

Business report

General conditions

Macroeconomic trends

Economies

The global economy slowed down in 2019. The decline in economic growth had an impact on all of the economies relevant to us. The reasons for this slowdown in growth were primarily of a political nature: the trade disputes between the USA and China as well as the EU, uncertainties with respect to the United Kingdom exiting the EU and the threat of military conflict in the Near and Middle East. Structural problems in the automotive industry, which is highly important for the whole economy, also had a negative impact in Germany. In Turkey, the inflow of foreign investment has decreased and the tourism industry has declined due to the increasing political uncertainty.

The economic situation in Europe and Germany is expected to improve slightly in 2020 compared to 2019. This expectation is based on a recovery in foreign demand, primarily from high-growth emerging economies, and easing of the political risks, for example with respect to the trade disputes. The macroeconomic trends are not expected to have a either a particularly positive or negative influence on the business performance of EnBW in 2020.

Development of gross domestic product (GDP)

in %	2020	2019	2018 ¹
World	3.4	3.0	3.6
Eurozone	1.4	1.2	1.9
Germany	1.2	0.5	1.5
France	1.3	1.2	1.7
Sweden	1.5	0.9	2.3
Switzerland	1.3	0.8	2.8
Czech Republic	2.6	2.5	3.0
Turkey	3.0	0.2	2.8

¹ The figures for the previous year have been restated.

Development of interest rates

Although it appeared for a long time that the US Federal Reserve would increase the base interest rate again, there was a reversal in policy in the summer in the USA. The European Central Bank (ECB) continued its expansive monetary policy against the background of an economic slowdown.

The discount rates applied to company pension provisions and nuclear provisions fell further in 2019 so that the present value of the pension obligations of EnBW, in particular, rose due to interest rate-driven reasons.

The consensus forecast for the ECB interest rate on the main refinancing operations remained unchanged at 0.00%.

Development of the sector and competitive situation

Selection of international, national, regional and new competitors

Established competitors		New competitors			
National and international ALPIQ, EDF, EDPR, Enel, Engie, E.ON, Equinor, EVN, Fortum, Iberdrola, Ørsted, RWE, Vattenfall, Verbund	Regional Badenova, Entega, EWE, Mainova, MVV, N-Ergie, SWM, Thüga	Commodity suppliers/solution suppliers/start-ups 1&1, bliss.energy, Deutsche Telekom, Fastned, Kesselheld, Lichtblick, NEXT Kraftwerke, Sonnen, stromio	Renewable Energies BayWa r.e., Encavis, ENERTRAG, PNE Wind, theolia, wpd	Other industries Daimler, Google, Shell, Tesla, VW/Elli	Financial investors Capital Stage, KGAL, Talanx
<ul style="list-style-type: none"> › Main focus on the areas of renewable energies, grids, sales/solutions › Some specialisation amongst international competitors 		<ul style="list-style-type: none"> › Entry of new market participants increases competition and leads to a deconstruction of the value chain › New competitors with strong focus/specialisation on one business field 			

The energy sector is currently experiencing a period of great upheaval. There is particular pressure for change due to the Energiewende. However, digitalisation, sector coupling (Glossary, from p. 139) and the desire of local authorities to become self-sufficient, for example, are also putting the sector under great pressure.

A significant factor is that the energy sector is highly regulated, which means that political policies strongly influence developments in the sector. In particular, this is currently affecting the restructuring of the generation landscape. Most importantly, renewable energies will increase their share of the transport and heating sectors in the long term. The business models of energy supply companies are changing at the same time, while new players from outside the sector are also entering the energy market. This is especially true for the commodity and solutions business. In addition, companies are repositioning themselves along the sector's traditional value chain and specialising in individual business fields.

The RWE subsidiary innogy has been split between E.ON and RWE in a deal that includes asset swaps between the two companies. This is having a major influence on the German and also the European energy market.

Traditional energy supply companies need to re-examine their competitiveness in individual business areas, exploit the potential offered by a changed market environment and align their strategies for the future.

Cross-segment framework conditions

Climate protection

The issue of climate protection is receiving a greater and greater amount of public attention. Clear examples of this can be found in the "Fridays for Future" movement and the results of the European elections.

In Germany, it is anticipated that the national climate targets for 2020 will be missed by a large margin. The climate action package introduced by the German government includes the phase-out of coal power, the introduction of charges for CO₂ emissions in the transport and heating sectors and numerous other measures, such as subsidies to promote electromobility. The aim is to increase the share of gross energy consumption accounted for by renewable energies to 65% by 2030. Despite the new climate protection measures it is, however, still not expected that the 65% target will be achieved – especially in view of the slow expansion of onshore wind energy.

We will continue to advocate the introduction of a minimum CO₂ price in the electricity sector and climate-based reform of the tax, duty and levy systems in order to help steer investment towards climate-friendly technologies.

The EnBW Chief Financial Officer, Thomas Kusterer, is a member of the EU Technical Expert Group on Sustainable Finance (TEG) (Glossary, from p. 139) which is developing a legal framework for sustainable financing opportunities. He is also engaged as a member of the Task Force on Climate-related Financial Disclosures (TCFD) (Glossary, from p. 139) in the development of climate-related risk reporting by companies.

Our strategy of concentrating investment on renewable energies, expanding the grids and developing new and increasingly digitalised business models supports the national climate protection targets and the international efforts for climate protection.

EU Green Deal

The framework conditions for achieving climate neutrality by 2050 are currently being defined at an EU level. At the end of 2018, the European Commission had already presented a revised analysis of possible climate pathways up to 2050. The EU now aims to enshrine the 2050 climate neutrality target, which was announced in its comprehensive Green Deal, into law. In addition, it will continue investigations into the effects of increasing the 2030 climate targets to at least 50% or 55% until autumn 2020 and make corresponding proposals for legislation in 2021. While the climate neutrality target is supported by the European Parliament and all member states except for Poland, and it is, therefore, probable that the legislation will pass quickly, further negotiations on the precise increase to the target for 2030 are expected.

In terms of the framework conditions facing EnBW and other players in the energy industry, further measures are expected as part of the Green Deal in future, such as a revision of the financial instruments and capital market guidelines as well as regulations and measures to decarbonise the gas and transport sectors.

Coal Commission

On 26 January 2019, the Coal Commission presented its final report, on the basis of which the Federal Government prepared a draft law and adopted it in the Federal Cabinet at the end of January 2020. This Act recommends the end of coal-fired power generation in Germany by 2038. German brown and hard coal capacities in the energy industry should be reduced to 15 GW each by 2022 (currently around 42 GW in total) and then to 17 GW in total by 2030. Incentives for the decommissioning of coal power plants should also be created by funding a fuel switch from coal to more climate-friendly energy sources.

The Cabinet decision of the Act deviates from the recommendations of the Coal Commission in some critical points. Due to the "late" decommissioning of brown coal power plants proposed by the law, it is expected that modern hard coal power plants will be removed from the grid relatively early. Negative implications for the operators of hard coal power plants are expected as a result of the intended "early" decommissioning of hard coal capacities without any compensation even for modern power plants.

It is feared that the proposed reform to the Combined Heat and Power Act (KWKG) that was also announced in the legislative package will not deliver sufficient incentives for promoting investment in the conversion of the supply of heating from coal to more climate-friendly fuels. EnBW will advocate that amendments are made to the draft law during the parliamentary process.

Sales segment

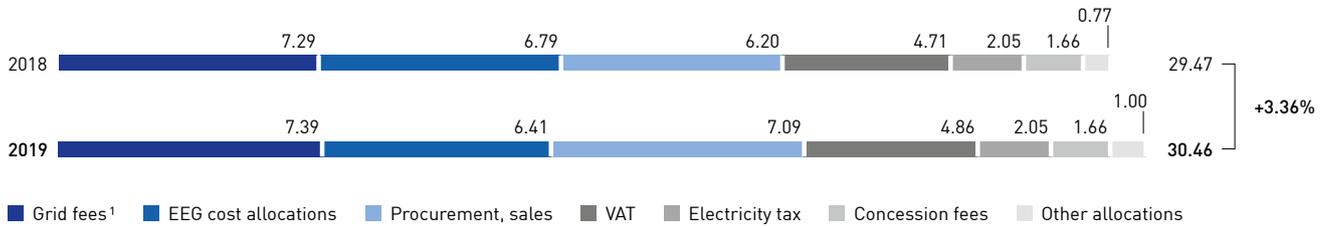
Electricity and gas prices for retail and industrial customers

According to an analysis of electricity prices by the German Association of Energy and Water Industries (BDEW) published in

January 2020, the average monthly electricity bill for a household with an annual consumption of 3,500 kWh in 2019 came to €88.84 compared to €85.94 in the previous year. Taxes and levies account for more than half of this amount. EnBW increased the price for the basic supply of electricity by around €37 per year on 1 January 2019. The reason for this was the increased costs for the procurement of electricity. For industrial customers receiving a medium-voltage supply, the average electricity price including electricity taxes increased according to calculations made by BDEW by 2.6%, from 17.96 ct/kWh in the previous year to 18.43 ct/kWh in 2019.

According to calculations by the German Federal Statistical Office, natural gas prices for private households in 2019 rose by 3.9% compared to the previous year; in contrast, the price of gas for industrial customers fell by 7.5%.

Average electricity price for a 3-person household (annual consumption of 3,500 kWh) in ct/kWh



¹ Including metering and metering station operation.
Source: BDEW | As of January 2020

Structural changes

The Climate Action Programme that was introduced by the German government and passed in October 2019 set a target for the provision of one million charging points for electric vehicles by 2030. This will be achieved with the “**Charging Infrastructure Master Plan**”. It contains measures for quickly establishing a comprehensive and user-friendly charging infrastructure (Glossary, from p. 139) for up to ten million e-cars by 2030. Furthermore, there are plans to simplify the regulations for the installation of charging infrastructure in the Act on the Ownership of Apartments and the Permanent Residential Right (WEG) and in tenancy law. The aim will be to make it obligatory for landlords to tolerate the installation of charging infrastructure.

In addition, the German government has increased the **subsidies for purely electric cars** with a list price of below €40,000 from €4,000 to €6,000. The subsidy increases to €5,000 for more expensive cars up to a limit of €65,000. Additional government subsidies, such as the tax exemptions for electric company cars that are valid from January 2019, create further incentives to purchase these e-cars.

We are engaged in the expansion of the charging infrastructure for household customers and also for commercial and local authority partners. As part of a programme in the Federal State of Baden-Württemberg to establish a **core charging network for electric vehicles in Baden-Württemberg (SAFE)**, a consortium

of 81 partners under our leadership has established a comprehensive charging network for e-cars in Baden-Württemberg based on a grid with a mesh size of 10 km by 10 km (p. 82).

Another goal of the German government is to develop a climate-neutral building stock by 2050. Achieving high levels of **energy efficiency in buildings** is a key factor in this area. The Building Energy Act (GEG), which was passed at the end of 2019, brings together various legal requirements for the energy-related properties of buildings. As a consequence, there will be stricter standards for the installation of oil heating systems from 2026 and related to this, a 40% subsidy for exchanging an oil heating system for a more climate-friendly alternative. In addition, the already existing government subsidies will be increased by 10% and a tax incentive to subsidise energy-related renovation measures of 20% of the investment costs will be introduced in 2020. Many new buildings actually already meet these stricter energy-related requirements. Due to the lower heating demands in these buildings, heat pumps can be used as an energy-efficient form of heating and their use in new buildings has been increasing for a number of years. It is also possible to improve the energy efficiency of existing buildings by replacing the heating system. Due to the age structure of heating systems, this replacement rate is set to increase in the coming years. The replacement of a heating system is often also accompanied by a switch in energy source to natural gas, district heating or renewable energy sources. We believe that there are huge opportunities for growth as a result of the dynamics in the heating market.

Grids segment

On 9 July 2019, the German Federal Court of Justice (BGH) decided that the **rates of return on equity for electricity and gas grid operators** for the third regulatory period did not need to be corrected upwards. The Higher Regional Court (OLG) in Düsseldorf had previously annulled the rates of return on equity set by the Federal Network Agency (BNetzA) because they were set too low.

On 10 July 2019, the OLG Düsseldorf annulled the **general sectoral productivity factor (Xgen)** (Glossary, from p. 139) for gas grid operators that was defined by the BNetzA on 21 February 2018. The BNetzA filed an appeal against the judgement with the BGH on 10 October 2019. A decision on the Xgen for electricity grid providers defined by the BNetzA has not yet been handed down by the OLG Düsseldorf.

The reform of the **Grid Expansion Acceleration Act (NABEG 2.0)** was approved on 4 April 2019. The act aims to simplify and accelerate the approval process for the new construction and reinforcement of electricity lines at the high and extra-high voltage level in Germany. EnBW is hoping for improved framework conditions that will allow the transmission system operators (TSO) in particular to implement the urgently required grid expansion measures on time.

On 20 December 2019, the BNetzA completed its examination of the **Network Development Plan Electricity (NDP Electricity)** (Glossary, from p. 139) 2030 that had been drafted by the TSO. The approved NDP will act as the basis for the legally prescribed amendment to the Federal Requirements Plan. An additional HVDC connection (Glossary, from p. 139) to Baden-Württemberg that was planned for the grid area covered by our transmission system operator TransnetBW has been rejected by the regulatory authorities at this point in time as they do not believe that its approval is merited.

Aside from the expansion of the grids, the German TSOs are focussing on other measures to ensure security of supply. This includes an invitation to tender for the construction of 1,200 MW of new power plant capacity as **special technical**

equipment for grids. In the tendering process held by TransnetBW for the construction and operation of a 300 MW power plant in south-western Germany, EnBW had its bid accepted in August 2019. The new power plant will be constructed at the EnBW power plant site in Marbach am Neckar. It will be placed into operation from 1 October 2022 in special emergency situations as a “safety buffer” for the supply of electricity and to support grid stability.

On 5 December 2019, the Federal Network Agency confirmed the framework scenario for the **Network Development Plan Gas (NDP Gas)** (Glossary, from p. 139) 2020 to 2030. For the first time, the framework scenario includes a separate presentation of the forecast for demand in Baden-Württemberg because the need for greater capacity here is growing constantly and the grid operated by our subsidiary terranets bw is heavily used. In comparison to the current demand for capacity, it is anticipated that over 30% more capacity will be required by 2030.

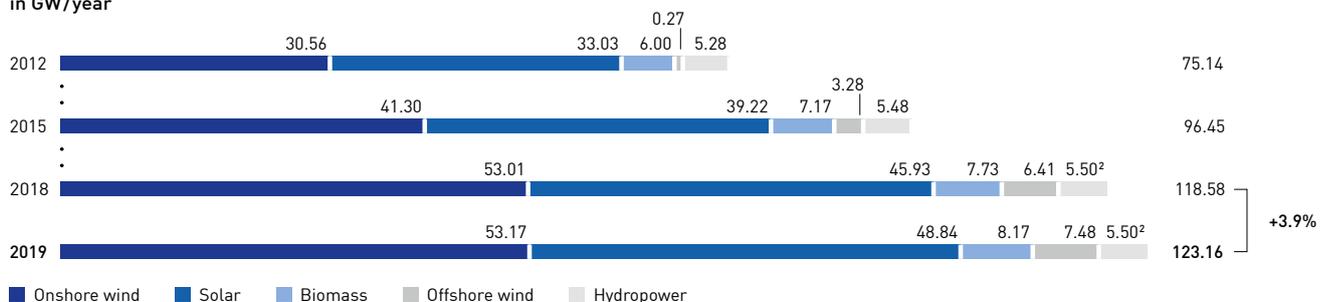
An increasing level of tension is expected overall in the regulated grid business. Investment in the expansion of the grids may reduce the earnings pressure on the grid operators but appropriate returns are necessary in order to continue pushing forward the expansion of the grids and to guarantee the security of supply in Germany. Overall, we anticipate that the grid business of the EnBW grid subsidiaries will be faced with more economically challenging framework conditions in the future.

Renewable Energies segment

Germany

Electricity generation from renewable energies overall in Germany rose significantly in 2019. According to Fraunhofer ISE (www.energy-charts.de) the proportion of total German electricity generation accounted for by renewable energies increased to almost 46% (2018: around 40%). Although there was a small rise in the installed output, this increase in comparison to the previous year is mainly attributable to better weather conditions.

Installed net output for electricity generation from renewable energies in Germany¹
in GW/year



1 The figures for the previous year have been restated.
2 Correction to the value for hydropower from 4.8 GW to 5.50 GW by EnBW.
Source: Fraunhofer ISE (www.energy-charts.de) | As of 03/01/2020

The climate action package introduced by the German government increases the target for the expansion of **offshore wind power plants** in Germany from 15 GW to 20 GW by 2030. We view

this as an important contribution towards achieving the climate targets and an opportunity for us to expand our offshore wind

portfolio beyond the projects we already have in operation and those currently under development.

In 2019, the growth in **onshore wind power capacity** slowed considerably due to the difficult approval conditions. Only around 700 MW of new output was placed into operation, which is around 75% less than in 2018. In the auctions held in 2019, only about half of the output available in the auctions was covered by projects. We were also considerably impacted by this development. In order to achieve the target of 65% generation from renewable energies by 2030, around 4,000 MW of new output will need to be added every year. The climate action package passed by the German government in December 2019 is not expected to accelerate the current slow expansion in onshore wind energy but will instead make this expansion more difficult due to the planned uniform minimum distance regulations. EnBW is campaigning strongly for an improvement in the approval conditions.

Due to the elimination of the 52 GW funding cap and progressively lower costs for PV modules, we anticipate that the **photovoltaic output** in Germany will continue to expand at an increasing rate. The construction of the Weesow-Willmersdorf solar park by EnBW – one of the first major projects without funding in Germany – demonstrates that photovoltaics have now also become economically viable here. The high appeal and availability of open-field photovoltaic plants in Germany was demonstrated by the fact that the auctions in 2019 were significantly oversubscribed.

France

We successfully entered the French market for renewable energies with the acquisition of Valeco in 2019. We expect dynamic growth in renewable energies in France, both in the wind power and photovoltaic sectors. The framework conditions in France, which are mainly centred around auction-based invitations to tender, guarantee continued and reliable funding for renewable energies.

Sweden

Sweden offers very favourable conditions and a competitive environment for renewable energies. In particular, onshore wind energy will play an increasingly important role on the Swedish generation market in the next few years. Since our entry onto the market in 2018, we have consistently expanded our wind power portfolio. The quota-based funding system for renewable energies that currently exists in Sweden means that power plants primarily generate their revenues on the electricity market. The sale of CO₂ allowances (Glossary, from p. 139) could be an additional source of revenue.

Turkey

The current funding mechanism in Turkey for the generation of electricity from renewable sources is valid for power plants that are placed into operation up until the end of 2020. Funding for

all other power plants has been switched over to an auction-based system. Under this new system, a total of around 1,000 MW of onshore wind capacity will be awarded, for example, in 2019. We are expanding the wind power portfolio of our joint venture with our Turkish partner Borusan with two projects that are currently under construction. These wind power plants are due to be completed in 2020. We still believe that the Turkish market is an attractive proposition for the future, although we are monitoring the current political and economic developments in Turkey very closely.

Generation and Trading segment

Electricity wholesale market

Despite the significantly higher prices for CO₂ allowances (Glossary, from p. 139), the average spot market price (Glossary, from p. 139) in 2019 was around €7/MWh below the level in 2018. It is important to note in this context that the second half of 2018 was characterised by a sharp increase in prices due to low water levels and the associated bottlenecks in the supply of coal. In contrast, the average price on the forward market (Glossary, from p. 139) in 2019 was around €4/MWh higher than the average price in the previous year due to the increase in CO₂ prices.

Forward market prices (Glossary, from p. 139) reflect the expectation that prices will continue to increase. The reasons for this are the phasing out of nuclear power and the expected decommissioning of coal power plants. A decisive factor for the future development of electricity prices will be the development of fuel and CO₂ prices and the trends in the electricity generation mix.

Development of prices for electricity (EPEX), base load product

in €/MWh	Average 2019	Average 2018
Spot	37.67	44.47
Rolling front year price	47.79	43.84

Gas market

The spot market price (Glossary, from p. 139) fell considerably in 2019. On the one hand, the global supply of liquefied natural gas (LNG) increased due to new production facilities in the USA and Australia, which led to a noticeable increase in LNG deliveries to north-west Europe, while on the other hand, above-average temperatures led to a much lower demand for heating. The fall in prices on the spot market also had an impact on annual prices.

Negotiations on a new gas transit contract between Russia and the Ukraine will be very significant for the further development of gas prices. In addition, it is possible that the LNG supply to Europe will increase further due to the commissioning of additional LNG facilities in the USA.

Development of prices for natural gas on the TTF (Dutch wholesale market)

in €/MWh	Average 2019	Average 2018
Spot	13.51	22.98
Rolling front year price	18.19	20.70

Oil market

Crude oil prices increased from US\$55/bbl to US\$75/bbl during the course of 2019. Production cuts by OPEC and some non-OPEC countries such as Russia eliminated the oversupply on the global market and supported prices. The conflict between Iran and the USA, combined with the threat made by Iran to block the Strait of Hormuz which is important to the oil trade, and the drone and rocket attacks on important oil facilities in Saudi Arabia also contributed to the higher prices. In contrast, concerns about the global economy and thus the demand for oil also had an effect on the development of the market in 2019. In this context, oil prices were negatively influenced, in particular, by the ongoing trade dispute between the USA and China.

Forward market prices are reflecting the expectation that prices will continue to fall. This expectation is due to fears of an excess supply on the oil market because of, amongst other things, the sharp rise in oil production in non-OPEC countries and lingering concerns regarding the economy and the associated fall in global demand for oil. However, there is also great potential for prices to spike if the ongoing conflict between Iran and the USA and Saudi Arabia escalates in the future.

Development of prices on the oil markets

in US\$/bbl	Average 2019	Average 2018
Crude oil (Brent) front month (daily quotes)	64.16	71.69
Crude oil (Brent), rolling front year price (daily quotes)	61.31	68.94

Coal market

Both the front year price and the spot market price fell significantly during the course of 2019. The main reasons for this fall in prices were the oversupplied global market and the considerable decrease in demand in Europe. In Europe, coal-fired electricity generation is being replaced to a large extent by renewable energies and often by cheaper gas-fired electricity generation due to the very low gas prices and relatively high emission allowance prices. In addition, China introduced restrictions on imported coal in the fourth quarter of 2019.

If the described trends continue, coal prices on both the spot market and the forward market (Glossary, from p. 139) will remain under pressure. As by far the largest consumer of coal in the world, China has a dominant influence on the international coal market. The increasing expansion of domestic coal production in China will continue to have a significant effect on coal imports into the country and thus on the global market.

Development of prices on the coal markets

in US\$/t	Average 2019	Average 2018
Coal – API #2 rolling front year price	69.54	87.03
Coal – API #2 spot market price	60.75	91.91

CO₂ allowances

Under the European emissions trading system, proof must be provided of the correct number of CO₂ allowances (Glossary, from p. 139) for the corresponding CO₂ emissions from power plants. The reduction in supply (so-called market stability reserve, MSR) for emissions allowances agreed in 2018 resulted in a further increase in the price for EUA certificates (Glossary, from p. 139) in 2019. The number of certificates available in 2019 was reduced by around 400 million, which was almost 50% less.

Further increases in the prices for EUA certificates are expected in the next few years. The largest driver of prices will continue to be the reduction in supply via the MSR.

Development of prices for emission allowances/daily quotes

in €/t CO ₂	Average 2019	Average 2018
EUA – rolling front year price	24.88	15.62
CER – rolling front year price	0.21	0.24

Nuclear power

The coalition agreement of the German government sets out the framework for current nuclear power policy. The main targets are the retention of specialist personnel and expertise, quick progress in the search for a final storage site for highly radioactive waste (by 2031) and the rapid commissioning of the final storage site for low- and medium-level radioactive waste (2027 according to the current plans). This should prevent the intermediate storage at the power plant sites becoming, to all intents and purposes, the final storage sites. On the basis of a ruling by the German Federal Constitutional Court from 6 December 2016, operators of nuclear power plants should receive compensation payments for investment in the period between the decision to extend the lives of the nuclear power plants (28 October 2010) and the reversal of this decision (from 16 March 2011), as well as for residual volumes of electricity remaining at power plants that can no longer be distributed. On the basis of the public law contract according to the Act for the Reorganisation of Responsibility in Nuclear Waste Management, EnBW has submitted an application for the approval of the return transport of radioactive waste from the reprocessing centre in France to the intermediate storage site at the Philippsburg nuclear power plant. A precise date for the transport has still not been agreed. On the basis of the same public law, the intermediate storage facility for highly radioactive waste was handed over to the German government on 1 January 2019. The waste storage facilities for low- and medium-level radioactive waste will follow on 1 January 2020. The authorisation to operate the Philippsburg 2 nuclear power plant for the purpose of generating power expired on 31 December 2019.