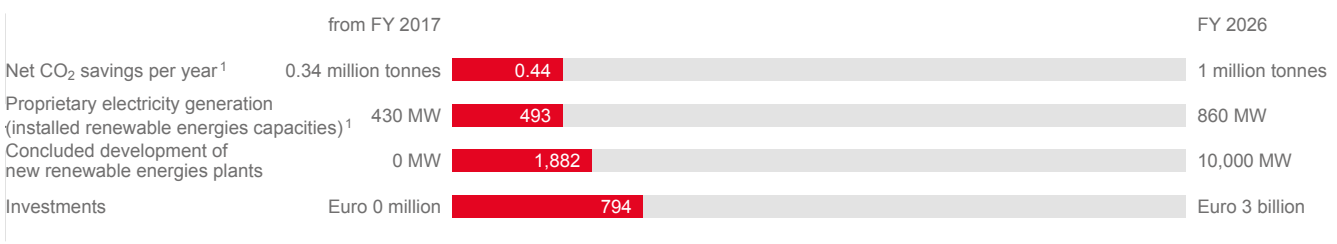
Our sustainability targets

Sustainability is the key pillar of our corporate strategy. At the end of 2016, i.e. at the beginning of our 2017 financial year, we set sustainability targets that we intend to achieve by the end of the 2026 financial year:

- We will triple annual CO₂ savings at our fully consolidated companies and the companies we recognise at equity to 1 million tonnes a year.
- We will double our proprietary electricity generation volumes from renewable energies at our fully consolidated companies and the companies we recognise at equity.
- We will connect 10,000 MW of renewable energies to the grid.
- The energy system of the future will remain our key investment focus. We will invest a further total of Euro 3 billion in the energy turnaround.
- As a competent partner, we will offer all customers – from private households to industrial players – the products and services they need to implement their own energy turnarounds.

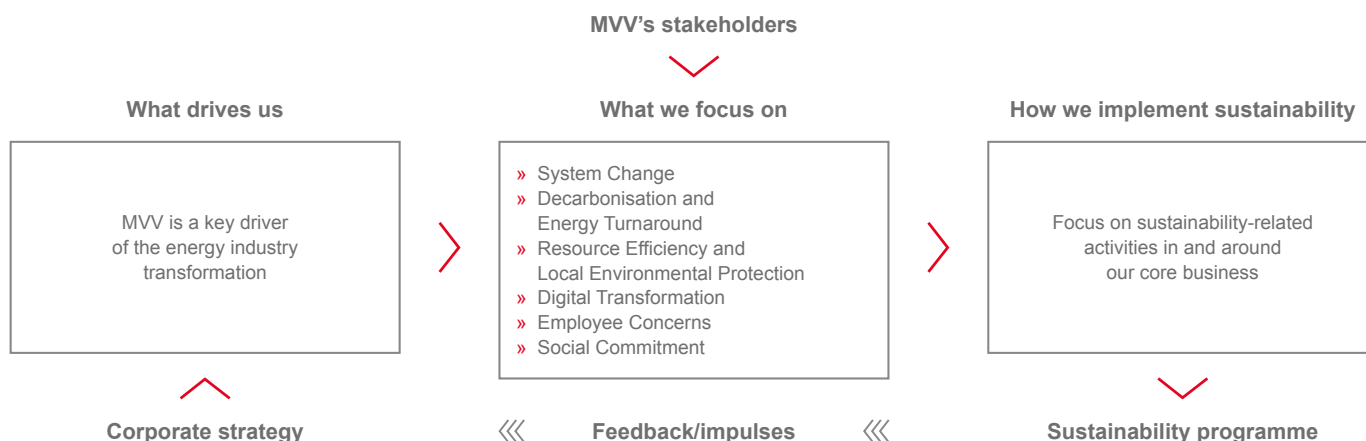
We are implementing these targets and further company-internal requirements with the assistance of our corporate strategy. We continually look into new approaches, our resource use and our target contributions  **Page 58.**

Target attainment FY 2019



¹ Fully consolidated companies and companies recognised at equity

MVV's sustainability at a glance



Compliance

Consistent adherence to all regulations and laws applicable to MVV is an absolute prerequisite for the company to act and be accepted as a reliable and trustworthy partner. High-quality compliance also makes an important contribution to our company's sustainable development and value creation.

Our compliance management system (CMS) helps us to safeguard compliance with applicable laws, as well as with in-company guidelines and the ethical standards to which we are committed. This way, we protect the integrity of our employees, our customers and business partners and save MVV from any negative consequences.

We have summarised the most important requirements and the necessary organisational structures and processes in our Compliance Management Handbook, which also lists relevant personnel responsibilities and lays down details about our reporting system. This handbook is binding for all limited liability companies at the Mannheim subgroup of MVV Energie AG and is permanently available for downloading to all of the employees at this subgroup. The other subgroups have introduced equivalent compliance management systems. Our Compliance Management Handbook is also available in English, for example for our British and Czech subgroups.

Our CMS is structured in such a way as to ensure that breaches of compliance are basically avoided in advance, above all by working with preventative measures in the respective business processes (systemic compliance). We already check relevant processes in sensitive areas during the respective operating process, for example, and act early to take corrective measures where necessary. Donations and payments to parties and political organisations are strictly prohibited. Payments to equity providers are made exclusively in the form of dividends.

Together with the various organisational units involved, our Compliance Officer compiles relevant compliance regulations, documents them and sees to their implementation in business processes. He is responsible for ensuring that employee training measures are implemented and that due account is taken of all CMS processes. Furthermore, he also acts in an advisory and supportive capacity to accompany measures intended to prevent and, where necessary, investigate any violations of the law, corruption or deliberate acts harmful to the company. He reports to the Executive Board and the Audit Committee on compliance and any violations of human rights.

We aim to avoid any infringements of compliance requirements on a preventative basis.

By actively implementing prevention measures within the relevant business processes themselves, we make every effort to avert all criminal or grossly incorrect actions or violations of the law. MVV has a zero-tolerance policy towards bribery and all other forms of corruption. To help prevent corruption, we therefore provide training, particularly to employees working in sales, related areas and procurement. Employees also receive instructions on how to deal with gratuities and invitations. We record and check any gratuities offered or invitations received. These measures enable us to minimise the risk of “soft bribery”. We also continually monitor adherence to compliance requirements, and that in all business fields, specialist divisions, group departments and subsidiaries. Employees and third parties can contact the Compliance Officer or an external confidence lawyer directly. Via “Whistleblower Hotlines”, they can provide anonymous tip-offs on potential misconduct. The telephone number of the confidence lawyer is also published on our website at www.mvv.de.

Alongside a number of minor infringements, two more notable incidents occurred at a subgroup in the period under report. One related to breaches of the law committed by a temporary manager, who was dismissed immediately, while the other involved a tax-related error.

To make sure that all of MVV’s managers and all employees with contact to customers or suppliers are well informed of general compliance requirements and familiar with the legal requirements relevant to their respective business units, we also provide regular training. The topics covered by this training include the requirements of capital market, securities and stock market law, competition and cartel law, combating money laundering, sanction lists and energy industry law. We provide extensive training to new management staff. For this, upcoming management staff and newly appointed managing directors take part in a seminar held over several days with attendance obligatory for all management staff from section manager upwards. In the 2019 financial year, 304 employees at the Mannheim subgroup and 330 employees at the other subgroups took part in this training. During this period, a further 190 individuals completed an online training programme provided by our Stadtwerke Kiel subsidiary.

At the end of each financial year, all senior managers and managing directors of subsidiaries and certain shareholdings are required to submit a Compliance Management Declaration (CMD) in which they must state whether the relevant compliance regulations and legal requirements have been complied with. The matters covered by the CMD include an enquiry as to whether, as required, the employees of the respective manager have received instruction and suitable training for the CMS. Moreover, in the CMD the managers also respond in detail to questions specifically tailored to circumstances at their respective business unit.

Respect for human rights is also integrated into our compliance management system. Our human rights policy www.mvv.de/responsibility underlines our commitment to internationally recognised principles of human rights. With this commitment, we also take due account of the National Action Plan for Business and Human Rights (NAP). Our human rights policy was adopted by our Executive Board, while the management at our companies and locations is responsible for compliance with all requirements of the policy.

GRI 102-16

Furthermore, our procurement terms www.mvv.de/centralprocurement also require our suppliers to respect and comply with human rights and privacy rights. The overwhelming share of our business activities takes place in Germany, as well as in the UK and the Czech Republic. Our suppliers are mostly located in Germany and other countries in which respect for human rights can generally be assumed. For select business fields with potentially critical terms, we have implemented specific sustainability evaluation measures in the context of our supplier management.

Acquisitions of companies or shareholdings are subject to a painstaking due diligence process that also covers compliance with human rights, adherence to compliance-related requirements and further sustainability aspects, such as environmental protection and occupational safety.

Sustainability Management

Our sustainability management focuses on those topics, processes and measures that we view as forming part of our core business. Our strategic sustainability targets were adopted by the Executive Board for the years 2016 to 2026 and are an integral component of our corporate strategy. 🌐 **GRI 102-44**

Our sustainability management is anchored across various levels of the Group. The Executive Board bears overall strategic responsibility. We continually review, evaluate and manage MVV's performance on the basis of sustainability indicators and medium-term targets. We also evaluate investment projects by reference to sustainability criteria. In organisational terms, the sustainability programme is located in our group strategy and energy industry department, where the team coordinates the sustainability strategy, plans projects and measures in connection with our group-wide sustainability management and implements these. It regularly reports to the steering committee on group level, as well as to the Executive Board.

🌐 **GRI 102-18**

Regular exchange of ideas and information with our shareholders

We describe our groups of shareholders and our involvement in networks and initiatives in the Local Communities section 📖 **Page 50**.

We draw on our regular talks and interviews with stakeholders to review the material topics. Together with MVV's specialist departments and companies, we ascertain the extent and ways in which specific concerns are to be accounted for. The results of this process are subsequently discussed by the experts in the sustainability programme and then implemented. In our comments on material topics, we refer to the core concerns of our stakeholders.

🌐 **GRI 102-42** 🌐 **GRI 102-44**

Focus on customer satisfaction

We aim to continually improve our relationships with our customers. To measure our performance objectively, we regularly perform customer surveys in cooperation with a variety of market research institutes.

In the past year, we took part in the BDEW service monitor once again in order to survey the medium-term trend in our customers' satisfaction. This monitoring programme focuses in particular on how our customers perceive their service contacts in their day-to-day business dealings. The customer service study aims to survey customer satisfaction, identify potential improvements and facilitate comparison with other study participants. In the year under report, the survey revealed a significant increase in our customers' satisfaction with our telephone customer support. Overall, satisfaction with MVV Energie remained unchanged compared with the previous year and, like customers' willingness to remain with the company, remained at a pleasing level.

Furthermore, we also survey our "net promoter score" and extended the questioning performed for this in the 2019 financial year. The net promoter score has been a recognised parameter of customer loyalty for many years now and is used worldwide by prestigious companies across all sectors. The score provides our sales units with insights into our customers' level of satisfaction over a longer-term period.

🌐 **GRI 102-43** 🌐 **GRI 102-44**

Materiality Analysis

To perform our materiality analysis, we continually monitor public debate and the positions of our stakeholders and regularly assess whether and how these have altered the relevance of our material topics. This multistage process involves desk-based research, internal analysis and surveys of those specialist departments with interfaces to external stakeholders. Furthermore, we hold workshops and interviews with select stakeholders. We review all aspects of the materiality process every three to four years, most recently in the 2018 financial year. Moreover, we also update the main characteristics and prioritisations on an annual basis.

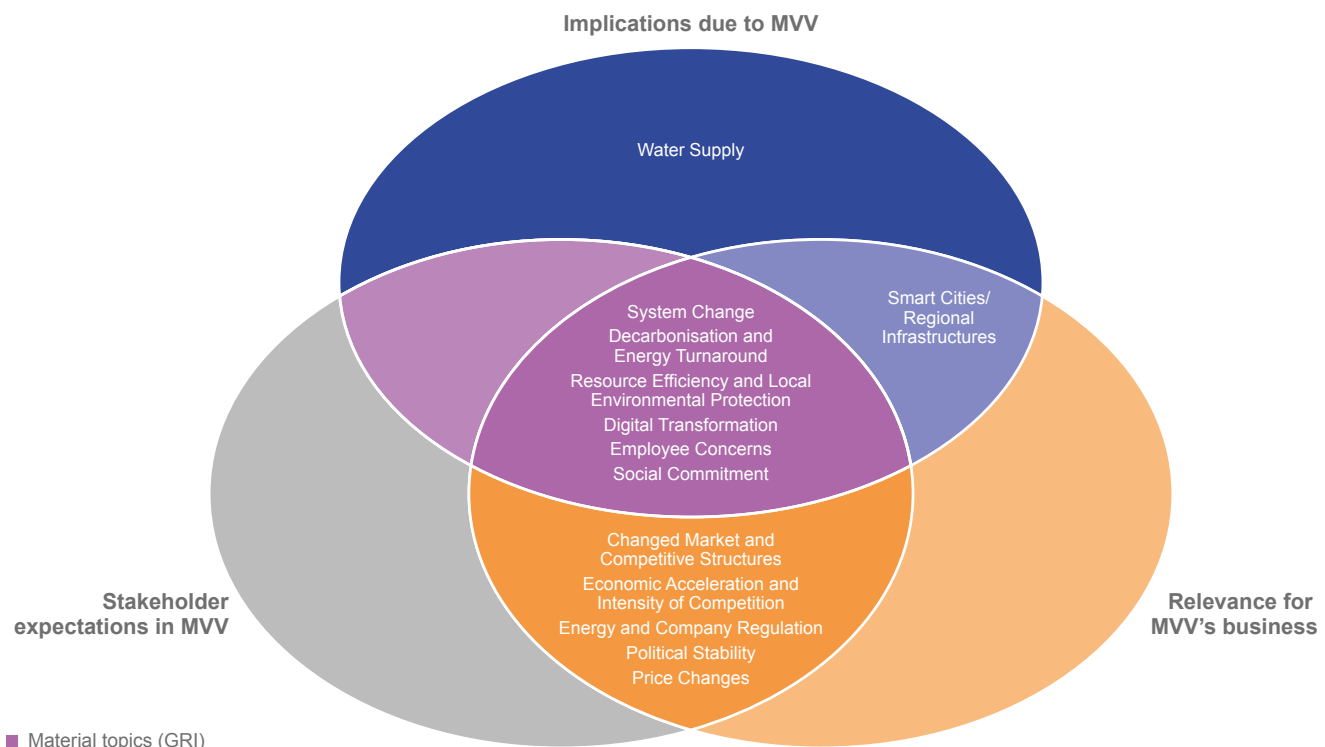
In terms of its contents, the materiality analysis accounts for global challenges and megatrends, sustainable development goals (SDGs) [Page 58](#), industry and technology-related trends and the expectations of internal and external stakeholders. In this, we account for three levels. On the one hand, we include the two perspectives relevant to the GRI, namely significance to stakeholders and the impact of our business activities. These perspectives result in the topics that we then identify as material pursuant to GRI. Furthermore, we also consider further topics that are of relevance to our company.

In determining the GRI-based material topics, we proceed in accordance with the approach recommended by the GRI. When identifying topics, we took account of the perspective of MVV's specialist departments and companies, as well as of the findings of extensive stakeholder analyses. We classify a sustainability topic as material when our stakeholders deem it relevant and/or the impact of MVV's business activities is high. We report in detail on these GRI-based material topics [Pages 10 – 11](#) and base our reporting on GRI standards. The results of this process were discussed on Executive Board level and their relevance confirmed. [GRI 102-46](#)

Within our sustainability reporting, we regularly publish an updated list of GRI-based material topics and comment on any changes compared with the previous year [Page 53](#).

With the exception of employee concerns (only inside) and social commitment (only outside), all the GRI-based material topics listed in the table below are material both inside and outside MVV. [GRI 103-1](#) [GRI 102-44](#)

Results of materiality analysis



OUR MATERIAL TOPICS (GRI)

Material topic: System Change

Pages 17 – 22

Specific disclosure ¹	What we aim to achieve	What we achieved in the 2019 financial year
Supply reliability (MVV)	We are smartly combining renewable and highly efficient conventional energies and contributing to supply reliability. We aim to minimise interruption-induced failure in the power supply.	We further expanded our broadly diversified generation portfolio and are implementing projects in our onshore wind and solar power businesses. These are expected to increase the diversity of our generation capacity in the years ahead. Our new highly flexible gas-fired CHP plant in Kiel commenced operations at the end of 2019. We were able to ensure a largely interruption-free supply of electricity.
Indirect economic implications (GRI)	In the years ahead, we will invest a further total of Euro 3 billion in the energy turnaround.	We invested Euro 310 million.
Sector coupling (MVV)	We actively contribute to sector coupling.	We launched operations with sector coupling infrastructure projects. We installed 25 new charging points for electric vehicles in Mannheim and the region and 19 new charging sites in Kiel.
Changed energy demand (MVV)	We prepare our supply grids for changes in energy demand in the electricity and heating energy sectors as a result of the energy system conversion or energy efficiency measures.	We systematically accounted for this factor in our strategic investment planning and also initiated and/or maintained research projects.

Material topic: Decarbonisation and Energy Turnaround

Pages 23 – 32

Specific disclosure ¹	What we aim to achieve	What we achieved in the 2019 financial year
Emissions (GRI)	We will triple our annual CO ₂ savings to 1 million tonnes a year by 2026. (basis: start of 2017 financial year: around 339,000 tonnes)	Annual CO ₂ savings at our fully consolidated companies and the companies we recognise at equity amounted to 480,000 tonnes.
Electricity generation volumes from renewable energies (MVV)	We will double our proprietary electricity generation from renewable energies by the end of the 2026 financial year. (basis: start of 2017 financial year: 430 MW)	Installed capacities for renewable energies and the biogenic share of waste/RDF at our fully consolidated companies and the companies we recognise at equity amounted to 493 MW, 14 MW more than one year earlier.
Concluded development of new renewable energies plants (MVV)	We will connect 10,000 MW of renewable energies to the grid by the end of the 2026 financial year. (basis: start of 2017 financial year: 0 MW)	We developed projects with capacities of 460 MW.
Energy (GRI)	We will raise plant efficiency levels and reduce emissions from our proprietary generation and at our customers.	We enhanced energy efficiency in numerous projects. The fuel efficiency rate at our fully consolidated companies and the companies we recognise at equity rose from 61 % in the previous year to 63 %.
System efficiency (MVV)	We aim to reduce grid losses in our electricity and heating energy grids.	Grid losses fell year-on-year in our district heating grids and remained almost unchanged in our electricity grids.

Material topic: Resource Efficiency and Local Environmental Protection

Pages 33 – 37

Specific disclosure ¹	What we aim to achieve	What we achieved in the 2019 financial year
Materials (GRI)	We reduce our ecological footprint by expanding highly efficient combined heat and power (CHP) generation and district heating and thus reducing the use of non-renewable fuels.	We further expanded and increased the density of district heating at our locations. This also included connecting the CHP plant in Mannheim to the district heating grid. We completed the construction of the new gas-fired CHP power plant in Kiel. Moreover, we initiated projects that will be implemented in the years ahead.

¹ (GRI): Disclosure pursuant to GRI standards; (MVV): additionally reported contents

Material topic: Digital Transformation

Pages 37 – 40

Specific disclosure ¹	What we aim to achieve	What we achieved in the 2019 financial year
Industry 4.0 (MVV)	By promoting digitalisation and networking in our own processes, at our customers and in our products, we safeguard MVV's future performance capacity.	We made further progress both in our digital dialogue with customers and in automating processes. In our digitalisation programme, we made substantial advances in terms of digitalisation and networking our activities.
Customer solutions (MVV)	As a competent partner, we offer all customers – from private households to industrial players – the products and services they need to implement their own energy turnarounds.	We supplemented our portfolio of solutions with newly developed services and products relating to the energy turnaround and climate neutrality and also extended our sales activities.
Information security and data protection (MVV)	We work with an extensive range of technical and organisational security measures to ensure information security and data protection.	We are continually improving the processes used to protect information. In the year under report, we further enhanced our processes.

Material topic: Employee Concerns

Pages 40 – 47

Specific disclosure ¹	What we aim to achieve	What we achieved in the 2019 financial year
Training and development (GRI)	With our broad range of training programmes, we aim to present to young people the whole variety of professional opportunities at the company. We aim to further develop the potential of our employees.	We employed 330 trainees as of 30 September 2019. Our employees took part in a variety of internal and external training and development programmes.
Promoting women (MVV)	By 2021, we aim to raise the share of female employees at our Group to 35 % and the share of management positions held by women to 25 %. (basis: 30 June 2015: 27 % and 14 %)	As of 30 September 2019, women accounted for 29 % of our workforce and for 15 % of our managers.
Occupational health and safety (GRI)	We support our employees in remaining healthy. We aim to keep the lost time injury frequency (LTIF) rate as low as possible.	The lost time injury frequency (LTIF) rate amounted to 7.7. We implemented our new inspection concept in further areas of the company and supplemented our company health management programme with new preventative measures.

Material topic: Social Commitment

Pages 47 – 51

Specific disclosure ¹	What we aim to achieve	What we achieved in the 2019 financial year
Economic output (GRI)	We aim to continue generating value and meet our responsibility as an economic player.	We raised our net value added year-on-year by Euro 14 million to Euro 895 million.
Local communities (GRI)	We aim to communicate transparently and openly with our stakeholders.	We further developed our communications instruments and increased public transparency.
Society (MVV)	We aim to show our commitment to the society in which we operate.	We continued our sponsoring and support measures in a targeted manner.

¹ (GRI): Disclosure pursuant to GRI standards; (MVV): additionally reported contents

 **GRI 102-47**

FURTHER TOPICS OF GREAT RELEVANCE TO MVV'S BUSINESS

Our aim is to provide extensive information about our business activities and company objectives. We therefore also report on those topics that were identified in our analysis as primarily being of relevance to MVV's business performance but which do not form part of the GRI topics.

Implementation of coal exit

MVV welcomes Germany's commitment to greater climate protection. We aligned our own strategy to this more than ten years ago already. This topic is also relevant to our stakeholders, who on many occasions seek to discuss this with our Executive Board and our employees, for example at our Annual General Meeting. Moreover, we are also active participants in relevant discussions in the political arena and within society.

The coal exit not only became increasingly relevant within society in the course of the 2019 financial year; it is also a topic for which political decisions were taken. The phasing out of the use of brown coal (lignite) and hard coal (anthracite) in Germany was specified in greater detail with the publication in early 2019 of the recommendations made by the Commission on Growth, Structural Change and Employment (KWSB) established by the Federal Government. The adoption by the Federal Cabinet of the German Coal-Based Electricity Generation Termination Act (Kohleverstromungsbeendigungsgesetz) in January 2020 means that a specific roadmap for phasing out the use of coal is now in place. However, this legislation still has to be conclusively addressed within the parliamentary process.

Of key importance in this respect is the decision to decommission the final coal-fired power plant by 2038 at the latest and, if reasonably possible for the energy industry, even by 2035. In the intervening years, coal-based generation capacities will gradually be decommissioned across Germany (see chart), with extensive structural aid available to cushion any social hardship in lignite-producing regions.

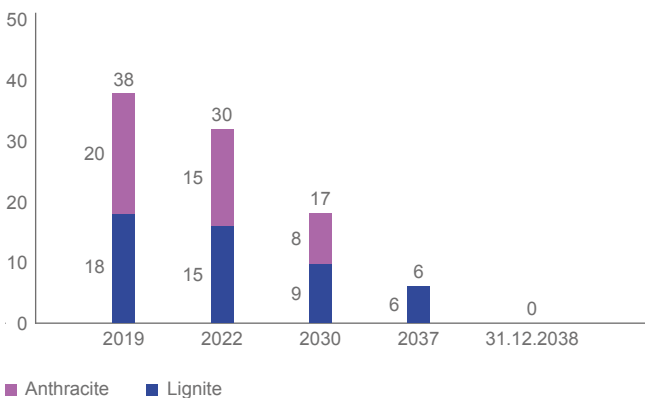
Furthermore, the German Coal-Based Electricity Generation Termination Act (in the version approved by the Cabinet at the end of January 2020) provides for granting the operators of lignite-fired power plants compensation of more than Euro 4.3 billion on the basis of individual agreements. In return, statutory decommissioning deadlines have been set, starting with a reduction of 2.8 GW in the Rhine Region by the end of 2022. The last lignite capacities of around 6 GW are scheduled to leave the market permanently by the end of 2038.

A two-stage procedure is envisaged for decommissioning hard coal-fired power plants. In Phase 1, such plants should leave the market voluntarily, particularly in northern Germany. A tender process is to be used to determine the amount of compensation paid, with the maximum price paid set to fall in each subsequent tender round. Southern German hard coal-fired power plants are not allowed to participate in the first tender round and will also be structurally disadvantaged in subsequent rounds due to the proposed price mechanism. In Phase 2, starting in 2027, the remaining hard coal-fired power plants will be decommissioned by regulatory law, with the measures already taking effect from 2024 should tender volumes not be met. Here, older power plants will be obliged to close first. No compensation is provided for in Phase 2. Due to the high volume of lignite capacities initially remaining in the grid, the final hard coal-fired power plants are currently only expected to leave the market several years before 2038.

Many hard coal-fired power plants are operated using combined heat and power (CHP) generation and play a major role in supplying district heating to large built-up areas. In most cases, CHP power plants can only be decommissioned once a solution for replacing the heating energy generation has been secured. This requires a suitable lead time of several years to implement the necessary planning, approval and construction measures. To account for this, key framework requirements for the future decarbonisation of centralised heating supply systems are stipulated in the amendment to the German Combined Heat and Power Generation Act (KWKG). With the "coal substitution bonus", the KWKG also offers incentives for voluntarily replacing hard coal-based CHP with natural gas-based CHP. The legislative amendment adopted

Exit from coal

Installed capacities¹ (GW)




¹ Capacity based on Cabinet Resolution on coal exit legislation, excluding reserves; hard coal based on assumptions

by the Federal Cabinet in January 2020 has further developed the subsidy system for replacing coal-based CHP with gas-based CHP, as well as for green heating energy. However, the level of subsidies provided for in the amendment falls significantly short of the minimum level needed to safeguard the economic viability of the replacement investments as calculated by energy industry associations.

We significantly reduced the role of coal in our proprietary generation portfolio in the 2019 financial year. With the decommissioning in March 2019 of the joint power plant in Kiel (Gemeinschaftskraftwerk Kiel – GKK), a hard coal-fired power plant with an installed capacity of 354 MW_e which we owned together with Uniper, we made a major contribution to the national coal exit. For our second German hard coal-fired power plant, which is located in Offenbach and has a capacity of 60 MW_e, we only expect decommissioning to take place during the 2020s. This is due to the lead time of several years needed to build low-CO₂ heating energy generation capacity.

At our strategic investments in the Czech Republic, we operate several small coal-based plants to generate and secure the supply of heating energy. There too, we will be discontinuing the use of coal and decarbonising the heating energy supply in the years ahead.

We are a minority shareholder in the large power plant in Mannheim (Grosskraftwerk Mannheim AG – GKM), with a 28 % stake, and do not operate the plant ourselves. The GKM plant currently operates four hard coal-fired CHP blocks. The decommissioning dates for these blocks will largely depend on the definitive decisions taken concerning the specific structure of the hard coal exit and on KWKG legislation. This means that conclusive decisions still have to be taken. With a plant age of five years, Block 9 at GKM is one of the newest and most efficient hard coal-fired power plants in Germany. Based on the Cabinet decision concerning the German Coal-Based Electricity Generation Termination Act, the hypothetical decommissioning date would be in the first half of the 2030s.

To decarbonise the district heating supply, MVV is compiling various concepts which account for all significant and forward-looking technologies. One first step to reduce heating energy generation from the GKM plant was implemented in February 2020 by linking up the waste-fired CHP plant on Friesenheimer Insel (Mannheim CHP plant)  **Pages 31 – 32**. Starting in 2020, this CO₂-neutral form of generation will cover up to 30 % of annual district heating volumes. One potential second step towards further

decarbonising the district heating system may involve extending the existing biomass-fired power plant (waste timber) in Mannheim to include a district heating decoupling facility. This would enable it to act as a CHP plant supplying an additional contribution to the district heating grid from 2024 onwards. Further options for decarbonising district heating generation are currently being investigated in detail. Among others, they include solutions such as geothermal energy, solar thermal energy, river heat pumps, the use of biomass, biomethane plants and of waste industrial heat. Which technologies are ultimately implemented will mainly depend on the technical and economic potential harboured by the respective alternatives, as well as on the medium to long-term regulatory environment.

Changed infrastructures and smart cities


Transforming the energy supply system will require large numbers of individual projects to be conducted on a decentralised basis. There is a need for end-to-end concepts for urban districts and quarters, for example, as the ongoing trend towards urbanisation is creating substantial environmental burdens. Growing populations in large built-up areas make it necessary to further develop towns and cities, their infrastructures and their environmental and climate protection measures, while also offering an opportunity to implement sustainable forward-looking concepts. The trend towards smart cities is a process in which we act as a partner to local authorities and innovative municipal utility companies. Information and communications technology can help in mastering the challenges involved. Integrating existing municipal infrastructure and connecting this to IT, mobile and cloud computing technologies can help make cities more efficient and sustainable and improve their quality of life. This involves changing various aspects of urban life, such as public transport concepts, parking policies or the digital management of supply functions. Examples here include the measures needed for senior citizens, senior citizen-friendly apartments and district solutions, or senior citizen-friendly mobility. To manage the very detailed tasks involved in smart cities in a transparent and targeted manner, we subdivide our activities into five segments: Smart City Management, Smart Energy, Smart Mobility, Smart Infrastructure und Smart Living.

Energy and corporate regulation

The future market design for renewable energies and energy efficiency directly impacts on our core business, as does grid regulation. Political decisions are due to be taken on various levels – EU, federal and regional – in the months and years ahead.

The decisions taken by the Climate Cabinet were highly significant in the 2019 financial year. One key point involves CO₂ pricing in the transport and heating energy sectors, a policy due to take effect from 2021 onwards. Revenues from this levy are to be used, among other purposes, to benefit people and businesses, in particular by lowering electricity costs and raising the allowance for long-distance commuters. These are accompanied by numerous sector-specific measures, such as subsidies for district heating grids and expanding e-mobility. Moreover, with the German Structural Reinforcement Act (Strukturstärkungsgesetz) already adopted in August 2019, the Federal Government will be supporting those regions particularly affected by the exit from coal. The gradual phasing out of coal-based electricity generation is governed by the German Coal-Based Electricity Generation Termination Act adopted by the Federal Cabinet at the beginning of 2020. The numerous other measures also include introducing tax incentives for energy-efficiency building refurbishments, irrespective of the specific technology used. We only have limited influence on developments such as these. We nevertheless observe and analyse them very closely and align our activities accordingly.

Developments in prices on the energy markets

Energy prices impact directly on the economic viability of energy-saving services and thus on their market volumes. Moreover, they also influence generation volumes and therefore CO₂ emissions and the profitability of our proprietary power plants. Our structured procurement activities mean that we are able to offer the best possible prices at all times to our business customers. Not only that, we also support our customers in enhancing their energy efficiency and thus in realising cost savings  **Page 32.**

The development in national and international energy prices for natural gas, oil, coal and CO₂ directly affects the energy price for end customers. We have little direct influence in this respect as we too are exposed to fluctuations in energy prices. We pass on developments on the wholesale markets to our customers. Within the limits of the possibilities available to us, we are nevertheless committed to ensuring price stability for our customers, particularly for the basic supply. One way we do this is by implementing efficiency enhancements.

Value Chain

We exercise influence on topics relating to sustainability along our upstream and downstream supply chains as well. In the upstream supply chain, for example, we can decide who we wish to do business with and which minimum requirements we place in our suppliers. Key factors influencing our supplier selection from a non-financial perspective include the topics of anti-corruption measures, human rights, employee rights, including work safety, and environmental protection.

We aim to avoid any situation in which activities along our value chain have or favour any harmful effects in terms of human rights.

For our customers in the downstream supply chain, we create incentives, for example by enabling them to monitor and reduce their energy consumption. We ourselves also make investments in decentralised energy solutions.

The energy industry supply chain is very much shaped by trading with energy sources, while other suppliers account for a markedly smaller share of total procurement volumes. Overall, our value chain comprises the following elements:

- Purchasing and marketing electricity and natural gas in the international wholesale business and marketing electricity from renewable energies
- Procuring waste, biomass and, to a minor extent, coal
- Generating electricity, heating energy and bio-methane
- Developing new generation plants, especially onshore wind and photovoltaics plants, for proprietary and third-party operation
- Operating electricity, natural gas, district heating and water grids and energy storage facilities
- Supplying electricity, gas, heating energy and water to end customers and secondary distributors
- Producing, processing and supplying drinking water
- Providing energy-related services.

 **GRI 102-9**

The majority of our procurement volumes involve energy carriers such as electricity and natural gas. We typically hedge these by way of financial transactions but do not physically procure them. For these commodities, we are not aware of any material sustainability-related topics that we are able to influence directly.

One matter of public interest is the origin of the hard coal used at power plants and whether we exert influence on production conditions at the coal mines. The only coal-fired plant we operate ourselves is the CHP plant in Offenbach. For this, we directly procured around 76 thousand tonnes of hard coal in the 2019 financial year. Most of this came from Russia. Due to our longstanding relationships with suppliers, we are familiar with the conditions there. We nevertheless do not have any direct contractual relationships to mine operators but, given the low volumes involved, procure the fuels via intermediaries. Not only that, our very low volume of demand means that we have hardly any possibility of exerting influence on location. Hard coal is also used at the large power plant in Mannheim (Grosskraftwerk Mannheim – GKM), where we are minority shareholders. Here, we have no direct influence on business activities and fuel procurement, as we are not the operators of the plant. We are nevertheless aware of our responsibility and exert our influence by raising sustainability topics and requesting information.

At our biomass-fired power plants, we chiefly use waste timber, residual forest timber and green cuttings. We obtain these fuels from disposal companies and incinerate them in accordance with strict legal requirements. Most of the waste timber incinerated comes from the regions surrounding the respective plants.


Other than fuel procurement, our remaining procurement volumes are relatively low. They mostly involve procuring goods and highly qualified services from contract partners often known to us for many years.

The basis for our cooperation with suppliers and service providers in Germany and the EU is provided by applicable laws and ordinances, as well as those compliance regulations, forms of conduct and work practices relevant to us.

Contractual relations with suppliers and service providers are additionally governed by our procurement terms and compliance guidelines, which are published on our website at www.mvv.de/centralprocurement. Our procurement terms include specific requirements in terms of compliance, adherence to employee rights and environmental protection. We expect our suppliers, for example, to uphold the basic employee rights set out in the international conventions of the United Nations (UN), the International Labour Organization (ILO) and the Organisation for Economic Cooperation and Development (OECD), as well as the UN Global Compact.

Suppliers to MVV Energie, Energieversorgung Offenbach, Juwi and Stadtwerke Kiel are all assessed in terms of sustainability, risks and compliance, as are the subcontractors we approve. Within our supplier management system, all suppliers are required to provide disclosures on whether they have compliance or anticorruption requirements and a code of conduct, as well as on whether they are committed to the UN Global Compact. Furthermore, they must disclose whether they have a sustainability concept and, if so, how this is implemented. Corresponding information and certificates are deposited in our supplier management system. Should we commission a supplier, then as standard practice we make our compliance requirements a component of the contract. Among other issues, these provide for contractual penalties in the event of corruption and bribery and require compliance with basic employee rights. Both aspects are monitored in our compliance management system. Compliance with social welfare standards also forms part of our contract awarding process. As a general rule, we do not obtain data from suppliers located further upstream in the supply chain.

The overwhelming share of our business activities take place in Germany, the UK and the Czech Republic, i.e. in European Union member states where respect for human rights is a core aspect of entrepreneurial activity. Within our supplier management, we have taken specific measures to perform a sustainability evaluation of select business areas with potentially critical conditions. If we access new regions or markets outside Europe, this mostly relates to our project development business. To safeguard respect for human rights along the value chain there as well, and more clearly than previously, in the 2019 financial year we launched new processes and measures within the respective compliance management systems. These will become part of standard processes in the 2020 financial year. Acquisitions of companies or shareholdings are subject to a painstaking review process that also covers compliance with human rights, adherence to compliance-related requirements and further sustainability aspects, such as environmental protection and occupational safety.

 **GRI 102-16**

Large numbers of subcontractors, most of which based in European Union countries, work on behalf of MVV. As human and employee rights are legally protected in these countries, we assume that employment conditions there are humane. High safety standards are also important to us for our subcontractors. We are therefore committed to ensuring that they comply with legal requirements and have issued corresponding requirements which provide, for example, for health and safety instructions to be issued to employees at third-party companies. At present, however, we do not perform systematic audits of our subcontractors. We do not keep comprehensive records of working conditions at our subcontractors, especially at their production locations.

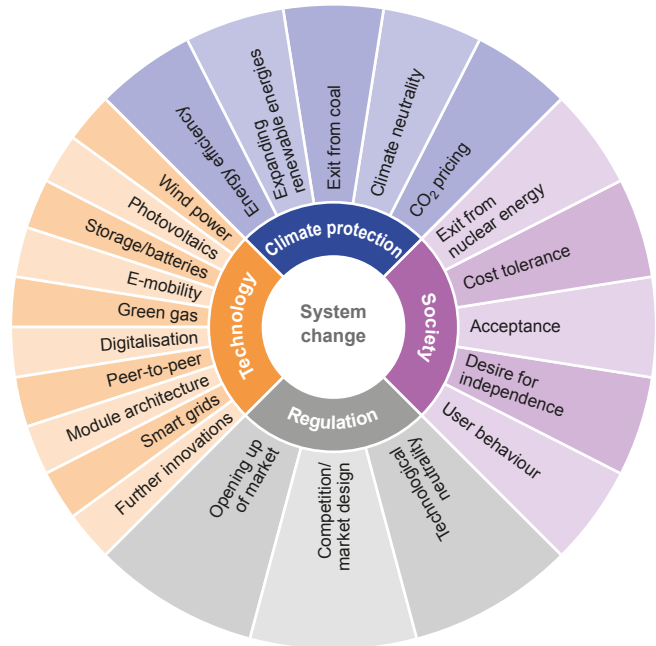
Material GRI-Based Topics

Our reporting on material GRI-based topics refers to MVV and thus to all fully consolidated companies. For some disclosures, we also report on the companies we report at equity. We are a co-shareholder with a stake in the large power plant in Mannheim (Grosskraftwerk Mannheim AG – GKM). As the blocks there generate conventional energy, we would also like to provide transparency as to their impact. Furthermore, the activities at Stadtwerke Ingolstadt are within the scope of companies consolidated at equity. If, for select topics, we focus our reporting on the major locations of Mannheim, Offenbach, Kiel and Wörrstadt, then we indicate this accordingly.

System Change

Energy companies play a key role in the energy system transformation. They do this by investing in the energy infrastructure to prepare this for the energy turnaround and make it fit for the future. At the same time, they perform what is for society the important task of ensuring a reliable and stable supply of electricity, gas, heating energy and water. The advancing energy turnaround raises new questions, as the volume of electricity fed in from renewable energies such as wind turbines or photovoltaics fluctuates in line with weather conditions and the time of day. As an energy company and distribution grid operator, we ensure that we provide our customers with a secure and reliable supply of energy at all times throughout the transformation in the energy system. As we head for the energy system of the future, we need to smartly combine renewable energies with highly efficient, flexible and controllable power plants. The reliability, smartness and performance capacity of our grids have a key role to play in this respect. That is why we are investing on an ongoing basis in maintaining, expanding and optimising our grids and plants.

Material aspects of system change



In what follows, we address further important specific disclosures relating to the GRI-based material topic of system change. These include market developments of significance to society as a whole, to which we as a company contribute. Among others, they include sector coupling, i.e. the use of electricity generated in environmentally-friendly ways in the transport and heating energy sectors as well, thus enabling the climate protection targets set by the Federal Government to be met. We are pressing ahead with this topic and, with regard to the heating energy supply, are currently focusing on making conventional generation more flexible, for example by working with power-to-heat solutions such as heating energy storage facilities, and on e-mobility. We also have to align our business to changing energy demand, as this has implications for strategic planning in all our business fields, as well as for the decisions we make concerning future growth investments.

🌐 [GRI 103-2](#) 🌐 [GRI 103-3](#)

SUPPLY RELIABILITY

Gradually converting our generation portfolio

As we shape our course towards the energy system of the future along social, ecological and economic lines, we are working to an increasing extent with renewable and to a decreasing extent with conventional energies and relying here on a variety of energy sources and technologies. Doubling our proprietary electricity generation from renewable energies between 2016 and 2026 will change our generation portfolio, which is set to become even more diversified. This kind of generation

portfolio will help us to ensure a secure energy supply for our customers. That is particularly true for the supply of heating energy to those private, business and industrial customers connected to our district heating and industrial steam grids in Mannheim, Offenbach and Kiel. At the end of the year under report, our fully consolidated companies had electricity, district heating, gas and water grids with a total length of more than 19,000 kilometres.

We are smartly combining renewable and highly efficient conventional energies and contributing to supply reliability.

Electricity generation volumes ✓

kWh million	Fully consolidated companies				Fully consolidated companies and companies recognised at equity			
	FY 2019	FY 2018	+/- change	% change	FY 2019	FY 2018	+/- change	% change
Biomass and biogas plants	418	498	- 80	- 16	452	529	- 77	- 15
Biogenic share of waste/RDF	309	274	+ 35	+ 13	309	274	+ 35	+ 13
Wind power	370	367	+ 3	+ 1	387	383	+ 4	+ 1
Hydroelectricity	2	6	- 4	- 67	2	6	- 4	- 67
Photovoltaics	4	3	+ 1	+ 33	4	4	0	0
Electricity generation from renewable energies	1,103	1,148	- 45	- 4	1,154	1,196	- 42	- 4
Electricity from CHP	418	501	- 83	- 17	1,121	1,260	- 139	- 11
Other electricity generation	224	187	+ 37	+ 20	1,184	1,422	- 238	- 17
Total	1,745	1,836	- 91	- 5	3,459	3,878	- 419	- 11

The reduction in electricity generation volumes at biomass and biogas plants was due above all to turbine damage at our biomass power plant at Ridham Dock and the resultant lower level of plant availability. Our plants which generate energy from waste and refuse-derived fuels (biogenic share of waste) generated more electricity, a development due to the fact that inspection and planned maintenance work had

reduced electricity generation volumes in the previous year. The decrease in the volume of electricity generated using CHP largely resulted from the reduced use of our heating energy-based CHP plants in Kiel and Offenbach. The growth in other electricity generation was chiefly driven by higher electricity generation volumes at our energy from waste plants.

 **MVV-1**

Heating energy generation volumes ✓

kWh million	Fully consolidated companies				Fully consolidated companies and companies recognised at equity			
	FY 2019	FY 2018	+/- change	% change	FY 2019	FY 2018	+/- change	% change
Biomass and biogas plants	198	202	- 4	- 2	199	202	- 3	- 1
EFW/RDF	1,725	1,851	- 126	- 7	1,725	1,851	- 126	- 7
Heating energy generation from renewable energies	1,923	2,053	- 130	- 6	1,924	2,053	- 129	- 6
Other heating energy generation	1,754	1,837	- 83	- 5	4,625	4,827	- 202	- 4
Total	3,677	3,890	- 213	- 5	6,549	6,880	- 331	- 5

The reduction in our heating energy volumes was mainly due to weather conditions.

Biomethane generation volumes ✓

kWh million	Fully consolidated companies				Fully consolidated companies and companies recognised at equity			
	FY 2019	FY 2018	+/- change	% change	FY 2019	FY 2018	+/- change	% change
Biomethane generation	233	254	- 21	- 8	234	254	- 20	- 8

The year-on-year reduction in biomethane generation volumes was attributable to the lower energy content of the substrates, as well as to lower plant availability levels.

Our generation structure hardly changed on the previous year in the 2019 financial year. The slight reduction in renewable electricity generation in absolute terms was mainly due to scheduled and unscheduled downtime at our biomass plants. The slight downturn both in conventional electricity generation and in heating energy generation chiefly resulted from weather conditions, as well as from short-term developments in market prices.

Our investments help to minimise grid downtime as far as possible and thus to ensure a secure energy supply. We invest in our existing plants, in expanding and maintaining our grid infrastructure, in developing smart grids and in energy storage systems. Renewable energies are a further focus of investment and we have a constantly growing portfolio of plants in this field. These mostly involve onshore wind turbines and biomass plants to generate electricity, heating energy and biomethane. We invested a total of Euro 310 million in the 2019 financial year. 🌐 **GRI 203-1** In Kiel, we completed our new gas-fired CHP power plant as the successor solution for the joint power plant (Gemeinschaftskraftwerk Kiel – GKK). The new plant, which secures the supply of district heating to the city, launched operations at the beginning of the new 2020 financial year. With a total volume of Euro 290 million, it is the largest investment we have made in recent years. The modular and flexible structure of the plant brings supply reliability in line with the energy turnaround. It sets completely new standards in terms of flexibility, efficiency and sustainability. The basis here is provided by combined heat and power generation, which results in a high efficiency level and an efficient primary energy use rate of more than 90 %. Electricity and heating energy are generated by burning gas, rather than the hard coal previously used. As a result, the new plant emits 70 % less CO₂ than did the former GKK plant. Its 20 gas motors can go from zero to 190 MW of electricity capacity in just five minutes. At the same time, when in operation the plant has heating energy capacity of 192 MW. The extremely short time needed for the new Küstenkraftwerk plant to reach full capacity means that it can react quickly and flexibly to changing requirements on the volatile energy market.

Safeguarding grid stability despite growing grid loads

One way to assess the reliability of the energy supply involves measuring the frequency and duration of grid downtime. Our three large grid companies MVV Netze GmbH, Energienetze Offenbach GmbH and SWKiel Netz GmbH have set themselves the goal of ensuring a secure supply free of interruptions and thus to avoid grid downtime and remedy any such downtime as quickly as possible. One key task for our grid companies is to work on further developing and operating our grid infrastructure. They therefore invest large sums in maintenance and modernisation measures.

One key non-financial performance indicator which shows the security of the energy supply is the system average interruption duration index (SAIDI), which presents the average interruption to the supply in minutes per year and customer. The SAIDI figure only accounts for unplanned downtimes lasting longer than three minutes and not due to force majeure.

We aim to minimise interruption-induced failure in the power supply.

The Executive Board and management bodies are provided with an annual overview of interruptions and continually informed about the implementation of measures to counter such interruptions. We draw strategic conclusions on this basis and factor these into our investment and maintenance projects.

We invested Euro 103 million in maintaining and expanding our grids in the 2019 financial year.

Electricity supply interruptions (SAIDI) ✓

Minutes/year	2018 ¹	2017 ¹	+/- change	% change
Grid regions				
MVV Netze Mannheim	29.8	18.5	+ 11.3	+ 61
Energienetze Offenbach	6.3	8.0	- 1.7	- 21
SWKiel Netz	15.3	12.2	+ 3.1	+ 25
Germany ²	13.9	15.1	- 1.2	- 8

¹ Calendar year

² Source: Federal Network Agency (BNetzA)

The SAIDI figures for the Mannheim grid region in 2017 and 2018 were significantly influenced by an increased number of interruptions on medium-voltage level. These resulted from the use of a special component. In 2018, one related interruption in particular meant that the SAIDI figure was significantly higher than in the previous year. By mid-2019, grid components of this type were replaced in a special project. We expect this to impact positively on the SAIDI figure for 2019.

Following a result at the lower end of the long-term normal range in the previous year, the SAIDI figure for the Stadtwerke Kiel grid region returned to the expected level in 2018. Here too, we reported a slightly higher number of interruptions on medium-voltage level.

SECTOR COUPLING

Smartly combining electricity, heating energy and mobility

One change in the energy market that is set to play a major role is sector coupling. Only this way will it be possible to turn the existing electricity turnaround into a comprehensive energy turnaround. First and foremost, this is about making electricity from renewable energies fit for use in the transport and heating energy sectors and about networking the entire system. One sub-goal involves distributing and storing surplus electricity from fluctuating renewables-based generation volumes in ways that make sense. Here, use can also be made of energy storage facilities outside the electricity sector, such as innovative power-to-heat solutions like heat storage units and electrode boilers. Putting electricity to intelligent use in this way represents one of the key challenges presented by the heating energy turnaround. E-mobility is another core component of the energy system transformation and of a new, resource-efficient lifestyle www.mvv.de/smart-energy. Sector coupling will also have repercussions in terms of demand for renewables-based generation, as well as for grid loads and expansion. In view of this, expanding sector coupling is a factor of strategic significance for us, particularly in the fields of project development, generation, grids and sales.

We actively contribute to sector coupling.

Promoting heat storage and decentralised energy management

We are pressing ahead with sector coupling and are currently focusing on enhancing flexibility by working with heat storage facilities and power-to-heat. One major component involves large-scale heat storage facilities, enabling CHP power plants to shut down their electricity generation for up to 24 hours when required by the market or grid situation. We have corresponding district heating storage facilities in operation in our major district heating grids. One key field of application for us once again in the year under report was urban district and quarter management. This is one area in which decentralised generation, e.g. from photovoltaics, can be smartly combined with covering heating energy requirements, for example by working with heat pumps or other technologies. The FRANKLIN conversion site in Mannheim is one example where we are testing these kinds of technical and business concepts.

Heating energy storage capacity

Cubic meters	FY 2019	FY 2018
MVV Energie	45,000	45,000
Stadtwerke Kiel	42,000	42,000
Energieversorgung Offenbach	8,000	8,000
Stadtwerke Ingolstadt	3,200	–

We are actively promoting decentralised energy management and sector coupling and act as a one-stop source of smart and decentralised energy management services and products for our industrial, retail and housing customers, as well as for business and private customers. [MVV-2](#)

Expanding e-mobility

Making renewables-based electricity suitable for use by the transport sector as well requires smart needs-based charging solutions. In the 2019 financial year, we installed charging points at 25 locations in Mannheim and the region and new charging points are being added on an ongoing basis. We are also expanding e-mobility at our other locations in Offenbach and Kiel and thus combining the energy of the future with the mobility of the future. This also involves examining our own mobility solutions. In Kiel, for example, we are converting the car pool at Stadtwerke Kiel to electric vehicles and aim to increase the share of these vehicles to 80 % by the end of 2021.

CHANGED ENERGY DEMAND

Structural changes accounted for in our strategic planning

Demand for energy will change significantly in the years ahead. This is true both of the energy sources used to generate heating energy and of electricity. On the one hand, we expect demand for heating energy to gradually decrease throughout the economy, with this being driven in particular by rising building energy efficiency. By 2050, buildings will require around 40 % to 50 % less heating energy. At the same time, the energy mix used for heating energy will also change – away from fossil fuels such as heating oil and natural gas. On the other hand, demand for electricity will also continue to change, with this being mainly due to the regulatory framework. The shift towards renewable energies in the electricity mix and reduction in end energy consumption are backed up with ambitious political targets. In parallel, our customers are increasingly interested in covering their electricity needs with their own generation plants.

Alongside the increased provision of renewable energies, two factors that are particularly gaining in significance are enhanced flexibility and energy storage. We systematically account for foreseeable changes in demand in our strategic investment planning and continually adapt our business in line with actual market developments. We report on research projects in our 2019 Annual Report www.mvv.de/GB2019.pdf, Pages 23 – 24.

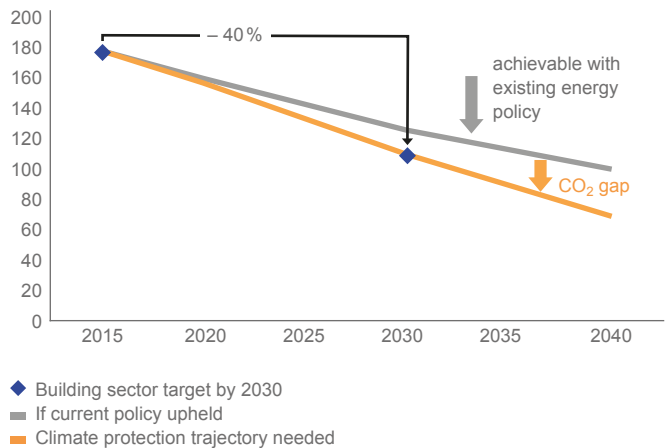
We prepare our supply grids for changes in energy demand in the electricity and heating energy sectors as a result of the energy system conversion or energy efficiency measures.

District heating has a key role to play in the heating energy turnaround

Together with ifeu Institut and the consultancy Navigant, at the end of 2018 we published a study showing how the heating energy turnaround in Germany can actually work and what steps are required. Even though heating energy accounts for a third of Germany's total CO₂ emissions, energy policy has so far focused on the electricity sector. The measures urgently needed to launch the heating energy turnaround were omitted, meaning that the climate targets for the building sector were not met. The same applies looking ahead: The shortfall to the required reduction in CO₂ is set to grow further (see chart), particularly if heating oil and fossil-based natural gas are to be fully phased out by 2050.

CO₂ gap in building sector

million tonnes of CO₂ p.a.



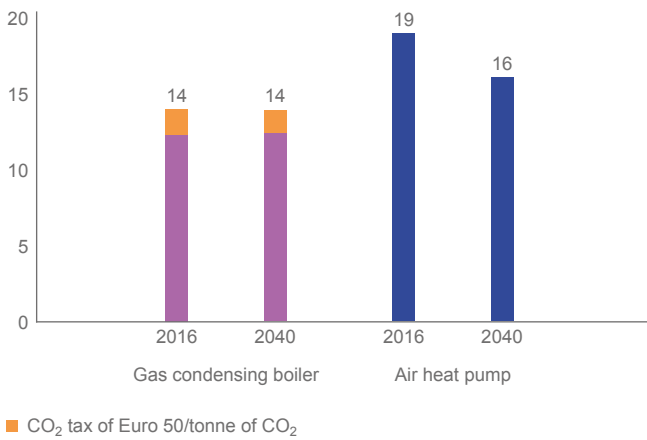
Source: "MVG, Take-Off Wärmewende 2019"

The Climate Package adopted by the Federal Government in autumn 2019 contains numerous measures that we had proposed in the study nine months earlier. Among others, these include appropriate CO₂ pricing, subsidies and tax deductibility for building refurbishment measures, a ban on new oil heating systems and a programme of immediate action for central heating systems in large built-up areas.

As we illustrated in the study by reference to specific practical examples, the main challenge is the substantial viability gap between conventional fossil-based heating technology on the one hand and green heating energy or enhanced building efficiency on the other. In typical applications, such as natural gas-fired condensing boilers – based on full-cost analysis and excluding CO₂ tax – falling investment costs are balanced by rising energy prices (see chart). For the economy as a whole, the viability gap already amounts to around Euro 9 billion by 2030 and is set to rise further in subsequent years. Even a CO₂ price of Euro 50 is, taken alone, not sufficient for many applications (see chart).

Real heat production costs

(cent/kWh)



Source: "MVV, Take-Off Wärmewende 2019"

The political standstill to date is also due to significant outstanding questions as to how the resultant burdens should be distributed. The electricity turnaround mainly addressed energy companies, with the costs being allocated to electricity consumers in their entirety (EEG levy). In the heating energy turnaround, it will now be necessary to focus in particular on tenants, homeowners and landlords, as most of the investments involved relate to end customers. In short, the heating energy turnaround has many more dimensions and is, in terms of distributing costs, more complex than the electricity turnaround.

We circulated the findings of this study within our industry and contributed them to the political debate www.mvv.de/Take-off.pdf.

District heating at MVV

As well as industrial district steam grids, in Mannheim, Kiel and Offenbach we also operate integrated district heating systems and provide our customers with a supply of environmentally-friendly, centrally generated heating energy. We aim to further decarbonise the heating energy supply for which we are responsible – not least in view of the climate protection targets for the building sector. The 2050 Climate Protection Plan adopted by the Federal Government provides for a 40 % reduction in emissions in this sector by 2030 already compared with 2014. The building heating energy turnaround can be realised in three areas: energy efficiency, low-CO₂ heating energy grids and renewable energies located close to the respective properties. The task for us will be to reduce CO₂ emissions in our district heating energy supply, which is already operated using highly efficient CHP, to enable us to meet future customer requirements. We are therefore working consistently on concepts to further reduce CO₂ intensity. We are expanding green heating energy in Mannheim and the region by connecting our waste-fired CHP plant at Friesenheimer Insel to our existing district heating grid and thus raising our energy efficiency from 57 % to 73 % [Pages 31 – 32](#).

Alongside these three integrated district heating grids, we also operate several smaller district heating, district steam and property-specific grids in Germany, the Czech Republic and the UK. In the Czech Republic alone we operate heating energy grids at 15 locations, in this case via our MVV Energie CZ subgroup.



[MVV-3](#)

Decarbonisation and Energy Turnaround

Since 2018, climate protection has become even more prominent as a topic within society, among the general public and in the political arena. With new analyses, such as the IPCC Special Report 1.5°C, climate science has underlined the urgency of adopting a far more ambitious approach towards decarbonisation, not least as global warming is advancing far more quickly than projected just a few years ago. Taken together with the fact that Germany will miss its climate protection targets for 2020, the results of the Commission on Growth, Structural Change and Employment (the so-called “Coal Commission”) and international and national movements within society, there is ever greater momentum in the field of climate and energy policy.

While the “2050 Climate Protection Plan” adopted in 2016 only defines sector CO₂ reduction targets and CO₂ budgets until 2030, since 2019 the Federal Government has been compiling specific policy measures to safeguard compliance with the decarbonisation targets for 2030. There is political consensus concerning the accelerated exit from coal by 2038 at the latest together with a more rapid expansion in renewable energies to 65 % by 2030. In September 2019, the “Climate Cabinet” of the Federal Government adopted the key points of the 2030 Climate Protection Programme. These include imposing prices on CO₂ emissions resulting from fuels not covered by European emissions trading. With a broad mix of additional subsidies, pricing instruments and regulatory law, the Federal Government aims to accelerate decarbonisation in private households and companies alike and thus ensure that the climate protection targets set for 2030 are actually met.

National decarbonisation has attained a new quality due to the increasing calls for long-term climate neutrality. This would involve moving away from the European and national target, which initially provided for reducing emissions in a range of 80 % to 95 % by 2050. By contrast, climate neutrality implies not only decarbonising by at least 95 %, but also compensating for or capturing unavoidable residual emissions. For the energy industry, climate neutrality means on the one hand that the use of fossil fuels will have to be reduced more rapidly than previously planned. On the other hand, more renewable energies will have to be planned and implemented to cover the full decarbonisation of other sectors, for example by working with power-to-gas or power-to-liquids. Decarbonisation and energy turnaround are of core significance to us as an energy company.

In what follows, we present our approaches and results for the topic of decarbonisation and the energy turnaround, which based on GRI we classified as being material, by reference to specific disclosures on climate protection and renewable energies. Scope 1 greenhouse gases, which are emitted upon the generation of electricity and heating energy, are the factor most decisively influencing our climate balance sheet. The medium to long-term development in our Scope 1 emissions will be determined on the one hand by the decommissioning dates for existing power and heating energy plants and on the other hand by potential additional sources of emissions resulting from growth investments. When implementing our ambitious climate protection targets, we therefore aim to avoid or reduce CO₂ emissions in the overall energy system. To this end, we are increasing our generation capacities at renewable energies plants and at plants with highly efficient combined heat and power (CHP) generation. The figures achieved and progress made are evaluated each year on Executive Board level and further measures are planned. Moreover, we also address energy efficiency, a further important specific disclosure in respect of the GRI’s material topic of decarbonisation and the energy turnaround. Increasing energy efficiency is a significant factor both in our own business and at our customers.  **GRI 103-2**
 **GRI 103-3**

CLIMATE PROTECTION

Our climate strategy

Our objective is climate neutrality

We are committed to the Paris Climate Accord and will achieve climate neutrality as a company by 2050 at

the latest. Our strategic sustainability targets for the period from 2016 to 2026 mean that we have already set clear and measurable milestones as we head to climate neutrality.

Our decarbonisation strategy covers four areas:

Climate protection

Generation positions	Renewable energies	Climate neutrality at customers	Handling remaining emissions
Reduce emissions from our conventional generation positions to zero by 2050 at the latest	Consistently press ahead with renewable energies expansion	Facilitate climate neutrality achieved at and by our customers, particularly with energy efficiency measures, renewable energies and services	Review new technologies for climate-neutral handling of unavoidable residual emissions

- **Generation positions**

We will reduce emissions from our conventional energy generation positions to zero by 2050 at the latest. The trajectory here depends on the specific time at which existing power and heating energy plants are decommissioned, as well as on the relevant replacement investments, including the availability of green gas products, such as renewable hydrogen or biomethane. Key aspects of the underlying conditions will be fixed by the legislation governing the exit from coal.

- **Renewable energies**

We have pressed ahead with expanding renewable energies for years now and will maintain this focus. One ambitious interim target involves doubling our own renewable electricity generation volumes in the period from 2016 to 2026. Furthermore, conventional heating energy generation will be replaced by low-CO₂ alternatives and gradually by renewable sources.

- **Climate neutrality at our customers**

Our products and services promote climate neutrality at and by our customers. Today, we already facilitate substantial reductions in CO₂ in other industries and sectors, for example by means of energy efficiency measures, by planning and operating renewable energies plants and by offering innovative services. We will significantly cut energy-related emissions at our customers and improve their climate footprints. Decarbonisation at our customers will be reflected in higher annual net CO₂ savings and the scope of projected volumes of renewable energies. For both these factors, we set specific interim targets in 2016 already for the period until 2026.

- **Handling residual emissions**

At our plants, we exploit ways of cutting emissions in order to reduce unavoidable emissions to an absolute minimum. Any remaining residual emissions, such as those resulting from waste incineration, can only be offset or used by drawing on new technologies, such as carbon capture and storage (CCS) or carbon capture and utilisation (CCU). This being so, we are monitoring and reviewing all relevant options in terms of reducing, using or offsetting CO₂ emissions.

Consistently implementing our decarbonisation strategy will gradually reduce our group-wide CO₂ intensity. We measure this figure as the relationship between value added and CO₂ emissions. We report on the development in this key figure just as transparently as on our direct and indirect CO₂ emissions and CO₂ savings.

Our decarbonisation strategy is specified in greater detail on a decentralised basis by our business fields, taking due account of local conditions. On group level, the investments made by all business fields are assessed in terms of their contribution to decarbonisation. Successful decarbonisation measures are regularly reviewed by our sustainability management team on group level. Taking due account of their strategic implications, the Executive Board then decides on measures.

As well as implementing climate neutrality in our business fields, we will also rapidly reduce direct emissions in our business operations. Even though, at around 8 thousand tonnes CO₂eq a year, these so-called Scope 2 emissions appear negligible, our employees and stakeholders expect us to achieve climate neutrality at our properties and in our mobility in the medium to long term.

Our climate balance sheet for the 2019 financial year

Absolute emissions

In our climate balance sheet, we distinguish between direct and indirect CO₂ emissions.

Direct CO₂ emissions designated as Scope 1 under the Greenhouse Gas Protocol arise upon energy generation at our proprietary plants or at plants from which we procure contingents.

Direct CO₂ emissions are influenced by weather-based demand for heating energy, as well as by the development in wholesale electricity prices and, related to this, capacity utilisation rates at our generation plants. MVV is not able to influence these factors. In the medium to long term, the development in direct emissions will largely depend on the dates on which existing plants are decommissioned and the replacement investments implemented.

Within direct emissions, we make a distinction between energy industry emissions, i.e. from generation plants, on the one hand and disposal industry emissions on the other hand. The latter emissions arise upon incineration of household and commercial waste at energy from waste plants. Here, the focus is on the hygienisation of materials that are in some cases harmful and toxic. As the products included in waste are in some cases made of non-renewable energies, the process of incineration gives rise to fossil CO₂. Only once product manufacturing has been decarbonised will it ultimately be possible to reduce the fossil share of the waste and thus the volume of emissions at energy from waste plants.

In view of this, the CO₂ reduction targets for the energy industry sector cannot be taken as the CO₂ reduction targets at energy from waste plants. Increasing efforts to achieve higher rates of recycling, increase cascaded product use and reduce plastic and waste volumes will only lead to a significant change in waste volumes in the longer term. In the medium term, we therefore do not expect to see falling waste flows or any resultant reduction in CO₂ emission at energy from waste plants.

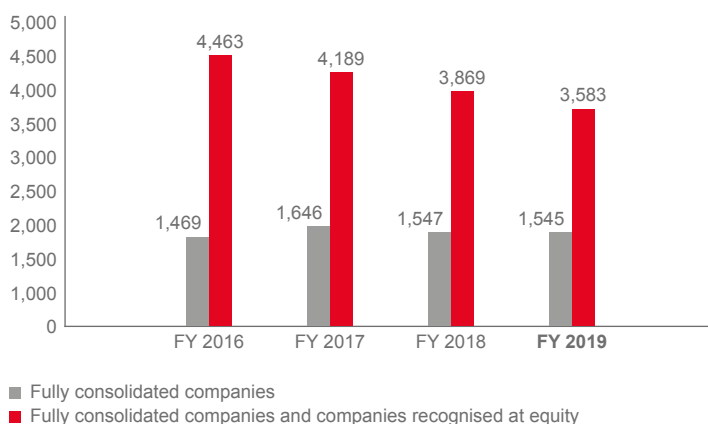
The coal-fired joint power plant in Kiel (Gemeinschaftskraftwerk Kiel – GKK), in which Stadtwerke Kiel owns a 50 % stake, was decommissioned in the 2019 financial year. We launched operations with the new gas-fired CHP plant in November 2019. In the before/after comparison, the decommissioning of GKK has significantly reduced emissions at the Kiel location in absolute terms. Viewed from a full consolidation perspective, however, MVV's direct CO₂ emissions will not decrease once operations begin at the gas-fired CHP plant, but may possibly rise slightly. That is because our 50 % stake in GKK involves a shareholding recognised at equity whose CO₂ emissions were outside MVV's reporting boundaries from a fully consolidated perspective. By contrast, the new, highly efficient gas-fired CHP plant will be fully consolidated. Following the launch of operations, 100 % of its emissions will therefore be reported under our direct CO₂ emissions.

CO₂ key figures depending on reporting boundaries

	MVV plants	Upstream/downstream stages of value chain	Overall economy
CO ₂ emissions	Direct emissions (Scope 1)	Indirect emissions (Scope 2/3)	
CO ₂ reductions	Direct emissions (Scope 1) Net CO ₂ saving	Indirect emissions (Scope 2/3) Net CO ₂ saving	Net CO ₂ saving

Direct CO₂ emissions (Scope 1)

1,000 tonnes CO₂ eq



The counterintuitive circumstance that a reduction in CO₂ by around two thirds in absolute terms does not impact positively on our direct emissions underlines the highly limited meaningfulness of this key figure in terms of the success achieved in decarbonisation. The same applies to other investments which may lead to higher direct CO₂ emissions despite a local reduction in CO₂ emissions. For this reason, we record and report on all reductions in CO₂ arising in the economy as a whole as a result of our strategic measures and investments by way of the “net CO₂ saving” key figure. Having said this, we have nevertheless reduced our Scope 1 emissions by around 20 % since 2016.

Indirect CO₂ emissions comprise greenhouse gases arising in upstream and downstream stages of the value chain. CO₂ emissions in upstream value chain stages arise at suppliers manufacturing products and services purchased by MVV. These relate, for example, to the production of photovoltaics systems and wind turbines or to procurement of electricity not generated by MVV. Emissions activities in downstream stages of the value chain chiefly involve the use of natural gas supplied by MVV to customers. Reporting on indirect CO₂ emissions forms part of any complete climate balance sheet. These disclosures are nevertheless largely of an informational nature, as we act here exclusively as a sales company and cannot control or even influence the CO₂ balance sheet of these commodities.

In the short term, the development in our indirect CO₂ emissions is largely dependent on sales volumes for electricity, gas and heating energy, as well as on the performance of the renewable energies project development business. In this respect, the reduction in the 2019 financial year was mainly due to lower sales volumes, lower fuel use and less capacity installed by our project development business.

The short-term development in direct and indirect CO₂ emissions provides only a limited picture of our efforts to protect the climate. Even an increase in CO₂ emissions in absolute terms in the climate balance sheet may be compatible with the long-term objective of climate neutrality in cases where our activities replace those of other more CO₂ intensive emitters and thus reduce the CO₂ intensity of the overall system. For this reason, in 2016 we already set ourselves the following climate protection target:

We will triple our annual CO₂ savings to 1 million tonnes a year by 2026.

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. For all activities, we record the average CO₂ savings for a maximum period of ten years from the beginning of the measure. We do not account for historic reduction projects and financial transactions.

The target also includes our at-equity shareholdings, whose specific target contributions we present in our separate Sustainability Report. However, the path towards the 2026 target year will not follow a linear trajectory. It will depend on the time at which new plants, such as the gas-fired CHP plant in Kiel, commence operations, as well on the market and regulatory climate, as these factors influence the attractiveness of investments and emission-cutting projects and the speed at which they can be implemented.

In the year under report, net CO₂ savings at our fully consolidated companies amounted to 485,507 tonnes of CO₂ eq (previous year: 484,789 tonnes of CO₂ eq). We achieved additional savings with energy efficiency projects and by launching operations with new renewable energies plants. Our at-equity shareholdings also slightly increased their CO₂ reductions compared with the previous year, in this case mainly as a result of activities relating to the supply of green heating energy at Stadtwerke Ingolstadt.

1,000 tonnes CO ₂ eq	Fully consolidated companies				Fully consolidated companies and companies recognised at equity			
	FY 2019	FY 2018	+/- change	% change	FY 2019	FY 2018	+/- change	% change
Direct CO ₂ emissions (Scope 1) ^{1,2} GRI 305-1	1,545	1,547	- 2	0	3,582	3,869	- 287	- 7
Energy industry activities	594	627	- 33	- 5	2,631	2,949	- 318	- 11
of which Germany	426	478	- 52	- 11	2,463	2,799	- 336	- 12
of which abroad	168	149	+ 19	+ 13	168	150	+ 18	+ 12
Disposal activities (energy from waste plants/RDF)	951	920	+ 31	+ 3	951	920	+ 31	+ 3
of which Germany	705	689	+ 16	+ 2	705	689	+ 16	+ 2
of which abroad	246	231	+ 15	+ 6	246	231	+ 15	+ 6
Indirect CO ₂ emissions (Scope 2) ¹ GRI 305-2	8	8	0	0	8	8	0	0
Indirect CO ₂ emissions (Scope 3) ^{1,3} GRI 305-3	6,346	8,386	- 2,040	- 24	5,119	6,925	- 1,806	- 26
of which from purchased goods and assets (GHG category 1)	303	730	- 427	- 58	303	730	- 427	- 58
of which from fuel and energy procurement (GHG category 3)	4,431	5,928	- 1,497	- 25	3,054	4,305	- 1,251	- 29
of which from transport and distribution (GHG category 9)	173	195	- 22	- 11	204	217	- 13	- 6
of which from use of products sold (GHG category 11)	1,439	1,533	- 94	- 6	1,558	1,673	- 115	- 7

1 For fuels, we refer to industry-typical emissions factors from GEMIS/Öko-Institut; for electricity to the Federal Environment Agency (UBA) and for district heating to certified emissions factors for the respective locations.

2 Around 23 % of Scope 1 emissions are attributable to ETS plants (fully consolidated and at-equity companies: around two thirds).

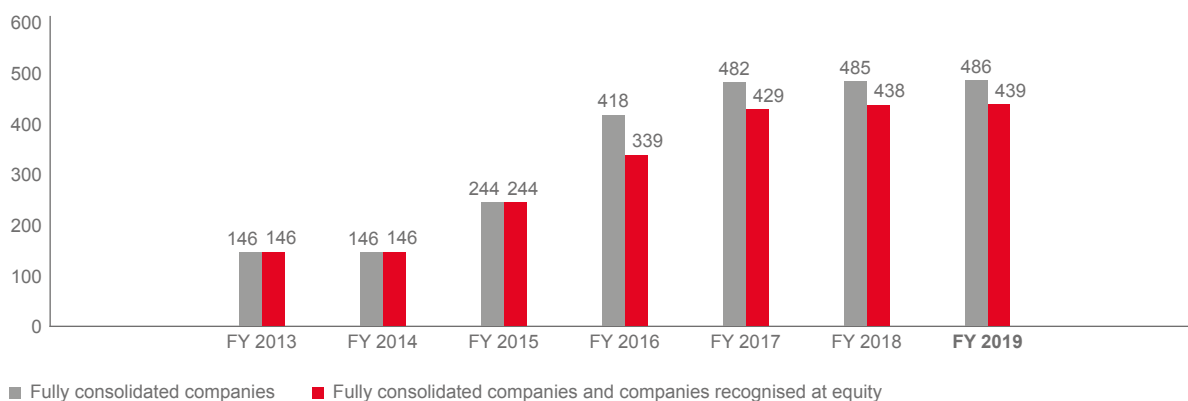
3 The method used to calculate indirect Scope 3 emissions was developed further in the 2019 financial year; direct comparison with the previous year's figures is therefore only possible to a limited extent.

In 2013, we worked together with the Institute of Applied Ecology (Öko-Institut) in Freiburg to develop a method to calculate net CO₂ avoidance and reviewed this in 2017. The net CO₂ avoidance figure includes the emissions avoided throughout the value chain. This figure reflects the genuine savings actually taking effect in the climate system. We assess how all new strategic activities, projects and investments at our group of companies impact on their direct and indirect greenhouse gas emissions. In this, all additional emissions (charge) and CO₂ reductions (credit) are netted

within and outside our accounting entity. This means that, alongside electricity, account is also taken of heating energy, services and efficiency measures for third parties. We record all CO₂ emissions avoided for a maximum of ten years from the beginning of the respective measure. No account is taken of historic reduction projects and financial transactions. The net CO₂ avoidance figure rose only slightly in the 2019 financial year. In the years ahead, however, we expect to achieve significantly higher savings due to our current and planned investments.

Reduction in greenhouse gas emissions

1,000 tonnes CO₂ eq



GRI 305-5

CO₂ intensity

Alongside absolute CO₂ savings, the CO₂ intensity of our business activities may also indicate whether, and to what extent, MVV is succeeding in decarbonising its activities. For this reason, we use CO₂ intensity key figures to offer visibility concerning the long-term success of our decarbonisation measures on the level of our reporting segments as well. Compared with the group-wide presentation of CO₂ intensity, this has the

added advantage that potentially opposing items in various business fields can be identified more easily. We use value added as the reference figure here, as the total value of the company's output provides a better indication for the development in business volumes than sales or operating earnings, for example. The reduction in CO₂ intensities in the 2019 financial year was due both to the increase in value added, as well as to lower CO₂ emissions.

CO₂ intensity

kg CO ₂ per Euro of value added	For direct emissions		For direct and indirect emissions	
	FY 2019	FY 2018	FY 2019	FY 2018
Customer Solutions	1	1	11	11
New Energies	2	3	3	5
Supply Reliability	6	9	7	11
Strategic Investments	5	5	10	12
MVV	3	4	7	10

Specific CO₂ emissions for district heating¹

g CO ₂ /kWh	FY 2019	FY 2018
Mannheim district heating system	201	201
Offenbach district heating system	150	150
SWKiel district heating system	218	218
SWIngolstadt district heating system	36	36
Decentralised gas heating systems in Germany	274	274

Particularly in Mannheim and Kiel, the specific CO₂ emissions for district heating will fall substantially in the coming years once work on connecting lower-CO₂ generation sources is complete.

¹ The figures are reassessed around every three years if the generation structure has changed.

RENEWABLE ENERGIES

Renewable energies contribute to climate protection targets

By 2050, electricity generation in Germany should be based almost entirely on renewable energies. They have a crucial role to play in meeting national climate protection targets. This situation harbours growth potential for our company; not least because of this, renewable energies are a key focus of our strategic alignment. By expanding renewable energies, we are also making a measurable contribution on behalf of society as a whole to the success of the energy turnaround and achievement of climate protection targets.

Here too, we set two specific sustainability targets in 2016 already and intend to reach these by the end of the 2026 financial year.

We will double our proprietary electricity generation from renewable energies by the end of the 2026 financial year.

This target of doubling our generation to more than 800 MW also includes the shareholdings we recognise at equity. We report on their specific renewable energies generation capacities in our separate Sustainability Report. To enable us to reach our target, we are consistently investing in expanding our proprietary renewable energies generation portfolio. One primary focus here involves onshore wind turbines.

The renewable energies electricity generation capacity at our fully consolidated companies amounted to 474 MW at the end of the 2019 financial year, 7 MW higher than in the previous year. This increase was due to the fact that we included wind turbines from Juwi's portfolio for the first time in the 2019 financial year. Electricity generation capacity at our at-equity shareholdings also showed a slight year-on-year increase.

We will be extending our renewable energies generation portfolio in the 2020 financial year. Our Juwi and Windwärts subsidiaries, for example, are currently building two windfarms with a total capacity of around 24 MW. We will be including these in our proprietary generation portfolio upon their completion in the 2020 financial year.

We will connect 10,000 MW of renewable energies to the grid by the end of the 2026 financial year.

Due in particular to Juwi and Windwärts, we have all-round expertise in developing, building and launching operations with renewable energies plants. We aim to reach the projecting target in particular by installing onshore wind turbines and photovoltaics systems both in Germany and abroad. Biomass plants and photovoltaics systems at customers' locations will contribute smaller amounts.

Since the beginning of the 2017 financial year, we have connected renewable energies plants with capacities of 1,882 MW to the grid. In the 2019 financial year, we connected 460 MW of new capacities.

Forward-looking generation portfolio

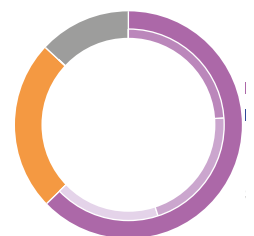
At the end of the 2019 financial year, electricity generation at renewable energies plants (including biomass CHP and the biogenic share of waste/refuse-derived fuels) accounted for a 63 % share of our total electricity generation volumes (previous year: 62 %).

Overall, we generated 1,095 million kWh of climate-neutral electricity at our renewable energies plants in the year under report.

Electricity generation ✓

Shares (%)

	FY 2019
■ Electricity from renewable energies ¹	63
■ Electricity from biomass and biogas plants	24
■ Electricity from wind power	21
■ Electricity from biogenic share of waste/RDF	18
■ Electricity from CHP	24
■ Other electricity generation	13



¹ Due to their immaterial shares, electricity generation volumes from hydroelectricity and photovoltaics have not been presented in this overview.

Electricity generation capacity from renewable energies and energy from waste (EfW)/refuse-derived fuels (RDF) ✓

MW _e	Fully consolidated companies				Fully consolidated companies and companies recognised at equity			
	FY 2019	FY 2018	+/- change	% change	FY 2019	FY 2018	+/- change	% change
Biomass and biogas plants ¹	104	104	0	0	116	109	+ 7	+ 6
EfW/RDF	160	161	- 1	- 1	160	161	- 1	- 1
Wind power	204	196	+ 8	+ 4	211	203	+ 8	+ 4
Hydroelectricity	2	2	0	0	2	2	0	0
Photovoltaics	4	4	0	0	4	4	0	0
Total	474	467	+ 7	+ 1	493	479	+ 14	+ 3

¹ Including biomethane plants

MVV-4

Heating energy supply

The heating energy generation capacity at our renewable energies plants for the first time also includes the figure for our energy from waste plant in Dundee.

Heating energy generation capacity from renewable energies and energy from waste (EfW)/refuse-derived fuels (RDF) ✓

MW _t	Fully consolidated companies				Fully consolidated companies and companies recognised at equity			
	FY 2019	FY 2018	+/- change	% change	FY 2019	FY 2018	+/- change	% change
Biomass and biogas plants	119	119	0	0	119	119	0	0
EfW/RDF	719	682	+ 37	+ 5	719	682	+ 37	+ 5
Total	838	801	+ 37	+ 5	838	801	+ 37	+ 5

Increasing significance of our project development business

With our Juwi and Windwärts subsidiaries, we offer end-to-end project development and services for planning, building and managing operations at renewable energies plants.

Concluded development of new renewable energies plants ✓

MW _e	FY 2019	FY 2018	+/- change	% change
Wind power	62	336	- 274	- 82
Photovoltaics	398	675	- 277	- 41
Total	460	1,011	- 551	- 55

The project development business is by its very nature volatile. The volume of new renewable energies plants at which operations are launched each year depends, among other factors, on social and political acceptance, the length of approval processes, regulations governing subsidies for renewable energies, as well as on specific implementation dates for individual projects, and can therefore vary widely from year to year.


MVV-5

Operations management for renewable energies plants ✓

MW _e	FY 2019	FY 2018	+/- change	% change
Wind power	1,246	1,295	- 49	- 4
Photovoltaics	2,288	1,768	+ 520	+ 29
Total	3,534	3,063	+ 471	+ 15

ENERGY EFFICIENCY

Great economic significance

Enhancing energy efficiency is high up on the political agenda. The term energy efficiency refers both to reducing end energy consumption, i.e. at the consumer, and to reducing primary fuel use at energy generators. Raising our energy efficiency is also important to us from an economic perspective. Starting points here for us as an energy company with its own electricity and heating energy generation include measures to increase the efficiency of our plants and measures to minimise grid losses in the operation of electricity and heating energy grids. At our plants, we achieve a high average fuel utilisation rate of 63 %  **Page 35.**

Within our investment programme, we are enhancing the generation efficiency of our proprietary power plants, for example by working with combined heat and power generation, and are continually investing in modernising our plants and grids. With our products and services, we are supporting our customers in reducing the energy used at their own plants and in optimising their energy management.

We will raise plant efficiency levels and reduce emissions from our proprietary generation and at our customers.

Increasing the efficiency of our own generation and our infrastructure

We assess the increase in energy efficiency at our generation plants due to modernisation measures on a project-by-project basis. The listed projects show that rising levels of energy efficiency at the plants also lead to lower CO₂ emissions. We are also tapping extensive energy efficiency potential in our own infrastructure and in our cooperation with customers.


Primary energy

For our major district heating supply systems in Mannheim, Offenbach and Kiel we calculate the primary energy factor (PEF), which indicates the efficiency of the infrastructure. The lower the PEF is, the more environmentally-friendly and efficient the energy use is. This factor, which presents the ratio of primary energy used to the volume of end energy yielded, is relevant for meeting legal requirements in terms of heating insulation and building facility technology.

Under the German Building Energy Act (GEG), decentralised natural gas or oil-fired heating systems are currently assessed with a PEF of 1.1, while uncertified district heating from combined heat and power has a standardised PEF of 0.6. The new GEG legislation adopted at the end of 2019 has updated the methodological basis used to calculate the primary energy factors, which may lead to slight adjustments in our PEF figures in the medium term.

PEF certification for district heating grid

	FY 2019	valid until
Mannheim district heating supply system	0.42	2024
Offenbach district heating supply system	0.47	2021
Kiel district heating supply system	0.00	2024

Fuel use at our conventional power plants is managed on the basis of economic criteria. In absolute terms, our primary energy consumption is determined by demand levels on the wholesale markets, i.e. by wholesale electricity prices and the generation margin (clean dark spread or clean spark spread). Moreover, weather-dependent electricity and heating energy demand has a major influence on capacity utilisation rates at our CHP plants. We therefore only have limited ability to control this factor. We report on the fuels used at our power plants on  **Page 35.**

Higher energy efficiency, lower CO₂ emissions, green heating energy

One important project in the year under report which has enabled us to raise the energy efficiency of our waste-fired CHP plant on Friesenheimer Insel in Mannheim from 57 % to 73 % was the connection of this plant to our existing district heating grid. At its Friesenheimer Insel location, MVV generates both process steam for neighbouring industry and electricity. For the first time, part of the district heating will now be fed in from this renewable source. Up to 30 % of annual heating energy needs in Mannheim and the municipalities connected to the regional district heating grid – reaching to Schwetzingen, Heidelberg and Speyer – will then be covered from Friesenheimer Insel. This way, district heating will remain an indispensable and forward-looking component of a sustainable heating energy supply in future as well.

Now that the necessary work has been completed, the CHP plant can feed in district heating throughout the year. This project also involved connecting Roche by launching a new steam pipeline between that company's factory and MVV's CHP plant. This pipeline passes through a new culvert built under the Old Rhine, which was completed in the autumn. With the opening of the pipeline, MVV supplies heating energy to Roche in the form of hot steam totalling around 105,000 MWh a year. This corresponds to the needs of around 7,500 households. These connections will increase the efficiency of our heating energy generation portfolio. We expect this to result in total net savings of 61,000 tonnes of CO₂ eq a year from 2021. Not only that, we are extending the CHP plant to include a facility that involves a further component of a sustainable recycling-based economy. Here, we will be incinerating municipal sewage and simultaneously facilitating the recovery of phosphorous, a valuable material used in the production of manure. 🌐 **GRI 302-5**

Grid losses

Limiting grid losses is an important task for us, and one that also benefits our energy efficiency. Grid losses arise when electrical energy is transported in electricity grids. They are mainly due to electrical resistance in the transmission cables and transformation losses between various voltage levels. Grid losses in heating energy grids are due to technical factors and mainly relate to the transport route between the source of the heating energy and the heat sink. The scale of grid losses depends on how well insulated the transport pipes are. The most important factors determining the scale of losses nevertheless involve natural circumstances, such as the temperature and weather conditions.

We aim to reduce grid losses in our electricity and heating energy grids.

Grid losses at MVV ✓

kWh million	2018 ¹	2017 ¹	+/- change	% change
Electricity	139	141	- 2	- 1
Heating energy	491	551	- 60	- 11

¹ Calendar year

Grid losses can be reduced with long-term infrastructure measures, such as improved insulation and other technical methods. In a pilot project conducted in March 2019, for example, we photographed several streets in Mannheim using a thermography camera. The resultant images provide information about heating energy losses and energy efficiency potential in these areas. 🌐 **MVV-6**

Increasing energy efficiency at customers


We support our customers in the industrial, retail, commercial and real estate sectors in reducing energy input in their systems and optimising their energy management. This way, we are making a major contribution to the energy turnaround. Our portfolio includes, for example, transparent electricity and gas procurement, solutions for sustainable energy generation, digital energy data management, billing services, contracting, smart metering, e-mobility and LED solutions for lighting concepts. We build efficiency partnerships with our customers in which we combine modern measurement technology, software and services. We can make all energy and process costs and all consumption visible to our customers, automate their monitoring and reporting and compile and implement plans to optimise all these factors. This way, we provide our customers with comprehensive solutions and services covering all aspects of energy efficiency.

Among other projects, in the year under report MVV worked with one of Europe's largest recycling companies to identify and tap energy saving potential. The sorting and treatment facilities at several of the company's locations were investigated using state-of-the-art measurement technology. In the first stage, the associated energy flows were made transparent. By optimising the mode of operation of screw compressors and training the staff, for example, it was possible to achieve CO₂ savings of 150 tonnes a year, and that at just one sorting facility.

In the year under report, MVV also successfully completed an efficiency project performed at a long-standing customer, a Mannheim-based mechanical engineering company that we supply with gas, electricity and district heating. We installed around 1,700 light sources in ten of the company's halls and generated energy savings of 60 % for the customer. This will reduce its CO₂ emissions by around 185 tonnes a year. A further project, a follow-up order for 1,200 light sources which should generate further CO₂ savings of 190 tonnes a year, is currently in the planning stage.

🌐 **GRI 302-5**

Resource Efficiency and Local Environmental Protection

We use natural resources to generate energy. Our thermal power plants also use resources such as natural gas and hard coal as fuels. These are finite and we aim to use them as efficiently as possible. One key indicator of efficient use involves high fuel efficiency rates resulting from optimised use of the energy contained in the fuel. This means we minimise the energy losses arising when the fuels are converted into end energy, such as electricity or heating energy. We describe this focus in detail in the section Decarbonisation and Energy Turnaround  **Pages 23 – 32**. We are consistently investing in enhancing the energy efficiency of our generation plants and in expanding district heating in conjunction with highly efficient combined heat and power generation.

Local environmental protection is a fixed component of our management systems, into which quality and compliance aspects are also integrated. Our subsidiaries and shareholdings are responsible for the operative management of all environmental concerns on a decentralised basis. As they work with different technologies and our stakeholders in the regions have a variety of concerns, these companies set their own accents within the framework provided by our group-wide guidelines. We work with decentralised environmental and energy management systems for the control and operative implementation of environmental protection measures.

We avoid other harmful environmental effects resulting from the generation and provision of our products and services where possible or reduce these to a minimum. We accord priority, for example, to cutting emissions of other air pollutants. Large combustion plants

produce pollutants such as nitrogen oxides, sulphur oxides and dust. While CO₂ emissions have a global impact in terms of climate change, other air pollutants can have negative implications on local ecosystems and the health of people living in the regions affected. We treat the pollutants thereby incurred very carefully. In the interests of recycling, unavoidable waste from energy generation and waste incineration, such as ash and slag – so-called by-products – is turned wherever possible into products for other companies. Where this is not possible, the waste is disposed of correctly.

 **GRI 103-2**  **GRI 103-3**

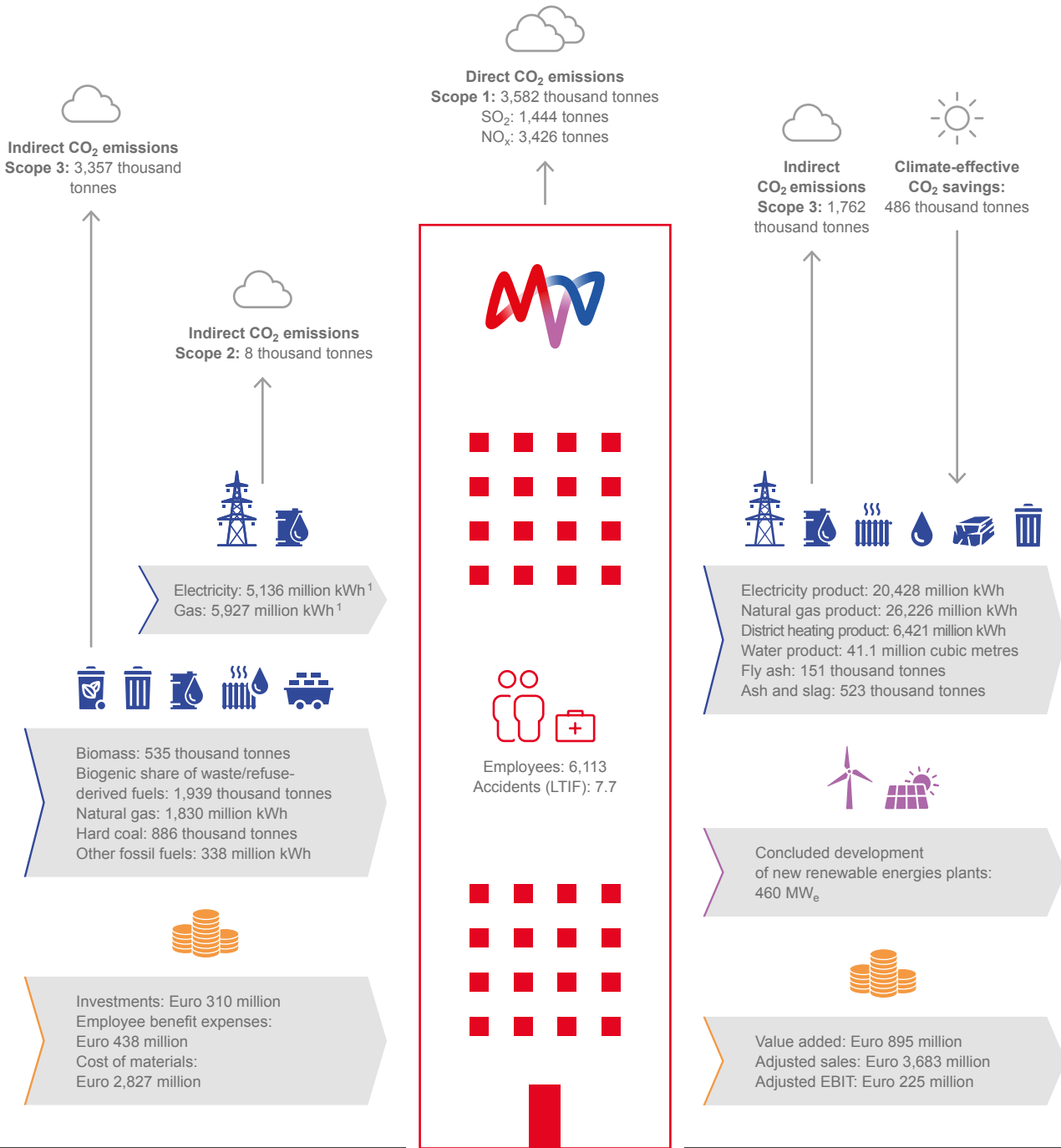
Environmental impact in our input/output balance sheet

We have compiled an input/output balance sheet each year for several years now. This balance sheet succinctly compares our environmental impact with our value added. The input/output balance sheet goes beyond a mere consideration of environmental concerns; as these concerns nevertheless account for a significant share of the information provided, the balance sheet offers transparency on key environmental implications.

Recent years have not seen any significant changes in terms of our emissions and by-products. Due to lower generation volumes, the volume of dust and other emissions fell slightly compared with the previous year. Over the same period, we generated growth above all with renewable energies and thus developed lower-CO₂ forms of generation. Overall, that shows that, based on a similar volume of input, we have managed to increase our business volumes, and thus the productivity of our natural resource, capital and employee factors.

MVV's input/output balance sheet

Fully consolidated and at-equity companies



¹ Excluding sales volumes from trading transactions

RESOURCE EFFICIENCY

To generate electricity and heating energy, power plants use fossil fuels, and here especially natural gas and hard coal, as well as regenerative fuels. These include both solid biomass and so-called refuse-derived fuels, which are produced from waste and have a biogenic share of around one half. We describe our value chain in greater detail on [Pages 14 – 16](#).

One way we help to protect resources is by reducing primary energy use with high fuel efficiency rates. The fuel efficiency rate presents the volume of end energy generated (electricity and heating energy) as a ratio of the energy input (primary energy) and thus quantifies the efficiency of generation.

We reduce our ecological footprint by expanding highly efficient combined heat and power (CHP) generation and district heating and thus reducing the use of non-renewable fuels.

If the fuel efficiency rate increases, a given generation portfolio has a higher energy yield. This way, we are also making what is an important contribution to cutting emissions. Our plants achieved an average fuel efficiency rate of 63 % in the year under report. This puts our energy yield ahead of the German average for generation activities, which the Federal Environment Agency has quantified at an average of 48 % for all energy sources (based on gross electricity generation in 2016).

We make targeted investments in highly efficient combined heat and power (CHP) generation – after all, the fuel efficiency rate for CHP is significantly higher than when electricity and heating energy are generated separately. In Kiel, we launched operations with our new gas-fired CHP plant [Page 19](#).

The volume of fuel that has to be used in individual financial years largely depends on developments in weather conditions and market prices, as well as on the properties of the fuel in question. By products, primarily ash and slag, arise in our waste incineration and our CHP plants [Page 35](#).

Ash and slag volumes are due to technological factors and do not lie within our control. We put these by-products to further use wherever this is technologically possible and economically viable. Consistent with the cascade use principle, we prepare them so that they can be returned to the economic cycle, for example as products for the construction industry. Residual volumes that are not recyclable have to be sent for landfilling in line with legal requirements. Other by-products and toxic or hazardous substances, such as polychlorinated biphenyls (PBC), play no role, or only a subordinate role, in our business activities. The rules for handling such substances and relevant control mechanisms are set out in our management systems for work safety and for quality and the environment.

Fuels used at power plants ✓

	Fully consolidated companies				Fully consolidated companies and companies recognised at equity			
	FY 2019	FY 2018	+/- change	% change	FY 2019	FY 2018	+/- change	% change
Biomass (1,000 tonnes)	501	602	- 101	- 17	535	636	- 101	- 16
Biogenic share of waste/refuse-derived fuels (1,000 tonnes)	1,939	1,889	+ 50	+ 3	1,939	1,889	+ 50	+ 3
Natural gas (kWh million)	1,809	1,931	- 122	- 6	1,830	1,953	- 123	- 6
Hard coal (1,000 tonnes)	71	78	- 7	- 9	886	1,045	- 159	- 15
Other fossil fuels (kWh million)	337	359	- 22	- 6	338	360	- 22	- 6

GRI 301-1

Average fuel efficiency rate

	Fully consolidated companies			Fully consolidated companies and companies recognised at equity		
	FY 2019	FY 2018	+/- change	FY 2019	FY 2018	+/- change
%	57	57	0	63	61	+ 2

LOCAL ENVIRONMENTAL PROTECTION

For us, environmental protection on both national and local levels is closely based on legal requirements. Approval requirements and strict threshold values form the basis for our activities, and that both when we build new plants and in our day-to-day operations. Compliance with these values is monitored by the relevant authorities. Certain aspects of our operations, such as plant-specific emissions at large combustion plants, are subject to reporting requirements.

The new European requirements governing air pollutant emissions were adopted in national law in the 2019 financial year. The amendment to the German Federal Immissions Protection Ordinance introduced stricter threshold values for various size categories of incineration-based generation plants. These chiefly relate to topics such as nitrogen oxides, sulphur dioxide and heavy metals. All our plants will continue to comply with the threshold values, some of which stricter than previously, in future as well.

We actively promote environmental protection with our investments.

A major share of our environmental protection activities on local level involves investments to modernise our plants. By enhancing their efficiency, we can save resources and protect the environment. One example here involves our activities at Gersthofen Industrial Park. The environmental management system at MVV Industriepark Gersthofen GmbH is certified in accordance with ISO 14001 and EMAS. In the year under report, we implemented numerous efficiency enhancement measures there. The canteen ventilation management system was renewed, for example, with speed-regulated power units being installed. We expect this measure alone to generate savings of

around 20 % in this building (approx. 96,000 kWh a year). By implementing technical measures at a production operation at the industrial park, whose wastewater activities were supported and accompanied by MVV, we managed to reduce the wastewater dirt load at the sewage plant operated by MVV by around 125 tonnes of chemical oxygen demand a year. Six charging points for electric cars were installed in spring 2019 and are available to customers and employees. We also act as the initiator and moderator of two energy efficiency networks at the industrial park. The GEENI Network established in 2016 was successfully completed as of 31 December 2018, with the project partners achieving savings of almost 100 GWh of electricity and heating energy. In view of these pleasing results, in spring 2019 we founded a new energy efficiency network – LEEN2019 – with an amended group of participants.

Our generation plants emitted around 1.6 million tonnes of climate-neutral biogenic CO₂ in the year under report. This results from the direct use of timber, other biogenic waste and other regenerative materials deployed as fuels at our plants.

In our operating business, the use of natural resources in our energy generation has the largest environmental impact. Compared to this, other business processes at our plants, buildings and business operations, such as administration, have a notably smaller impact. As a result, the environmental protection measures we take to improve our own direct electricity and water consumption and our use of other materials or to reduce our own waste volumes only have a relatively limited effect in terms of their environmental benefits. We nevertheless promote several aspects in our decentralised environmental management systems.

Other emissions and residues

tonnes	Fully consolidated companies				Fully consolidated companies and companies recognised at equity			
	2018 ¹	2017 ¹	+/- change	% change	2018 ¹	2017 ¹	+/- change	% change
NO _x	2,227	2,236	- 9	0	3,426	3,441	- 15	0
SO ₂	772	900	- 128	- 14	1,444	1,675	- 231	- 14
Dust	34	45	- 11	- 24	72	91	- 19	- 21
Ash and slag	519,502	506,537	+ 12,965	+ 3	522,648	510,767	+ 11,881	+ 2

¹ Calendar year

 **GRI 305-7**

Further environmental protection aspects form part of the environmental management systems at our local companies, which are responsible for these on a decentralised basis. These companies also set their own accents. MVV Netze and Stadtwerke Kiel, for example, play an active role in protecting ground water and water surfaces. As they are responsible for the supply of drinking water in their regions, their supply systems have to be regularly analysed and checked. Here, the production, treatment and distribution of drinking water are not only of economic significance; the public supply mandates serve the common good. As the most important source of life, drinking water is governed by strict quality standards. The most important objectives for the water supply involve complying with these quality standards and minimising relevant contents. We have published our targets and management approach for our drinking water supply in our Water Policy www.mvv.de/water-policy.

Digital Transformation

Traditionally a demand-driven market, energy generation is already characterised by interactive relationships between supply and demand. This process is set to intensify further in future. One major future trend for us is the digitalisation, networking and automation of business processes, an approach partly described by the catchword “Industry 4.0”. We provide our customers with individual solutions enabling them to align their processes even more holistically and enhance their efficiency – this way we are also helping to reduce the long-term impact of energy consumption on the environment.

As we head for the energy system of the future, renewable energies will have to be smartly linked with highly efficient conventional energies and energy storage facilities. Not only that, flexible sources of demand will also have to be integrated. For us as a company, that means we are making sure our customers themselves can play an active role in the energy turnaround. In the following sections, we state our specific targets and associated activities.

Digitalisation at the company – both in terms of its processes and of its products and services – is a key driver to secure MVV’s future success. As well as securing sustainability at the company in economic terms, digital solutions also offer opportunities to reach ecological and social targets. At MVV, the cross-divisional topic of digitalisation is being implemented across all business fields. We coordinate key aspects of this process in our digitalisation programme and also ensure this is closely dovetailed with our sustainability programme.

We are also committed to protecting information and data with a wide range of technical and organisational security measures. These apply in particular to personal data, which we collect in connection with the solutions and service products we offer to our customers and for employment and other contractual relationships with employees and suppliers. Working with an information security management system based on the international norm DIN ISO 27001 and a data protection management system, the employees entrusted with this task manage and monitor the security of business processes in terms of IT and data protection law on a decentralised basis and ensure that the information is protected against unauthorised viewing, loss or manipulation. All measures we implement in terms of information security and data protection are intended to detect and manage any potential risks. Our goal here is to maintain existing relationships of trust with our customers, shareholders, suppliers, service providers and employees and, where possible, to extend this trust even further.

In the year under report, we met our objective of protecting information and data with technical and organisational security measures based on the recommendations made by the Federal Office for Information Security (BSI). The same applies to the data we collect from our customers in connection with our solutions and service products.

 **GRI 103-2**  **GRI 103-3**


INDUSTRY 4.0: CHANGED PATTERNS OF CONSUMPTION AND CUSTOMER RELATIONSHIPS

For the energy system of the future, we need a decentralised communications infrastructure that networks generators, marketers and consumers with each other. This will give rise to consistent end-to-end processes. As the industrial transformation already underway – Industry 4.0 – progresses further, all industrial equipment and tools down to end points will in future be connected both to each other and to the internet. This way, they will form the “Internet of Things”. The aim then will be for end consumers to use large quantities of electricity when this is available in large quantities and inexpensive. At times when less electricity is available due to more significant fluctuations at renewable energies plants, electricity demand will also have to fall. The electricity price will thus fluctuate in the course of the day. In summary: In the past, power plant production was aligned towards electricity demand. In the future, the electricity supply will be influenced by wind and sun conditions, meaning that electricity demand will have to adapt in line with these. This process, which involves demand side management, will lead to changes both in patterns of consumption and in customer relationships.

Combining digitalisation, automation and networking should make it possible to coordinate generation and consumption in real time. This will create further benefits, as data aggregation and analysis will enable business processes to be structured more efficiently, thus reducing CO₂ emissions. Early warning indicators will also make it possible for plant maintenance processes to be planned more effectively. Not only that, the avoidance of peak loads means the investment costs needed to expand Germany’s grids can be expected to turn out lower.

By promoting digitalisation and networking in our own processes, at our customers and in our products, we safeguard MVV’s future performance capacity.

Digitalisation on end customer level and Industry 4.0 on B2B level – both form part of the energy system of the future. In view of this, we are systematically evaluating technological options resulting from these trends and extending the range of solutions for our customers. The topic of Industry 4.0 is therefore continuing to merge with the following topic of Individual Customer Solutions. In the 2019 financial year, for example, we equipped a customer with an electricity storage facility that charges itself with self-generated electricity from a photovoltaics system. The storage facility is managed by a smart energy management system that safeguards the discharging process during times of high output requirements. This increases the own-use quota for the photovoltaics system while simultaneously lowering grid fees. Working with this solution, our customer has achieved a 75-percent rate of self-sufficiency.


We implemented a further digital solution in the 2019 financial year, in this case for the business incubator mg: mannheimer gründungszentren gmbh, which we assisted in managing its eight sites. Each of these incubators enables between 30 and 100 start-ups to promote their wide variety of business ideas by offering flexible office space. The innovative digital solution measures all utilities consumed at a given site and bills this on a room-specific, consumption-driven basis. It works by connecting smart meters for electricity and district heating with the meters used for electricity and heating cost billing and by integrating these within a holistic wireless infrastructure. This digital wireless infrastructure also makes sense when used solely for energy monitoring purposes, as it offers a more comprehensive and up-to-date basis of data and thus provides an overview of potential savings.  [MVV-7](#)





INDIVIDUAL CUSTOMER SOLUTIONS

Digitalisation is not the only trend that will contribute towards the energy system transformation. The degree of networking between energy sources and with other industries is also set to increase in connection with sector coupling. These factors will be accompanied by the trend towards end customers increasing their proprietary electricity and heating energy generation from renewable energies – a trend that applies both to business and to retail customers. On the one hand, we have to record our customers' energy data in real time and network this with applications intended, for example, to optimise energy consumption or enhance energy efficiency. On the other hand, we must enable our customers to supply themselves and to integrate, and thus secure, this supply in ways that make best sense.

As a competent partner, we offer all customers – from private households to industrial players – the products and services they need to implement their own energy turnarounds.

As an energy service provider, we have a key role to play here. Our customers require individual advice accompanied by increasingly automated solutions. This is clearly relevant for our business and commercial customers, but we also expect to see the same developments in our relationships with retail customers. Here, automation will affect all interfaces from customers right up to the energy system as a whole.

Our business models are based on a consistent focus on service, smart networking and maximum flexibility (see chart). Long-term partnerships are the structure that best enable us to support our customers in mastering the complex energy-related challenges they face, taking part in the energy turnaround and meeting their own individual decarbonisation targets. In the 2019 financial year, for example, we compiled an innovative compressed air concept for a customer with a photovoltaics system and energy monitoring. By viewing various areas from a holistic perspective and drawing on previously unused waste heat potential, we were able to significantly enhance the customer's energy efficiency. Thanks to the resultant CO₂ saving of 171 tonnes a year, it was possible to apply for subsidies which reduced the customers' investment costs by 30 %.  [MVV-8](#)

 Energy supply, generation & marketing decentralised/centralised	 Energy management	 Buildings & TGA	 Services
<ul style="list-style-type: none"> » (Green) electricity » Gas » District/local heating » Contracting solutions » Direct marketing » Flexibilities management » Tenant electricity » Sustainable generation plants (biomass, PV) » Utility energy (steam, compressed air, cooling energy) » Heating direct service 	<ul style="list-style-type: none"> » Energy check » Data-based energy management » Energy efficiency analysis » Energy efficiency controlling » Smart analytics & control » Peak load management » Management systems (ISO 50001, Energy Audit 16247, Alternative System) 	<ul style="list-style-type: none"> » E-mobility » LED lighting » Engineering (heating, cooling, air-conditioning, ventilation, sanitary) » Electro/ICE » Engineering/planning services » Data centre solutions » Storage solutions 	<ul style="list-style-type: none"> » Smart metering » Smart metering plus » Portal solutions » Electricity/natural gas tenders » Subsidy consulting » Invoice verification » Mobility check » Data centre risk analysis

INFORMATION SECURITY AND DATA PROTECTION

Information security and data protection are indispensable foundations for any successful business activity. Due not least to the advance of digitalisation in all areas, we continuously review, question and optimise our processes to protect personal data and information.

We work with an extensive range of technical and organisational security measures to ensure information security and data protection.

We act on the basis of applicable legal requirements. In an extensive project conducted in the year under report, we implemented the stricter requirements resulting from the European General Data Protection Regulation (GDPR) and the new version of the German Federal Data Protection Act (BDSG) concerning the treatment of personal data, and that across all areas of the company and in all business processes. Here, we supplemented the existing information security management system by setting up a data protection management system in order to ensure that data protection risks are sustainably addressed. We have established a central point of contact to deal with all internal and external enquiries and issues relating to data protection.

We regularly train all our employees with a variety of measures, inform them about the steadily rising standards applicable to information security and data protection and work to raise their awareness both of existing risks and threats and of the need to treat personal data and information with due care. 🌐 [MVV-9](#)

Employee Concerns

We offer attractive and secure jobs to around 6,100 employees. That is a great responsibility, and one that we are aware of and account for in our strategic decisions.

Motivated, healthy and well-qualified employees are crucial to MVV's success. Viewed in the long term, demographic trends and changes in the population structure will create additional challenges when it comes to finding and retaining suitable employees. This being so, our personnel strategy focuses on the following areas:

- **Leadership:** We are continually and systematically improving the quality of management at the company and adapting this in line with changing market and employee requirements.
- **Demographics, work-life balance, compensation management:** Our aim is to remain an attractive employer. That is why we offer attractive compensation packages and are committed to helping our employees combine their work with their family or nursing care commitments. In our recruitment, we have a particular focus on promoting women and expanding diversity at the company.
- **Ongoing change management:** We are making continuing efforts to further develop our company and corporate culture and aim to retain and enhance our employees' skills. To this end, we invest in training our workforce and enhancing its willingness to embrace change. After all, we need highly trained, flexible and innovative specialists and managers willing to make their contribution to the new energy system.
- **Talent management:** We deliberately identify, support and cultivate upcoming talent – and that from among our trainees and new recruits right up to our managers.

The Labour Director is a member of the Executive Board and is responsible for all personnel-related activities. Reporting on relevant personnel-related topics is provided to the full Executive Board on a

regular basis and whenever necessary due to individual events or topics. The specific structure and implementation of the personnel strategy is organised on a decentralised basis. This way, targeted focuses can be set in line with circumstances on location. MVV has a Group Works Council and numerous works council bodies and committees. The company's management works together with these bodies on a basis of trust, meaning that both the company's concerns and those of its workforce are accounted for in all significant decisions. The Supervisory Board of MVV Energie AG includes equal numbers of shareholder and employee representatives. This means that employee concerns are central to any important company decisions.

We aim to protect the physical and mental wellbeing of our own employees and of those employees who work on our behalf. To this end, we are continually working to improve work safety at the Group. Consistent with this objective, the work safety committees organised on a decentralised basis offer structured programmes and measures about which the Executive Board is also kept regularly informed.

In our integrated safety management system, we lay down organisational and technical framework requirements for occupational safety and fire safety, as well as for plant and environmental safety. Our work safety committees formed pursuant to § 11 of the German Occupational Safety Act (ArbSicherG) are established by the companies on location. They include employee and employer representatives and meet at least once a quarter. Around 120 individuals across the Group are active as members of work safety-related committees at the various companies. We agree our occupational safety and accident prevention strategies and measures with professional associations and employee representatives and maintain close links with these. When it comes to reintegrating employees, we work with a clearly structured operative integration management system which also involves employee representatives and occupational health professionals. 🌐 **GRI 403-1**

In the following section, we deal with the employee concerns topic defined by GRI as material and present our approaches and results for the specific disclosures of training and development, diversity and occupational health and safety. 🌐 **GRI 103-2** 🌐 **GRI 103-3**

Key figures for our employees

We employed a group-wide total of 6,113 individuals as of 30 September 2019. The increase compared with the previous year was mainly due to the first-time consolidation of DC-Datacenter-Group in the year under report. Our employees abroad include 500 employees at our Czech subgroup, 241 at Juwi's foreign shareholdings and 135 at the British subsidiaries of MVV Umwelt.

Employee key figures		
	FY 2019	FY 2018
Number of employees ✓	6,113	5,978
of which		
Germany ✓	5,232	5,137
Abroad ✓	881	841
of which		
Women ✓	1,756	1,701
Men ✓	4,357	4,277
of which trainees¹		
Women	87	79
Men	243	233
Total ✓	330	312
of which part-time employees (%)		
Women	10	10
Men	4	4
Total	14	14
of which permanent employees		
Women	1,568	1,507
Men	3,910	3,823
Total	5,478	5,330
Average age (years)		
Women	42.4	42.2
Men	44.6	44.7
Total	44.0	44.0
Average length of years of service (years)		
Women	11.9	12.1
Men	13.6	13.8
Total	13.1	13.3
Number of employees on childcare leave²		
Women	105	125
Men	91	97
Total	196	222
Staff turnover rate ² (%)	10.0	9.6
Employees with severe disabilities² (%)	5.0	5.1

¹ Including students at Baden-Württemberg Cooperative State University (DHBW)

² In Germany

🌐 **GRI 102-8**

CORPORATE AND MANAGEMENT CULTURE

Our cultural values of Community, Responsibility, Appreciation and Courage shape our dealings with one another and are a firm component of our company's DNA. To ensure that these values are not only protected, but can also be experienced by everyone, employees, managers, the Works Council and the Executive Board worked together on a shared definition of high-quality leadership at MVV. This also provided transparency as to the fact that and the differing extent to which markets/customers, organisational structures and employees influence our company in a very wide variety of ways. This led to a management concept with nine principles. What makes this concept special is that we see leadership as a task not only for managers, but rather for all employees. Everyone has responsibilities – whether in a project, a meeting or in preparing a decision for a manager.

We aim to inspire our employees with MVV's corporate culture and management concept.

Together with the opportunities and challenges presented by digitalisation, the shared management concept of "Leading towards the Future" were the main topics in our dialogue formats in the 2019 financial year. Mainly held at the Mannheim location, these addressed a very wide variety of target groups and attracted more than 1,000 participants in total. The first event, attended by around 200 managers in March 2019, was the second "Lived Energy Conference". This set a key milestone in terms of making our corporate culture actually liveable and tangible. As active designers of our culture, the managers worked together to develop ideas as to how they themselves can actually contribute very specifically to successfully leading MVV towards the future. In the following months, MVV employees discussed this issue with their managers and colleagues in their respective units and also on a cross-departmental basis with each other and our Executive Board members at "MVV in Dialogue". By sharing ideas closely in this way, we laid a foundation for anchoring our jointly developed management concept at the company on a long-term basis.

TRAINING AND DEVELOPMENT

Training with promising prospects for the future

Training acts as a key pillar of MVV's recruitment strategy. We therefore offer a wide variety of training programmes.

In Mannheim alone, we offer the next generation of employees training in more than 20 different commercial and technical vocations, as well as combined training and study programmes. In the year under report we took on two refugees for the first time as employees. In Mannheim, Offenbach, Kiel and Gersthofen close to Augsburg, we are among the largest trainers in the regions.

Our broad range of training programmes aims to show young people the wide variety of career opportunities at our company.

As of 30 September 2019, a total of 330 young women and men were in training at MVV. Our trainees also include five former refugees who are training as specialists in metals technology and industrial electricians.

In 2019, we participated in a STEM (science, technology, engineering and maths) internship that we are offering with other companies in the region. Pupils from Year 9 upwards spend five days at five companies getting to know five training vocations and five study programmes in STEM subjects. This innovative approach, in which our trainees and our students present the contents of their subjects in practical terms, enables us to arouse young people's interest in STEM vocations and provide them with initial guidance.

Since 2018, we have taken part in the European research project EATAP (European Apprenticeship Talent Program). In cooperation with partners from Austria, Lithuania and the UK, we are looking into ways of promoting the talent of high-potential apprentices in STEM vocations in line with common standards across Europe. In the year under report, we also took part once again with our City College partner in Plymouth in the ERASMUS+ European exchange programme for trainees in programmes offered by the Chamber of Industry and Commerce (IHK).

Targeted measures to secure the next generation of talent: the Junior Consulting Team (JCT)

The JCT is an interdisciplinary team of university graduates from a variety of disciplines. Within MVV, the team acts as an internal consulting unit and independently acquires projects and tasks. Projects addressed by the JCT in the year under report included analysing the heating energy market, alternative heating energy concepts for new buildings, and marketing opportunities available to our sales company for these kinds of concepts. The team's strength lies in its independence of departments and divisions. This enables it to gain fresh perspectives and provide momentum. With their analytical and theoretically sound approach, team members base their activities on their internal client's objectives and develop and propose qualified solutions. At the same time, the participants themselves also gain experience and obtain a good overview of our individual business fields.

Targeted personnel development

For us, targeted personnel development is a key factor which also determines our competitive success. We have therefore developed numerous measures and instruments based on the experience we have gained in the rapidly changing economic climate in which we operate.

Our further training measures enable us to ensure a shared basis of knowledge on overriding strategic topics. Alongside in-house training, we also offer team development and individual measures, such as coaching and mentoring.

We aim to develop the potential of our employees.

When it comes to the individual further development measures we provide to our employees, we have set one key focus on the topic of digitalisation. In the past financial year, we held more than 30 events in Mannheim, with topics ranging from specialist areas, such as artificial intelligence, robotics, blockchain and augmented reality, to general knowledge transfer and digital aids in everyday office life through to questions relating to the interplay of ethics and digitalisation. One of our key focuses in the 2020 financial year will be on collaboration. Looking at our everyday working life in a large organisation, the aim here will be to network our cooperation even more closely, share knowledge, accept mutual impulses and information and integrate new topics into our own work processes.

In Mannheim, we work with a management review system to record the skills and further training needs of our managers and high-potential employees and to plan their next career steps. This involves a graded process including self-assessment and third-party assessment, internal management review conferences and concluding feedback talks held between employees and managers. In the year under report, 239 managers and employees with management potential took part in this programme. Individual development measures are implemented under the responsibility of specialist departments, while employees with management potential are developed within a well-established talent management process. This function is being continually expanded to enable the company to retain high-potential employees. Our understanding of talent also extends to specialist and upcoming staff, such as trainees and career starters.

The MVV-specific competency model forms the basis for personnel development meetings and individual support programmes. We regularly hold bottom-up appraisals and surveys at our main locations in Germany. This way, our employees have the opportunity to provide honest feedback and we can enhance the quality of management at our company. 🌐 **GRI 404-2**

Change management

Changes in the energy industry are arising in ever more rapid cycles – this fact, and the appreciative and positive approach we aim to adopt to addressing such changes, are the reason for our focus on professional and continuous change management, and that both on the level of the organisation as a whole and of individuals. On an organisational level, we train managers and the personnel department in planning and implementing changes affecting the organisation and its way of work. On an individual level, employees can rely on us to extend their skills in line with further developments in their areas of work, as well as to offer them personal support in viewing changes positively. Given the numerous change initiatives underway, we have designed the MVV Change Model on a central basis. In structured talks with those involved in and affected by change processes, we developed a phase-based model comprising a total of 30 modules that can be deployed in line with the respective change logic. Decentralised change offices in those areas implementing restructuring measures are qualified in a multi-part change curriculum.

DIVERSITY

With a view to the company's sustainable development, MVV has set itself the strategic target of designing and gradually implementing an approach to diversity management that is tailored to the company's needs and consistent with the times in which we live. This approach, which we refer to as "Energy for Diversity", is based on three pillars: promoting women, work and family and demographic management.

Equal opportunity on all levels

Women have traditionally accounted for a comparatively low share of the overall workforce at energy companies, and MVV is no exception in this respect. That is why we aim to offer more targeted and closer support to women. We are convinced that different skills and management styles impact positively on our business performance. We therefore see raising the share of women in our Group's workforce on a long-term basis as one key to MVV's successful further development. We are addressing the low share of women in management positions typical to our industry with targeted promotional measures.

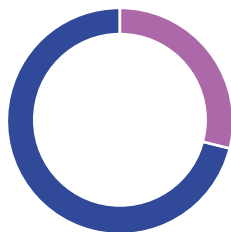
By 30 September 2021, we aim to raise the female share of the workforce to 35 % and of our total management staff to 25 %.

These targets were adopted by the Supervisory Board and Executive Board of MVV Energie AG in 2015. Both key figures are collected and analysed each year.

Women and men Shares (%)

	FY 2019
■ Women	29
■ Men	71

Status: 30 September 2019

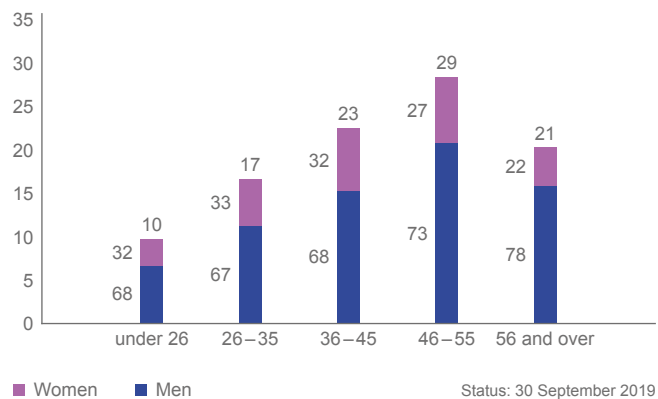



Women accounted for 29 % of our workforce and 15 % of our managers at 30 September 2019. For MVV Energie AG, we report on the share of women in both first and second management tiers. In August 2017, the Executive Board set targets to be achieved by 30 September 2021. By that date, the share of women in the first management tier should have reached 25 %, with a corresponding target of 30 % for the second management tier. At 10 %, the share of female managers in the first tier as of 30 September 2019 was slightly lower than in the previous year (30 September 2018: 11 %). The share of women in the second management tier rose year-on-year and, at 29 %, almost reached the specified target (30 September 2018: 22 %).

The age structure of our workforce will raise the share of female employees at the company in the years ahead. That is because women account for a higher share of employees in age groups up to 45 than in age groups from 46 upwards. Our personnel structure will therefore help us to meet our targets. Having said that, this factor will be insufficient to achieve the desired increase.

Age structure of employees

(%)



To reach our targets, we are adopting various approaches, drawing on a variety of promotional measures and programmes and expanding these further. One major package of measures involves offering targeted personnel development to women with suitable potential. One example is the individual support offered to women in mentoring schemes. In X-Company-Mentoring, a cross-company programme organised each year in cooperation with other well-known companies in the region, male and female mentors in the management tiers of participating companies pass on their skills and experience to talented female employees for a period of one year. This is intended to support employees in their own personal development, with a separate special focus on management. A further focal point involves building networks between current participants and those who took part in the programme in previous years. As part of our corporate membership of “European Women’s Management Development”, an association for professional women, we offer free membership for interested female employees. This way, they can benefit from free contingents of places in presentations and seminars. Since the 2018 financial year, we have offered an internal lecture series specially targeted at women. These lectures, which have attracted great interest, deal with career-related topics such as how to deal with power and status, as well as body language.  **MVV-10**

Combining work and family commitments

A further key plank of our personnel policy relates to employees’ ability to combine their work and family commitments. Our aim here is for our employees to be able to successfully combine these commitments, and that on an ongoing basis. We offer a variety of working hour models at the company, such as flexible working hours. Digitalisation and the use of modern communications appliances also facilitate teleworking in line with specific needs. Parents in Mannheim, Offenbach and Wörrstadt have the option of taking their children to care facilities at or close to company locations. In Mannheim, Kiel and Offenbach, we have set up parent and child rooms which can be used when any childcare difficulties arise at short notice. In Wörrstadt, parents can take their children to work with them in these situations.

Another area in which our employees will have greater needs in future relates to caring for relatives. We are also supporting them here. Employees caring for relatives can be granted leave from work. We also inform our staff about care options by holding information events, providing emergency folders with information about work and care and – like at Energieversorgung Offenbach, for example – by cooperating with a nursing care service.

Our family-oriented personnel policies are important to us and we intend to become ever better in this significant and rapidly developing area. That is why we have drawn for many years now on the impetus provided by the *berufundfamilie*[®] programme offered by the Hertie Foundation. This assists companies in their efforts to improve the compatibility of their employees’ work and family commitments. In the audits, catalogues of measures are compiled and bindingly agreed for the respective locations. Checks are performed at a later date to ascertain whether and how these agreements have been implemented. Our Mannheim location has been audited and certified within this scheme since 2008 already. Audits have been performed in Offenbach since 2009 and in Kiel since 2012. In Wörrstadt, the audit was introduced in 2017. The certification at Stadtwerke Kiel was renewed in December 2017. In Mannheim, MVV successfully passed the certification process in March 2018; since May 2018, the new certificate will be valid for a further three years. The relevant certificate in Wörrstadt was also granted in 2018.

Proactive demographic management

With the third pillar of “Energy for Diversity”, we address the demographic challenges we face. In select departments in Mannheim, we perform so-called “parallel runs”, in which employees due to retire from the company help to train their new colleagues over an extended period of time. We have also established a trainee programme specially tailored to the needs of departments in order to counter the loss of expertise resulting from employees retiring.

Furthermore, we established “Age-Appropriate Work”, a workgroup which coordinates its own activities and operates across various departments and functions. At numerous meetings and workshops, this group compiled a broad range of measures aimed at countering the effects of rising average ages and the shrinking pool of available employees.

OCCUPATIONAL HEALTH AND SAFETY

Avoiding accidents

One important matter for us involves protecting the physical and mental health of our employees and of those employees who work on our behalf. We therefore make permanent efforts to improve work safety at the Group.

As well as laying down organisational and technical framework requirements for occupational, fire, plant and environmental safety, we also regularly reassess our occupational safety and prevention measures and develop these further. Our work safety committees, comprising both employer and employee representatives, are formed by the companies on location. We liaise closely with professional associations and employee representatives and agree our occupational safety and accident prevention strategies with them.

We aim to prevent accidents and health risks by raising awareness among our managers and employees for the risks and dangers of accidents. In our instructions, we explain the interrelationships involved and lay down work safety requirements. With an electronic instruction system we offer work safety training units specially tailored to individual workplaces. This way, our employees can flexibly and individually address a variety of basic work safety topics. As well-informed contact partners for occupational health and safety in their organisational units, our safety officers also perform an important function. They are regularly trained by our occupational safety specialists and work safety coordinators, who communicate our company-specific safety requirements and prevention focuses.

We aim to keep the lost time injury frequency (LTIF) rate at MVV as low as possible.

We regularly inspect our plants and operating divisions to identify weak points and make every conceivable effort to prevent accidents. We systematically evaluate accidents at the Group.

Our accident statistics and accident prevention measures are regularly evaluated on Executive Board level, with further measures also being discussed and planned.

Accident statistics

	FY 2019	FY 2018	+/- change	% change
Lost time injury frequency rate (LTIF) ^{1,2,3} ✓	7.7	6.7	+ 1	+ 15
Fatal accidents	0	1	- 1	- 100

- 1 Includes all fully consolidated companies in Germany and individual shareholdings recognised at equity in Germany
- 2 Calculation based on work-related accidents from first day of absence per 1,000,000 working hours
- 3 Basis for centrally recorded FTE figures:
FTE figures at reporting date on 30 September
Basis for non-centrally recorded FTE figures:
FTE figures directly from companies at reporting date on 30 September
Working hours = number of FTE (full-time equivalents) at reporting date on 30 September multiplied by 1,700 hours (≙ 1 FTE)

Our target for the 2019 financial year amounted to 4.6 and was based on our target of achieving an LTIF figure of 3.9 by the 2020 financial year. By systematically recording and evaluating accidents and regularly communicating accident statistics, we recognised at an early stage that we would not reach the target set in the year under report. We therefore took immediate measures to counter this trend.

We implemented our new inspection concept in further areas of the company and stepped up our regular safety briefings in order to further raise awareness for safety-related issues on all levels. Furthermore, we analysed all work-related accidents in detail, processed these and made suitable information available to our employees in the "Learning from previous accidents" section of our electronic instruction system. We backed up these measures with campaign days focusing on occupational health and safety.

We consider all accidents at or on the way to work, including more minor injuries. The assessment and evaluation are performed on a gender-neutral basis and in line with data protection requirements. Based on the insights gained, we inform our managers and employees, not least via our electronic instruction system. Furthermore, we review which additional preventative measures would make sense. In the 2018 financial year, we regrettably reported one fatal accident on the way to work at a subsidiary of Juwi. No fatal accidents occurred in the year under report. We will continue to make every effort to avoid accidents and work-related health risks and to reach our targets in this area. We will therefore be further intensifying our activities in the field of occupational health and safety. 🌐 **GRI 403-2**

Protecting health and avoiding health-related problems

We have set ourselves the goal of boosting the health of our employees with a prevention-based approach and therefore support them with a variety of company health management measures. Alongside the extensive range of services available at our occupational health service, we also offer employees at our major locations in Germany further health promotion opportunities that go far beyond legal requirements. We make therapeutic devices available, for example, and experienced coaches guide participants in health-related courses. We offer a very wide range of sports groups and have cooperations with fitness centres. We also offer nutritional advice and wide-ranging prevention measures, such as flu vaccinations, skin cancer screening and laboratory diagnostics services to detect common metabolic illnesses at an early stage. By organising courses and holding presentations on topics such as nutrition or exercise, we help our employees to obtain the specific information they need. The key focuses and services on offer vary in line with the requirements and circumstances at our individual locations. Employees at all of our locations have shown great interest in the services on offer.

Social Commitment

As a company with regional roots, we are an active part of society in the locations and regions in which we operate. We are aware of our relevance to society in this respect. We assume responsibility for our decisions, actions, products and services, and that towards our customers and capital providers, as well towards the environment and the society in which we live. The value we create on site makes us a major economic factor at our locations. We make investments, award contracts to local or regional businesses where possible, secure jobs, offer high-quality training and pay taxes and duties. It goes without saying that we do not use any questionable measures to avoid taxes or move profits across borders.

We have the responsibility to use our resources to promote the conversion in the energy system so as to provide a more sustainable and efficient energy supply and, to this end, to maintain a transparent dialogue with our stakeholders. For many of the projects involved in expanding renewable energies and the necessary infrastructure, acceptance by people on location is absolutely crucial. One aspect of our social commitment involves planning and implementing projects together with local populations and their representatives on location, promoting acceptance for these projects on the basis of dialogue and to reach decisions that also convince third parties.

We contribute to the common good in those regions in which we operate. The way we deal with and exchange information with all relevant groups within society shapes the relationship between us as a company and local populations. As a general rule, our social commitment is project-based and supports the fields of social welfare, education, culture and sports. We set our focuses here in line with the specific context. Responsibility for our social commitment lies with the management of the respective companies.

🌐 **GRI 103-2** 🌐 **GRI 103-3**

ECONOMIC OUTPUT

Creating value

In our input/output balance sheet, we present all significant flows of materials, energy, goods and money associated with our business activities. Our adjusted EBIT and ROCE key figures show how successful MVV was in economic terms in the past financial year. Consistent with the logic of business administration, at base these and other key figures chiefly refer to the economic capital committed or created. The value added statement we compile each year supplements the perspectives provided in the input/output balance sheet, as well as those in the annual financial statements, by presenting all “added values” created by MVV and measured at market prices. Value added reflects the output generated at market prices and resulting from the efficient deployment of all resources – capital, employees and natural resources. It represents MVV’s contribution to gross domestic product.

We aim to continue generating value and meet our responsibility as an economic player.

Our value added statement calculates the net value creation of our operations. This figure comprises our production value, from which our input costs and capital consumption are deducted. This measurement nevertheless only approximates to the value we actually create. After all, measuring net value creation on the basis of market prices does not account for non-monetary output such as intellectual capital and other external costs like environmental damages. Environmental scientists criticise the fact that the actual contribution to social prosperity is lower than value added or the contribution to gross domestic product. One indisputable fact, for example, is that global biodiversity is shrinking due to the consumption of natural resources and unavoidable environmental pollution. This is known to have negative long-term ecological and economic implications, such as those due to falling natural yields. Given that no robust and systematic possibilities of quantifying these and other so-called external effects are yet available, however, these factors are not accounted for in monetary accounting. As a company, we nevertheless aim to minimise any such implications of our activities for society, people and the natural world.

Generation of value added

Euro million	FY 2019	FY 2018	+/- change	% change
Company performance ^{1,2}	4,033	4,211	- 178	- 4
Input costs ^{2,3}	- 2,954	- 3,116	- 162	- 5
Depreciation	- 184	- 214	- 30	- 14
Value added	895	881	+ 14	+ 2

1 Mainly sales

2 Previous year's figures adjusted due to first-time application of IFRS 9

3 Cost of materials/energy and fuel procurement, other expenses, other taxes

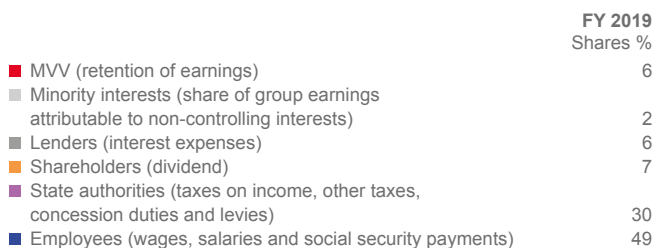
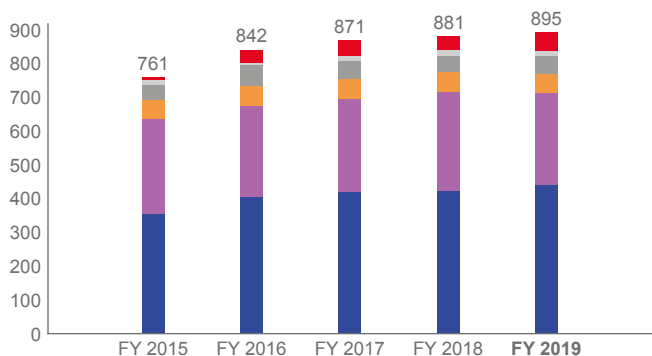
Utilisation of value added

Euro million		FY 2019	FY 2018	+/- change	% change
Recipient	Utilisation				
Employees	Wages, salaries and social security payments	438	422	+ 16	+ 4
State authorities	Taxes on income, other taxes, concession duties and levies	274	294	- 20	- 7
Shareholders	Dividend	59	59	0	0
Lenders	Interest expenses	52	50	+ 2	+ 4
Other shareholders	Share of group earnings attributable to non-controlling interests	17	17	0	0
MVV ¹	Retention of earnings	88	39	+ 16	+ 41
		895	881	+ 14	+ 2

¹ Previous year's figures adjusted

Allocation of value added

Euro million



The figures presented in the value added statement reflect fundamental trends. The value added statement for the 2019 financial year shows we were able to increase our net value added despite a slight reduction in sales and a high volume of investments – a result of our diversified business portfolio.

We also present the uses to which this value added is put. We enabled our shareholders to participate stably in the value added we created, and that although the trend towards low returns on capital seen in recent years has persisted. The high distribution quota, corresponding to 61 % of adjusted annual net income after minority interests, clearly demonstrates our commitment to long-term continuity in our dividend payment. Just under a third of our value added benefits state authorities in forms including taxes and concession duties. Part of this sum is paid to the City of Mannheim on top of the dividend payments it receives as majority shareholder. The largest share of our value added is attributable to our employees. The slight year-on-year increase here is due to the higher number of employees, as well as to pay rises on a scale customary to the sector. 🌐 **GRI 201-1**

LOCAL COMMUNITIES

In dialogue with stakeholders

We operate at a variety of locations and in diverse business fields and therefore come into contact with the interests of numerous, often heterogeneous groups of stakeholders. Our shareholders, employees and customers are among our most important stakeholders, as are government and political representatives. Other major stakeholders include non-government organisations (NGOs), analysts, local residents at our locations, the media, associations and suppliers. These are joined by cooperation partners, business partners and research institutes. 🌐 **GRI 102-40**

Our aim is to communicate transparently and openly with our stakeholders.

We attach great value to maintaining an open and transparent dialogue with our stakeholders, and that both in our one-to-one contacts and in the publications on our websites, in press releases, on social networks and in specialist formats such as analysts and press conferences. We take part in public discussions and other events, such as specialist energy industry conferences and public information events. 🌐 **GRI 102-43**

We play an active role in the relevant bodies, associations and networks, participate in research projects and take part in the public debate focusing on the transformation of the energy system. Via our membership in industry associations, we participate in energy policy and energy industry discussions. We are members, for example, in the following associations relevant to the areas in which we operate: Bundesverband der Energie- und Wasserwirtschaft e. V. (BDEW), Verband kommunaler Unternehmen e. V. (VKU), Energieeffizienzverband für Wärme, Kälte und KWK e. V. (AGFW), Bundesverband Neue Energiewirtschaft e. V. (BNE), Bundesverband WindEnergie e. V. (BWE) and Bundesverband deutscher Wohnungs- und Immobilienunternehmen (GdW). Not only that, our subsidiaries and shareholdings on location are involved in local initiatives and networks. Apart from membership fees and project contributions, we do not make payments to associations or other institutions.

We occasionally finance studies and surveys on matters relating to the energy industry. These are published and our involvement is suitably signalled. We commissioned the Wuppertal Institute to compile an energy framework study for Mannheim in order to illustrate the transformation processes that will be triggered as we head for climate neutrality across all sectors. The study should show how existing energy infrastructures and services can contribute to the electricity, heating energy and transport turnarounds and indicate which new infrastructure measures will be needed for Mannheim to achieve its ambitious climate protection targets. We expect results at the end of 2020. In the year under report, Kiel began implementing the climate protection masterplan developed in 2018. We too were involved in the compilation of this plan.

🌐 **GRI 102-12** 🌐 **GRI 102-13**

We have the responsibility to use our resources to promote the conversion in the energy system to provide a more sustainable and efficient energy supply. Acceptance by local populations is crucial for many projects aimed at expanding renewable energies and the infrastructure needed for these.

Constructing new generation plants, extensively converting and expanding the electricity grid and implementing far-reaching modernisation projects for existing plants – all these measures change the local environment and often involve restrictions for local residents.

We already give systematic and comprehensive consideration to these challenges when selecting suitable locations. Our companies weigh up the conservation, economic and social aspects on a decentralised basis on location for each individual case. In the project planning stage, they perform environmental compatibility audits in accordance with approval requirements. These deal, for example, with emissions loads, conservation requirements and immission protection. Not only that, they also look into the potential implications of the projects for the surrounding countryside or for architectural and natural monuments. The results of these analyses are mostly published.

Various authorities and project partners are involved in the approval process. We actively involve residents, local clubs, associations and citizen's initiatives, and that to an extent that goes beyond minimum legal requirements. Our companies provide information about projects, for example in their general press work and on their respective homepages. Representatives of our companies attend information events and are on hand to answer any questions. These activities are important for ensuring the necessary degree of acceptance among local residents. Particularly for infrastructure projects, such as onshore wind turbines, we have observed growing resistance to the associated interventions in the natural world and changes to the appearance of the countryside. The best way to counter concerns and reservations is to enter into face-to-face dialogue.

In view of this, in the 2019 financial year we were once again actively involved in planning and implementing projects together with local populations and their representatives on location, promoting acceptance for these projects on the basis of dialogue and reaching decisions that also convince third parties. We perform these measures on a project-by-project basis. We do not collect any quantitative data on the measures we take to involve local stakeholders, the evaluation of implications or the subsidy programmes implemented.

All our existing generation plants continually benefit from technical supervision in accordance with legal requirements. Should any interruption to operations arise that could affect local populations, we proactively and quickly inform all affected parties. Here, all companies have routine processes in place to protect the safety of local communities. 🌐 **GRI 413-1**

SOCIETY

Regional focuses

At the same time, the companies within our Group support local and regional projects, especially in the fields of social welfare, education, science, culture and sport. One key focus is on promoting upcoming talent and young people. Based on shared values, the specific structure and scope of regional social commitment is organised on a decentralised basis. Staff on location are familiar with local needs, have contacts to local projects and determine the priorities they would like to address with their activities. In most cases, the support provided is financial, taking the form of donations or sponsoring.

We are committed to the social environment in which we operate.

At MVV Energie, the Sponsoring Fund represents one key example of its commitment. Twice a year, this provides financial support to clubs, organisations and institutions in Mannheim and the Rhine-Neckar metropolitan region. The new Kunsthalle art gallery in Mannheim holds MVV Art Evenings with free entry every first Wednesday in the month. With its "Heart and Soul for Your Project!" sponsorship contest, Energieversorgung Offenbach supports regional clubs and organisations. Stadtwerke Kiel has partnered Camp 24/7, in which around 6,000 children and young people a year learn how to sail and the only project of its kind in Germany, since 2002 already. 🌐 **MVV-11**

Further Information

About this Report

In our 2019 Sustainability Report, we have documented information about sustainability at MVV in accordance with the Sustainability Reporting Guidelines of the Global Reporting Initiative (GRI) in the GRI Standards version.

The listed company MVV Energie AG, which has its legal domicile in Mannheim, is the parent company of MVV. It has its own operations and also directly and indirectly holds shares in those companies which belong to the Group. As a stock corporation under German law, it has three governing bodies: the Annual General Meeting, the Supervisory Board and the Executive Board. 🌐 **GRI 102-5** Information about the areas of responsibility and modes of operation of the Executive and Supervisory Boards of MVV Energie AG can be found in the Corporate Governance Report 📄 www.mvv.de/CGe.pdf. 🌐 **GRI 102-18** Including MVV Energie AG, the MVV Group comprises a total of 165 fully consolidated companies and 36 companies that are recognised at equity. The largest locations of our group of companies are in Mannheim, Kiel, Offenbach and Wörrstadt. We are also present in more than 20 countries. Alongside Germany, these particularly include the United Kingdom and the Czech Republic. 📄 www.mvv.de/GB2019.pdf, Page 100
🌐 **GRI 102-1** 🌐 **GRI 102-3** 🌐 **GRI 102-4**
🌐 **GRI 102-7** 🌐 **GRI 102-45**






With around 6,100 employees, MVV is one of Germany's leading energy companies. Our activities focus on providing a reliable, economical and environmentally-friendly supply of energy to our industrial, commercial and private household customers. Their individual needs and expectations motivate us in developing innovative products and business models. Here, we cover all major stages of the energy value chain: from energy generation, energy trading, energy distribution via proprietary distribution grid companies through to sales activities for energy solutions and our environmental energy business. We also produce and distribute water. Renewable energies are a particular focus of our business model. Here, our activities include project development and operations management for windfarms and solar parks, as well as biomass power plants. 🌐 **GRI 102-6**


We manage MVV in five segments on which we also base our external reporting. Various business fields are allocated to the reporting segments. The **Customer Solutions** reporting segment comprises the business fields of Commodities, Retail and Business Customers. The Environmental Energy, Wind/Biomethane and Project Development business fields are allocated to the **New Energies** reporting segment. Alongside the Combined Heat and Power business field, the **Supply Reliability** reporting segment also includes the Grids business field. The **Strategic Investments** reporting segment mainly consists of Köthen Energie and MVV Energie CZ, as well as the at-equity result of Stadtwerke Ingolstadt. We pool our shared service companies and cross-divisional functions in the **Other Activities** reporting segment. Our shared service companies perform metering, billing and IT services for the Group. 🌐 **GRI 102-2**

Unless otherwise stated, the information provided refers to our 2019 financial year (1 October 2018 to 30 September 2019). 🌐 **GRI 102-50**

This report has been compiled in accordance with the "Core" option of the GRI Standards. 🌐 **GRI 102-54** In our GRI Content Index 📄 **Pages 54 – 56** we list both the material topics for our Group and associated topic-specific disclosures for GRI. We also publish proprietary topic-specific disclosures. The page references in the index all refer to this 2019 Sustainability Report, which we published on 25 February 2020. Our previous Sustainability Report, which also complied with the "Core" option of the GRI Standards, formed one component of our 2018 Annual Report, which we published on 11 December 2018. 🌐 **GRI 102-51** In the previous year, the Sustainability Report and the associated Combined Non-Financial Declaration were included in the Annual Report. In the GRI Content Index, we indicated which reporting contents were subject to an external audit. In the year under report, the information contained in the Sustainability Report was not subject to any external audit. By contrast, our Combined Non-Financial Declaration published in our 2019 Annual Report was externally audited. Information on the various concerns has been included in this Sustainability Report. The scope of external assurance therefore did not differ to any material extent between 2018 and 2019 🌐 **GRI 102-56**
📄 www.mvv.de/GB2019.pdf, Page 187

Within this report, indications and references are denoted as follows:


-  Reference to other information contained in this report.
-  Reference to other information on the internet.
-  **GRI** Reference to a sentence or paragraph that contains disclosures in accordance with the Sustainability Report Guidelines of the Global Reporting Initiative.
-  **GRI** If underlined, the reference indicates a section.
-  Externally audited.

Unless we indicate otherwise, the information refers to MVV, i.e. to all fully consolidated companies. In our sustainability reporting, we publish additional data about our at-equity shareholdings as our stakeholders rightly expect a high degree of transparency from us. Most of the energy we generated conventionally in the 2019 financial year, for example, came from the large power plant in Mannheim (Grosskraftwerk Mannheim – GKM) and from the joint power plant since decommissioned in Kiel (Gemeinschaftskraftwerk Kiel – GKK), both of which we consolidate using the equity method, or did so through to decommissioning.  **GRI 102-45**

For select topics, we focus on our largest locations of Mannheim, Offenbach, Kiel and Wörrstadt. Unless stated otherwise in the comments on the various indicators, our reporting focuses on those markets and regions in which we primarily operate. These are Germany, the UK and the Czech Republic. Most of our suppliers and partners are also located in these regions.  **GRI 102-6**




We compile our greenhouse gas balance sheet on the basis of the Greenhouse Gas Protocol. The overwhelming share of the CO₂ emissions we report comes from plants governed by the emissions trading system (ETS) and is therefore certified. We collect further data with the assistance of various internal and external systems. Among others, these include energy audits and energy management systems, occupational health and safety systems such as OHSAS 18001, environmental management systems such as EMAS and compliance management systems.


In the following table, we show how our material topics changed compared with the previous year and explain the changes made.

Material sustainability topics 2019	Material sustainability topics 2018	Changes on previous year  GRI 102-49
System Change <ul style="list-style-type: none"> • Supply Reliability • Sector Coupling • Changed Energy Demand 	System Change <ul style="list-style-type: none"> • Secure Energy Supply • Sector Coupling • Changed Energy Demand 	Supply Reliability (designation adapted in line with Non-Financial Declaration)
Decarbonisation and Energy Turnaround <ul style="list-style-type: none"> • Climate Protection • Renewable Energies • Energy Efficiency 	Decarbonisation and Energy Turnaround <ul style="list-style-type: none"> • Climate Protection • Renewable Energies • Energy Efficiency 	–
Resource Efficiency and Local Environmental Protection	Resource Efficiency and Local Environmental Protection	–
Digital Transformation <ul style="list-style-type: none"> • Industry 4.0: Changed Patterns of Consumption and Customer Relationships • Individual Customer Solutions • Information Security and Data Protection 	Digital Transformation <ul style="list-style-type: none"> • Industry 4.0: Changed Patterns of Consumption and Customer Relationships • Individual Customer Solutions • Information Security and Data Protection 	–
Employee Concerns	Employee Concerns	–
Social Commitment	Social Responsibility	Social Commitment (designation adapted in line with Non-Financial Declaration)

 **GRI 102-49**

GRI Content Index GRI 102-55

GRI Standard	Designation	Page	Notes	External assurance ¹  GRI 102-56
Foundation				
GRI 101: Foundation 2016				
GRI 102: General Disclosures 2016				
Organisational profile				
102-1	Name of the organisation	52		FSA
102-2	Activities, brands, products and services	52		FSA
102-3	Location of headquarters	52		FSA
102-4	Location of operations	52		FSA
102-5	Ownership and legal form	52	 www.mvv.de/shareholderstructure	
102-6	Markets served	52, 53		FSA
102-7	Scale of the organisation	52		FSA
102-8	Information on employees and other workers	41		
102-9	Supply chain	14		
102-10	Significant changes to the organisation and its supply chain	–	None	
102-11	Precautionary principle or approach	–	Given our strategy, we account for the precautionary approach towards dealing with potentially negative implications for the environment.	
102-12	External initiatives	50		
102-13	Membership of associations	50		
Strategy				
102-14	Statement from senior decision-maker	2-3		
Ethics and integrity				
102-16	Values, principles, standards and norms of behaviour	6 – 7, 15 – 16		ISAE 3000 (revised)
Governance				
102-18	Governance structure	8		ISAE 3000 (revised)
		–	 www.mvv.de/GB2019.pdf , Pages 173 – 180	FSA
		52		
Stakeholder engagement				
102-40	List of stakeholder groups	50		ISAE 3000 (revised)
102-41	Collective bargaining agreements	–	73 % of our employees in Germany are employed at companies that have concluded collective bargaining agreements.	
102-42	Identifying and selecting stakeholders	8		
102-43	Approach to stakeholder engagement	8		
		50 – 51		ISAE 3000 (revised)
102-44	Key topics and concerns raised	8, 9	Key stakeholder concerns are dealt with in greater detail under Material Topics (Pages 27 – 59).	

GRI Standard	Designation	Page	Notes	External assurance ¹ GRI 102-56
Reporting practice				
102-45	Entities included in the consolidated financial statements	52, 53	 www.mvv.de/GB2019.pdf , Page 100	FSA
102-46	Defining reporting content and topic boundaries	9	Supplementary information on Pages 17 – 19	
102-47	List of material topics	10, 11		
102-48	Restatements of information	53	None	
102-49	Changes in reporting	53		
102-50	Reporting period	53		
102-51	Date of most recent report	52		
102-52	Reporting cycle	–	Annual	
102-53	Contact point for questions regarding the report	59		
102-54	Claims of reporting in accordance with the GRI Standards	52		
102-55	GRI content index	54 – 56		
102-56	External assurance	52		
GRI 103: Management approach 2016				
103-1	Explanation of the material topic and its boundary	9		
103-2	The management approach and its components	17, 23, 33, 37, 41, 47		
103-3	Evaluation of the management approach	17, 23, 33, 37, 41, 47		
Specific standard disclosures on material topics				
Material topic: System Change				
<i>Specific disclosures</i>				
MVV-1	Diversified generation portfolio	18		
GRI 203-1 2016	Infrastructure investments and services supported	19		
MVV-2	Sector coupling	20		
MVV-3	Changed energy demand	22		
Material topic: Decarbonisation and Energy Turnaround				
<i>Specific disclosures</i>				
GRI 302-5 2016	Reductions in energy requirements	32		
GRI 305-1 2016	Direct (Scope 1) GHG emissions	27		ISAE 3000 (revised)
GRI 305-2 2016	Energy indirect (Scope 2) GHG emissions	27		ISAE 3000 (revised)
GRI 305-3 2016	Other indirect (Scope 3) GHG emissions	27		ISAE 3000 (revised)
GRI 305-5 2016	Reduction of GHG emissions	28		
MVV-4	Installed renewable energies capacities	30		ISAE 3000 (revised)
MVV-5	Concluded development of new renewable energies plants	30		ISAE 3000 (revised)
MVV-6	Grid losses	32		

GRI Standard	Designation	Page	Notes	External assurance ¹ GRI 102-56
Material topic: Resource Efficiency and Local Environmental Protection				
Specific disclosures				
GRI 301-1 2016	Materials used	35		
GRI 305-7 2016	Nitrogen oxides (NO _x), sulphur oxides (SO _x) and other significant air emissions	36		
Material topic: Digital Transformation				
Specific disclosures				
MVV-7	Changed patterns of consumption and customer relationships	38		
MVV-8	Individual customer solutions	39		
MVV-9	Information security and data protection	40		
Material topic: Employee Concerns				
Specific disclosures				
GRI 403-1 2016	Worker participation, consultation and communication on occupational health and safety	41		
GRI 403-2 2016	Occupational health and safety	46 – 47		
GRI 404-2 2016	Knowledge management	43		ISAE 3000 (revised)
MVV-10	Promoting women	44 – 45		ISAE 3000 (revised)
Material topic: Social Commitment				
Specific disclosures				
GRI 201-1 2016	Direct economic value generated and distributed	49		
GRI 413-1 2016	Local communities	51	No disclosures on scope	
MVV-11	Society	51		

¹ Audit of 2019 consolidated financial statements; www.mvv.de/GB2019.pdf, Pages 181-186
 ISAE 3000 (revised); audited contents of combined non-financial declaration www.mvv.de/GB2019.pdf, Pages 187-188




Progress Report for UN Global Compact

MVV is committed to the ten principles of the UN Global Compact. By way of a progress report, in the following table we link our material sustainability topics to the principles of the UN Global Compact.

Progress report for UN Global Compact		
Principle	Topic	Page
Human rights		
1. Businesses should support and respect the protection of internationally proclaimed human rights.	Human rights policy	7
2. Businesses should make sure that they are not complicit in human rights abuses.	Compliance	6 – 7
Labour		
3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.	Employee concerns – workforce representation	41
4. Businesses should be committed to the elimination of all forms of forced and compulsory labour.	Value chain	14 – 16
5. Businesses should be committed to the effective abolition of child labour.	Value chain	14 – 16
6. Businesses should be committed to the elimination of discrimination in respect of employment and occupation.	Compliance Corporate culture	6 – 7, 42
Environment		
7. Businesses should support a precautionary approach to environmental challenges.	Material Topics	17 – 53
8. Businesses should undertake initiatives to promote greater environmental responsibility.	Material Topics	17 – 53
9. Businesses should encourage the development and diffusion of environmentally-friendly technologies.	Material Topics	17 – 53
Corruption		
10. Businesses should work against corruption in all its forms, including extortion and bribery.	Compliance	6 – 7

UN Sustainable Development Goals (SDG)

In 2015, the United Nations created a basis for jointly tackling global challenges with its “Sustainable Development Goals”, the 17 targets set out in its “2030 Agenda for Sustainable Development”. In 2019, we completed our analysis of the Sustainable Development Goals. With our business activities, we contribute in particular to the following three SDGs:

SDG		Chapter	Content	Page
	Sustainable and modern energy for everyone – securing access to affordable, reliable and up-to-date energy for everyone.	System Change	Supply Reliability	18 – 20
	Sustainable cities and communities – shaping cities and communities to make them inclusive, resilient and sustainable.	Materiality Analysis	Changed Infrastructures and Smart Cities	13
	Take immediate measures to combat climate change and its implications.	Decarbonisation and Energy Turnaround	Climate Protection Renewable Energies Energy Efficiency	23 – 32

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