Bundesnetzagentur

Annual Report 2019

Networks for the digital world

Bundesnetzagentur Strategic Plan 2020

The Bundesnetzagentur is required under section 122(2) of the Telecommunications Act (TKG) to include a strategic plan in its Annual Report, listing matters of legal and economic policy in telecommunications to be addressed by the Bundesnetzagentur in the current year. In addition, the Bundesnetzagentur includes all its main projects in all its fields of activity in which issues of fundamental importance are expected in 2020.

The strategic plan can be found at
www.bundesnetzagentur.de/vorhabenplan

Greater competition and transparency in the markets for energy, telecommunications, railways and post strengthen Germany's industrial competitiveness and make it more attractive as a place to do business. The consumers profit from this as well. Through its decisions, the Bundesnetzagentur ensures fair competition among the providers in the energy and telecommunications markets. It also promotes continued development of competition in the post and railway sectors.

In order to prevent congestion, the networks must be expanded. For instance the energy transition requires a comprehensive modification of our electricity supply system, and the rapid development of the telecommunications market necessitates a constant expansion of the communication networks. The Bundesnetzagentur makes sure that companies can invest in their networks so that Germany has, and will continue to have, a modern, efficient infrastructure.

Competition adds options. The multitude of products, however, makes the market more complex. Here the Bundesnetzagentur facilitates the dialogue between the companies and the consumers, ensuring that customers' rights are safeguarded. The Bundesnetzagentur is an independent, competent point of contact in the energy, telecommunications and postal sectors.

The president and vice-presidents of the Bundesnetzagentur
Dr. Wilhelm Eschweiler, Jochen Homann and Peter Franke (from left to right)

»The Bundesnetzagentur fosters corporate investments in telecommunications networks to make them fit for the future.«

Dear Reader,

The Bundesnetzagentur's work addresses key economic and social issues. Infrastructure and the provision of vital services are the focus of politics. Efficient networks are essential for people in Germany, and they secure the country's future as an attractive business location.

As an independent regulatory authority, the Bundesnetzagentur fosters corporate investments in telecommunications networks to make them fit for the future. In this way, the Bundesnetzagentur is laying the groundwork for Germany's digitisation. The conclusion of the spectrum auction once again attracted much public attention to us. Spectrum totalling 420 MHz in the 2 GHz and the 3.6 GHz bands was auctioned for an overall sum of €6,549,651,000. The Bundesnetzagentur provides additional spectrum in the 3700 to 3800 MHz band for local broadband networks – a special innovation with the objective that the new 5G mobile communication standard can reach its full potential in trade and industry, too.

We have also taken important steps forward regarding the general conditions for broadband expansion in the landline network. With the market definition and analysis for the "last mile" and the beginning of the process for the regulatory order, the regulatory framework for fibre connections has taken shape. Rather than superimposing existing copper-network regulation as-is onto new fibre-optic lines, the intention is to implement targeted regulation whilst keeping it to the minimum necessary.

The number of complaints about unsolicited marketing calls declined over the last year from around 62,200 to around 57,600. At the same time, the Bundesnetzagentur continues to take action against companies operating unfairly. In 2019 it imposed fines totalling €1.3m. Compared with the previous year, there was a slight increase in the number of complaints and inquiries regarding telephone number misuse, with around 125.500 written complaints and inquiries. As part of its efforts to combat this problem, the Bundesnetzagentur cut off around 530 telephone numbers and issued bans on billing and collection to around 6,700 telephone numbers. The new consumer protection requirements for customer payment via mobile phone bill will be particularly important. The determination prevents the notorious "subscription traps" while also taking the market participants' interests into account by enabling innovative payment models.

Our market monitoring staff in our regional offices and locations throughout Germany has withdrawn a number of devices from the market. Our radio monitoring and inspection service has eliminated numerous radio disturbances in rural areas and conducted coverage measurements to check the current mobile coverage status. Furthermore, we have developed a new calculation method for 5G, and our radio monitoring and inspection service has developed a 5G measuring method that is ready for implementation and enables quick testing of base station sites for electromagnetic compatibility.

»In the energy sector we continue to make our contribution to the success of the energy transition and we are closely following the restructuring of the energy landscape.«

In the energy sector, we continue to make our contribution to the success of the energy transition and we are closely following the restructuring of the energy landscape. Amidst the remodelling of the generation structure, the expansion of the electricity networks remains an urgent matter. Here we are making great progress.

Nearly all of the large network expansion projects of the Federal Requirements Plan Act (BBPlG) are in advanced planning phases. At the end of the third quarter of 2019, 881 km of lines from the Power Grid Expansion Act (EnLAG) had been completed. By the end of the third quarter of 2019, there were about 2,505 km of lines from the Federal Requirements Plan Act (BBPlG) in the spatial planning or federal sectoral planning procedures, about 1,680 km about to be or in the planning approval or notification procedures, and 361 km of lines had been completed.

In spite of all the changes, we noted that supply interruptions have remained at a low level. In the few instances where we identified unusual occurrences in the energy market, our ruling chambers and our market transparency unit reacted promptly, launched investigations and further improved the market design.

In December we approved the scenario framework for the gas NDP. Here green gases and the lively discussion about the use of hydrogen in the energy system are playing an increasingly prominent role.

About 19,000 queries and complaints were sent to the Bundesnetzagentur's energy consumer advice service last year. Key consumer concerns were billing, price increases, delays in switching supplier and contractual disputes. The Bundesnetzagentur worked together with the PTB (Physikalisch-Technische Bundesanstalt – National Metrology Institute) to add public keys to the charging stations map. Public keys allow users of charging points to check remote readings for accuracy.

In 2019, essential groundwork was laid in the postal sector. For example, as part of the price cap decision, we set the parameters for letter price increases until 2021, and subsequently we approved the Deutsche Post letter prices. For the approval we took the recent amendment to the charges regulation into account. Further changes are also emerging regarding future postal regulation through a fundamental revision of the Postal Act, which is now 20 years old.

In the rail sector the Bundesnetzagentur approved, among other things, the 2020 track access charges, DB Netz AG's incentive system and the station charges. In conducting the review for competitiveness in the area of maintenance, we consulted the market about our assessment of appropriate regulation. We had to reject several of DB Netz AG's planned changes to its network statements for the 2020/21 timetable. DB Netz AG had allowed itself too much leeway and some of its planned arrangements were vague.

This annual report testifies to the diversity of the Bundesnetzagentur's work – and gives an idea in many instances of the work that lies ahead for us. I hope you find it a pleasant read!

Jochen Homann
Präsident of the Bundesnetzagentur

»Further changes are also emerging regarding future postal regulation through a fundamental revision of the Postal Act, which is now 20 years old.«

ENERGY

Restructuring the energy supply

The energy transition is making progress. As in previous years, the proportion of conventionally generated electricity is shrinking, while the share of electricity generated from renewable sources is growing. The Bundesnetzagentur has focused its activities on the expansion and upgrade of the necessary infrastructure and the required adjustment of the regulatory framework conditions.

Content

The authority has confirmed the electricity network development plan (NDP) 2019-2030 with 114 network expansion measures. There is a need for additional measures covering a total of 3,550 kilometres of transmission routes compared with the Federal Requirements Plan Act (BBPlG).

The total length of plans in the BBPlG is currently about 5,827 km. By the end of the third quarter of 2019, there were about 2,505 km of lines in the spatial planning or federal sectoral planning procedures, about 1,680 km in the planning approval or notification procedures, and 361 km of lines had been completed.

The Bundesnetzagentur published an overall report on the status and expansion of the distribution systems for the first time in 2019, which was compiled from the reports submitted by the high-voltage network operators.

Market watch

The rise in electricity from renewables was rather less steep in 2018, but even so, 37% of domestic gross electricity consumption was generated from renewable energy – a record high.

In 2018, households were able to choose between an average of 143 electricity suppliers and 104 gas suppliers in each network area. Around 4.7m household customers switched electricity supplier and about 1.5m switched gas supplier in 2018.

Development of conventional and renewable energy

The energy transition continues to make progress. As in previous years, conventionally generated electricity is losing ground to electricity from renewable sources. The increase in electricity from renewables was smaller in 2018, partly because of the decline in new build projects, but even so, 37% of domestic gross electricity consumption was generated from renewable energy – a record high. This was due particularly to solar power, which saw records in the number of hours of sunshine and global radiation. Moreover, the 2.9 GW increase in photovoltaic (PV) installations surpassed the government's expansion target of 2.5 GW (gross). The construction of new onshore and offshore wind turbines, meanwhile, eased off somewhat and, at 2.5 GW, missed the expansion target of 2.8 GW (gross).

Despite the increase in electricity generated by installations receiving payments under the Renewable Energy Sources Act (EEG), the total amount of EEG payments fell for the first time in 2018 compared to previous years. The decrease was due in particular to the comparatively high electricity prices. These affect the level of the statutory payments for installations marketed directly by the producers, which make up the overwhelming majority of this generation.

Evaluation of minimum generation

In 2019, the Bundesnetzagentur again looked into why conventional power plants do not respond flexibly, accepting losses in times when prices on the power exchange are low or even negative. It confirmed its findings from 2017: only a minority of the total price-inelastic generation capacity is the minimum generation, ie the amount of generation required for the operation of the grid. The majority of it is due to other reasons, such as the provision of heating and self-generation. A further area of analysis was why renewable installations were curtailed during periods of negative exchange prices. This was found to be due in particular to vertical network congestion, ie congestion in transformer stations between the distribution and transmission systems. According to the relevant network operators, expansion measures have now been carried out for these areas of congestion or will be carried out in the short to medium term.

Developments in network charges, standing charges, etc

The indications for network charges published on 15 October 2019 remained largely unchanged for 2020. There were no changes between the indicated and ultimate network charges among the transmission system operators (TSO). Network charges are up overall. Model calculations for a large industrial customer connected to the extra-high voltage level show a rise of 5% from TenneT, 9% from both 50Hertz and TransnetBW, and 16% from Amprion. One of the reasons for the increase in network charges is that the aggregate revenue cap of the four TSOs has risen from €4.9bn to €5.2bn, primarily due to an increase in expenditure for system security measures and higher investments. Once again, only customers in the TenneT network will benefit from the second stage of the national harmonisation of the TSOs' charges. In the other TSOs' networks, the harmonisation will lead to higher charges, which is also the reason for the disproportionately high increases in charges from Amprion and TransnetBW, the network areas with comparatively low charges.

The network charges of the distribution system operators (DSOs) will rise by 5.6% for a typical household customer and 6% for a commercial customer on average across the country. The network charge for an industrial customer at the medium-voltage level will rise by 6.2%. The increase is due in particular to the higher charges from the upstream TSOs and the higher investments in the capex mark-up.

The standing charges, as a fixed component of the network charges for consumers at the low-voltage level without interval metering, will rise by an average of nearly 5% and the national average will be nearly €62 a year. Nevertheless, the DSOs that already had particularly high standing charges in 2019 have not further increased them. The highest price of the network areas surveyed continues to be €105 a year.

Developments in the electricity markets (supplier diversity, supplier switching, prices)

In the year 2018, final consumers were able to choose from an average of 143 electricity suppliers in their network area. About 4.7m consumers switched supplier during that year. In addition, around 2m household customers changed their electricity supply contract with the same supplier.

In 2018, a relative majority of 42% of household customers were on non-default contracts with their regional default supplier. The percentage of household customers on default contracts stood at 27%, while 31% of all household customers are now served by a supplier other than their local default supplier.

Electricity prices for household customers were higher in 2019. In the consumption band between 2,500 kWh and 5,000 kWh a year, the average volume-weighted price for household customers increased by 0.97 ct/kWh or 3.1% compared with 2018 and was 30.85 ct/kWh on 1 April 2019.

Capacity reserve

The capacity reserve provides additional capacity in unexpected, exceptional circumstances when, despite free pricing on the wholesale market, there is not enough electricity on offer to cover the total demand.

The German Energy Industry Act (EnWG) and Capacity Reserve Ordinance (KapResV) set out that plants held in the capacity reserve must be determined every other year by the TSOs in a tendering procedure.

The TSOs have carried out the tender for the first delivery period (1 October 2020 to 30 September 2022). They had to draw up standard terms and conditions in advance so that the technical conditions for the tender were absolutely clear. These detail the provisions of the KapResV and have to be approved by the Bundesnetzagentur.

The authority approved them on 23 July 2019 (*https://www.bundesnetzagentur.de/kapres*).

Developments in the gas markets (supplier diversity, supplier switching, prices)

In 2018, final consumers were able to choose from an average of 104 gas suppliers in their network area. Just over 1.5m household customers switched gas supplier during the year. In addition, 600,000 household customers changed the existing gas supply contract they had with their supplier. Half of household customers are still on a non-default contract with the local default supplier. Just under 18% of household customers use default supply. The percentage of household customers who have a contract with a supplier other than the local default supplier rose again to about 32%. The average network charge (including metering and meter operation charges) for household customers independent of the type of supply contract is currently around 1.56 ct/kWh and thus just over 3% higher than in the previous year. The weighted average price across all contract categories in the consumption band between 5,556 kWh and 55,556 kWh rose by 0.27 ct/kWh compared with 2017 to 6.34 ct/kWh.

Incremental capacity – market-based procedure to create additional gas transport capacities

The network code on capacity allocation mechanisms in gas transmission systems (NC CAM) sets out a market-based procedure for the creation of gas transport capacity at the borders between market areas in Europe.

This ensures that an appropriate share of the costs associated with making additional capacity available (in particular costs of network expansion measures) is borne by those network users that triggered the investment decision by expressing their demand.

The incremental capacity for which demand was indicated in 2017 at the market area borders to the Russian Federation, Poland, Austria and the Netherlands did not lead to a successful market test or was not able to be offered in the 2019 annual auction.

In 2019, indications for incremental transport capacity were made at the borders of seven market areas (Denmark, Russian Federation, Poland GCP, Poland Mallnow, Austria, Switzerland and the Netherlands). These procedures will be completed by the time of annual auction in 2021.

Distribution system operators invest €10bn in distribution systems

By 31 December 2018, the Bundesnetzagentur had approved capex mark-ups for distribution system expansion amounting to around €900m. This corresponds to past or planned investments totalling some €10.4bn.

Capex mark-ups applied for the first time

The Bundesnetzagentur introduced the capex mark-up for electricity distribution systems for the first time as from 1 January 2019. DSOs are able to apply for mark-ups on the revenue cap approved by the Bundesnetzagentur to directly take account of network infrastructure investments.

Extrapolation of total investment

From the capex mark-ups of about €900m, past or planned investments totalling around €10.4bn can be extrapolated because only the annual capital expenses of the investments, including return on equity, feed into the revenue caps for a given calendar year.

The approved capex mark-ups relate to past or planned investments in 2017, 2018 and 2019. The capex mark-ups approved by the Bundesnetzagentur are supplemented by further investments by the 700 smaller companies under the regulatory responsibility of the federal states. More information about the regulation of network charges can be found under *www.bundesnetzagentur.de/anreizregulierung*.

Security of supply and network expansion

The total costs for network and system security measures were still high at over €1.4bn in 2018. Only by rapidly expanding the electricity grid will it be possible to bring these costs down in the long term.

At the end of the third quarter of 2019, 881 km of lines from the Power Grid Expansion Act (EnLAG) had been completed. By the end of the third quarter of 2019, there were about 2,505 km of lines from the Federal Requirements Plan Act (BBPlG) in the spatial planning or federal sectoral planning procedures, about 1,680 km about to be or in the planning approval or notification procedures and 361 km completed.

Network and system stability: redispatching and feed-in management

There has been a large increase in the number of measures to ensure the security and reliability of the electricity supply system in recent years due to the changing generation landscape, the delays in grid expansion and the effects of weather. Redispatching involves measures intervening in the market-based operating schedules of conventional generating units to shift feed-in geographically in order to take pressure off those elements of the grid which are under strain. In addition, feed-in management is used to temporarily curtail the priority feed-in of electricity from renewable energy installations and CHP installations if network capacity is insufficient.

According to current information, the total costs for network and system security measures were still high at over €1.4bn in 2018. Redispatch measures (operational plants) comprised a total volume of 14,875 GWh in 2018. The TSOs estimated the costs for these measures at €352m.

The costs of reserving and using grid reserve power plants were about €415m for the year with an activated volume of 904 GWh. The total curtailed energy due to feed-in management was 5,403 GWh in 2018. The estimated compensation payments claimed by installation operators for this period amounted to approximately €635m.

The information obtained from reports on these measures is published every quarter at *www.bundesnetzagentur.de/systemstudie*.

Network and system security measures from 2015 to Q1 2019

	Redispatching			Grid reserve power plants				Feed-in management		Feed-in adjustments
	Total volume operational plants (GWh)[1]	Cost estimate for redispatching (€m)[2, 3]	Cost estimate for countertrading (€m)[3]	Volume (GWh)[4]	Cost estimate for activation (€m)[3]	Capacity[5] (MW)	Reserve & other costs not dependent on use (€m)[6]	Volume of curtailed energy (GWh)[7]	Estimated compensation (€m)	Volume (GWh)
2016	11,475	222.6	12.0	1,209	102.9	8,383	182.8	3,743	372.7	4.1
2017	18,456	391.6	29.0	2,129	183.9	11,430	296.1	5,518	609.9	34.5
2018	14,875	351.5	36.0	904	85.2	6,598	330.3	5,403	635.4	8.3

The quarterly total may not exactly match the yearly total owing to updates for the full year and rounding up.
[1] Amounts (reductions and increases) including countertrading measures according to monthly report to the Bundesnetzagentur.
[2] TSOs' cost estimate based on actual measures.
[3] Costs for the full year may not equal the totals of the individual quarters owing to annual updates. If figures are not shown for the individual quarters, they are only available for the full year.
[4] Activations of grid reserve power plants including test starts and test runs. The feed-in of grid reserve power plants is only increased.
[5] Total capacity of German and foreign grid reserve power plants in MW. Figures from 31 December 2018 only include German grid reserve. As at 31 December of the respective year. The figure for 2019 is provisional.
[6] According to TSOs' report to the Bundesnetzagentur. The figure for 2019 is provisional and does not include costs for restoring operational readiness or other costs not dependent on deployment.
[7] Reduction of installations remunerated in accordance with the RES or CHP Acts.
Source: network operators' data reports to the Bundesnetzagentur

Report on the status and expansion of the distribution systems

In accordance with the EnWG, the Bundesnetzagentur records the network development plans of high-voltage network operators and requires them to produce a report on the status of the network and expansion planning of the other network and voltage levels of the affected network operators. Currently, 57 high-voltage network operators with a high-voltage network over 20 km long are legally required to submit these reports. In 2019, the Bundesnetzagentur published an overall report on the status and expansion of the distribution systems for the first time, which was compiled from the reports submitted by the high-voltage network operators.

In addition to expansion planning, the overall report focuses on the status of the network, in particular due to the generating capacity that is increasingly connected in the distribution systems and the expected growth in the electric vehicles sector. As well as the need for network expansion and the utilisation of the existing networks, therefore, the published report covers topics that are currently the subject of intense discussion: electric vehicles, IT security and system services. It thus sheds light on the challenges facing DSOs in their operation of the networks, even now.

The Bundesnetzagentur's report on the status and expansion of the distribution systems is a further step towards greater transparency in the expansion of the distribution systems and also reflects their growing importance in the light of decentralised generation and the planned growth in electric vehicles. This is also taken account of in the European electricity market Directive (EU) 2019/944, which has now entered into force and contains provisions on the creation and publishing of network development plans by DSOs, although these still need to be transposed into national law by the legislature.

Special grid facilities

TSOs can hold special grid facilities in reserve. These plants are intended to restore the stability of the networks in the event of an actual failure of one or more facilities in the transmission system. This is known as curative redispatching. In other words, the facilities are not used preventively to relieve strain on the system when a lot of transmission has to take place, but only when a network fault has occurred despite all redispatch options being made use of and the grid needs to be put back from a (n-0) status to a secure (n-1) status.

In February 2017, the affected TSOs Amprion, TenneT and Transnet BW submitted a demand assessment to the Bundesnetzagentur, which the authority used in May 2017 as a basis to determine a need for 1.2 GW of special grid facilities in southern Germany. The TSOs presented a procurement concept in May 2018 and in June they started a European tender process for the facilities. Potential tenderers were able to notify their interest until 1 August 2018.

The TSOs are acquiring a total of 1,200 MW of active power divided into twelve lots of 100 MW each. Three lots, ie 300 MW, are allocated to each of the four regional lot groups (lot groups A to D). Companies can

apply for one lot or for packets of lots within a lot group. To qualify for the tender, plants must be able to reach full capacity operation within an hour and be able to supply (in the case of generating installations) or reduce (in the case of interruptible loads) for at least 38 consecutive hours. The total operating period is at least 500 hours a year. The period of performance is ten years and runs until 30 September 2032.

So far, EnBW has won the tender in lot group B with a project in Marbach, while Uniper has won the tender in lot group D; it is planning a gas-fired power plant at the Irsching site ("Irsching 6") with a generating capacity of 300 MW.

Grid reserve and power plant closures

On 30 April 2019, the Bundesnetzagentur published its assessment of reserve power plant requirements for the winter of 2019/2020 and the year 2022/2023. The assessment confirmed the results of the system analyses that had been submitted to the Bundesnetzagentur by the four TSOs in compliance with the Grid Reserve Ordinance (NetzResV). The system analysis performed by the TSOs determined the measures needed to guarantee the secure and reliable operation of the transmission system.

A common problem is the transport of electrical energy from northern Germany, where it is generated, to the south of the country where it is most needed. Redispatching is required to prevent lines from becoming overloaded. If there is not enough power plant capacity available from power plants on the market for redispatching measures to rectify congestion in the system, the TSOs have to make up the deficit of redispatch capacity from reserve power plants. For this purpose, each year the TSOs establish the demand for reserve capacity during the periods under review, taking account of requirements defined by the Bundesnetzagentur. The Bundesnetzagentur then reviews, assesses, and publishes the outcome of this needs analysis in report form. The report for 2019/2020 identified 5,126 MW of required reserve capacity. It was therefore not necessary to contract grid reserve from neighbouring countries. According to preliminary findings, grid reserve power plants with a total capacity of 10,647 MW will be required for 2022/2023. These requirements were calculated without yet taking into account the recommendation, made on 26 January 2019, of the Commission on Growth, Structural Change and Employment to reduce the capacity of coal-fired power stations on the market to about 15 GW of lignite and about 15 GW of hard coal in 2022.

Following the notification of planned closures received by the Bundesnetzagentur by 1 December 2019, approval has so far been given for 15 power generation units with a total capacity of 3,999 MW to be categorised as essential for the system.

This enables the Bundesnetzagentur to ensure system stability by prohibiting the closure of such essential power plants. These plants become part of the grid reserve. Seven power plants with a total capacity of 2,952 MW, for which the operators had applied for temporary closure, have also been identified as essential for grid operations by the TSOs. These are now part of the grid reserve as well and are reserved for the exclusive use of TSOs.

Gas-fired power plants that are essential for the system

The Bundesnetzagentur approved the designations by TSOs Amprion GmbH, TenneT TSO GmbH and TransnetBW GmbH of a total of about 40 gas-fired power plants (total capacity: 7,380 MW) as essential for the system for another 24 months in notices dated 27 August 2019, 30 September 2019 and 23 October 2019. In the event of a shortage of gas, these power plants could receive gas as a priority in order to guarantee the electricity supply. TSOs have to use the essential gas-fired power plants for redispatching purposes in the event that the security or reliability of the electricity supply would otherwise be disrupted or jeopardised by the restriction in gas supply. It must be ensured that the supply of gas or an alternative combustible primary energy source is available at all times.

Discussion paper on reactive power provision for network operation

The Bundesnetzagentur incorporated the results of the discussion paper on reactive power provision for network operation, published in 2018, into the work of the Commission on the Future Procurement of Reactive Power set up by the Federal Ministry for Economic Affairs and Energy (BMWi). The final report of the reactive power commission was published by the BMWi on 10 October 2019.

The ministry had assigned the commission the remit of developing model proposals for the procurement and remuneration of reactive power. This task had arisen partly from the controversy over the determination of technical limits for the provision of reactive power by generating installations in the technical connection rules and the upcoming

implementation of the European electricity market Directive (EU) 2019/944 into German law. The models presented include the distinction, preferred by the Bundesnetzagentur, of the maintenance of voltage stability at the local level in order to reduce the need for grid expansion, which is a duty incurring no charges. Providing reactive power without payment to maintain local voltage stability is in line with the principle of causation, in the view of the Bundesnetzagentur, but other provision of reactive power should be acquired on the market by network operators, ie the generating installations should be remunerated for it. It is planned for the contractual provision of reactive power, which is already taking place in a few cases, to be carried out in a transparent, non-discriminatory process in future, in order to increase the efficiency of reactive power provision with contractual arrangements and reduce the potential for abuse.

In the rest of the procedure, it is planned for the options developed by the reactive power commission to be examined in terms of their legal and technical feasibility and to undergo a cost-benefit analysis. The target model is to enable the procurement of reactive power in an economically efficient way. This is becoming even more urgent as the energy transition is altering the framework conditions for the existing voltage stability maintenance concept. Conventional generating installations, which are mostly connected to the extra-high and high voltage network, can increasingly no longer be used as sources of reactive power, while growing transits and more cabling of new lines in the transmission system are leading to an increased need for reactive power.

Increasable loads in the network expansion area in accordance with section 13(6a) EnWG – contracts with 50Hertz in 2019

In January 2018, the Bundesnetzagentur agreed on a voluntary commitment known as "use, don't curtail" with the three relevant TSOs: TenneT, Amprion and 50Hertz. This enables the TSOs to contract with CHP installation operators in the "network expansion area" for the reduction of active power feed-in while continuing to supply electrical energy to maintain heat supplies. The aim is to avoid feed-in management measures (FIMM) in the network expansion area and, at the same time, to make new redispatch potential available. Under the voluntary commitments, a power plant is suitable for the economic and efficient elimination of congestion if the savings obtained from the avoided FIMM are projected to cover at least the required investment costs forecast over the five-year period following commissioning (terms of the contracts). This means that an across-the-board efficiency approach – one not related to grid costs – is adopted. The above-mentioned TSOs offered to conclude contracts with installation operators in the course of 2018 and 2019. In the control area of 50Hertz, three contracts for about 140 MW of redispatch load and an additional approximately 57 MW of increasable load from power-to-heat were concluded in 2019. Further negotiations are ongoing.

Electricity network development plan 2019 – 2030

On 20 December 2019 the Bundesnetzagentur confirmed the electricity network development plan (NDP) 2019-2030, with a total of 114 grid expansion measures confirmed. There is a need for additional measures totalling 3,550 km of lines compared with the 2015 Federal Requirements Plan Act (BBPlG). Only 800 km of these are new-build measures within Germany (of which 700 km are HVDC systems), while the rest are reinforcements of the existing networks. The NDP also includes optimisation measures, such as the monitoring of overhead lines and innovative technical approaches.

Pilot installations to test innovative network operating resources, such as grid boosters, are contained in the NDP for the first time. Grid boosters are a reactive approach to operational management. They allow the grid to be overloaded for a brief period if a fault occurs, thus increasing the transport capacity of the grid. Network security is maintained in an automated process and very rapidly, managing controllable generating installations and consumer equipment in front of the congestion, as well as batteries behind the congestion to ensure electricity supply.

Phase-out of electricity generated from coal taken into consideration

The final report of 26 January 2019 by the Commission on Growth, Structural Change and Employment was taken into consideration in the latest NDP. Scenario C 2030 reflects the phase-out plan for electricity generated from coal up to 2030. The Bundesnetzagentur also took the long-term effect of a complete end to coal-fired power into account in the additional Scenario C 2038*.

74 new measures
The Bundesnetzagentur has confirmed 74 new measures in addition to the previous BBPlG. These measures are necessary and sustainable, no matter what electricity future lies ahead. An additional high-voltage direct-current transmission corridor will be needed by 2030. It will run from Schleswig-Holstein through Lower Saxony to North Rhine-Westphalia and will carry in particular the additional wind power from the north to the south of the country, where it is most needed.

Joint planning of onshore and offshore expansion for the first time
The NDP 2019-2030 is the first NDP to include the planning for offshore transmission links, replacing the previous offshore NDP, and is based on the determinations of the site development plan (FEP). On the basis of the provisions of the FEP, the NDP defines the necessary offshore transmission links.

By 2030, seven or eight additional transmission links in the North Sea and Baltic Sea will be needed in order to connect offshore wind farms, depending on the scenario. They will enable 20 GW of offshore wind farms to be connected.

Widespread public participation
A ten-week public participation process took place before the NDP was confirmed. The Bundesnetzagentur received over 800 responses to its consultation. All the responses were recorded and evaluated and the arguments put forward considered in terms of their importance to the decision-making process. In addition, the authority held various information events across Germany. Although some of the responses tended to focus on general issues of energy policy rather than on the decision-making process for a single measure, they are extremely important for the entire process and for acceptance of the grid expansion.

Network Development Plan and Federal Requirements Plan
The Bundesnetzagentur will present the BMWi with a draft of the new Federal Requirements Plan in early 2020. It will be based on the results of the NDP 2019-2030. It is essential for planned measures to be included in the Federal Requirements Plan if they are to be implemented on time, as this ensures that the administrative proceedings are launched quickly.

Network expansion

By 2022, the nuclear power plants in Germany will be gradually taken out of service, while the proportion of renewable energy in the energy supply is to be increased in line with the government's energy policy. This creates new challenges for electricity generation and network infrastructure. The expansion of the transmission system is one of the key prerequisites for expanding and transporting electricity generated from renewable sources as well as being an interface of key points in the energy transition, which is supported by a broad consensus. In addition to sustainability, a further aim is for Germany to continue to be able to provide one of the most secure and stable electricity systems in the world.

Federal sectoral planning
The Federal Requirements Plan Act (BBPlG) currently includes 46 projects involving extra-high voltage lines. Of these, 16 are designated as crossing federal state or national borders within the meaning of the Grid Expansion Acceleration Act (NABEG) and fall under the responsibility of the Bundesnetzagentur. The Bundesnetzagentur carries out the federal sectoral planning for these projects and, in the next step, the planning approval procedure.

The federal sectoral planning replaces regional planning at the level of the federal states and serves as the first step in concrete spatial planning. A corridor up to 1,000 metres wide is made binding as part of this procedure. The exact route the line will take is determined in the following stage of the planning process.

Federal sectoral planning begins with an application submitted by a TSO as the project promoter. The application under section 6 NABEG, which includes the proposed route corridor, possible alternatives and explanations of the potential impact on people and the environment, forms the basis of information for the public scoping conference that has to be held. The Bundesnetzagentur uses the results of the scoping conference to determine a scope of assessment for the planning evaluation and the strategic environmental assessment of the route corridor under section 8 NABEG, which also presents the supplementary documents and reports required from the project promoters.

Once the project promoter has submitted all the required documents, the Bundesnetzagentur consults authorities and the public again. The Bundesnetzagentur displays the documents required under section 8 NABEG for a month at its office in Bonn and at other suitable locations. The objections and comments received using the consultation phase are dealt with at a hearing with the project promoters, public agencies and respondents.

The Bundesnetzagentur then weighs up all the arguments brought forward and makes a decision on the route corridor. The aim is for a technically and environmentally feasible corridor that keeps the negative impact on people and the environment as low as possible. The basis for the subsequent planning approval process in which the exact route of the lines is determined – with public participation – has thus been laid.

Significant progress was made in the field of grid expansion in 2019. To give an example, the Bundesnetzagentur concluded the federal sectoral planning for eight projects or project sections with their decisions in accordance with section 12 NABEG, in addition to the four route corridors it had determined in 2018. Other projects are currently in the federal sectoral planning procedure, including all sections of the Suedlink project (projects 3 and 4 BBPlG). Scoping conferences and hearings were carried out for all sections of that project in 2019. The federal sectoral planning procedure is expected to be completed in 2020. Scoping conferences and hearings also took place for all sections of project 5 BBPlG, the SuedOstlink, in 2019 as well. The federal sectoral planning procedures for sections B and C of the SuedOstLink have already been completed.

Planning approval

The planning approval procedure is based on the route corridor made binding in the federal sectoral planning. In the course of this procedure, the exact route of the line and the technical design it will take have to be decided. There are also various opportunities to participate in the planning approval procedure. Once all the documents have been submitted in accordance with section 19 NABEG, the Bundesnetzagentur holds a scoping conference, in which any interested person, public agencies and associations can take part.

The Bundesnetzagentur takes the results of the scoping conference and uses them to specify the scope of the planning approval, determining the necessary content of the plan that has to be submitted under section 21 NABEG and of the documents. The authority then involves the public when all the documents have been presented. Anyone whose interests are affected by a project can raise an objection within a specified deadline. The consultation phase is followed by a hearing. Finally, the Bundesnetzagentur decides on the exact route based on the planning approval decision.

Planning approval procedures were opened for seven projects or project sections in 2019. Scoping conferences have already been carried out and the scope of assessment defined for sections A1 and B1 of project 2 from the BBPlG as well as for projects 11, 14 (West) and 25 BBPlG. The documentation in accordance with section 21 NABEG is expected in the coming year.

Further information on individual projects, including the current status of proceedings, the relevant application documents and the federal sectoral planning decision can be accessed at *www.netzausbau.de/vorhaben*.

Monitoring the status of projects under the Power Grid Expansion Act (EnLAG) and the Federal Requirements Plan Act (BBPlG)

As part of its monitoring role, the Bundesnetzagentur provides quarterly updates on the progress in planning and construction that has occurred for individual projects in the transmission system during the previous three months. To do so, it requests data from the four German TSOs. This covers the projects from the BBPlG and the EnLAG as well as transmission links to offshore wind farms. The Bundesnetzagentur evaluates the data it receives, compares it with its own schedules and coordinates with the relevant federal states.

It also measures the status of the planned and implemented measures to optimise the network. The past and planned activities of network operators designed to increase the utilisation of the existing transmission system are presented.

Current status of EnLAG projects

The current version of the law contains 22 projects that require urgent implementation in order to meet energy requirements. EnLAG project no 22 was deleted after a review was carried out during the process of drafting the NDP 2022. Because of alternative network solutions, in the NDP 2024 the TSOs considered project no 24 no longer necessary to meet energy supply requirements. The individual federal state authorities are responsible for conducting the spatial planning and planning approval procedures for the EnLAG projects.

The projects listed in the Power Grid Expansion Act comprise lines with a total length of some 1,817 km. Of these, 881 km of lines had been completed by the end of the third quarter 2019. A further 462 km have been approved and are under construction or about to be so. Around 50 km are currently in the spatial planning procedure and around 424 km are in or about to start the planning approval procedure.

Current status of BBPlG projects

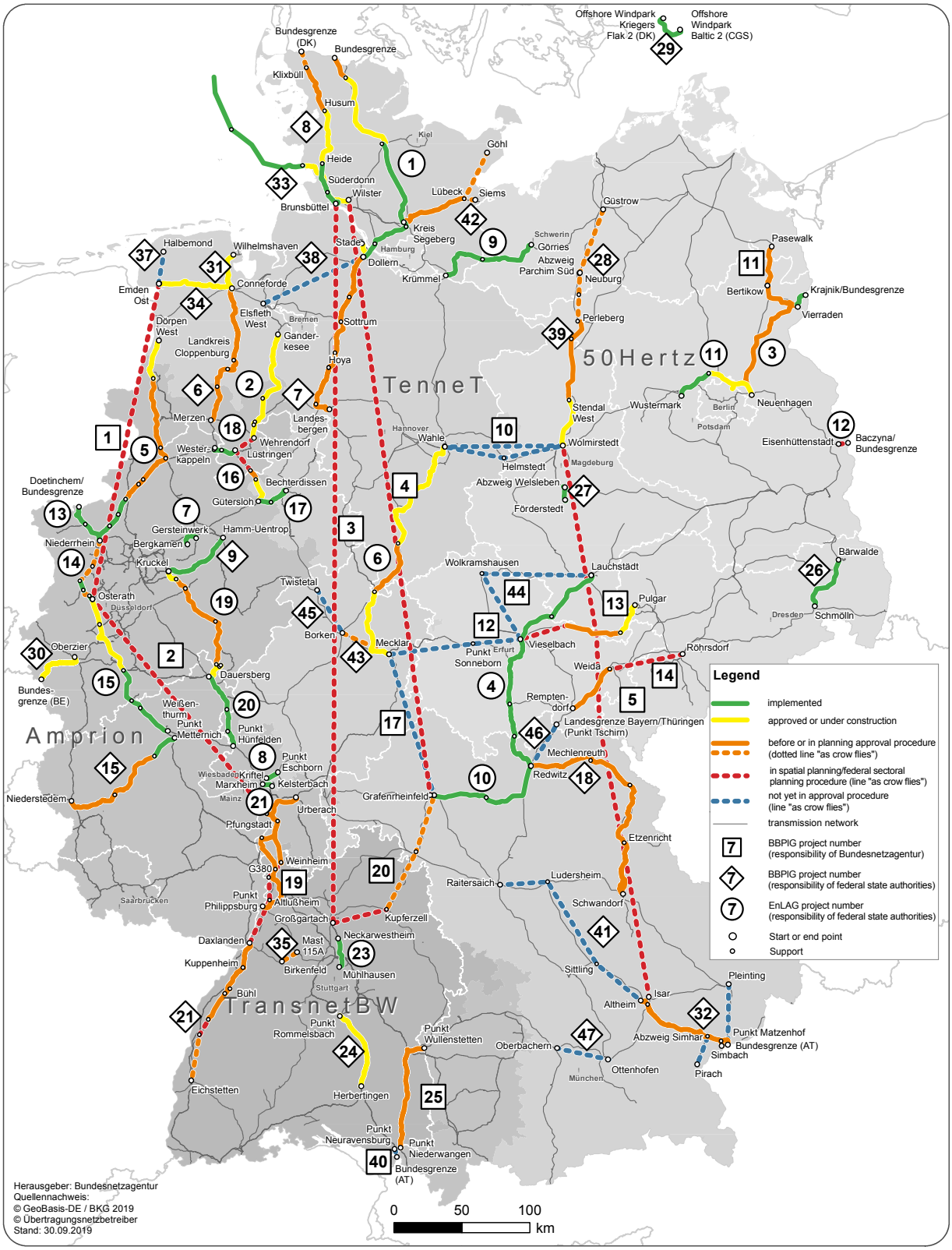
Of a total of 43 projects nationwide, 16 are designated as crossing federal state or national borders within the meaning of the Grid Expansion Acceleration Act (NABEG). The Bundesnetzagentur is responsible for the federal sectoral planning and the subsequent planning approval procedure for these projects.

Eight of the 43 projects have been designated as pilot projects for low-loss transmission over long distances (high voltage direct current (HVDC) transmission). Five direct current (DC) projects have been earmarked for priority underground cabling and five alternating current (AC) projects for partial underground cabling. In addition, one project is a pilot project using high-temperature conductors and two are submarine cable projects.

The projects currently listed in the BBPIG comprise lines with a total length of some 5,827 km. About 3,524 km of these come under the Bundesnetz-agentur's responsibility. The total length of power lines will be largely determined by the route of the new direct current project linking the north and south of Germany. The route this project takes will become apparent in the course of the procedure. As of the third quarter of 2019, 361 km of lines had been completed, while a further 342 km have been approved and are under construction or about to be so. About 939 km are ready to start the planning approval procedure. Around 2,505 km are currently in the spatial planning or federal sectoral planning procedure and around 1,680 km are in or about to start the planning approval or notification procedure. The status of projects under the EnLAG and the BBPlG can be found at *www.netzausbau.de/vorhaben*.

The following map shows the expansion status of EnLAG projects and BBPIG procedures as at the third quarter of 2019:

Projects under the EnLAG and the BBPlG as at the third quarter of 2019



Participation and dialogue
The Bundesnetzagentur wants to inform the public as fully and early as possible about the necessary expansion of the electricity network, the expansion process and the opportunities to get involved in it. It therefore deliberately goes beyond the statutory requirements. Among other things, the Bundesnetzagentur hosts open information and dialogue events as well as method conferences in order to make the process transparent, clear and comprehensible for members of the public.

It held an exchange of scientific views about the grid expansion on 10-11 October 2019. This event was based around discussions from various academic disciplines on the challenges of the grid expansion. After short presentations introducing current research issues on the grid expansion, the researchers and practitioners were able to engage in discussion.

The programmes and presentations from the different events may be accessed at *www.netzausbau.de/termine*.

In addition to the physical events, the Bundesnetzagentur provides a broad range of information on various important grid expansion issues through several channels, including its website *www.netzausbau.de*, its newsletter and brochures/flyers. It is also present on other platforms such as Twitter and YouTube. People can also contact the energy grid expansion public liaison service if they have any questions or suggestions.

Scenario framework for the gas network development plan 2020-2030
The scenario framework includes all the information which is relevant to the anticipated development of gas demand and supplies as well as the expected development of the required gas transport capacities in Germany for the period to 2030. The assumptions of gas transport capacity are particularly relevant here. They form the basis for the calculation of the network expansion requirements in the gas network development plan (NDP).

The Bundesnetzagentur confirmed the scenario framework for the Gas NDP 2020-2030 on 5 December 2019 following a consultation with the market by TSOs.

There were some requests for new gas power station sites and three requests for planned LNG terminals at the sites Brunsbüttel, Wilhelmshaven and Stade to be connected to the gas network, which all became the basis of the NDP.

"Green gas" projects were included in the NDP process for the first time. However, in contrast to what was proposed by the TSOs, the resulting expansion requirements are not to be calculated in the basic variant but in a separate modelling variant. This approach will deal with the fact that there is a lack of a general regulatory framework and it is uncertain whether individual projects will actually be implemented.

The TSOs will represent the merger of the two German gas market areas, which was laid down in the amendment to the Gas Network Access Ordinance (GasNZV) and is planned to take place on 1 October 2021, in the NDP using a calculation system specially developed for this purpose.

The TSOs develop the gas NDP on the basis of the confirmed scenario framework. It is expected to be published in early 2020.

Launch of the core energy market data register

The core energy market data register is a comprehensive, public register for the core data of the electricity and gas markets.

Who has to register?

All electricity and gas market players are required to register themselves and their installations on the website *www.marktstammdatenregister.de*. Solar installations, CHP installations, fixed battery-storage systems and emergency generators have to be registered, just as wind turbines or conventional power plants do. As well as installation operators, other electricity and gas market players such as network operators and electricity or gas traders have to register too.

Core data

The core energy market data register only contains core data, including site data, contact information, technical data on installations and company types. Data regarding activities in the energy sector, such as volumes of electricity produced or storage levels, cannot be entered into the core energy market data register.

Existing installations that were in operation before the core energy market data register was launched have two years, until 31 January 2021, to be registered.

The register provides up-to-date core data on the electricity and gas supply to installation operators, network operators, policymakers, the authorities and interested members of the public.

Consumer protection and advice

About 19,000 queries and complaints were sent to the Bundesnetzagentur's energy consumer advice service last year. Key consumer concerns were billing, price rises, delays in switching supplier and contractual disputes.

The Bundesnetzagentur worked together with the National Metrology Institute (PTB) to add public keys to the charging stations map. Public keys allow users of charging points to check remote readings for accuracy.

Energy consumer advice service

The Bundesnetzagentur's energy consumer advice service provides information for consumers about their rights, help available to them and possible action they can take as well as general energy issues. It received about 19,000 enquiries in 2019, another slight increase of 15% on the previous year. Around 10,700 queries were received by telephone, 7,500 by email and 500 by post. In May, an online contact form was added to the Bundesnetzagentur website, providing another way for consumers to get in touch with the energy consumer advice service. Around 300 enquiries have been received that way since then.

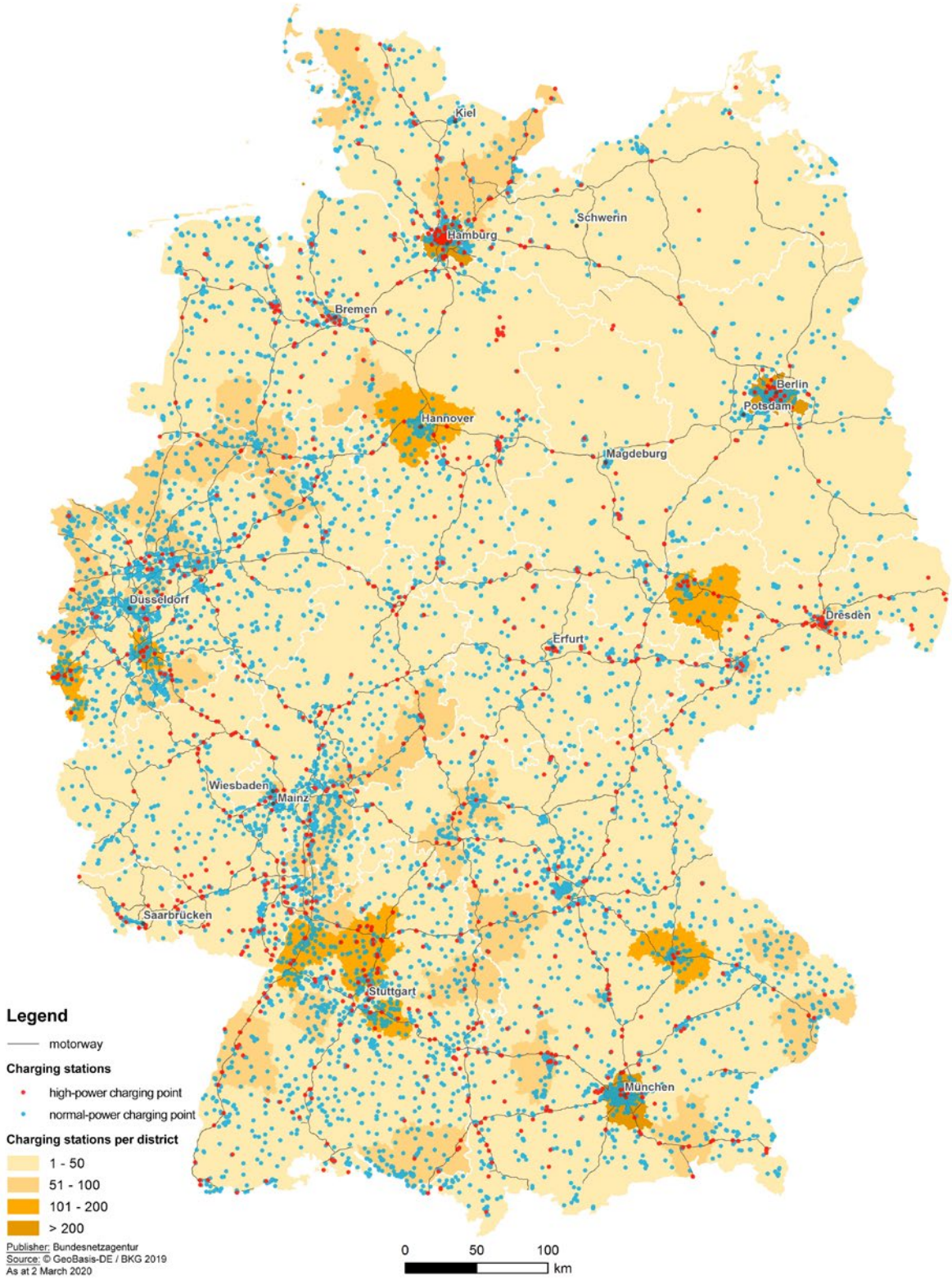
Enquiries largely concerned billing, price increases, delays in supplier switching and contractual disputes. There was another rise in the number of enquiries about modern, digital electricity metering devices, as these are currently being installed in a lot of households. This is further illustrated by the fact that the section of the website dealing with connections and metering, www.bundesnetzagentur.de/messeinrichtungen, also received nearly 49,000 clicks. The comprehensive FAQs explain the difference between modern metering equipment and smart metering systems, show the timescale for the planned conversions and discuss the costs and benefits. Flyers and info sheets provide an additional means of finding out about such issues.

Electric vehicles/charging stations

The Bundesnetzagentur's map of publicly accessible charging points for electric vehicles in Germany was regularly updated in 2019. By the end of 2019, 22,025 public charging points were registered, up from 13,844 at the end of 2018. The data are also used increasingly for other applications and analyses, such as the location tool of the Federal Ministry of Transport and Digital Infrastructure (BMVI). The up-to-date map providing an overview of charging points for electric vehicles in Germany, broken down by federal state and district, can be accessed on the Bundesnetzagentur website at www.bundesnetzagentur.de/ladesaeulenkarte.

At the start of the year, public keys were added to the map with the help of the PTB. Now customers of the relevant operators can check the data on the bill from their e-mobility provider for accuracy.

Excerpt from the Bundesnetzagentur's map of charging points



Fourth Market Area Conversion Forum

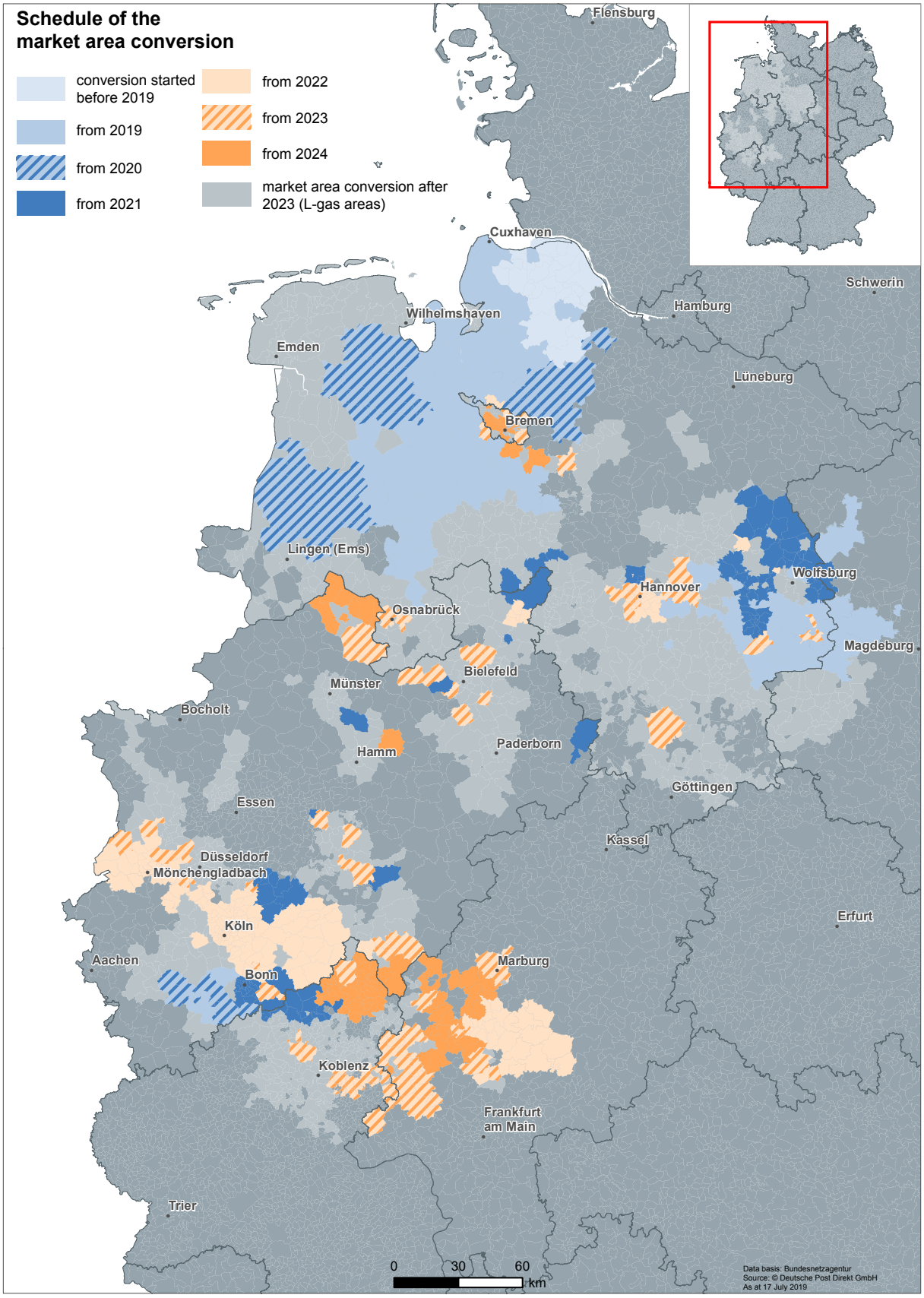
The Bundesnetzagentur's fourth annual Market Area Conversion Forum took place on 10 April 2019. Over 140 representatives of network operators, service providers, associations, research institutions and authorities came together at the Wissenschaftszentrum in Bonn to discuss topical issues on the conversion of the market area from L-gas to H-gas in west and north-west Germany. Subjects included the current status of gas production in Groningen, the Netherlands, and reports from TSOs and DSOs on the status of the market area conversion. The report on the effects on industrial customers of the fluctuations in gas quality, which will increase in future, received a lot of attention. The bottom line of the event was that the sector is making good progress but cannot relax its efforts to implement the conversion on time and with as few conflicts as possible, given the strong increase in the number of devices that need to be converted.

Guidelines on the control of abusive practices in electricity generation/wholesale trade

On 27 September 2019, the Bundeskartellamt and the Bundesnetzagentur published guidelines on the control of abusive practices in the electricity generation and wholesale trade sector under competition and energy wholesale law.

The guidelines set out the rules of application and the scope of the control of abusive practices on the market for the first-time sale of electricity, and deal with issues of interpretation of the Regulation on wholesale energy market integrity and transparency (REMIT) with respect to wholesale energy trading. They make clear that price spikes caused by free pricing arising from the fair, competition-based interaction of supply and demand do not come under the prohibition of market manipulation under wholesale energy legislation.

The guidelines have been published on the Bundesnetzagentur website at *www.bundesnetzagentur.de/missbrauchsaufsicht*.


Schedule of the market area conversion
conversion started before 2019
from 2019
from 2020
from 2021
from 2022
from 2023
from 2024
market area conversion after 2023 (L-gas areas)
Flensburg
Cuxhaven
Wilhelmshaven
Emden
Hamburg
Schwerin
Lüneburg
Bremen
Lingen (Ems)
Wolfsburg
Hannover
Osnabrück
Magdeburg
Bielefeld
Münster
Bocholt
Paderborn
Hamm
Göttingen
Essen
Kassel
Düsseldorf
Mönchengladbach
Erfurt
Köln
Aachen
Marburg
Bonn
Koblenz
Frankfurt am Main
Trier
0
30
60
km
Data basis: Bundesnetzagentur
Source: © Deutsche Post Direkt GmbH
As at 17 July 2019

Rulings, activities and proceedings

In accordance with the Gas Network Access Ordinance (GasNZV), the two market areas "Gaspool" and "NetConnectGermany" are to be merged to form one single German market area by 1 April 2022 at the latest. The TSOs, market area managers and the Bundesnetzagentur agreed that the single market area will be launched on 1 October 2021.

The Federal Court of Justice (BGH) has confirmed the rate of return on equity determined by the Bundesnetzagentur for the third regulatory period, reinforcing the authority's position as an independent referee, balancing the interests of companies and society.

Setting revenue caps for electricity system operators (efficiency benchmarking)

The decisions setting the revenue caps for TSOs Amprion, TenneT and TransnetBW were completed in 2018, while the decision for 50Hertz was issued on 22 January 2019. The following efficiency levels were determined for the companies for the third regulatory period: Amprion 100%, Tennet 99.92%, TransnetBW 100% and 50Hertz 100%. Amprion GmbH and 50Hertz GmbH appealed to the Higher Regional Court (OLG) in Düsseldorf against their revenue caps.

All 100 standard procedures for the setting of revenue caps were completed by 31 December 2019.

Responsibility	Number of standard procedures
Federal	90
Delegated Brandenburg	3
Delegated Schleswig-Holstein	4
Delegated Thuringia	3
TotalSumme	**100**

A total of 92 of the 100 decisions had been made in the simplified procedures by the end of the year. Seven of the unfinished procedures concerned GETEC group companies.

Responsibility	Number of simplified procedures	Completed procedures
Federal	17	10
Delegated Brandenburg	23	23
Delegated Bremen	2	2
Delegated Schleswig-Holstein	34	33
Delegated Thuringia	24	24
Total	**100**	**92**

Suspected breaches in wholesale energy trading

The Bundesnetzagentur monitors compliance with Regulation (EU) No 1227/2011 on wholesale energy market integrity and transparency (REMIT). It usually receives information about breaches of REMIT – insider trading or market manipulation – from the market monitoring bodies of the energy exchanges. It has so far received a total of 97 reports of suspicious trading behaviour, 34 of them in 2019.[1] These reports are initially treated as suspected breaches.

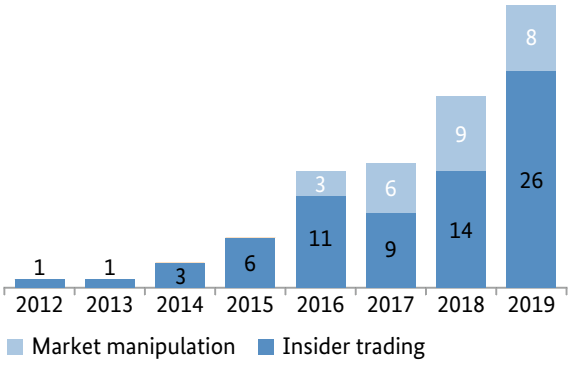
[1] As at: 31 December 2019

They are categorised according to the two main types, market manipulation and insider trading. If there is suspicion of insider trading, it is also always checked whether there has been a breach of the obligation to publish inside information. Both types of breach presuppose the existence of inside information. Inside information is information that would, if it were made public, be likely to significantly affect the prices of a wholesale energy product. Examples could be the failure of a power station or a gas production site. Insider trading usually refers to transactions concluded prior to the publication of power plant failures. Market manipulation includes cross-transactions and the placing of orders with no intention of executing them.

The Bundesnetzagentur conducts its own data analyses to investigate suspected breaches. If the suspicion is confirmed, the authority can open administrative fines proceedings or, if the case may have consequences under criminal law, pass it on to the relevant prosecution service.

Of the 97 reports received, 22 of them are still being investigated and a further 25 with cross-border relevance are also still being investigated. Cross-border processing means that more than one national regulatory authority is involved. A total of 49 cases were closed. Fines have been imposed in one case so far.

Suspected breaches 2012-2019[1]
Number



[1] As at 31 December 2019

Guidance on renewable energy electricity storage facilities and on metering and estimating for renewable energy surcharge payments

The Bundesnetzagentur published a guidance document on renewable energy electricity storage facilities on 12 March 2019. Operators of fixed electricity storage devices are required to have their facilities entered into the core energy market data register. All electricity storage facilities – both those that only use renewable electricity for the storage process and other types – must be registered. Operators who have only registered their renewable energy installation (eg solar installation) but not their electricity storage device (eg home battery storage) also need to have their storage device entered into the core energy market data register. One of the consequences for operators not registering their facilities as required is that they may only be eligible for a reduced level of financial support. In light of this, the Renewable Energy Sources Act (EEG) includes a new temporary arrangement under which operators not registering their electricity storage facilities will still be eligible for the full level of support provided the co-located renewable energy installation has been registered ("electricity storage amnesty"). Operators who have still not registered their storage device by the deadline under the amnesty arrangement will face reductions in the level of financial support for electricity from their renewable energy electricity storage facility.

The guidance on renewable energy electricity storage facilities explains the amnesty arrangement, the registration requirements for electricity storage facilities, the legal consequences for operators not registering their facilities, the financial support available for electricity from renewable energy electricity storage facilities and co-located renewable energy installations, and the difference between renewable energy electricity storage facilities and other storage facilities.

The Bundesnetzagentur published a consultation draft of a guidance document on metering and estimating for renewable energy surcharge payments on 9 July 2019. The EEG's statutory arrangements on metering and estimating that came into force on 1 January 2018 led to requests from companies, associations and consultants for guidance on how to interpret the arrangements.

Renewable energy surcharge privileges can only be claimed by those meeting the legal prerequisites (eg self-suppliers and electricity-intensive companies)

and providing proof of the amounts of electricity eligible for privileges. If, for instance, a company claiming privileges transmits electricity to another company not eligible for privileges, the amount of electricity transmitted must be measured separately to calculate the renewable energy surcharge payable. This requirement was introduced in the revised EEG in 2014. Before the new arrangements were introduced in 2018, all electricity had to be measured using calibrated meters to differentiate between electricity eligible for privileges and other electricity consumed, and it was not possible to estimate the amounts. The new arrangements specify for the first time when it is not necessary to separately measure small amounts of electricity transmitted to third parties and when it is possible to estimate the amounts instead. The legislative provisions include various terms requiring explanation and interpretation.

The draft guidance document is about 50 pages long and is divided into five sections with examples, diagrams and tables designed to explain how the arrangements work in practice. The aim is to help achieve the highest possible degree of consistency and legal certainty in applying the arrangements. The document is designed to explain the brief wording of the provisions as clearly but also as generally as possible.

An open workshop was held on 5 December 2019 to discuss the draft guidance document and consultation responses with companies and associations. A final version will be drawn up and published on the basis of the consultation and workshop discussions.

Setting the gas revenue caps

The third regulatory period for DSOs and TSOs began on 1 January 2018 and will last until 2022. The Bundesnetzagentur first determined the base level by examining costs in accordance with the provisions of the Gas Network Charges Ordinance (GasNEV). The revenue caps for DSOs using the simplified procedure were set in 2018, as were those for all TSOs except one. Following three rulings by the Federal Court of Justice (BGH), there were delays in setting revenue caps for DSOs under the standard procedure. In 2019, it was largely possible to set the revenue caps for DSOs using the standard procedure.

Capex mark-up

The annual capex deduction, introduced in 2016 pursuant to section 6(3) of the Incentive Regulation Ordinance (ARegV), was applied by the Bundesnetzagentur's Ruling Chamber 9 for the first time in the course of its determinations of revenue caps for the third regulatory period for gas (2018 to 2022). For each year of the regulatory period, the capital expenditure resulting from the reduction in residual value over time is deducted from the capital expenditure calculated for the base year on the basis of the cost examination conducted in 2017.

The capex mark-up, which has the opposite effect, is designed as a yearly application procedure. Rising capital expenditure due to investments is then reflected in the annual revenue cap. In 2019, Ruling Chamber 9 received 129 applications from gas network operators under the Bundesnetzagentur's responsibility. Decisions on these applications were taken in the second half of 2019.

Gas regulatory account

In 2019, the Bundesnetzagentur again examined and made final decisions on applications from network operators requesting adjustment of their revenue caps under the regulatory account scheme. The decisions focus on the differences of the years 2012 to 2016 and the resulting regulatory account balance as of 31 December 2016, which is then spread out over each year up to the end of the third regulatory period. Decisions have already been taken on the majority of the applications for the differences of the years 2012 to 2016. The Bundesnetzagentur also started examining the applications for 2017 submitted by the deadline of 30 June 2018. Draft decisions have been put out to consultation and the first decisions finalised. Decisions on the remaining applications will be taken as soon as possible.

Implementation of the network code on transmission tariff structures for gas

The three determination proceedings REGENT, AMELIE and MARGIT, which regulate the TSOs' joint tariff system and implement Commission Regulation (EU) 2017/460 establishing a network code on harmonised transmission tariff structures for gas (NC TAR), were concluded at the end of March 2019. In May 2019, Ruling Chamber 9 opened two further determination proceedings (BK9-19/610 – "REGENT 2021", and BK9-19/607 – "AMELIE 2021") in light of the planned merger of the current two German market areas into one single German market area as of 1 October 2021. Consultation on the MARGIT determination is to be conducted annually in accordance with Article 28 NC TAR, thus new proceedings were also opened (BK9-19/612 –"MARGIT 2021"). These proceedings will be

concluded by the end of the first half of 2020, putting in place key building blocks regulating the TSOs' network tariffs for the market merger process.

Implementation of virtual interconnection points

Pursuant to Article 19(9) of Commission Regulation (EU) 2017/459 of 16 March 2017 establishing a network code on capacity allocation mechanisms in gas transmission systems and repealing Regulation (EU) No 984/2013 (NC CAM), where two or more interconnection points connect the same two adjacent market areas, the TSOs concerned must offer the available capacities at the interconnection points at one virtual interconnection point (VIP) as of 1 November 2018 at the latest.

Legal uncertainty meant that some VIPs could not be set up until 2019. Ruling Chamber 7 monitored and supported the process of implementing VIPs at the borders of the market areas in accordance with the conditions laid down in the NC CAM. It held numerous meetings with the TSOs responsible for each market area border and with the regulatory authorities involved and, in particular, explored individual questions arising during the implementation at each border. The TSOs have announced that the last VIPs will be set up in the first half of 2020.

Support for the merger of the two German gas market areas

The Gas Network Access Ordinance (GasNZV) requires the TSOs to merge the current two market areas – Gaspool and NetConnect Germany – to form one single German market area by 1 April 2022 at the latest. The TSOs, market area managers and the Bundesnetzagentur have agreed that the single market area will be launched on 1 October 2021. The Bundesnetzagentur is closely monitoring the merger process and supports the TSOs and market area managers to ensure a smooth process with respect to security of supply and gas trading efficiency. Key elements of the market area merger process are capacity offer, network tariffs, network development planning and balancing/conversion.

Individual aspects of the future offer of capacity in the single German market area are covered by the KAP+ proceedings (BK7-19-037) currently in progress. The background is the increase in transport options in the future single German market area and the consequence that, for physical reasons, the existing network infrastructure will allow only a limited amount of firm, freely allocable entry capacity to be offered. The aim of the KAP+ proceedings is to enable additional firm capacity to be offered after the market merger under an oversubscription and buy-back scheme on the basis of the gas transmission networks regulation (Regulation (EC) No 715/2009). It will also enable market-based instruments to be used to secure this additional firm capacity. It seems logical to approve the oversubscription and buy-back scheme for a transitional period up to the annual auction in 2024. In the meantime, it would be possible to determine long-term capacity requirements in the single German market area in the scenario framework/ network development planning process and also to test the functionality and securing effect of the market-based instruments. It would then be feasible to offer the sufficient amount of firm, freely allocable capacity, as determined in accordance with the provisions of the GasNZV, as from the annual auction in 2024.

Alongside Ruling Chamber 7's KAP+ procedure, Ruling Chamber 9 opened the KOMBI proceedings on the recognition of the costs for market-based instruments and capacity buy-backs under the oversubscription and buy-back scheme as volatile costs with effect from 2021. This would minimise effects on the efficiency benchmarking for the fourth regulatory period.

Ruling Chamber 7 also concluded the proceedings on standardising capacity products (KASPAR) with its decision of 10 October 2019. The aim of the proceedings is to increase harmonisation and standardisation of capacity products in the German gas market. The proceedings were also conducted with the upcoming market area merger in mind. The determination sets out an exhaustive and reduced list of permissible capacity products in the gas market. TSOs will no longer be able to offer firm capacity with restricted allocability. This product is to be replaced by the current dynamically allocable capacity product. The determination also specifies the order of interruptions to interruptible capacity and/or firm capacity with interruptible elements at any one network point. In addition, the determination defines harmonised steps and arrangements for an over-nomination procedure for allocating within-day interruptible capacity and lays down publication and information requirements.

The majority of these arrangements will apply from the beginning of the gas year 2021/2022, when the new single German market area is launched.

Investments in electricity distribution networks, capex mark-up 2019

The Bundesnetzagentur introduced the capex mark-up for electricity distribution networks for the first time as from 1 January 2019. DSOs are able to apply for mark-ups on the revenue caps approved by the Bundesnetzagentur to directly take account of network infrastructure investments.

The revenue caps cover all network costs plus a return on equity, which companies may pass on to consumers through the network charges. The capex mark-up is essentially a form of pre-financing, since it enables companies to price in planned investments.

By the deadline of 30 June 2019, 170 applications for capex mark-up approvals for 2020 had been received (107 under the Bundesnetzagentur's own responsibility and 63 under delegated responsibility).

By 31 December 2019, the Bundesnetzagentur had approved capex mark-ups for distribution network expansion amounting to around €1bn. This corresponds to past or planned investments totalling some €13bn. Through the capex mark-up, only the annual capital costs of investments, including a return on equity, feed into the revenue caps for a given calendar year.

The approved capex mark-ups relate to past or planned investments in 2017, 2018, 2019 and 2020. The capex mark-ups approved by the Bundesnetzagentur are supplemented by further investments of the 700 smaller companies under the regulatory responsibility of the federal states.

Abuse proceedings – grid reserve capacity

Four applications were made for special abuse proceedings under section 31 of the Energy Industry Act (EnWG) concerning individual network operators' refusals to continue offering grid reserve capacity. Grid reserve capacity is charged for through a special price component for network usage, in other words a special network charge. If a network operator orders grid reserve capacity, the operator does not need to pay the upstream operator for high amounts of capacity used during the temporary outage or maintenance of a distributed generation installation provided the total outage times in a year do not exceed a certain level (up to 600 hours). In return, the network operator ordering the reserve capacity pays a fixed charge, similar to an insurance premium. The charge must be paid even if no reserve capacity is used, but it is usually lower than the additional charge that would have to be paid if the capacity used during an outage were charged for normally. Ordering reserve capacity enables network operators to pay a fixed amount to cover themselves against the risks of temporary outages of distributed generation installations. The price lists of the upstream network operators concerned did not include a price for grid reserve capacity; other network operators also decided not to offer grid reserve capacity as from 2019.

The applicants stated that the network operators' refusals were in breach of the provisions of the EnWG and the Electricity Network Charges Ordinance (StromNEV).

Ruling Chamber 8 rejected two applications for abuse proceedings to be opened; two proceedings have been put on hold pending a final court decision. There is no legal right to grid reserve capacity for downstream operators in the ordinance or higher-ranking legislation. It is not an essential price component within the meaning of section 17 StromNEV. The ruling chamber's competence under section 30 StromNEV is restricted solely to the "how" of grid reserve capacity. No right can be derived from the fact that this instrument was tolerated in the past and was covered by the Associations' Agreement II+, nor from the principle that network charges must be reasonable (section 21 EnWG). An upstream operator's decision to abolish this price component, taking account of energy supply factors, cannot be objected to. The decisions are under judicial consideration.

Decisions on standby lignite-fired power plants

The lignite-fired power plants listed in section 13g(1) of the Energy Industry Act (EnWG) are to be shut down, initially temporarily, on the specified dates. The aim is to reduce carbon dioxide emissions in the electricity supply sector. The plants are transferred to security standby status and may only be operated by TSOs as a last resort to guarantee system stability. After four years, the plants must be permanently closed.

The plant operators are remunerated for use of the plants for security standby purposes, for the decommissioning of the plants, and to repay the costs of putting the plants on security standby. Remuneration is a flat rate based on the revenues that the operators would have generated with their plants during the four-year security standby period, minus short-term variable costs. Unlike with the grid reserve, administrative proceedings are addressed directly to the plant operators.

- On 28 May 2018, Ruling Chamber 8 issued a determination for the Buschhaus plant to Helmstedter Revier GmbH and TenneT TSO GmbH (BK8-17/3006-R).
- On 15 August 2018, Ruling Chamber 8 issued a determination for the Frimmersdorf P and Q plant to RWE Power AG and Amprion GmbH (BK8-17/2006-R).
- On 17 July 2019, Ruling Chamber 8 issued a determination for the additional plant equipment of the Buschhaus power plant to Helmstedter Revier GmbH and TenneT TSO GmbH (BK8-17/3009-R).
- On 6 September 2019, Ruling Chamber 8 issued a determination for the Niederaußem E and F plant to RWE Power AG and Amprion GmbH (BK8-17/3006-R).

Determination on network operators' annual accounts under section 6b EnWG (BK8/9, 610/611)

Ruling Chambers 8 and 9 issued determinations under section 6b(6) of the Energy Industry Act (EnWG) on 25 November 2019 (BK8-19/00002-A to BK8-19/00006-A and BK9-19/613-1 to BK9-19/613-5).

The additional provisions for drawing up and auditing annual financial statements and balance sheet and profit and loss statements apply to vertically integrated energy utilities and legally independent network operators. They are applicable to network operators under the Bundesnetzagentur's own responsibility and under delegated responsibility (Berlin, Brandenburg, Bremen and Schleswig-Holstein).

The determination specifies that the existing obligation to draw up balance sheet and profit and loss statements for energy services applies to affiliated network operators. It also requires companies to have additional information that is closely related to regulatory administrative proceedings certified as part of their financial statement audit.

The determination will apply to annual financial statements with reporting dates from 30 September 2020.

Further development of the quality element

The Incentive Regulation Ordinance (ARegV) provides for quality of supply to be taken into account through a quality element. The quality element serves to secure long-term efficient and reliable operation of energy supply networks. In 2019, the Bundesnetzagentur commissioned a review of the quality element's design and integration in the revenue cap with proposals for further developing it.

The basic principles for the design and implementation of the current quality element were developed in 2009. The review was based on these principles and focused on three main areas.

"Possible future design options" involved investigating the advantages and disadvantages of making a distinction between different customer groups. A distinction would enable a more accurate replication of individual customer groups and their specific supply interruption costs. This would provide added value in calculating the economically best level of reliability. It would also make sense to publish additional parameters to provide a more transparent presentation of the level of reliability.

"Engineering analyses using simulations" involved making reliability calculations for realistic reference networks and their supply services. The findings confirmed the results of previous analyses and produced further parameters that could also be worth analysing in future. These findings largely corresponded to those made in the "empirical analysis using historical data".

The Bundesnetzagentur will now evaluate the results of these analyses to see how they can be taken into account in the quality element's future design.

Federal Court of Justice ruling on the rate of return on equity for the third electricity and gas regulatory period

As in the previous two regulatory periods, the network operators requested a judicial review of the rates of return on equity set by the Bundesnetzagentur for the current third regulatory period (6.91% for new assets and 5.12% for old assets). In particular, the operators requested a review of the methodology for calculating the market risk premium, which has an effect on the companies' risk premium.

The Federal Court of Justice (BGH) ruled on 9 July 2019 that the methodology used by the Bundesnetzagentur was lawful and did not need to be changed (file numbers EnVR 41/18 and EnVR 52/18). The rulings therefore confirm the rates of return on equity set by the Bundesnetzagentur. The court rulings reinforce the authority's position as an independent referee, balancing the interests of companies and society.

The rates of return represent an adequate basis for necessary investments in energy infrastructure, without imposing unreasonable costs on consumers through the network charges.

Auctions under the Renewable Energy Sources Act (EEG)

The level of payments for renewable energy installations was determined in 2019 in auctions for solar, onshore wind and biomass power and in joint auctions for onshore wind and solar power.

Solar installations
For the first time, five auctions were carried out for solar power in the space of a year, including the special auctions introduced in 2019. All auction rounds carried out in 2019 were oversubscribed. The award prices were all around, and in one case above, 5 ct/kWh.

Onshore wind plants
More auctions were also held for onshore wind due to the special auctions. However, the competitive situation was different compared with solar power. All auction rounds except for the last were considerably undersubscribed. This is reflected in the award prices, which were based on the highest price bid. In December 2019, the Bundesnetzagentur issued another determination setting the highest bid price eligible for award at 6.2 ct/kWh for the auction rounds in 2020. This is a response to the cost level for wind power plants and ensures that while new projects have sufficient scope, they do not receive too high a level of support because of the lack of competition.

Biomass plants
The Bundesnetzagentur held two auction rounds for biomass plants in 2019. The number of bidders continued to increase. The average volume-weighted price for winning bids was considerably lower than in the previous year.

Joint auctions for wind and solar plants
As in 2018, joint auctions for onshore wind plants and solar installations were held in 2019 in April and November. These auctions featured the distribution network component, which takes account of network and system integration costs incurred by the building of new solar installations and onshore wind plants. All the bids submitted in both rounds were for solar installations.

Auctions for combined heat and power (CHP) installations

Since December 2017, the Bundesnetzagentur has been holding two auctions a year to determine the level of financial support for CHP electricity that is fed into the public grid; while the first auction round was open only for CHP installations, auctions in the second and subsequent rounds have also been for innovative CHP systems. In the auction for CHP installations held in June 2019, the total bid volume was considerably higher than the auction volume. The average volume-weighted award price was 3.95 ct/kWh. The following auction held in December 2019 was undersubscribed, with a higher average volume-weighted award price of 5.12 ct/kWh.

In contrast to CHP installations, the auctions for innovative CHP systems showed a considerable increase in competition. While the auction in June 2019 was undersubscribed, the bid volume in the following auction in December 2019 was much higher than the auction volume. The average volume-weighted award price was 11.17 ct/kWh in June and 10.25 ct/kWh in December. The increase in demand indicates that innovative CHP systems – a combination of a CHP plant, an innovative, renewable heat source and an electric heat generator – are becoming increasingly popular with market participants, no doubt also because of the considerably higher permissible bid prices compared with CHP installations.

On-demand night lighting of wind turbines

The Omnibus Energy Act (EnSaG) makes it mandatory for wind turbines to be fitted with night-time lights that only flash when necessary by 30 June 2020. The measure aims to put an end to lights flashing all through the night and to increase acceptance of wind turbines among local communities. The requirement applies to wind turbines that are required by aviation regulations to be lit at night, which generally means all turbines higher than 100 metres and so around 19,000 existing and new turbines. Operators not complying with the requirement will not be eligible for financial support under the EEG.

In light of this severe sanction, in particular, the Bundesnetzagentur was tasked by law to look into extending the compliance deadline should the required technical systems not be sufficiently available in the market. Ruling Chamber 6 held an early consultation because it was already apparent at the beginning of the year that an extension would be necessary. All the consultation respondents were clearly in favour of extending the deadline, because the required transponder technology had not been approved under aviation regulations and owing to the length of time required to fit all existing and new turbines with the new technology. The transponder technology is a new technology for on-demand night lighting that is a relatively inexpensive solution for small wind farms as well. The changes to aviation regulations that are needed for the technology to be approved are not expected to be in place until 2020.

Ruling Chamber 6 therefore extended the compliance deadline by one year to 30 June 2021 in its determination of 22 October 2019 (BK6-19-142). The ruling chamber expects to revisit the matter in 2020 after reviewing the legal and technical situation. Operators can apply to the Bundesnetzagentur for exemption from the requirement; exemption is granted if compliance would be economically unreasonable for an operator. The application form and accompanying notes are available online. The ruling chamber has already received more than 200 applications. So far, 130 exemptions have been granted for a total of 475 wind turbines.

Introduction of a balancing energy market in Germany

On 2 October 2019, Ruling Chamber 6 approved the application submitted by the four TSOs responsible for the control areas in Germany to introduce a balancing energy market (BK6-18-004-RAM). The new arrangements bring about fundamental changes in the procurement of balancing services (balancing capacity and balancing energy).

The approval is based on Commission Regulation (EU) 2017/2195 establishing a guideline on electricity balancing and on Regulation (EU) 2019/943 on the internal market for electricity. The regulations provide for the establishment of (national) balancing energy markets that are to be integrated to form a European balancing energy market at a later point in time through two European balancing energy exchange platforms, the Platform for the International Coordination of Automated Frequency Restoration and Stable System Operation (PICASSO) (for automatic frequency restoration reserves (aFRR), the equivalent of secondary control reserves) and the Manually Activated Reserves Initiative (MARI) (for manual frequency restoration reserves (mFRR), the

equivalent of tertiary control reserves). The approval provides for implementation of the national balancing energy market on 1 June 2020.

A new market design will be introduced for aFRR and mFRR. In future, balancing capacity and balancing energy will be procured in two separate, successive markets instead of in one joint process. In the balancing capacity market, bids will be awarded on the basis of the balancing capacity price bid. In the balancing energy market, bids will be awarded – and activated balancing energy will be remunerated – on the basis of the balancing energy price bid. In future, all pre-qualified providers will be able to deliver balancing energy independent of (successful) participation in the capacity market. Up until now, balancing energy could only be delivered by providers with successful bids in the capacity market.

In the balancing energy market, all providers, including those with successful bids in the capacity market, will be free to change their energy bids up until gate closure time. Providers with successful bids in the capacity market will be required to submit energy bids in the balancing energy market prior to the gate closure time. The providers' bids must correspond to the volume of their successful balancing capacity bids. This, together with the possibility to hold a second tendering process for balancing capacity, ensures a liquid balancing energy market. It ensures that there are always sufficient bids to cover the volumes tendered by the TSOs.

If the volume of energy tendered by the TSOs in the balancing energy market is covered by the bids submitted, the energy from the "surplus" bids is free to be marketed elsewhere, for instance in the intraday market. This also applies to successful bids already awarded a capacity price in the balancing capacity market.

The balancing capacity market will in future also have a key function as an "insurance product" that will come into play if there is an outage in the balancing energy market, for instance because of technical problems. In this case, the procurement process in the balancing energy market will be suspended, and the balancing energy required will be activated solely on the basis of the successful balancing capacity bids. Any balancing energy activated in this way will be paid a substitute energy price that will reflect a provider's individual cost structures as closely as possible.

Determination of TSOs' reporting requirements for provisional and final network charges

The determination (BK8-19/0001-A) sets out requirements on the TSOs responsible for the control areas to publish their provisional and final network charges as well as associated reporting requirements.

The aim is to improve how the Bundesnetzagentur is involved in and informed of the TSOs' charge-setting process. This will enable the process to be completed and the charges finalised considerably earlier.

The aim of setting deadlines for the TSOs to publish their upstream network charges is to facilitate a smooth downstream charge-setting process. The TSOs' charges are upstream network costs and the key parameter in the charge-setting process for all downstream DSOs. This means that the quality of the provisional network charges and timely notification of any planned changes in charges to downstream operators are of particular importance.

Decisions relating to the grid reserve

In 2019 audited provision costs were determined for the first time for all plants in the grid reserve. The price-setting for 2020 and the regulatory account 2020 for 2019 take account of these new planning costs and the costs compared with the actual costs in the TSOs' revenue caps.

Grid reserve plants are contracted and used, without prejudice to legal rights and obligations, in accordance with the Grid Reserve Ordinance model on the basis of contracts concluded between TSOs and plant operators in consultation with the Bundesnetzagentur. One of the components of these grid reserve contracts is the remuneration paid by TSOs to plant operators and set in consultation with the Bundesnetzagentur.

Operators whose plants are contracted for the grid reserve are entitled to appropriate remuneration as set out in section 13c of the Energy Industry Act (EnWG). Remuneration depends on whether an operator intended to shut down a plant temporarily or permanently.

Costs incurred by TSOs for remunerating plant operators are recognised in each systemic relevance period of a grid reserve plant as regulated, permanently non-controllable costs in accordance with the applicable requirements by a determination from Ruling Chamber 8 on a voluntary commitment by the TSOs.

The costs incurred from the grid reserve are passed on by connecting TSOs to network customers as permanently non-controllable costs.

The following determinations on the recognition of costs for the provision and use of domestic power plants in the grid reserve were made in 2019:

- decision of 7 June 2019 addressed to Amprion GmbH concerning the first systemic relevance period of the grid reserve plant GTKW Darmstadt (BK8-17/2004-R);
- decision of 24 June 2019 addressed to TransnetBW GmbH concerning the first to third systemic relevance periods of the grid reserve plants Marbach II GT, Marbach III GT (solo) and Marbach III DT (BK8-17/4001-R; BK8-17/4003-R; BK8-18/4001-R); and
- decision of 7 November 2019 addressed to Amprion GmbH concerning the first systemic relevance period of the grid reserve plant Mainz Block KW2 – DT – (BK8-17/2001-R).

Measures to improve data quality

In 2019 the Bundesnetzagentur initiated a broad discussion about improving data quality in regulatory processes, which is still ongoing. The Bundesnetzagentur had face-to-face discussions with industry within the scope of specialist committees and events. Webinars were also held as part of the consultation process with the aim of explaining the details of two determination proceedings to a larger circle of interested parties and answering questions direct. Over 300 pre-registered company representatives took part; further webinars are planned. The Bundesnetzagentur is also looking at other instruments to improve data collection processes. At the same time, it has asked the industry to work on internal quality management processes for data retention and transmission to the authority. It is also looking at sanctions against companies that deliberately or culpably report incorrect data.

Eleventh Göttingen energy conference on sector coupling and the role of network operators

The eleventh energy conference conceived, organised and held jointly by the Energy Research Centre of Lower Saxony (EFZN) and the Bundesnetzagentur took place in the Paulinerkirche in Göttingen on 8 and 9 May 2019 and focused on sector coupling and the role of network operators. The energy conference provides an interdisciplinary forum for discussion between market participants, consultants, authorities and scientists. At the 2019 conference, economists, engineers and legal experts discussed the opportunities and challenges of integrated energy systems. The twelfth energy conference will look at consumers in the new energy world, action in the market and challenges for the network and is due to take place on 27 and 28 May 2020.

Bundesnetzagentur confirms electricity network development plan 2019-2030

The electricity network development plan (NDP) 2019-2030 covers nearly 3,600 more kilometres of transmission routes than the applicable Federal Requirements Plan. The majority of these are planned to strengthen existing connections. Despite the inclusion of grid optimisation measures and innovative technical approaches, additional grid expansion will still be needed to meet the government's target of increasing the proportion of electricity generated from renewable sources to 65% of gross electricity consumption by 2030.

74 new measures

The Bundesnetzagentur confirmed 74 new measures, including an additional high-voltage direct-current transmission corridor that will run from Schleswig-Holstein through Lower Saxony to North Rhine-Westphalia.

Offshore transmission links planning

The NDP 2019-2030 is the first NDP to include the planning for offshore transmission links, replacing the previous offshore NDP. The goal is to connect offshore wind farms with an installed capacity of 20 GW by 2030.

Phase-out of electricity generated from coal taken into consideration

The final report of 26 January 2019 by the Commission on Growth, Structural Change and Employment was taken into consideration in the latest NDP in Scenario C 2030, which reflects the phase-out plan for electricity generated from coal up to 2030.

International cooperation

The Clean Energy for All Europeans Package (CEP) adopted in 2019 will introduce new regulation for central areas of the European internal electricity market. This includes provisions on the design of bidding zone configurations and the calculation of cross-border capacities.

The Federal Ministry for Economic Affairs and Energy, the German TSOs and the Bundesnetzagentur are working together on implementing the clean energy package in national law.

Clean Energy for all Europeans Package

At the end of 2016, the European Commission presented a comprehensive package of legislation with the aim of further integrating the European single energy market. The Clean Energy for all Europeans Package (CEP) was adopted in 2019 and set the following goals:

- Energy efficiency must be the top priority.
- The EU needs to take a leading role in renewable energy globally.
- Consumer interests should be strengthened.
- Specifically, the Commission published the following legislative proposals:
- Revised Regulation (EU) No 714/2009 on conditions for access to electricity networks
- Revised Renewable Energy Directive 2009/28/EU
- Revised Internal Electricity Market Directive 2009/72/EU
- Regulation on measures to safeguard security of electricity supply (replaces Directive 2005/89/EC on Security of Supply)
- Revised ACER Regulation (EC) No 713/2009
- Revised Energy Efficiency Directive 2012/27/EU and Energy Performance in Buildings Directive 2010/31/EU
- Regulation on the Governance of the Energy Union

The CEP will introduce new regulation for central areas of the European internal electricity market. This includes provisions on the design of bidding zone configurations and the calculation of cross-border capacities. The Bundesnetzagentur argued for the single German bidding zone to be kept.

Following the CEP's publication in the EU Official Journal in June 2019 and because of the tight implementation deadlines, the Bundesnetzagentur, the German TSOs and the Federal Ministry for Economic Affairs and Energy began intensive work in 2019 on the new principles, in particular in light of a further opening up of European electricity trading. The internal electricity market regulation adopted as part of the CEP requires a minimum of 70% of the transmission capacity to be kept available for cross-zonal trade from 1 January 2020. In Germany, this would suddenly lead to considerable internal congestion and a considerable increase in redispatching measures and costs.

EU member states with identified structural congestion can present an action plan with measures to reduce the congestion. These member states must achieve the minimum capacity of 70% by 31 December 2025 by making increases based on a linear trajectory with calculated values for 2020 as the starting point.

The German TSOs submitted a congestion report to the Bundesnetzagentur, which was confirmed in November 2019 and enables an action plan to be adopted for Germany. An action plan was drawn up by the Ministry in cooperation with the Bundesnetzagentur. The plan sets out a package of measures to reduce the internal structural congestion and a timetable for adopting the measures. The measures are divided into national measures and regional measures based on cross-zonal cooperation (in particular redispatching). The national measures are grouped into measures to increase electricity transmission capacity and accelerate grid expansion and measures to improve congestion management and strengthen cross-zonal trading.

The Ministry's action plan also sets out the principles for calculating the starting values for the linear trajectory to achieve the required trading capacity of 70% by the end of 2025. The starting values are calculated by the German TSOs using the Bundesnetzagentur's explanations of the methodology published online on its website.

Action against ACER decision on capacity calculation methodologies

On 21 September 2019 the Bundesnetzagentur brought an action before the EU Court of Justice against the decision of the Agency for the Cooperation of Energy Regulators (ACER) on the capacity calculation methodology for the central Europe region (core region). The Bundesnetzagentur objects to the requirement for TSOs to potentially include fewer internal network elements in capacity calculations and thus allow considerably more cross-zonal trade and corresponding loads on the network. This would lead to an increase in redispatching measures in Germany. The Bundesnetzagentur believes that not including internal lines in Germany would mean that at least 100% of the capacity of these lines would need to be made available for cross-zonal trade. This is in breach of the EU's new legislative provisions under the Clean Energy Package, which allow the capacity available for cross-zonal trade to be increased linearly on an annual basis to achieve the required minimum capacity of 70% by 31 December 2025. The Bundesnetzagentur also objects to the fact that ACER permits TSOs in the central Europe region to take account of one-sided and uncoordinated network-related remedial measures (eg use of phase shifters) at a very early stage in capacity calculations. This would have a negative impact on optimising flow-based capacity calculations and would lead to redispatching measures that could otherwise be avoided.

4MMC interim project for market coupling

Market coupling enables the efficient use of the limited transmission capacity available between different countries or bidding zones. The aim of market coupling is to achieve more efficient allocation of cross-zonal transmission capacity and improve pricing in regional day-ahead markets, with a view to increasing liquidity and trading options and aligning prices.

The multi-regional coupling (MRC) scheme now covers the day-ahead markets in 20 European countries (representing more than 85% of Europe's electricity consumption). The next step is to integrate Poland and the four 4MMC countries – Czechia, Hungary, Slovakia and Romania – into the current MRC scheme in an interim project. The regulatory authorities in these countries, the Austrian regulatory authority E-Control and the Bundesnetzagentur agreed on this in December 2018. The aim is to strengthen integration of the day-ahead market in the region until the core flow-based market coupling project takes effect. The 4MMC project is due to be completed in the second half of 2020.

Bidding zone review

The EU internal electricity market regulation requires a review to be carried out of the bidding zone configuration in Europe. TSOs were required to submit a proposal for the methodology and assumptions and for alternative bidding zone configurations by 5 October 2019. EU regulatory authorities must take a unanimous decision on the proposal within three months, otherwise ACER decides within an additional three months on the methodology and alternative bidding zone configurations. Since the regulatory authorities unanimously decided that the proposal was incomplete, in December 2019 the TSOs were given a further two months to complete the proposal. This pushes back the deadlines for approval by the regulatory authorities or ACER. One of the points of criticism was that the TSOs' proposal did not include consideration of alternative bidding zone configurations for the countries in the central Europe region. The Bundesnetzagentur believes that a comprehensive bidding zone review should include a balanced consideration of alternatives in all relevant countries.

Once the regulatory authorities have approved the methodology or ACER has decided on the proposal, the TSOs have twelve months to carry out the review and submit a joint proposal to amend or maintain the bidding zone configuration. If structural congestion is identified, the member states with identified structural congestion can establish action plans or amend their bidding zone configuration to relieve or manage the congestion. The relevant member states must reach a unanimous decision on amending the bidding zone configuration. If they fail to reach a unanimous decision, the European Commission will decide whether to amend or maintain the bidding zone borders.

Congestion management between Germany and Austria – summary

The congestion management scheme between the German and Austrian wholesale markets was introduced on 1 October 2018.

The split was made necessary by the fact that in recent years, unlimited trading flows had no longer reflected the physical reality. The additional power lines planned between the two countries were still not enough to carry the flows of electricity at all times. These trading flows would have had to be secured permanently using expensive system security measures and unplanned flows via neighbouring countries, but, in the long term, this situation neither makes economic sense nor is it permitted under energy law.

The congestion management scheme was the result of intensive talks between E-Control and the Bundesnetzagentur, during which, in May 2017, the basic points of its implementation were determined in an agreement. A minimum capacity of 4.9 GW was set and secured, including by means of the provision of redispatching power plants with 1 GW (1.5 GW from October 2019) in Austria. The long-term transmission rights are issued as financial transmission rights (FTRs) and the capacity calculation is carried out using the flow-based method of capacity calculation in the central western Europe (CWE) region. This method is the European target model and aims to distribute cross-border trading capacity among the individual borders in the best way possible.

A total of 2,940 MW of yearly capacity for 2019 (60% of 4,900 MW) was auctioned for €3.33/MWh. In the twelve months following the introduction of the congestion management scheme, the average price spread was €3.40/MWh. This showed that the market had made a good forecast of the price development at the annual auction and disproved fears of a considerable rise in prices, in particular in Austria.

The average monthly price spread in the period ranged from €8.60/MWh in October 2018 to €0.10/MWh in May 2019. In 2019, Austria was again the neighbouring country with by far the largest imports from Germany. Overall, Austria's trading volume (imports and exports) with Germany is the second highest behind France.

The yearly capacity for 2020 was auctioned for €2.65/MWh, again indicating that trading between Germany and Austria frequently leads to the same prices and continues at a high level.

The Bridge Beyond 2025

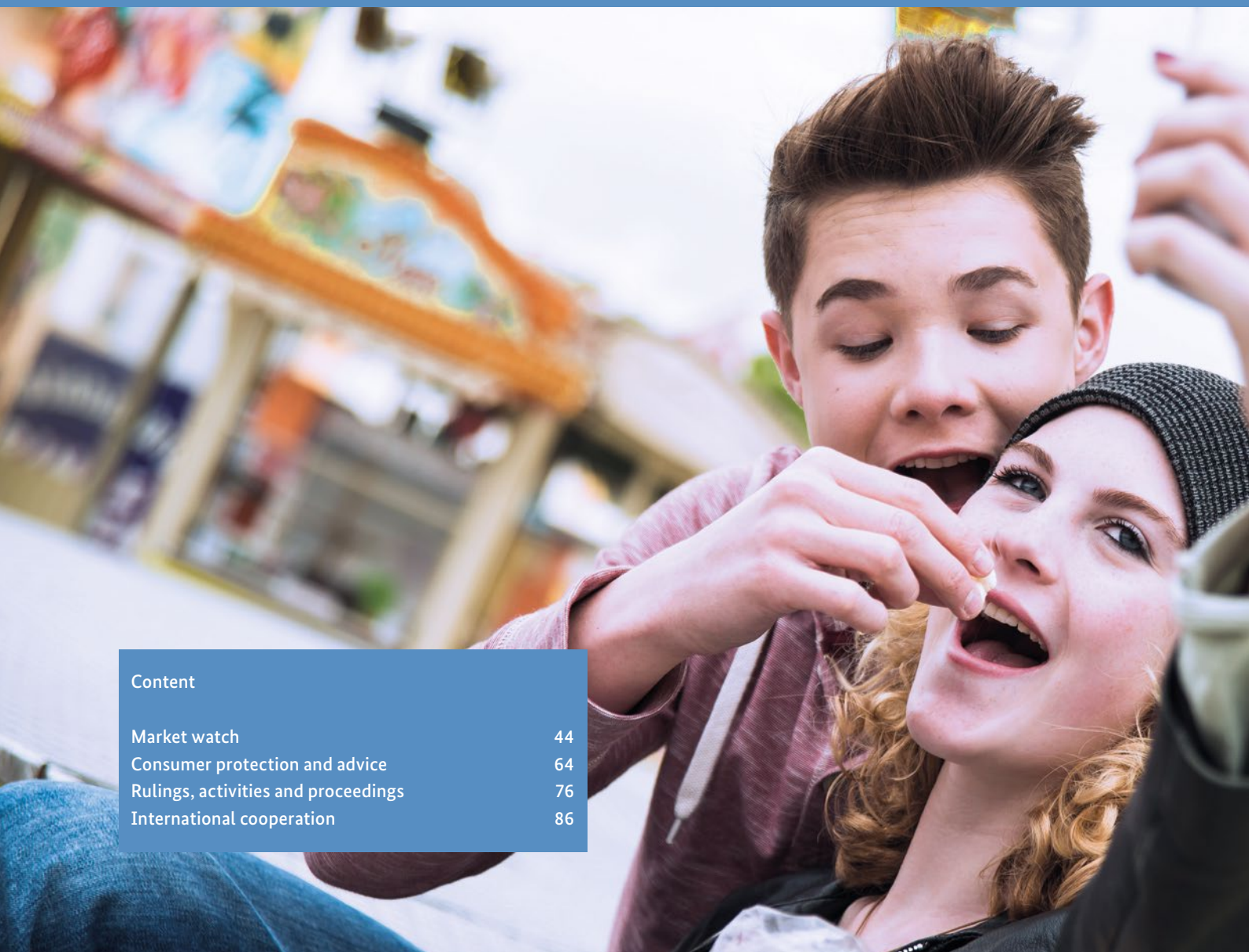
In November 2019 the Agency for the Cooperation of Energy Regulators (ACER) and the Council of European Energy Regulators (CEER) published a joint conclusions paper entitled "The Bridge Beyond 2025". The conclusions presented in the paper take into account the responses to two public consultations. The joint purpose is for the two bodies to identify priorities for future legislative and regulatory action to support the European Commission. The paper discusses possible changes in governance for infrastructure planning and in the regulatory framework for the European internal market. The paper also identifies the need for action in developing a sustainable gas sector in an increasingly decarbonised energy market. Here, the main priority is to remove any regulatory barriers to the development of new technologies, such as the production of hydrogen from renewable energy sources.

The Bundesnetzagentur actively contributed to the paper within various groups at ACER and CEER and was thus able to share viewpoints with other regulatory authorities and shape results. The Bundesnetzagentur plays an active role in developing the regulatory framework for the gas market through its participation in working groups and open workshops.

TELECOMMUNICATIONS

Shaping digital change

Powerful networks are vital to the people of Germany and cement the country's future as an attractive location for business and industry. As the independent regulatory authority, the Bundesnetzagentur creates an investment-friendly environment for businesses investing in the future of telecommunications networks – and thus lays the foundations for digitalisation in Germany.



Content

In 2019 the Bundesnetzagentur held the auction for German 5G spectrum, auctioning a total of 420 MHz in the bands at 2 GHz and 3.6 GHz and raising an aggregate amount of €6,549,651,000. The Bundesnetzagentur is opening up additional spectrum in the band at 3700–3800 MHz for use in local broadband networks.

The Bundesnetzagentur began the process to determine the future regulation of access to the copper and fibre access network. Rather than superimposing existing copper-network regulation as-is onto new fibre-optic lines, the intention is to implement targeted regulation whilst keeping it to the minimum necessary.

The number of complaints in connection with nuisance marketing calls fell over the last year from around 62,200 to around 57,600. In parallel, the Bundesnetzagentur continues to tackle dubious business practices, in 2019 imposing fines of over €1.3m. At around 125,500, the number of complaints and enquiries in connection with number misuse increased marginally versus the previous year. In its efforts to combat misuse, the Bundesnetzagentur ordered the disconnection of some 530 telephone numbers and issued billing and collection bans for around 6,700 telephone numbers.

Market watch

More than four fifths of all call minutes in fixed networks are already made using IP technology.

Mobile call volumes now significantly exceed those in the fixed networks.

Demand is growing sharply for broadband lines with high nominal transmission rates.

Telecommunications markets as a whole

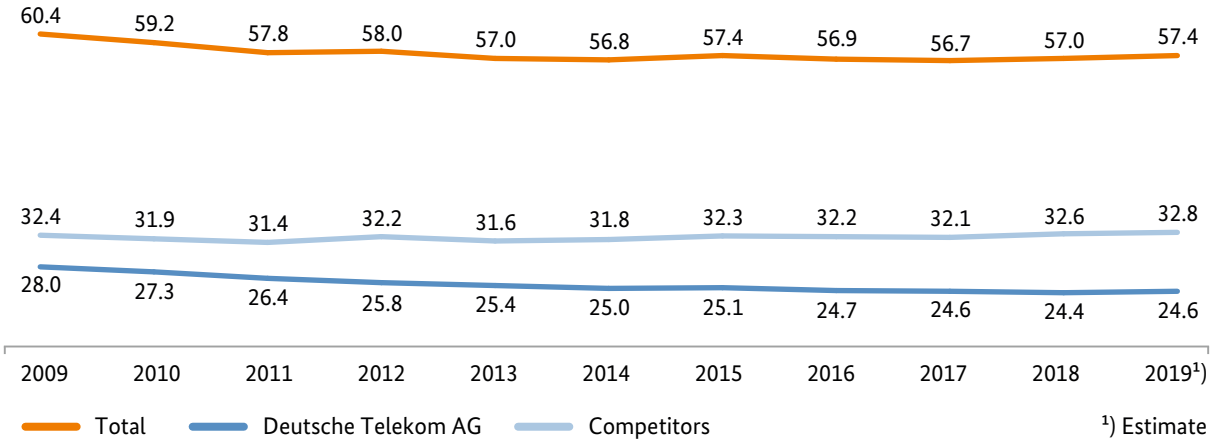
External revenue

According to the Bundesnetzagentur's preliminary calculations, external revenue in the telecommunications market grew to €57.4bn in 2019. This represents a year-on-year increase of €0.4bn.

A breakdown of revenue by providers shows that the revenue in 2019 of both competitors and Deutsche Telekom AG (DTAG) increased in each case by €0.2bn year on year. Whilst the external revenue of competitors rose to €32.8bn in 2019, the external revenue of DTAG increased to €24.6bn

A breakdown of revenue by market segment shows that the shares have remained steady since 2017. The largest share is attributable to mobile services. Accounting for €26.57bn (46%), the market share of mobile services in 2019 was more than that of conventional telecommunications networks with €21.72bn (38%) and of HFC networks with €5.77bn (10%).

External revenue in the telecommunications market
€bn



External revenue by segment						
	2017		2018		2019[1]	
	€bn	%	€bn	%	€bn	%
External revenue in the telecommunications market	**56.7**		**57.0**		**57.4**	
External revenue in conventional telecommunications networks	**21.65**	100[2]	**21.60**	100	**21.72**	100
Via retail	16.95	78	17.19	80	17.32	80
Via wholesale	4.41	20	4.12	19	4.13	19
Other external revenue	0.29	1	0.29	1	0.27	1
External revenue in HFC networks	**5.48**	100	**5.85**	100[2]	**5.77**	100[2]
Via retail	5.11	93	5.37	92	5.45	94
Via wholesale	0.09	2	0.09	2	0.08	1
Other external revenue	0.28	5	0.39	7	0.24	4
External revenue from mobile services	**26.37**	100	**26.55**	100	**26.57**	100
Via retail (excluding terminal equipment)	18.82	71	18.66	70	18.82	71
Via wholesale	2.80	11	2.91	11	2.90	11
Via terminal equipment	3.38	13	4.16	16	4.04	15
Other external revenue	1.37	5	0.82	3	0.81	3
Other external revenue	**3.19**	100	**2.99**	100	**3.33**	100

1) Estimate

2) Totals may deviate from rounded cumulative figures.

Conventional telecommunications networks

In the conventional telecommunications networks segment, external revenue grew slightly in 2019 according to currently available data, amounting to €21.72bn. This was 0.6% higher year on year. Conventional telecommunications networks are networks based on copper and optical fibre cables.

External revenue in conventional telecommunications networks consists of revenue from retail and wholesale services and other external revenue. Revenue via retail is generated from services for private, commercial and public sector customers. According to the Bundesnetzagentur's estimates, it accounted for around 80% in 2019. Wholesale services for fixed-network and mobile operators and service providers outside of the DTAG group accounted for around one fifth of external revenue. These services include wholesale products for voice traffic and telephony, broadband and internet, and infrastructure services.

HFC networks

The revenue of HFC (hybrid fibre-coax) network operators fell in 2019 by more than 1% year on year to approximately €5.8bn. This decrease is attributable to the inclusion of a special factor in 2018 in other external revenues. Adjusted for this special factor, the uptrend seen in recent years would have continued – albeit with a significantly slower rate of growth.

The lion's share of external revenue in HFC networks (94%) was attributable to retail. Wholesale business accounted for around 1%. The limited significance of wholesale business compared with the conventional telecommunications networks segment is probably largely due to the fact that no HFC network operator to date offers wholesale products that can be used by third parties to provide broadband connections.

Mobile services

External revenue from mobile services amounted to an estimated €26.57bn in 2019 and was therefore slightly higher than in 2018 (0.1%). According to the Bundesnetzagentur's estimates, 71% of this external revenue was attributable to retail business (excluding terminal equipment) and 11% to wholesale business. Revenue from terminal equipment accounted for 15%, down one percentage point on 2018.

The distribution of revenue between mobile network operators and mobile service providers shows that the lion's share of this revenue (over 80%) was attributable to network operators. In 2019 their share decreased by one percentage point year on year to around 81%. By contrast, rising revenues for service providers in 2019 led to their share increasing year on year by around one percentage point to 19%. The general trend for the period 2017 to 2019 was thus one of relative stability, with revenues from mobile services hovering at around €26bn, network operator revenues at around €21bn, and service provider revenues at around €5bn.

External revenue from mobile services

	2017		2018		2019[1)]	
	€bn	%	€bn	%	€bn	%
Total	**26.37**	**100**	**26.55**	**100**	**26.57**	**100**
Network operators	21.25	81	21.67	82	21.58	81
Service providers	5.12	19	4.88	18	4.99	19

[1)] Estimate

Investments in fixed assets

According to the Bundesnetzagentur's preliminary calculations, investments in fixed assets in the telecommunications market increased once again in 2019 to reach €9.6bn, thereby surpassing the 2018 level by €0.5bn (an increase of 5%).

Competitors invested €5.2bn in 2019 compared with €4.7bn in 2018. At almost 11%, the growth rate once again reached double digits and thus continued the trend for rising investments by competitors seen since 2017.

By contrast, DTAG's investments lingered at the prior-year level. It invested €4.4bn or 46% of all investments in the telecommunications market in 2019.

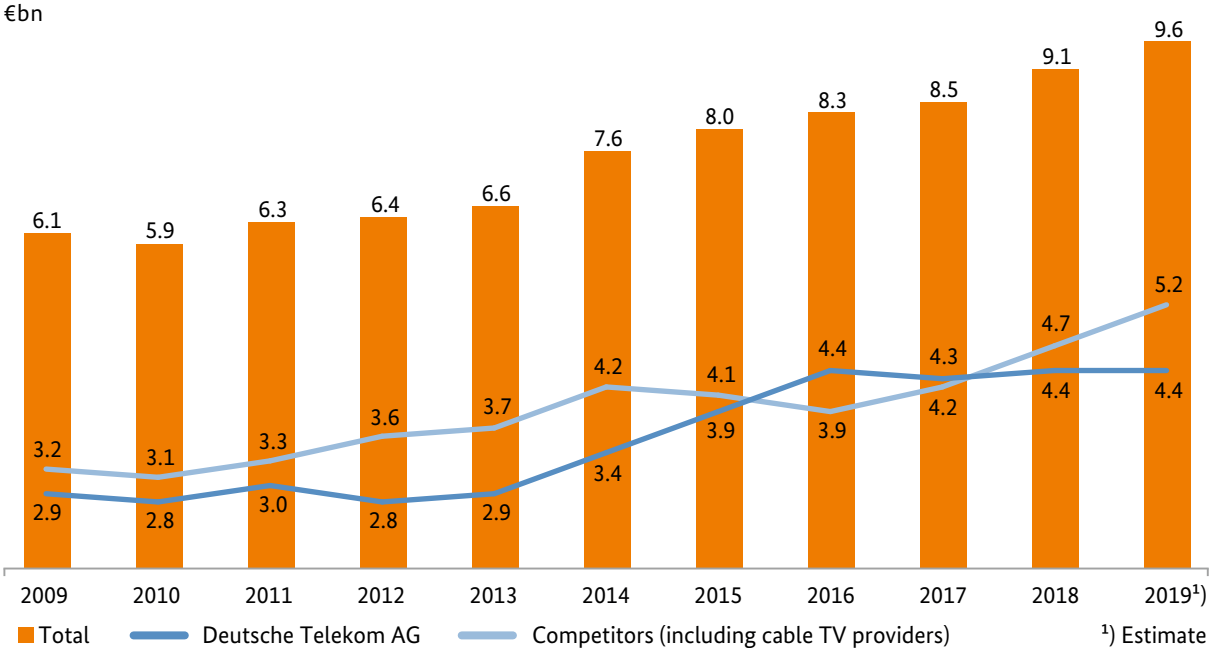
According to currently available data, companies invested primarily in new broadband network infrastructure. This includes investments that create new opportunities in the areas of broadband coverage and bandwidths. They accounted for around 71% of all investments in 2019. Maintenance of existing broadband network infrastructure accounted for approximately 14% and other investments for around 15%. These encompass investments in subscriber terminal equipment, the expansion of data centres and investments in customer support.[1]

In the fixed-network segment, investments concentrated on the rollout of broadband and optical fibre networks and the upgrading of cable networks. In mobile networks, the focus was on building out mobile infrastructure with LTE.

Since the market opened up in 1998 through to the end of 2019, companies have invested a total of €163.7bn in fixed assets in the telecommunications market. Of this amount, 52% (€85.4bn) is attributable to competitors and 48% (€78.3bn) to DTAG.

[1] When interpreting the data, it should be noted that the assignment of investments to the categories "existing broadband network infrastructure", "new broadband network infrastructure" and "other" may have been subject to different interpretation by the companies surveyed in order to collect information for this report. In addition, not all companies were able to provide a breakdown of their data. These companies are not included in the calculation of shares.

Investments in fixed assets in the telecommunications market
€bn

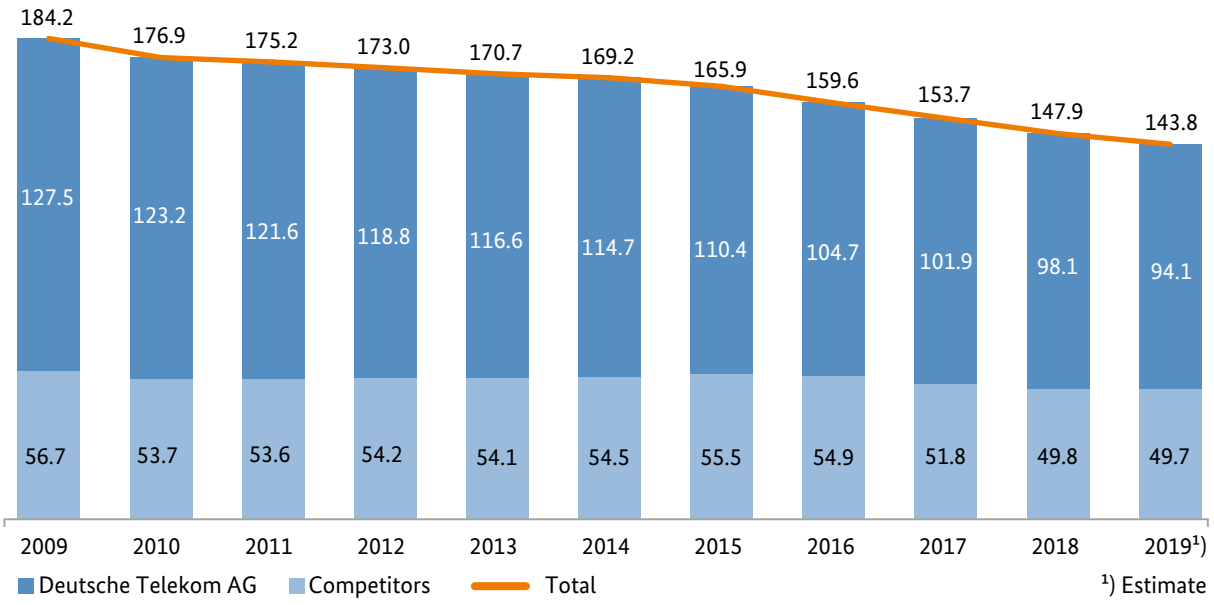


Employees

According to the Bundesnetzagentur's initial calculations, 143,800 people were employed by companies in the telecommunications market at the end of 2019. This is around 4,100 (almost 3%) fewer than at the end of 2018. DTAG reduced its headcount by 4,000 year on year to 94,100. The staff numbers of competitors remained stable year on year at 49,700 (a decrease of 100).

These developments have been influenced by two key factors. First, companies are being forced to realise efficiency potential due to increasing competition. Second, recent years have been characterised by technological advances, the innovative potential of which is best realised in a competitive environment. The investments made have enabled the provision of more telecommunications services of a better quality by fewer employees. This increase in productivity is particularly marked in the telecommunications sector.

Employees in the telecommunications market
Thousand



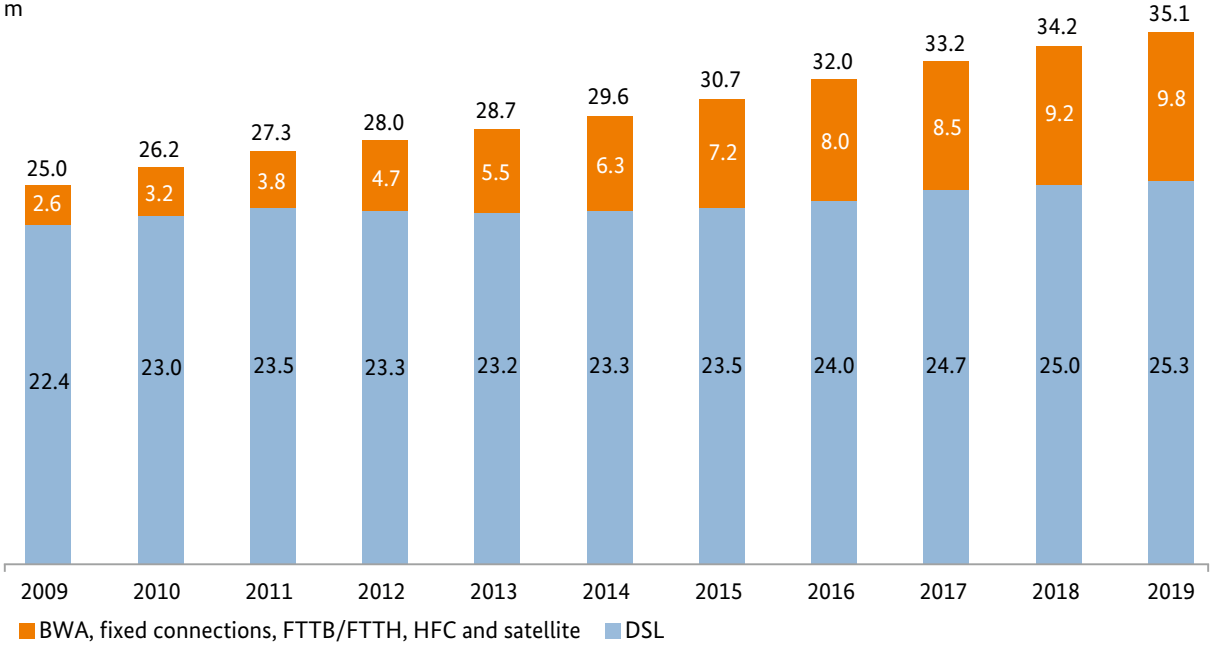
Fixed network

Broadband connections

The number of contractually agreed broadband connections increased by around 3% year on year in 2019, bringing the total to 35.1m at the end of 2019.

With a share of 72% (25.3m), the majority of broadband connections continue to be based on various DSL technologies. Together, all other technologies accounted for approximately 9.8m connections. Most of these were based on HFC networks (around 8.3m), whilst approximately 1.4m were based on fibre-to-the-building (FTTB) or fibre-to-the-home (FTTH). Roughly 0.1m connections were broadband wireless access (BWA), fixed connections or satellite connections.

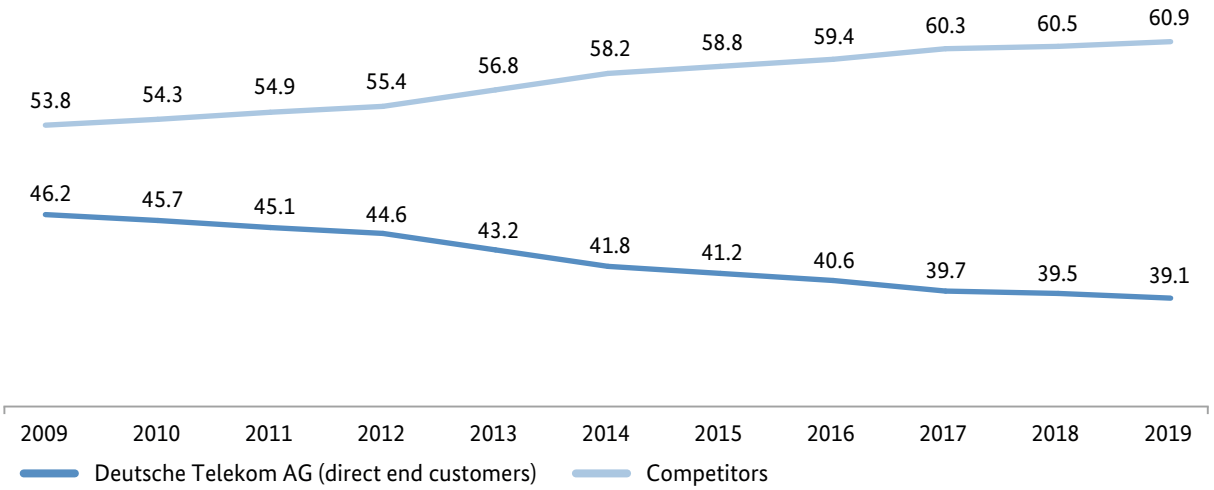
Broadband connections in fixed networks
m



DTAG's competitors were able to expand their share of the broadband market once again in 2019.

With regard to retail business, competitors had achieved a market share of around 61% of all broadband connections by the end of 2019.

Share of fixed broadband
%

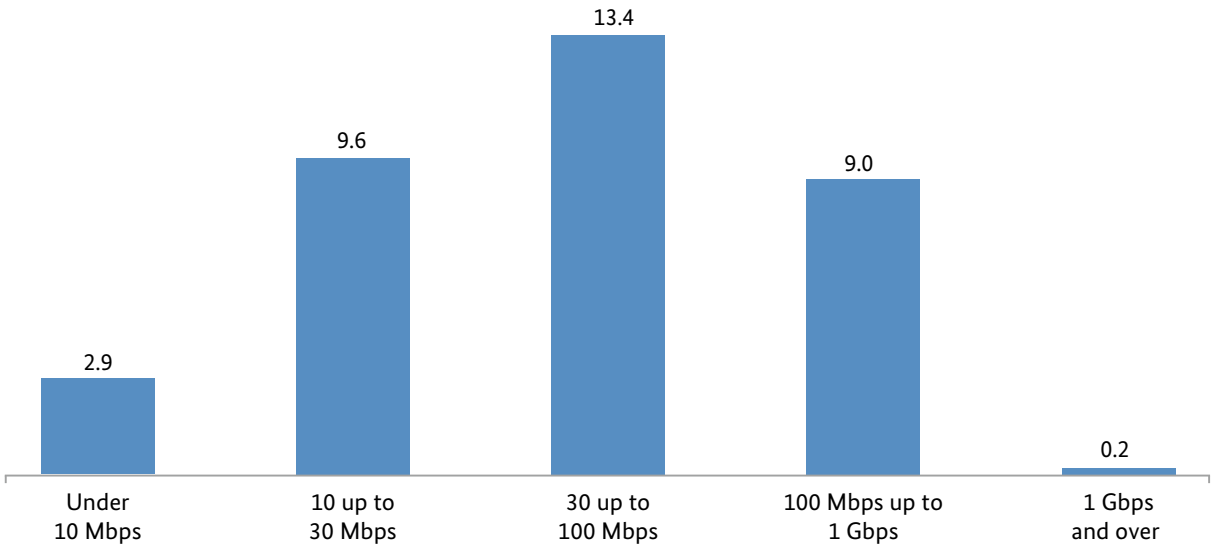


Transmission rates

In the broadband market, demand for connections with high nominal bandwidths increased markedly in 2019. In relation to the total number of active broadband connections in fixed networks (35.1m), the number of connections with speeds of at least 100 Mbps rose from just under 20% in 2018 to around 26% at the end of 2019. Roughly 0.2m connections were available with a nominal bandwidth of at least 1 Gbps at this point in time.

Some 2.9m broadband customers were still using connections with a nominal data rate of under 10 Mbps at the end of 2019.

Advertised speed of contract-based fixed broadband connections in 2019
m



DSL connections

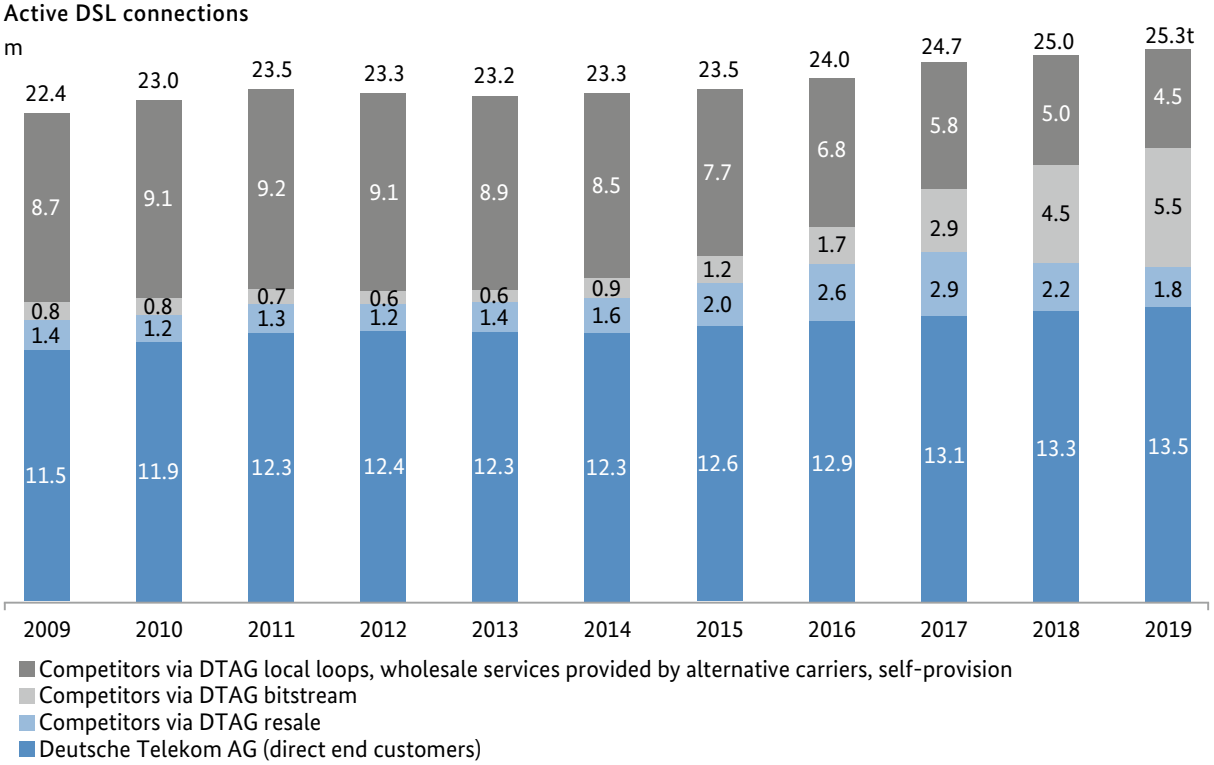
In total, there were approximately 25.3m operational DSL connections at the end of 2019, around 13.5m of which were attributable to direct end customers of DTAG and around 11.8m to competitors, which primarily marketed DSL connections to customers on the basis of the specific wholesale products of DTAG and alternative carriers. Based on these figures, DTAG's competitors had achieved a DSL market share of around 47% by the end of 2019.

The growth of the DSL market is still based chiefly on the positive development of the number of VDSL connections. With over 15m connections, VDSL accounted for a share of almost 60% of all DSL connections at the end of 2019. Around 6.8m VDSL connections were provided by DTAG's competitors and around 8.3m direct VDSL connections by DTAG. The rise in the spread of VDSL is most likely due mainly to vectoring technology, which currently enables transmission rates of up to 250 Mbps.

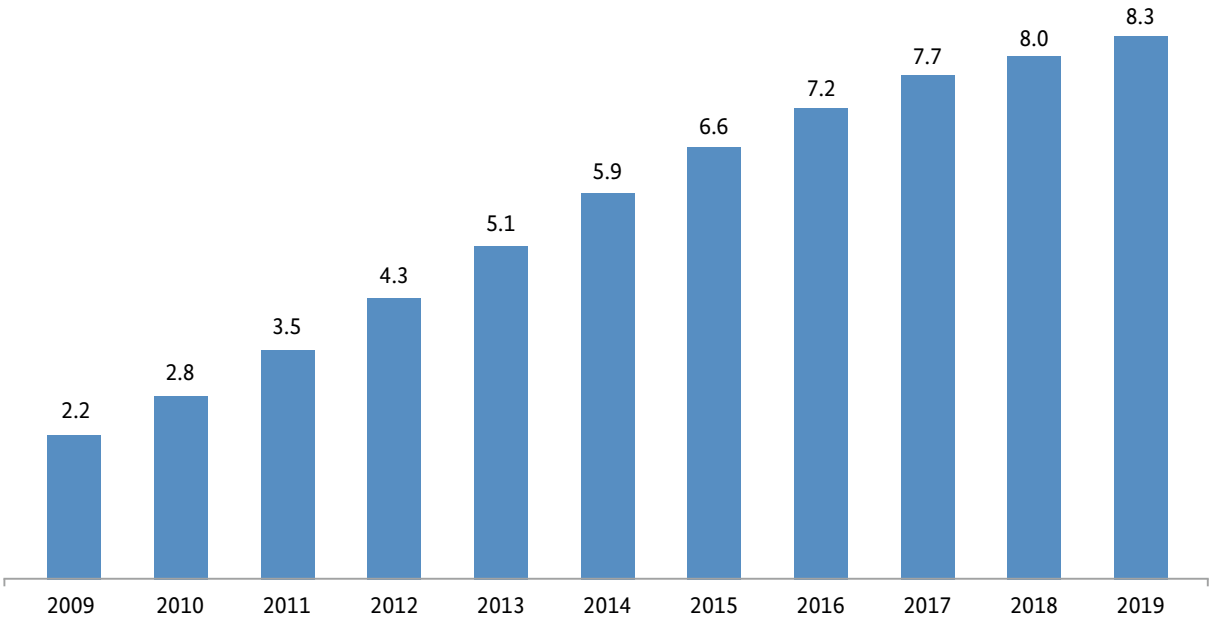
The significance of VDSL was also reflected at the wholesale level. In the last few years it led to a considerable rise in demand for specific DTAG VDSL wholesale products. Demand for bitstream wholesale products was especially high, with a strong year-on-year increase in the total number of products sold of approximately 1.0m. This could be due partly to the fact that, in addition to the established layer 3 bitstream product, DTAG has been offering a layer 2 bitstream product since early 2017 which is available to competitors as another alternative for providing end-user access.

By contrast, demand for competitor-operated connections based on DTAG's high bitrate, unbundled local loops fell further.

Active DSL connections



Active broadband connections via HFC networks



Broadband connections via HFC networks

Using a combination of optical fibre and coaxial cables and the latest DOCSIS 3.1 transmission standard, HFC networks pave the way for building out gigabit networks. A growing number of cities now have this infrastructure in place with download speeds at present of up to 1 Gbps. At the end of 2019 there were 8.3m connections via HFC networks. Of these, over 4.9m (60%) had delivering speeds of over 100 Mbps. Whilst annual growth remained consistently between 600,000 and 800,000 from 2009 to 2016, in 2018 and 2019 it slowed substantially to around 300,000.

Broadband connections via FTTB/FTTH

Thanks to their outstanding technical properties and almost unlimited bandwidths, optical fibres are considered to be the perfect medium for transporting data and are seen as the future of telecommunications infrastructure. Due to the continued spread of FTTB and FTTH, the number of active connections grew by around 300,000 year on year to reach around 1.4m in total at the end of 2019. The number of end customers with broadband totalled around 4m at the end of the first quarter of 2019. This figure includes both active and inactive connections, ie those that are available for connecting further end customers but are not yet activated under a contractual agreement.[2]

Satellite broadband connections

Offering access from virtually any location, satellite internet connections can make a contribution to ensuring full broadband coverage in regions where other technologies are not, or not sufficiently, available. With around 23,000 of these connections at the end of 2019, demand remained low due to the availability of more cost-effective alternative access options, often with higher maximum bandwidths.

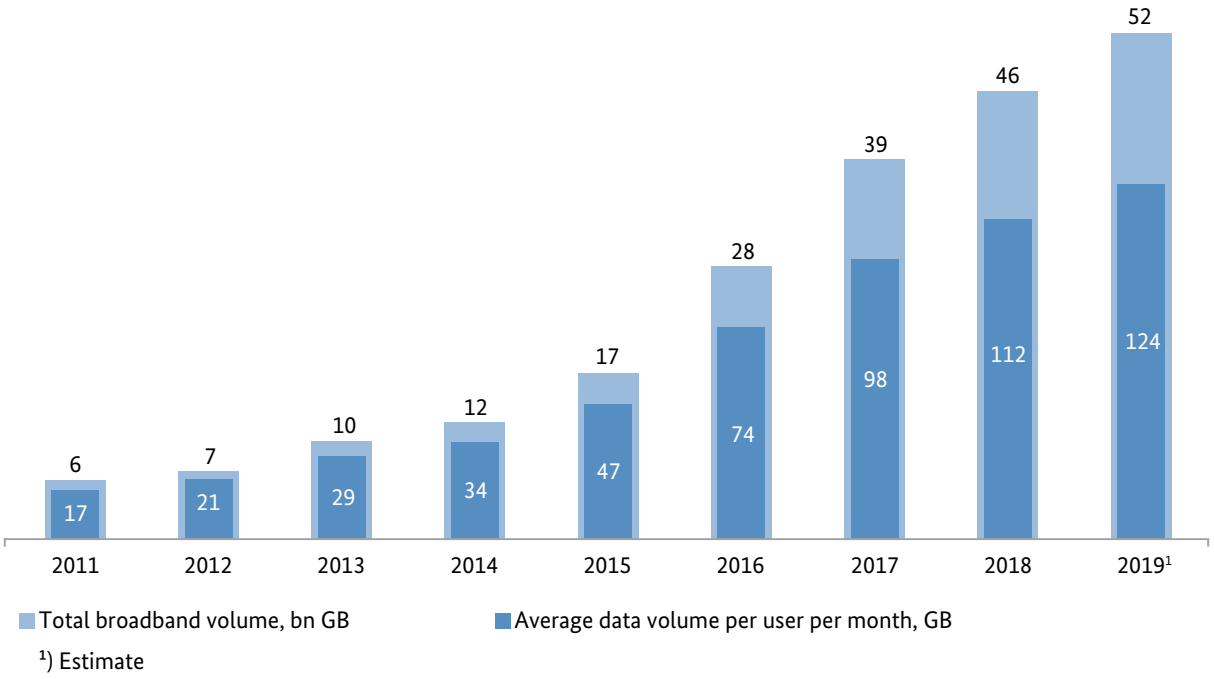
[2] However, it is impossible to rule out the possibility that the companies surveyed interpreted the questions regarding the work still required to connect further end customers in different ways.

Data volumes

The data volume per fixed-network broadband connection continued to rise sharply in the period under review. End customers used a total volume of roughly 46bn GB in 2018. This corresponded to an average data volume per connection per month of around 112 GB.[3]

Initial calculations suggest that they will generate a total volume of around 52bn GB in 2019. This corresponds to an average of approximately 124 GB per fixed-network broadband customer.

Development of data volumes in fixed networks



[1]) Estimate

Bundled products

Bundled products which, in addition to a broadband connection, include at least one other telecommunications service (fixed-network telephony, TV or mobile services[4]) in a single contract are now offered as standard by companies in their marketing to end customers. In many cases, it is no longer possible to purchase these services separately. Consumers who enter into a fixed-network and mobile contract with the same provider can also take advantage of additional discounts and exclusive offers by bundling the two contracts in special advantage programmes. By offering such measures, providers seek to increase customer loyalty to their products.

At the end of the first quarter of 2019 DTAG and its competitors were providing around 32.6m bundled tariffs and advantage programmes. Accounting for approximately 21.3m customers, bundled products with two services were by far the most common of these. The majority of these double-play products consist of an IP-based telephone service in addition to a broadband connection.

At the end of the first quarter of 2019 around 9.8m customers had triple-play bundles. Approximately 66% of these consisted of a broadband connection, a telephone service and a TV service, whilst roughly 34% had a mobile component instead of a TV service. Over 1.5m customers were using quadruple-play bundles and advantage programmes consisting of four fixed-network and mobile services.

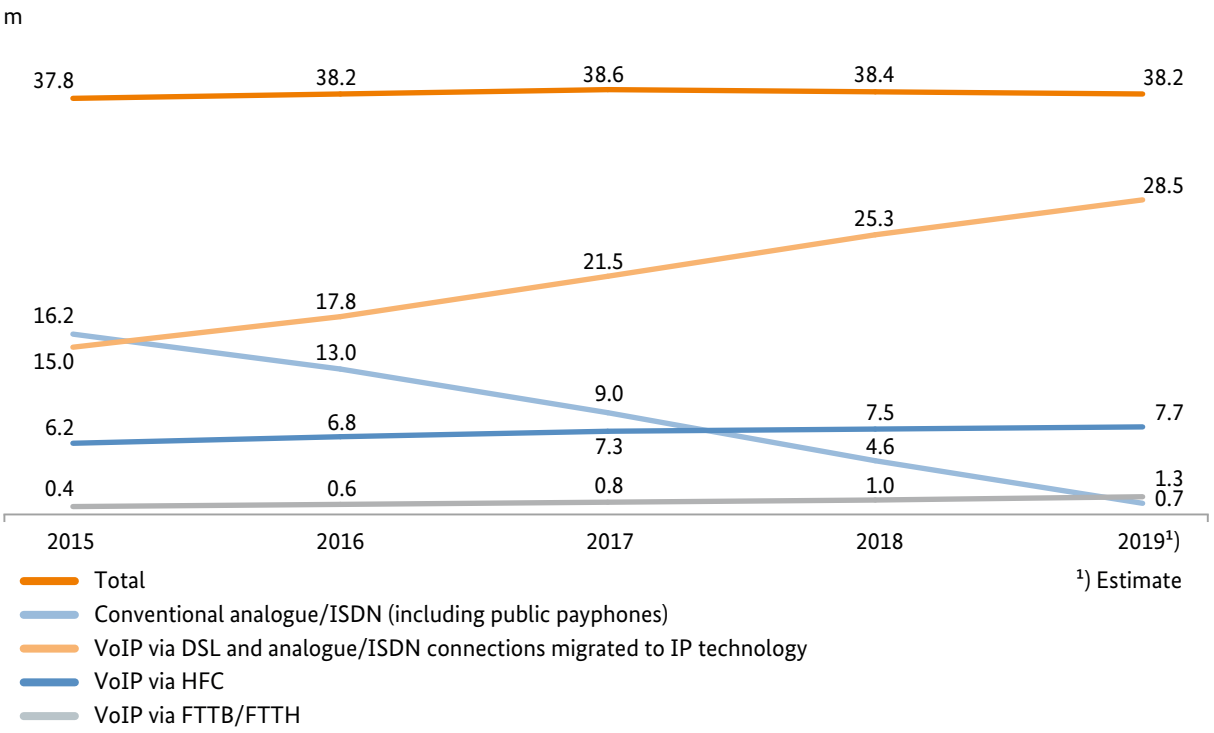
[3] The traffic volumes shown do not include data volumes from DTAG's IPTV (internet-based TV) service.
[4] No distinction is made between mobile voice and mobile data services.

Telephone connections

The changeover to Voice over Internet Protocol (VoIP) in fixed networks is now almost finished. The last few years have seen contrasting trends in voice communication using conventional telephone lines on the one hand and IP-based voice services on the other.

The use of IP-based voice services has increased to the detriment of conventional telephone lines. Overall, demand for voice communication services from fixed networks declined slightly in 2018 compared with the previous year. A further downwards trend is expected for 2019.

Total number of telephone connections



Telephone lines and IP-based voice services – competitors' shares

	2017		2018		2019[1]		
	Total stock	Competitors' share	Total stock	Competitors' share	Total stock	Competitors' share	
	m	%	m	%	m	m	%
Analogue lines[2]	**5.60**	9	**2.47**	14	**0.09**	0.02	22
ISDN basic rate lines[2]	**3.32**	37	**2.02**	49	**0.53**	0.47	89
ISDN primary rate lines[2]	**0.084**	36	**0.071**	28	**0.056**	0.02	36
Public telephones	**0.022**	5	**0.018**	6	**0.016**	0.001	6
VoIP via HFC	**7.26**	100	**7.50**	100	**7.71**	7.69	100
VoIP via FTTB/FTTH	**0.82**	89	**1.04**	85	**1.34**	1.11	83
VoIP via DSL[3]	**21.50**	45	**25.32**	40	**28.48**	11.15	39
Total connections	**38.61**	**50**	**38.44**	**52**	**38.22**	**20.46**	**54**

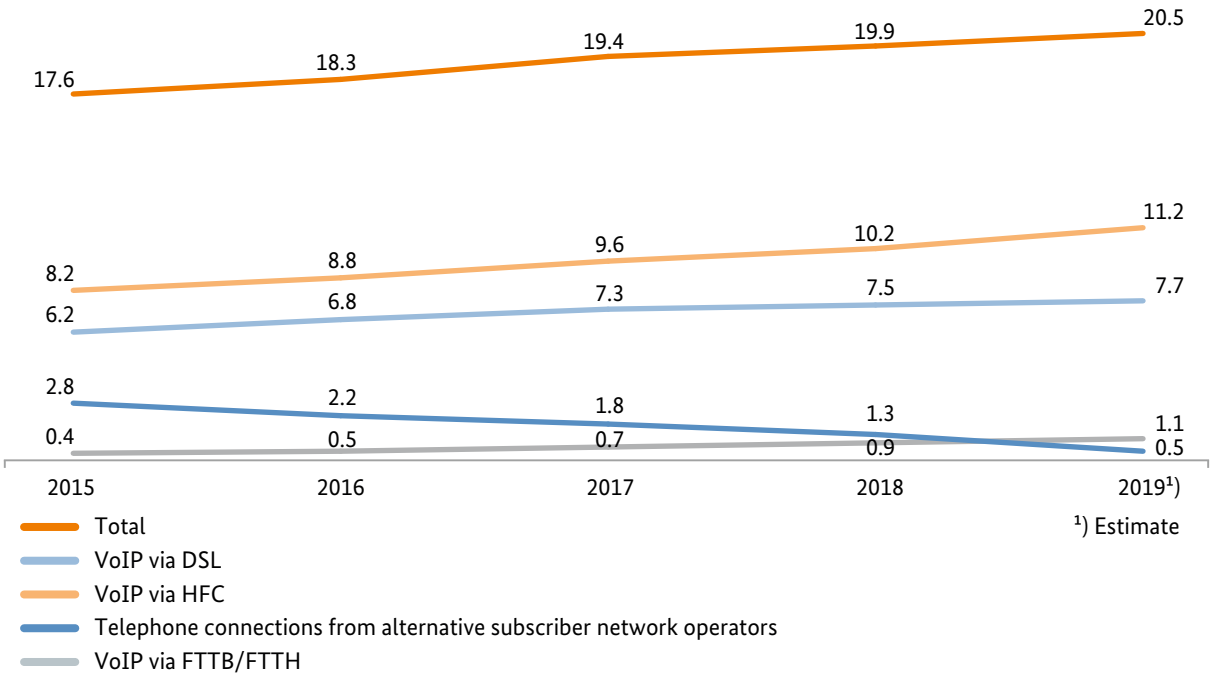
[1]) Estimate
[2]) Conventional telephone lines
[3]) Including analogue/ISDN lines migrated to IP technology

At the end of 2019 the Bundesnetzagentur estimates that in the DTAG and competitor fixed networks there were around 28.5m DSL lines used for VoIP and analogue/ISDN connections that had been migrated to IP technology. The number of HFC connections used for telephony increased to approximately 7.7m. By the end of 2019 the number of voice lines in optical fibre networks (FTTB/FTTH) had also risen to approximately 1.3m.

At the same time, the number of conventional fixed-network analogue lines, ISDN basic rate lines and ISDN primary rate lines fell to around 0.7m. These lines are being replaced by IP-based technologies, which now account for an estimated 98% of connections. The total number of public payphones (coin- and card-operated) is expected to be around 16,000 at the end of 2019.

Telephone connections from alternative subscriber network operators

m

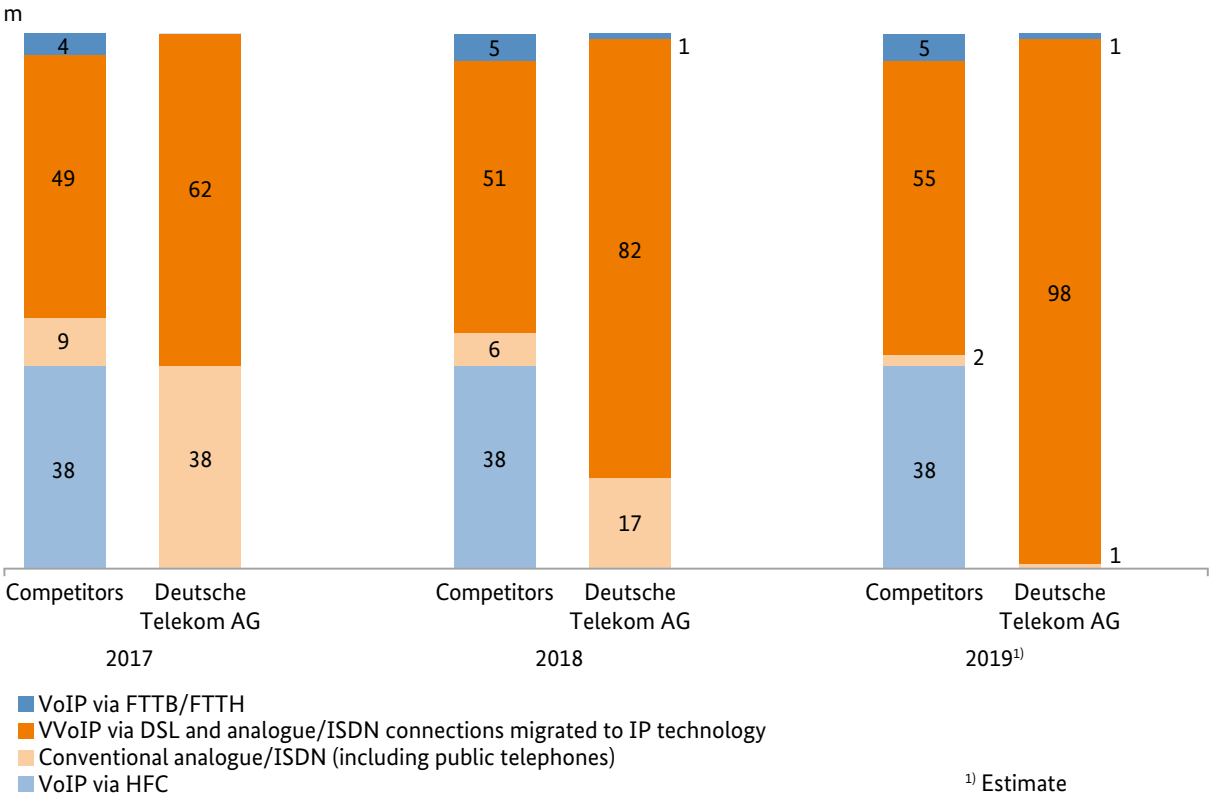


DTAG's competitors had an estimated 20.5m telephone lines and access points to IP-based voice services at the end of 2019. Whilst the number of conventional analogue and ISDN lines provided by alternative subscriber network operators decreased further, their share of IP-based voice services continued to rise.

Relative to the number of fixed-network telephone connections provided by DTAG's competitors, at around 55% the share of DSL lines for VoIP was significantly higher than the share of voice lines in HFC and optical fibre networks in 2019, which together accounted for around 43%. Overall, the Bundesnetzagentur estimates that around 98% of all competitors' lines were based on IP technologies at the end of 2019. At DTAG, DSL lines used for VoIP and analogue/ISDN lines migrated to IP technology will account for around 98% of telephone connections at the end of 2019, with a further 1% or so coming from VoIP lines in optical fibre networks. Both for alternative subscriber network operators and for DTAG, conventional telephony via analogue and ISDN lines is now of little relevance.

The fixed-network voice communication services of alternative subscriber network operators are operated primarily on the basis of contracts on access to the DTAG local loop, or using the alternative providers' own local loops.

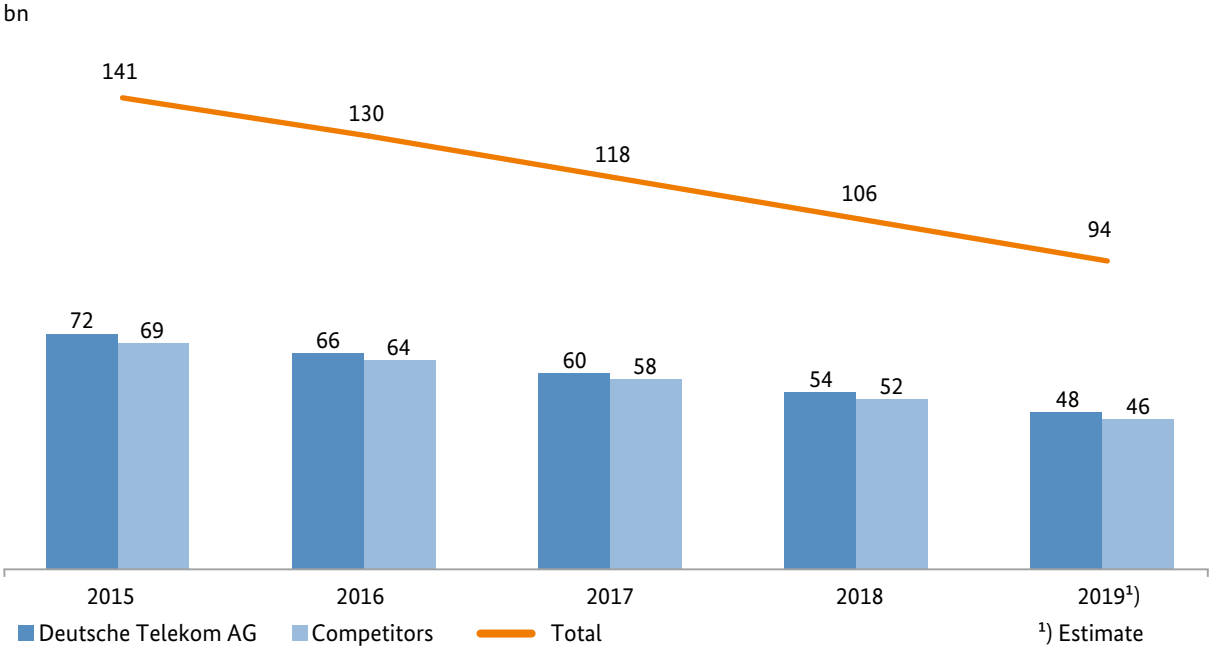
Active DSL connections



Call minutes in fixed networks

The volume of call minutes within Germany, international calls and calls to German mobile networks within conventional telephone networks and IP-based fixed networks continued to decrease. According to the Bundesnetzagentur's estimates, the volume of call minutes in fixed networks totalled approximately 94bn minutes in 2019.

Outbound fixed call minutes



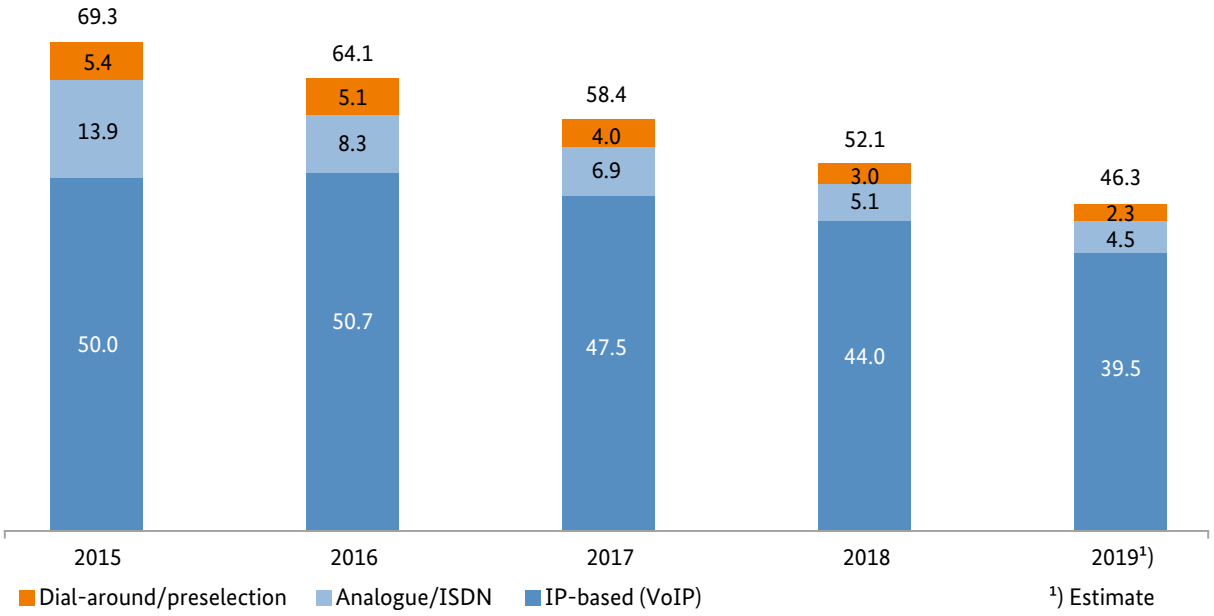
This decrease is likely to be due to, among other things, the increasing use of internet-based communication services (over-the-top services) and, to some extent, to a shift in calls to mobile networks.

Calls within German fixed networks amounted to an estimated 81bn minutes in 2019. According to an initial forecast, around 83% of these were billed via flat rates. In addition, calls to national mobile networks accounted for around 8bn minutes (around 26% flat rate) and calls to foreign fixed and mobile networks for an estimated 5bn minutes.

The Bundesnetzagentur estimates that around 85% of all calls were being handled via IP technology by the end of 2019.

Call minutes via alternative providers

bn



In total, the Bundesnetzagentur estimates that around 46.3bn call minutes had been handled by DTAG's competitors by the end of 2019. The majority of these calls (39.5bn minutes) were made via IP-based networks. The volume of calls (4.5bn) made via conventional lines continued to fall.

Based on initial forecasts, indirect dial-around and preselection calls handled by alternative providers accounted for a total of 2.3bn minutes – or 5% – of all calls handled by competitors at the end of 2019. Despite a decrease in the number of lines with preselection in the DTAG network, preselection call volumes exceeded dial-around.

With regard to individual call segments, the Bundesnetzagentur estimates that DTAG's competitors were able to roughly maintain their shares of domestic calls (49%), calls to foreign fixed and mobile networks (60%) and calls to national mobile networks (46%).

In general it should be noted when interpreting the above-mentioned call minutes that certain traffic volumes are not currently included in the Bundesnetzagentur's database. These primarily include voice transmission by over-the-top providers that do not operate their own fixed-network lines or telecommunications networks and that offer internet-based services independent of the network infrastructure (eg DSL, HFC or optical fibre).

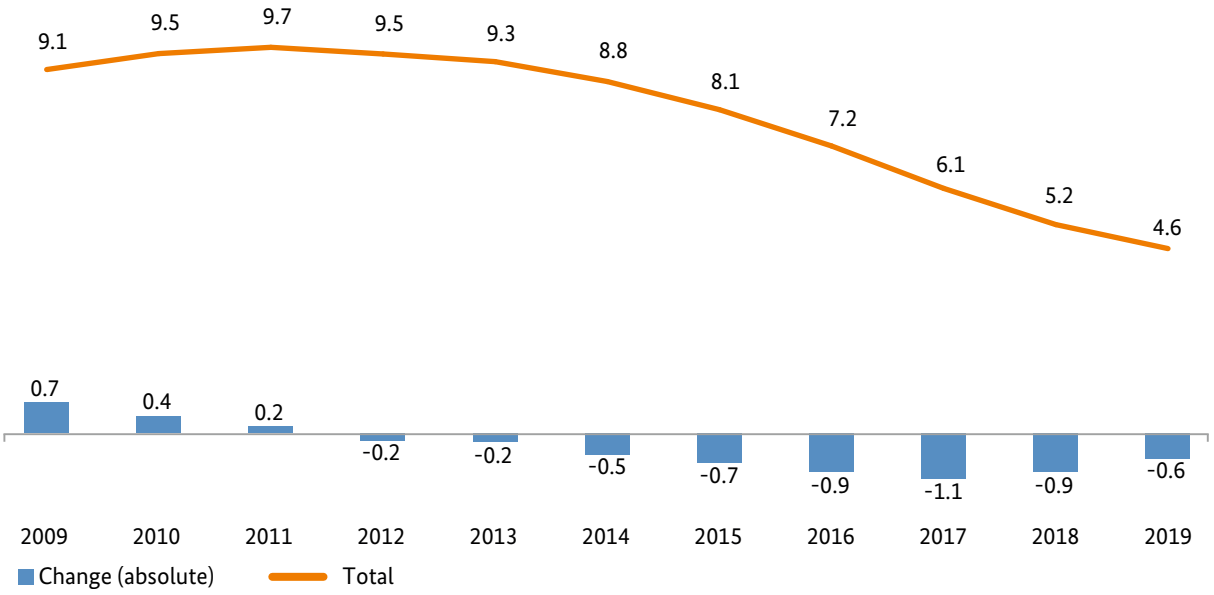
Subscriber lines

The number of local loops leased by DTAG's competitors in 2019 fell by around 0.6m year on year. In total, around 4.6m local loops were being leased by competitors at the end of 2019.

Whilst the decrease in 2019 was slower than in previous years, the significance of local loops as a wholesale product continues to decline. This is likely to be due mainly to the shift in demand for wholesale services to DTAG's VDSL bitstream wholesale services. Customer acquisitions by cable providers also have a negative effect on the number of local loops. Since the cable providers have their own access infrastructure, there is little need for them to use local loops as a DTAG wholesale product. Alternative providers are also increasingly migrating their end customers to optical fibre lines they operate themselves.

Volume of leased subscriber lines

m



Mobile communications

Subscribers

Actively used SIM cards

Data collected by the Bundesnetzagentur suggests that there were 107.2m active SIM cards at the end of 2019. Statistically speaking, each inhabitant has around 1.3 SIM cards. SIM cards are defined as active if they have been used for communication in the last three months or if an invoice has been generated for the SIM card in this period.

The number of LTE SIM cards in active use stood at 59.1m by the end of 2019. This represents a share of 55%, which increased by 8 percentage points versus the previous year (50.5m cards).

The shares of actively used SIM cards attributable to network operators and to service providers remained stable year on year. At the end of 2019 the network operators accounted for 75% (79.9m) of SIM cards in active use versus around 74% (80.0m) in 2018. The breakdown by contract type also remained stable. Whilst the number of active postpaid cards increased to 70.9m at the end of 2019 compared with 70.1m in the previous year, the share accounted for by these cards remained largely constant.

Some 29.7m SIM cards were being used for data communication between devices (M2M) at the end of 2019 (2018: 23.1m). This increase of almost 30% is likely to be a result of sustained high demand for smart home and IoT applications.

Actively used SIM cards and distribution

		2017		2018		2019	
		m	%	m	%	m	%
Total, excluding M2M SIM cards		**109.7**		**107.5**		**107.2**	
Penetration (SIM cards/inhabitant)		**-**	**132 %**	**-**	**130 %**	**-**	**129 %**
Network technology:	LTE	44.9	41	50.5	47	59.1	55
	UMTS/GSM	64.8	59	57.0	53	48.1	45
Business:	Network operators	81.6	74	80.0	74	79.9	75
	Service providers	28.1	26	27.5	26	27.3	25
Contract type:	Postpaid	69.8	64	70.1	65	70.9	66
	Prepaid	39.9	36	37.4	35	36.3	34
M2M subscribers		17.6	–	23.1	–	29.7	–
VoLTE users		– [1]	–	20.9	–	32.2	–
Use at a fixed location		0.9	–	1.1	–	1.2	–

[1] Active VoLTE users were first counted for the 2018 calendar year.

LTE voice telephony services are increasingly based on Voice over LTE (VoLTE). Based on the Internet Protocol, VoLTE offers superior voice quality and faster connectivity compared with conventional 2G and 3G telephone services. At the end of 2018, 20.9m active users had a VoLTE-capable device in combination with a suitable mobile contract. This number will continue to grow as VoLTE-capable devices become more widespread and LTE tariffs more attractive. The number of VoLTE users was already at 32.2m by the end of 2019.

Around 1.2m SIM cards were used at a fixed location at the end of 2019. Mobile connections at a fixed location enable internet access using mobile connectivity between a special UMTS or LTE router and the base station. A hybrid variant is also possible, where the internet connection can hop between either a mobile connection or a fixed broadband connection.

Registered SIM cards

The total number of SIM cards registered in Germany is significantly higher than the total number of SIM cards in active use. One reason for this is that second and third devices or other spare SIM cards are not in constant use.

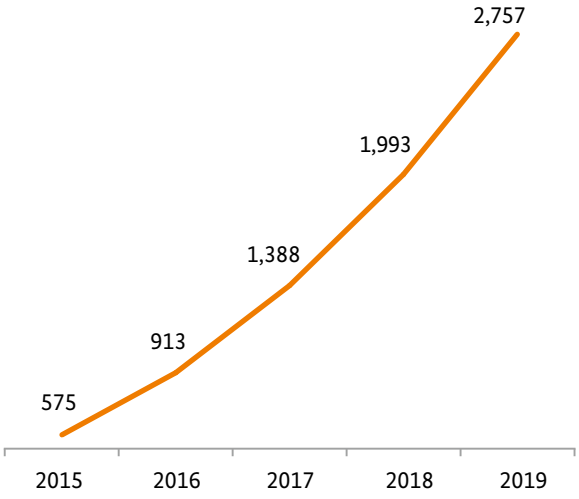
At the end of 2019 the mobile network operators reported a total of 142.9m registered SIM cards[5]. This represents an increase of 5.9m compared with 2018.

Traffic volumes and usage

Mobile broadband

Mobile data volumes increased significantly once again. Current data collected by the Bundesnetzagentur suggests that 2,757m GB of data were being transmitted by the end of 2019, up from 1,993m GB in 2018. Whilst the annual growth rates are slowing overall, the market is unlikely to reach saturation point any time soon.

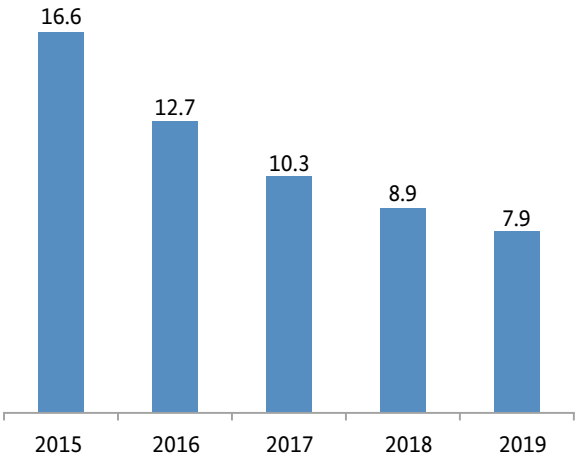
Mobile data volumes
m GB



SMS messages

The decline in the use of the Short Message Service (SMS) continued in 2019. The number of SMS messages sent fell to 7.9bn in 2019 compared with 8.9bn in 2018. The growing popularity of smartphones and smartphone messaging apps that replace traditional text messaging continue to drive this trend. However, the annual rate of contraction is slowing down, which could be due in part to the increasing use of SMS-based M2M applications.

SMS messages sent
bn



Call minutes

Almost 127bn minutes of outgoing calls were made within German mobile networks in 2019. Mobile call volumes now significantly exceed those in the fixed networks. The growth rate in mobile telephony increased to 7% in 2019 compared with the previous year. The breakdown of mobile call traffic has altered only marginally in recent years. Around 41% of call minutes in 2019 were within the same operator network (on net), whilst approximately 32% were calls to other national mobile networks (off net).

More than 104bn minutes of inbound calls were terminated within mobile networks in 2019. Around 48% of the call minutes were from the same operator network and approximately 40% from other national mobile networks.

In 2019 monthly revenue (excluding terminal equipment and VAT) per SIM card in active use was around €14.61. The average data volume included in this amount has increased almost fivefold since 2015.

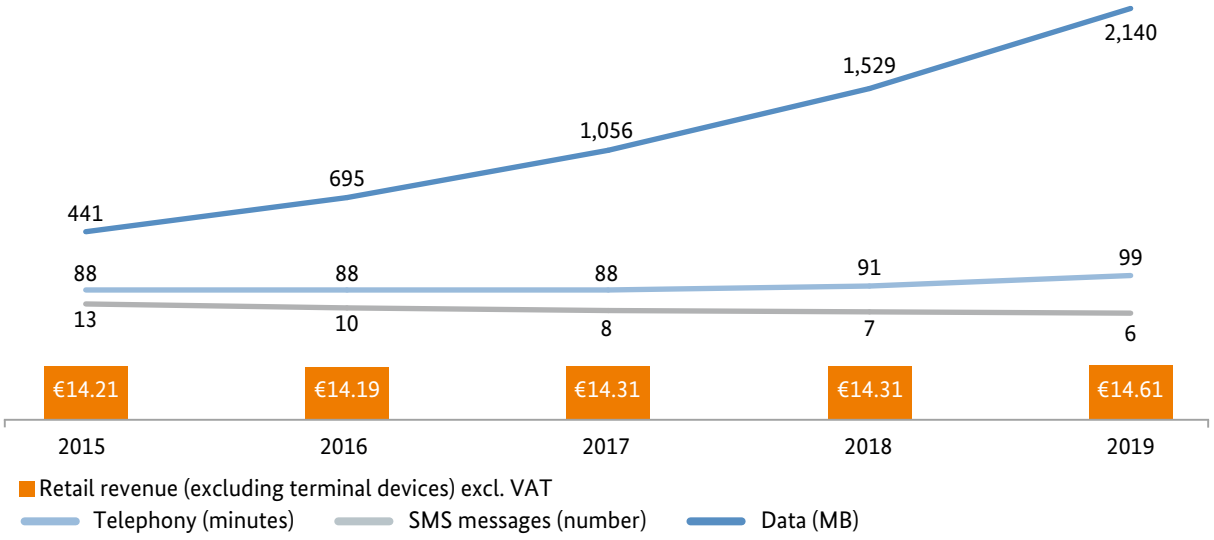
[5] No standard definition applies to the number of SIM cards specified in the publications of network operators. Each company decides for itself how to count SIM cards and when adjustments are required.

Outbound and inbound mobile voice minutes

		2015	2016	2017	2018	2019
Mobile outbound traffic minutes (bn)		**114.23**	**115.57**	**115.88**	**118.50**	**126.88**
of which:	To German fixed networks	31.14	31.28	29.93	29.76	30.22
	To the same mobile operator network	43.23	45.56	46.88	47.80	51.98
	To other national mobile networks	34.27	33.42	34.12	36.52	40.50
	To foreign networks (fixed/mobile)	4.06	3.78	3.28	2.81	2.67
	Other outbound traffic (premium-rate, shared-cost and service numbers)	1.53	1.53	1.67	1.61	1.51
Mobile inbound traffic minutes (bn)[1)]		**89.86**	**92.40**	**93.38**	**94.17**	**104.10**
of which:	From German fixed networks	12.70	12.54	10.76	10.44	9.78
	From the same mobile operator network	43.15	40.55	45.89	46.68	50.26
	From other national mobile networks	32.43	37.52	35.08	34.17	41.47
	From foreign networks (fixed/mobile)	1.58	1.79	1.65	2.88	2.59

[1)] Some inbound traffic volumes were estimated for 2015/2016.

Revenue and services per SIM card per month



International roaming

Since the introduction of "roam like at home", which allows consumers to use their domestic mobile plan on equal terms in other EU countries, the use of mobile data services in particular has increased considerably. The volume of data generated abroad increased by around 48% from 66.5m GB in 2018 to 98.7m GB in 2019. By contrast, the number of outgoing call minutes in other EU countries remained around the prior-year level at 3,812m in 2019 (2018: 3,724). The number of text messages sent in other EU countries followed the general downward trend in SMS use, decreasing by around 19% year on year from 277m in 2018 to 223m in 2019.

Infrastructure and network coverage

The expansion of the mobile communication networks relies heavily on the installation of additional radio base stations. These interfaces between the wireless and wireline network grew in number to 190,595 at the end of 2019 (2018: 181,640). The number of LTE base stations in operation at the end of 2019 was 62,567 (2018: 54,911). UMTS/3G accounted for 57,457 base stations (2018: 57,180) and GSM/2G for 70,432 base stations (2018: 69,549). At the end of 2019, an additional 139 5G-capable base stations were activated.

In practice, radio base stations often integrate the GSM, UMTS and LTE technologies in one.[6] Since base stations that combine multiple technologies are counted multiple times in the information provided above, the number of physical antenna sites comes to just under half the number of radio base stations (end of 2019: 81,282).

LTE network coverage in relation to the population at the end of 2018 was 98.1% for DTAG, 98.6% for Vodafone and 92.2% for Telefónica Germany.

In relation to households, LTE availability in mid-2019 was 97.7% according to the federal government's broadband atlas[7]. Broken down by region type, LTE availability was 99.7% in urban areas, 96.7% in semi-urban areas and 89.7% in rural areas.

By comparison, a survey published by the European Commission[8] in mid-2018 reported that LTE network coverage in Germany was 97.5% in relation to households. The survey covered all 28 EU member states plus Norway, Switzerland and Iceland. The average LTE network coverage in relation to households for all EU member states[9] was 98.9% in mid-2018.

Radio base stations

	2017		2018		2019	
		%		%		%
Total	**175,976**	**100**	**181,640**	**100**[1)]	**190,595**	**100**
5G	–		–		139	0
LTE	48,146	27	54,911	30	62,567	33
UMTS/3G	57,905	33	57,180	31	57,457	30
GSM/2G	69,925	40	69,549	38	70,432	37

[1)] Totals may deviate from rounded cumulative figures.

[6] These are known as multi-standard radio base stations.
[7] See https://www.bmvi.de/DE/Themen/Digitales/Breitbandausbau/Breitbandatlas-Karte/start.html
[8] See https://ec.europa.eu/digital-single-market/en/news/study-broadband-coverage-europe-2018
[9] The United Kingdom was still a member of the European Union at the time of collecting the data.

Key figures and competitors' shares

The following table provides an overview of selected key figures and competitors' shares in the telecommunications market for the period from 2017 to 2019.

Key figures	**2017**	**2018**	**2019**
Revenue (€bn)	56.7	57.0	57.4 [1]
Investments (€bn)	8.5	9.1	9.6 [1]
Employees	153,700	147,900	143,800 [1]
Total active fixed broadband connections (m)	33.2	34.2	35.1
- DSL	24.7	25.0	25.3
- HFC	7.7	8.0	8.3
- FTTB/FTTH	0.8	1.1	1.4
- Other	0.1	0.1	0.1
Broadband penetration rate (active connections/household) % [2]	82	84	86
Total telephone connections in fixed networks (m)	38.6	38.4	38.2 [1]
- Conventional analogue/ISDN (including public telephones)	9.0	4.6	0.7 [1]
- VoIP via DSL and analogue/ISDN connections migrated to IP	21.5	25.3	28.5 [1]
- VoIP via HFC	7.3	7.5	7.7 [1]
- VoIP via FTTB/FTTH	0.8	1.0	1.3 [1]
DTAG leased subscriber lines (m)	6.1	5.2	4.6
Active mobile subscribers (SIM cards in m)	109.7	107.5	107.2
Mobile penetration rate (% of inhabitants) [3]	132.5	129.5	128.8

Competitors' shares %	**2017**	**2018**	**2019**
Revenue	57	57	57 [1]
Investments	49	52	54 [1]
Fixed broadband connections	60	61	61
DSL	47	47	47
Telephone connections in fixed networks	50	52	54 [1]

[1] Estimate
[2] Number of households according to Eurostat
[3] Number of inhabitants according to the Federal Statistical Office

Consumer protection and advice

The number of complaints in connection with nuisance marketing calls fell over the last year from around 62,200 to around 57,600. In parallel, the Bundesnetzagentur continues to tackle dubious business practices, in 2019 imposing fines of over €1.3m.

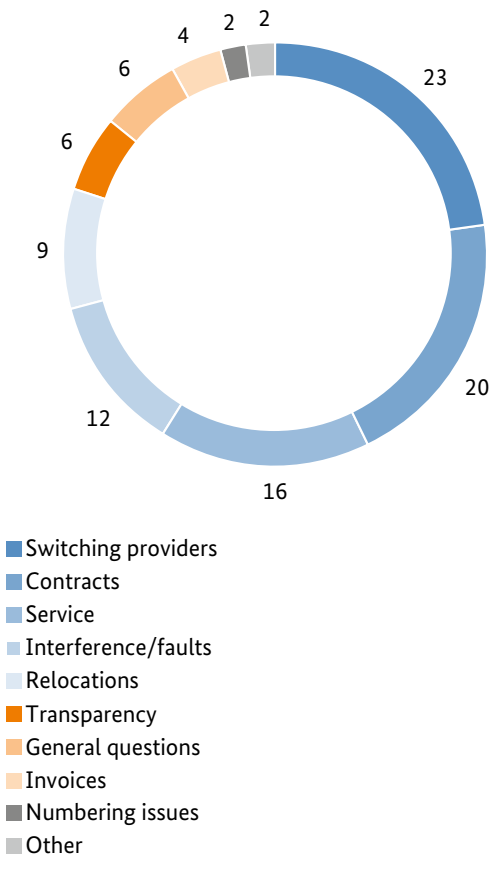
The number of written complaints and enquiries in connection with number misuse increased marginally to around 125,500, up from around 116,500 in the prior year. In its efforts to combat misuse, the Bundesnetzagentur ordered the disconnection of some 530 telephone numbers and issued billing and collection bans for around 6,700 telephone numbers

Consumer protection enquiries

In 2019 the Bundesnetzagentur once again resolved a large number of enquiries from consumers and other customers of telecommunications companies. In total it received around 35,500 enquiries and complaints (including follow-up enquiries) in connection with telecommunications. One of the Bundesnetzagentur's jobs is to ensure that telecommunications companies uphold the customer protection provisions contained in the Telecommunications Act. To this end, the Bundesnetzagentur informs consumers and other end users of their rights and provides assistance in individual cases in dialogue with the telecommunications companies.

An analysis of the biggest causes of friction between customers and telecommunications companies shows that contractual issues and switching providers comprise the lion's share of problems, followed by service provision, faults and the relocation of telecommunications services.

Main subjects of enquiries and complaints in connection with telecommunications
%



Roughly one in four enquiries relates to switching providers. Customers mainly complain when the move to another provider does not run smoothly, if their service is interrupted or delayed, if they are unable to take their existing number to a new provider, or if they consider the charge for taking the existing number excessive and unreasonable.

Another frequent source of complaints and enquiries is the conclusion, amendment or termination of a telecommunications contract. Whilst the product information sheet and the contract itself contain important information about the contract, disputes still occasionally arise between the customer and the telecommunications company regarding inconsistencies in contractual provisions, such as the monthly basic charge, the term of the contract, or the services agreed. Verbal contracts in particular are susceptible to mismatches between the customer's expectations and the subsequent order confirmation.

A common gripe amongst customers of telecommunications companies is that an offer directed at new or returning customers does not bring about the promised financial benefits. The Bundesnetzagentur assists in matters concerning the customer protection provisions within its sphere of responsibility. It is not permitted to provide general advice on matters outside of its jurisdiction, for instance those pertaining to civil or criminal law.

End users also asked the Bundesnetzagentur for its help with obtaining a network connection and the desired telecommunications services, in some cases with the involvement of the provider concerned.

Coverage-related concerns addressed to the Bundesnetzagentur related to the provision of basic services, which DTAG currently ensures, the statutory provisions regarding quality and the minimum scope of basic coverage, the prerequisites for provision by a specific service provider (network access), and the deadlines and installation costs for establishing a connection. With the availability of broadband internet access services growing in importance for end users, there exists a great need for information on both the broadband expansion and the options for connecting (new residential areas) to broadband networks.

The migration of DTAG lines to IP technology was also the subject of enquiries and complaints received by the Bundesnetzagentur. The decision to change over the telecommunications network from circuit-switching PSTN technology to packet-switching IP technology is entirely at DTAG's discretion. Via a special card in the exchange, DTAG provides end customers using analogue-only voice lines with a comparable IP-based line.

The Bundesnetzagentur has been in regular dialogue with DTAG since 2015. The Bundesnetzagentur assists individuals affected by the IP migration by clarifying the legal framework and in individual cases by involving DTAG to find a resolution.

Enquiries and complaints about faults with fixed and mobile connections accounted for 12%. The complaints related to the acceptance and handling of fault reports, a lack of communication from telecommunications companies on the clearance status, lengthy fault resolution times and the billing of visits by technicians. Telecommunications customers also voiced expectations of monetary compensation for the lack of service provision.

When customers move property and take their telecommunications connections or services with them, in some cases customers and providers disagree as to whether the conditions for special termination are met. There is a particular need for more information on the three-month rule in cases where the service cannot be provided at the new location, as well as on the contract terms that apply after the relocation.

Other consumers and end users turn to the Bundesnetzagentur for advice when the delivered data transfer rate deviates from the contractually agreed speed. The Bundesnetzagentur recommends they use its dedicated measuring tool to check the performance of their fixed and mobile broadband connections.

In individual cases, subscribers contacted the Bundesnetzagentur regarding unsuccessful invoice disputes. Issues included the billing of items such as unwanted third-party subscriptions. The Bundesnetzagentur advises subscribers first and foremost to set up a third-party billing block, to block premium telephone numbers and to regularly check their telephone bill.

Other enquiries and complaints related to the subscriber directory, payment transactions, broadcast transmission, spectrum awards, numbers and rights of way, telecommunications secrecy, data protection and public safety, with consumers also interested in topical issues including the rules on intra-EU communications and on geo-blocking.

Dispute resolution

The Bundesnetzagentur's telecommunications consumer dispute resolution panel celebrated its 20th anniversary in 2019. Since 1999 the panel has acted as a neutral intermediary between subscribers and telecommunications companies to resolve disputes under telecommunications law outside of court. The Telecommunications Act defines a subscriber as a natural person or legal entity who or which is party to a contract with a provider of publicly available telecommunications services for the supply of such services.

Subscribers can ask the telecommunications consumer dispute resolution panel to mediate disputes that arise in connection with specific customer protection provisions of telecommunications law (section 47a of the Act). Contractual disputes once again accounted for the lion's share of the cases in 2019. Most of the subscribers' grievances related to the failure of companies to provide the contractually agreed services. Billing, contract terminations and disagreements on the contract term were further common sources of dispute.

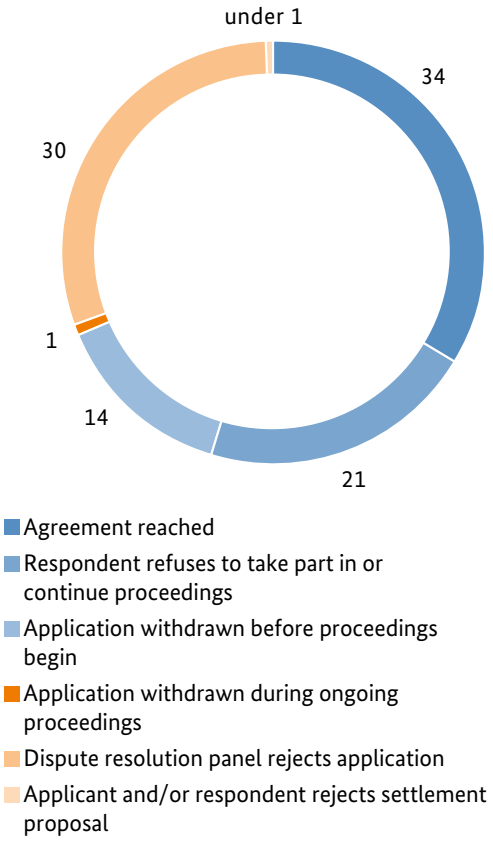
In July 2019 the telecommunications consumer dispute resolution panel replaced the online application form with a dynamic version. The new version guides applicants through the process and provides additional information, making it much easier for subscribers to submit an application.

In 2019 the telecommunications consumer dispute resolution panel received 1,695 applications for dispute resolution. In addition, the consumer dispute resolution panel received 725 enquiries and requests for assistance as to whether the facts presented in their cases could be resolved through conflict resolution. The consumer dispute resolution panel handled and closed 1,605 cases in 2019. In 34% of closed cases, the parties concerned reached an agreement, usually before a settlement proposal was made. In a handful of cases, the parties rejected the settlement proposal.

Participation in dispute resolution proceedings mediated by the telecommunications consumer dispute resolution panel is voluntary for both parties. In 15% of cases, the applicants withdrew the applications because the matter had been resolved quickly, for example. In 21% of cases, the telecommunications companies implicated in the dispute resolution proceedings refused to take part or to continue the proceedings and offered no solution to the issue at hand.

In 30% of the cases closed in 2019, the consumer dispute resolution panel dismissed the application for dispute resolution on the basis that the prerequisites for initiating proceedings were not met – in particular the absence of a violation of customer protection rights under the Telecommunications Act.

Results of dispute resolution proceedings in 2019
%



In accordance with the Alternative Consumer Dispute Resolution Act, additional information is published in the dispute resolution panel's annual activity report, which can be found on the Bundesnetzagentur's website.

Switching providers

If customers are to make full use of the options available to them from competing telecommunications service providers, they need to be confident that a change of provider will go without a hitch. Customers of telecommunications companies put smooth provider transitions and the assurance of keeping their existing phone number at the top of their wish list.

The Bundesnetzagentur assumes that most switches to new providers are handled satisfactorily. In many cases, the providers involved resolve any difficulties between themselves. Customers turn to the Bundesnetzagentur for assistance primarily in cases where service is disrupted for more than one day with no agreement to the contrary. The Bundesnetzagentur reviews the plausibility of the complaints and, where the customer has provided sufficient facts establishing a legal right to resumption of service, forwards them to the companies involved.

A determination from 2012 places the companies under an obligation to remedy the individual cases within a short time limit. The goal is to resume telecommunications services for the customer as quickly as possible.

The number of complaints concerning service interruptions peaked at 5,300 in 2015. Since then, the numbers have dropped significantly, with 2,350 received in 2018. This fell to below 2,000 in the period under review.

The Bundesnetzagentur continues to strive to determine as closely as possible the causes of disruptions, with a view to taking suitable measures to reduce the number of unintentional service disruptions to a minimum.

Transparency measures

The transparency requirements and information obligations of the Transparency Ordinance have been making it easier for consumers to select products in the telecommunications market since June 2017. In the period under review a number of consumers contacted the Bundesnetzagentur in particular to report discrepancies between actual performance levels and contractually agreed download speeds.

The Ordinance requires service providers to inform consumers of possible ways to test internet speed, for instance by making them aware of the Bundesnetzagentur's measuring tool, which is available at www.breitbandmessung.de. This enables consumers to inform their providers of any inconsistencies between actual and contractually agreed data transmission rates.

The Bundesnetzagentur has developed a special complaints procedure for discrepancies in fixed networks. Above all, this sets out the requirements for the measurements made by consumers in the event that the contractually agreed speeds are not being met and no solution can be found between the end user and the provider. The Bundesnetzagentur asks that consumers use the desktop version of its broadband measuring tool. Consumers made increasing use of this option in 2019.

Measuring broadband speeds

In mid-March 2019 the Bundesnetzagentur published a third report containing detailed findings from the broadband measuring campaign. End users can use the test to measure the speed of their internet connection and the performance of their fixed-line and/or mobile broadband connection independent of provider and technology. The measurements covered in the publication were taken between 1 October 2017 and 30 September 2018. A total of 900,579 valid measurements for fixed lines and 384,999 for mobile connections were used.

In fixed broadband connections, 71.3% of users across all bandwidth classes and providers recorded at least half of the maximum contractually agreed download data transfer rates, whilst for 12.8% of users, the maximum download rates were met in full or exceeded. These figures are virtually on a par with those from the previous year. The results vary according to bandwidth class and provider.

The ratio of actual to agreed maximum data transfer rates for mobile broadband connections was once again below that for fixed broadband connections. 16.1% of users across all bandwidth classes and providers recorded at least half of the contractually agreed maximum download data transfer rates, whilst for 1.5% of users, the maximum download rates were met in full or exceeded. The delivered speeds continue the downward trend seen in previous years. The percentages tended to be lower in particular in the higher bandwidth classes.

In late October 2018 the German Federal Ministry of Transport and Digital Infrastructure had asked the Bundesnetzagentur to update its existing broadband measuring app to enable consumers to report dead spots in mobile radio coverage. The dead spot app records at regular intervals whether there is network coverage and whether the coverage is 2G, 3G or 4G (or for Android devices 5G since October 2019).

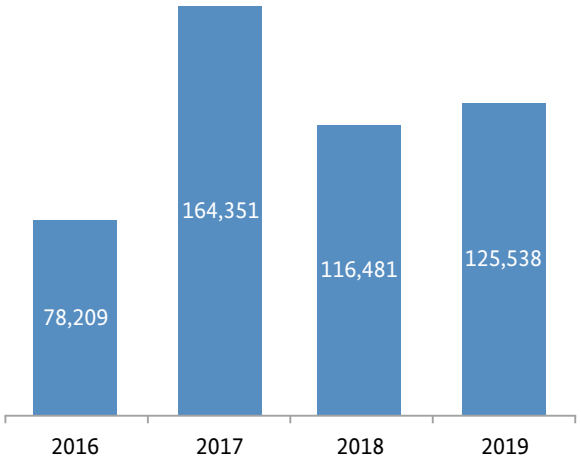
The Bundesnetzagentur then published a map of its findings on 7 November 2019. The map contains almost 160m measurements taken by users, who downloaded the app around 187,000 times in the first year.

Combating number misuse

The Bundesnetzagentur is the supervisory authority responsible for combating number misuse. It follows up on any breach of number use. Most of the cases pursued in this context relate to frequent breaches of the consumer protection provisions in the Telecommunications Act and the Unfair Competition Act. A variety of measures are in place to protect affected parties against disturbances and financial losses.

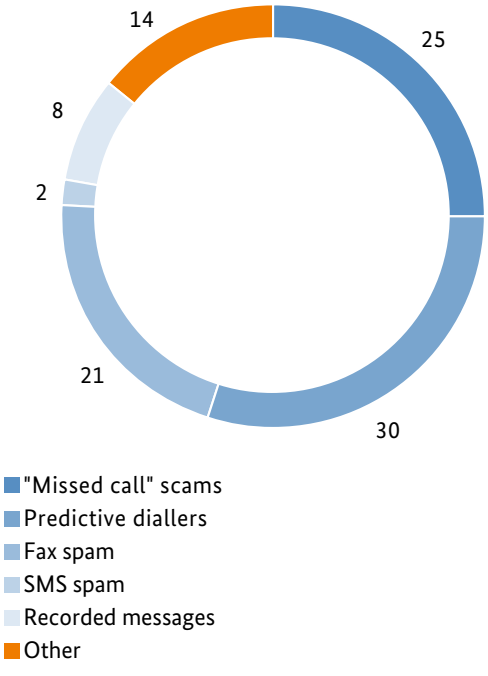
In 2019, the Bundesnetzagentur received 125,538 written complaints and enquiries in connection with number misuse, in addition to 21,463 telephone enquiries and complaints relating to number misuse and nuisance marketing calls.

Number of complaints



In 2019 the Bundesnetzagentur opened administrative proceedings in 2,044 cases to combat attempts to circumvent consumer protection provisions, the receipt of unsolicited advertising and nuisance calls, the unauthorised billing of third-party services and subscriptions, illegal call queuing and many other breaches. In 365 cases the Bundesnetzagentur ordered the disconnection of 533 phone numbers. Billing and collection bans were also issued for 6,682 telephone numbers. In one case, the Bundesnetzagentur banned a company from operating an illegal business model. All actions are published online in a continually updated list (*www.bundesnetzagentur.de/Massnahmenliste*).

Share of complaints by subject
%



Determination on payments via mobile phone bills
In October 2019 the Bundesnetzagentur established definitive regulations on the billing of third-party services via mobile phone bills. Mobile communications companies have until 1 February 2020 at the latest to comply with the requirements. The Bundesnetzagentur set a four-year review period. The determination establishes a framework that balances the interests of consumers in avoiding unwanted billing and subscription traps against the legitimate interests of (mobile communications) companies in having simple, reputable business models.

Technical, administrative and financial measures make mobile payment more secure and transparent. Maximum protection for consumers is assured when disreputable providers are not integrated into the mobile providers' billing platforms. As such, the Bundesnetzagentur's decision included related provisions. Under the new rules, mobile communications companies may only bill third-party services where the customer is redirected during the process of paying for a third-party service from the third-party provider's website to a website of a mobile provider or where the mobile communications company implements various specific consumer protection measures (combination model). Whilst the redirect option is a purely technical solution, the alternative – the combination model – works based on a number of security mechanisms. The combination model also requires the mandatory use of the redirect function for subscription services. Different rules apply to single purchases and particularly trustworthy third-party providers that require customers to log in to confirm their identity. In return, in many cases customers can invoke a money-back guarantee from mobile communications providers in the event of unwanted third-party billing.

Subscription traps in the fixed network
The Bundesnetzagentur took action against subscription traps in the fixed network in 2019. These traps related to one-click "saver tariffs" or "low-cost subscriptions" offered by long-distance carriers. For some number resources, simply offering such services is a fundamental breach of the allocation rules. The subscriptions violated transparency requirements applicable to chargeable services and breached aspects of the Unfair Competition Act.

Predictive diallers
The Bundesnetzagentur received a total of 37,495 complaints concerning nuisance calls that fall into the category of predictive diallers. This number is lower than in the previous year (2018: 39,605).

There are no legal regulations regarding the specific call behaviour and thus configuration of predictive diallers. The number of call attempts and associated inconvenience (calls in the early or late hours, repeated call attempts on the same day etc.) can constitute unreasonable harassment and therefore a breach of section 7(1) of the Unfair Competition Act. The Bundesnetzagentur took remedial action in a variety of cases, reprimanding the company involved and ordering the disconnection of the call centre telephone numbers. In 2019 the notification process was used to make a further 39 companies aware of complaints about call behaviour.

"Missed call" scams – update and addition to the price indication service
A total of 31,332 written complaints were received in connection with "missed call" scams displaying telephone numbers from outside of Germany. In January 2019 alone, the Bundesnetzagentur received 13,076 complaints in connection with "missed call" scams following the expiry at the end of 2018 of a one-year requirement to provide pricing information on the charges associated with specific country codes. The Bundesnetzagentur then re-ordered the activation of a price indication service in mobile communication networks to provide no-cost information on the call charges. The service was extended to cover 56 country codes in total. The aim is to help consumers avoid making costly return calls to these numbers. The Bundesnetzagentur also issued billing and collection bans to ensure that consumers can neither be billed for the costs of calls to such numbers nor pursued for recovery of the debt.

Fax spam and SMS spam
The Bundesnetzagentur received 25,941 complaints about fax spam in 2019 (2018: 26,195). Of particular note is the measure to stop companies sending fax spam offering to purchase used cars. In the past, the Bundesnetzagentur had regularly ordered the disconnection of the contact telephone numbers given on the faxes. Malicious call tracing set up by one of the people affected was able to identify 59 telephone numbers from which the faxes were being sent. The Bundesnetzagentur ordered the disconnection of these numbers. In another case, the Bundesnetzagentur stopped the continual sending of

fax spam advertising workshop equipment. The Bundesnetzagentur identified the company behind the faxes and prohibited it from continuing to operate its business model under threat of a fine.

The number of complaints received in connection with SMS spam grew by around 550 year on year to 2,894 in 2019. It appears that the new regulations in section 111 of the Telecommunications Act introduced in 2017 along with the Bundesnetzagentur's concerted efforts to combat misuse have had a significant impact on stabilising the number of complaints at a level significantly below that of previous years. In 2019 the Bundesnetzagentur issued warnings to senders of SMS spam and ordered the disconnection of the sending parties' numbers.

Misleading pop-up error messages from Microsoft/ Technical Support

This year the Bundesnetzagentur disconnected 296 telephone numbers that appeared on users' screens in misleading pop-up error messages when using the fixed internet. This was prompted by 322 complaints (2018: 189), including from Microsoft itself, which had presented its own findings on this matter to the Bundesnetzagentur.

Illegal pop-ups are windows that appear on the user's computer screen suggesting that the computer is affected by a virus or software issues. The scammers illegally purport to be from "Microsoft/Technical Support". When contacted by telephone to carry out remote diagnostics, they demand money for expensive repair work and/or obtain data. The pop-ups are often accompanied by acoustic signals or voice messages to put users under further pressure to act, even though no actual technical problem exists. Once the user grants remote access to their PC over the telephone, the scammers can manipulate the computer. Whilst these schemes mainly affected freephone 0800 numbers, they are increasingly using local area codes and mobile telephone numbers.

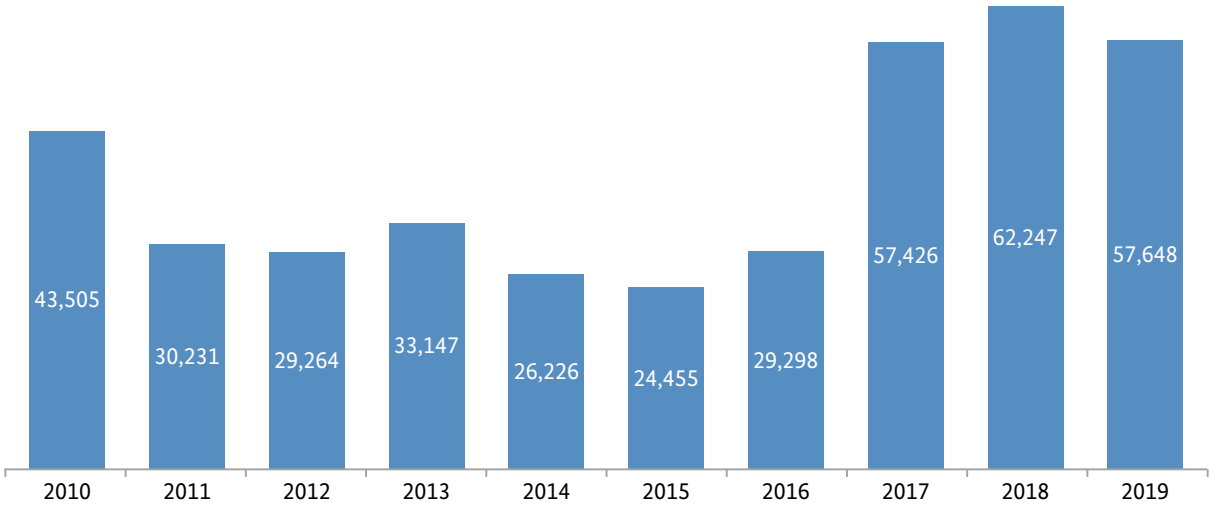
Telephone system and router hacking

The Bundesnetzagentur follows up on a variety of different types of cyberattacks on end customers. In all cases, an unknown attacker hacks into the end customer's router/telephone system and illegally generates a number of premium-rate calls, primarily to numbers outside of Germany.

The Bundesnetzagentur issued billing and collection bans to protect the end customers targeted by the attacks. This ensures that customers can neither be billed for the costs of calls to such numbers nor pursued for recovery of the debt. In many cases, the protection also extends to payment bans for the network operators affected. These aim to ensure that the network operators make no payments to foreign partners in respect of call charges generated in this way.

The Bundesnetzagentur receives information about hacking cases primarily from the network operators affected, enabling it to take faster action and permanently stop payment flows. The Bundesnetzagentur continues to pursue the cyber-security strategy adopted in 2018 at a national and international level. Its focus is on identifying patterns of misuse early on and permanently halting payment flows.

Written complaints about nuisance marketing calls
Years



Combating nuisance marketing calls

In 2019 the Bundesnetzagentur continued to crack down on nuisance marketing calls. The number of complaints concerning nuisance marketing calls and caller ID suppression remains high, with 57,648 received in 2019. Whilst this figure is slightly below last year's all-time high, it is still the second-highest number of complaints ever received by the Bundesnetzagentur. The Bundesnetzagentur is monitoring the situation but does not yet see a turnaround on the horizon.

The number of complaints received by the Bundesnetzagentur clearly shows that nuisance marketing calls are still a major problem in numerous industries. In 2019 many nuisance marketing calls once again related to electricity and gas supply contracts. The number of complaints involving the telecommunications sector and finance and insurance products grew sharply. Significantly more consumers complained about cold calls with offers of prize draws and subscriptions to print media than in the previous year.

In some market segments a marked increase was seen in the number of large-scale campaigns being operated nationwide. These typically target several hundred or even over a thousand consumers as the victims of nuisance marketing calls. Many such large-scale campaigns are in grave violation of consumers' privacy rights. For example, callers make false claims or offensive or insulting comments to consumers with a detrimental impact that goes far beyond the usual scope. The Bundesnetzagentur handles these cases as a matter of special priority. In the period under review, the Bundesnetzagentur issued 17 fines amounting to €1,309,500 in total. This represents an increase of around 19% compared with the total fines issued in the previous year (€1,105,000).

In two of these cases, the Bundesnetzagentur issued press releases on the proceedings to warn consumers about the dangers of the telephone campaigns. This firstly concerned the administrative fine proceedings against Vodafone Kabel Deutschland GmbH, which the Bundesnetzagentur had fined €100,000 in June 2019 for making nuisance marketing calls. Investigations by the Bundesnetzagentur revealed that Vodafone Kabel Deutschland GmbH and its contracted call centres and sales partners had made marketing calls for cable TV, internet and telecommunications services without obtaining the call recipients' consent. Callers were not only attempting to acquire new customers but also contacting former customers to encourage them to reinstate the contractual relationship or retract a contract cancellation. The fine imposed on Vodafone Kabel Deutschland GmbH is legally binding; the company has not appealed the decision.

The second case related to Sky Deutschland Fernsehen GmbH & Co. KG. The Bundesnetzagentur fined the company €250,000 on 16 December 2019. Sky Deutschland Fernsehen GmbH & Co. KG is alleged to have wilfully neglected to implement oversight measures to prevent nuisance marketing calls. At the most recent count, the Bundesnetzagentur had received around 1,000 complaints regarding nuisance

marketing calls. The calls were advertising a pay-TV subscription aimed at acquiring new customers and winning back former customers. The Bundesnetzagentur found evidence in 187 cases of calls being made without the company having obtained the call recipient's consent to marketing calls or in which the call recipient had previously withdrawn their consent to such calls. Sky Deutschland Fernsehen GmbH & Co. KG has appealed the decision. The Bundesnetzagentur is currently reviewing the matter.

In parallel, the Bundesnetzagentur was closely involved in dialogue to improve the statutory framework governing nuisance marketing calls, and in particular on the planned update to the Unfair Competition Act by way of the draft bill on "fair consumer contracts". The Bundesnetzagentur contributed its practical experiences from investigative and prosecutorial activities in this field during a consultation with the German Bundestag's Committee on Rights and Consumer Protection. The Bundesnetzagentur advocated against reducing the current level of protection for consumers in connection with nuisance marketing calls both now and as European law develops in the future. In view of its investigative and prosecutorial responsibility, the Bundesnetzagentur emphasised that it sees the need to introduce a documentation and submission requirement for advertisement consents, revenue-oriented fines, a confirmation process and increased staffing. The Bundesnetzagentur sees an urgent need to flesh out the legal framework for prosecuting nuisance marketing calls if it is to take effective action in the areas identified in the evaluation report on the act against dubious business practices.

Expert forums on combating abusive practices

In 2019 the Bundesnetzagentur once again convened a number of expert forums on combating abusive practices. The forums offer the various participant groups a platform for exchange and dialogue with the Bundesnetzagentur outside of ongoing abuse, objection or legal proceedings, and the opportunity to address unresolved questions. In return, the Bundesnetzagentur provides an insight into the technical, financial and legal frameworks governing the market and consumers. At the 10th edition of the forum on combating abusive practices in the telecommunications market, experts met with representatives from consumer protection and fair competition bodies to discuss current developments in this field, the fight against unauthorised marketing and the billing of third-party services on mobile phone bills, as well as issues relating to broadband speed and net neutrality. At the expert forum on activities by the authorities to combat abusive practices, representatives of state and federal authorities debated topical legal and technical issues and approaches to cooperation between authorities.

Action to combat the misleading use of geographic telephone numbers

The use of specific telephone numbers to feign a local presence remained a key focus of the Bundesnetzagentur's consumer protection activities in the telecommunications sector in 2019. Geographic telephone numbers require the local number to be geographically related to the user, ie where the subscriber has a telephone connection or a place of residence or business in the respective locality. Such telephone numbers allow inferences to be drawn about the geographic location of the subscriber.

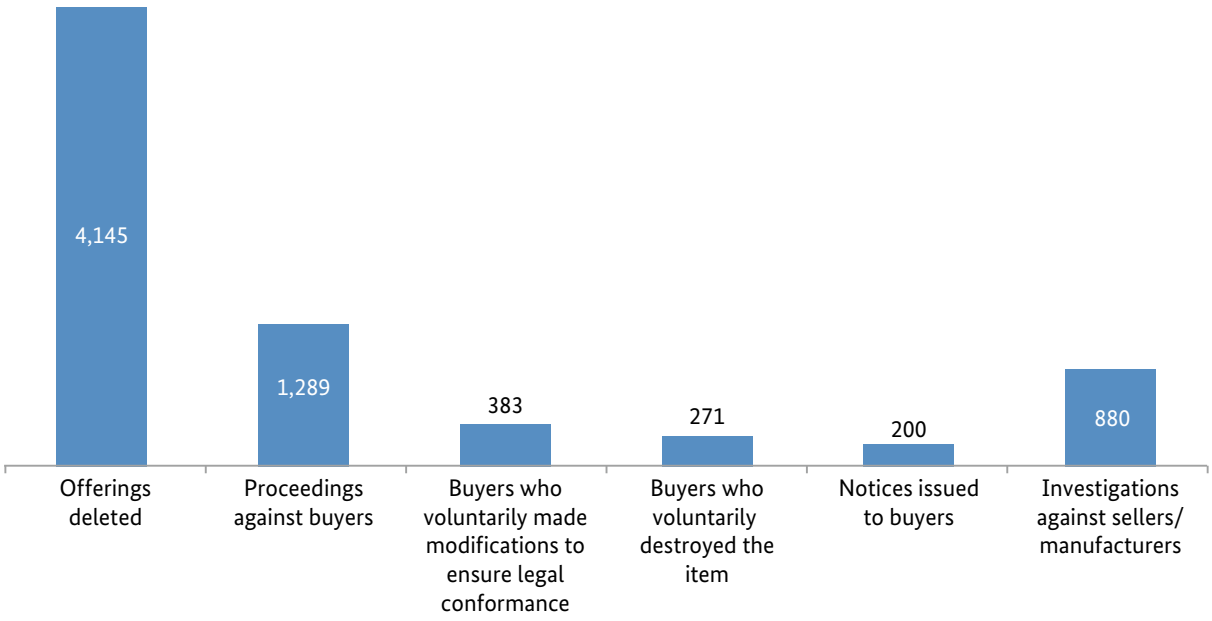
In order to protect consumers and other market participants, the Bundesnetzagentur initiated administrative proceedings on a regular basis against companies feigning a local presence. This action was sufficient to remedy most violations of numbering and competition law. Where the companies failed to take remedial action, the Bundesnetzagentur ordered the network operator to disconnect the illegally used telephone numbers or prohibited the companies from following such business models.

The Bundesnetzagentur also ordered the disconnection of telephone numbers where it identified unauthorised third-party use. In some cases, phone numbers are provided without authorization to third parties or for third-tier use with the specific goal of creating ambiguity over the chain of responsibility. These telephone numbers often appear in connection with exploitative business models, such as emergency call-outs for tradespeople. Whilst a range of number types are used, geographic telephone numbers top the list. However, there is a perceptible shift towards other number types, such as mobile telephone numbers or freephone 0800 numbers.

Misuse of transmitting equipment

In 2019 the Bundesnetzagentur expanded its activities to combat the use of prohibited cameras with a transmission function and listening devices concealed in everyday objects. Whilst the Bundesnetzagentur continued to monitor typical

Current cases



banned transmitting equipment such as smoke detectors and power banks with hidden cameras or concealed microphones, it also cracked down on multi-functional devices including GPS trackers with a listening function and lamps with cameras or microphones capable of transmitting data. Toy cars and robot vacuums with transmission-capable cameras were also in the spotlight.

As in the previous year, the Bundesnetzagentur successfully worked with the manufacturers to ensure the products were reconfigured in line with legal requirements without having to impose a ban on sales. One example was the removal of the listening function in particular from GPS trackers by changing the software or hardware.

In 2019 the Bundesnetzagentur also stepped up its activities to combat unauthorised advertising for transmission-capable spy cameras and microphones. The advertising ban covers all spy cameras and microphones with a transmission function whether or not they are concealed in everyday objects. Adverts claiming that a transmitting device is suitable for listening in on conversations not intended for the public or for capturing images of persons by stealth are prohibited. The Bundesnetzagentur follows up on breaches with administrative fine proceedings. Fines can be between €5 and €100,000.

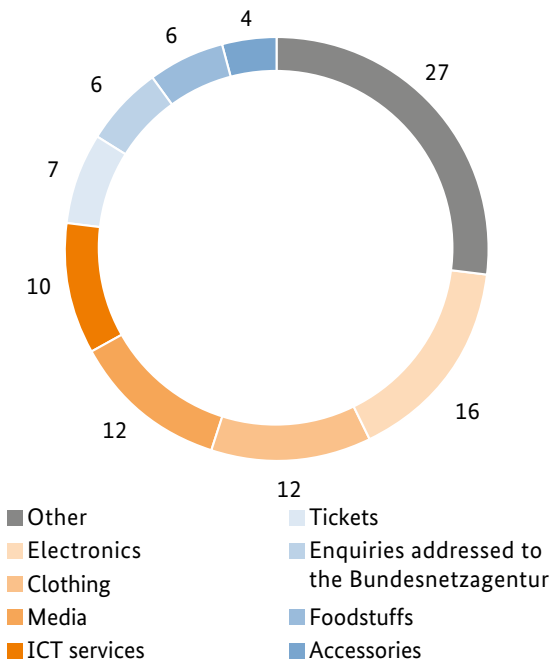
Geo-blocking

The Geo-blocking Regulation is an important element of the EU's Digital Single Market strategy. In Germany, the responsibility for enforcing the rules falls to the Bundesnetzagentur. The Regulation addresses unjustified discrimination against customers in the EU based on their nationality, residence or place of establishment. It removes barriers to cross-border business between providers and customers for the sale of goods and provision of services ("shop like a local" principle).

The Geo-blocking Regulation applies to both online and brick-and-mortar retailers. The key provisions cover access to online interfaces, non-discriminatory treatment when purchasing or accessing goods and services, and non-discriminatory treatment in connection with payments. Certain goods and services, including audiovisual, healthcare, financial, telecommunications and transport services, are excluded from the scope of the Geo-blocking Regulation. Also not covered is access to electronically supplied services for copyrighted content, other subject matter and their use. Moreover, a customer buying goods is not entitled to delivery to a location outside the provider's field of activity.

Since July 2019 consumers can submit their complaints to the Bundesnetzagentur using a simplified online dialogue. Almost 90 cases had been reported by the end of 2019. Most related to orders for electrical appliances, clothing and e-books.

Geo-blocking complaints by category
%



To date all cases have been resolved in the consultation stage without the need for further action. The Bundesnetzagentur served consumers' interests with the rapid resolution of complaints. In addition to providing consumer assistance, the Bundesnetzagentur is in ongoing dialogue with retailers to improve cross-border business where needed. For instance, in June 2019 the Bundesnetzagentur held a workshop with retailer associations to discuss initial experiences with the Geo-blocking Regulation.

Universal service

In 2019 over 1,200 end users wrote to the Bundesnetzagentur for support with matters concerning the provision of basic telecommunication services. Universal services are a minimum set of available services to which all end users must have access at an affordable price. DTAG currently provides the basic service in Germany on a voluntary basis. For end users, a large number of complaints submitted to the Bundesnetzagentur were prompted by delays in the provision of a telephone line. With the involvement of DTAG the Bundesnetzagentur is regularly able to ensure a speedy and satisfactory resolution for DTAG's customers. The provision of public payphones and cardphones is likewise part of the universal service. At the end of 2019 an inventory of payphones and cardphones listed around 15,700 phones. Mobile communications continued their extensive spread, now having reached more than 106.9 million actively used SIM cards. This market development and the full coverage nationwide that has been attained with landlines have reduced demand for public telephones.

Text and video relay service for people who are deaf or hard of hearing

The text and video relay service enables people who are deaf or hard of hearing to make phone calls. To do so, they set up a video or data link via a PC, tablet or smartphone to a sign language interpreter or speech-to-text reporter provided by the service. They call the requested person and translate the message into spoken language. Conversely, the recipient's message is translated into sign language or written language. The service provides an accessible way for people who are deaf or hard of hearing to make telephone calls with hearing persons.

In the interests of aligning the living conditions of people who are deaf and hard of hearing with those of people without disability, the Bundesnetzagentur reduced the charges for using the service for private calls. The basic monthly fee was abolished on 1 January 2019 and the call charges reduced.

The Bundesnetzagentur once again took appropriate measures in 2019 to ensure the financing of the text and video relay service. In particular, it determined the proportionate costs to be paid by providers of publicly available telephone services.

Surveilling the internet market

The Bundesnetzagentur's market surveillance activities include the monitoring of internet platforms offering a range of products from different retailers.

It identified new platforms being used in many cases to import extremely cheap goods from non-EU countries to Germany. Many such products do not meet the minimum standards required under EU law, which was confirmed in a number of anonymous test purchases.

The Bundesnetzagentur was unable to contact the non-EU retailers directly and could only reach the platform operator.

The Bundesnetzagentur believes that the business model being operated in Germany is in contravention of several laws. It is thus addressing the issue with other market surveillance authorities and with the European Commission in an effort to combat the sale of non-compliant products over such platforms in the future.

Market surveillance conference 2019
The German market surveillance conference took place at the Federal Institute for Materials Research and Testing in Berlin on 25–26 September 2019. The conference was organised by the office of the German Market Surveillance Forum, which is part of the Bundesnetzagentur.

The annual conference offers all organisations and interested parties from all industries a platform to discuss and exchange information on market surveillance activities. This year the central theme was online trade in connection with the new Regulation (EU) 2019/1020 on market surveillance. Around 220 attendees had the opportunity to discuss diverse issues with representatives from the internet platforms eBay, real-digital and Restposten, as well as with manufacturers, associations and authorities.

Investigating interference – the radio monitoring and inspection service

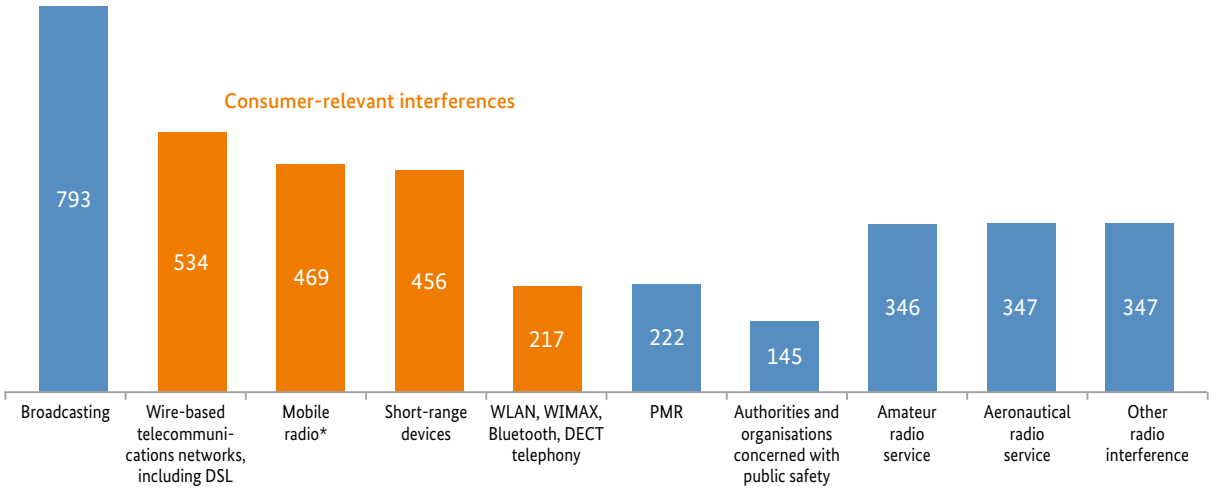
The Bundesnetzagentur also makes an important contribution to consumer protection through its radio monitoring and inspection service. Almost 4,000 cases of radio interference and electromagnetic disturbances were investigated and resolved by the radio monitoring and inspection service in 2019. In addition to resolving cases of radio interference for security-related radio services and radio services used in industry, in over 1,200 cases inhabitants benefited from the resolution of faults in connection with mobile communications, Wi-Fi and generally assigned radio applications, for instance radio headsets, remote control car key fobs and garage door remote controls, as well as the resolution of electromagnetic interference on DSL connections.

The low level of fault resolution is partly the result of quality assurance initiatives to carry out preventive checks on frequency assignments with the spectrum license holders.

Thanks to its round-the-clock availability and nationwide presence in 19 locations throughout Germany, the radio monitoring and inspection service ensures speedy and efficient fault processing. This service can be used by institutions, companies and consumers at no cost. This also applies to those who cause radio interference, provided the interference was caused unintentionally.

By resolving cases of radio interference, the radio monitoring and inspection service makes an important contribution to the efficient and interference-free use of radio spectrum.

Interference volumes by type of service in 2019



* 36 of the 469 cases of mobile communications interference were reported by consumers

Rulings, activities and proceedings

In 2019, the Bundesnetzagentur held the auction for German 5G spectrum, auctioning a total of 420 MHz in the bands at 2 GHz and 3.6 GHz and raising an aggregate amount of €6,549,651,000. The Bundesnetzagentur is opening up additional spectrum in the band at 3700–3800 MHz for use in local broadband networks.

The Bundesnetzagentur began the process to determine the future regulation of access to the copper and fibre access network. Rather than superimposing existing copper-network regulation as-is onto new fibre-optic lines, the intention is to implement targeted regulation whilst keeping it to the minimum necessary.

Spectrum management

Forward-looking assignment of spectrum for digital infrastructure expansion

5G represents the next generation in powerful mobile communications technology. It not only meets the demand for high data rates combined with growing mobility, but also endows mobile connections with greater capacities, higher availability and low latency. 5G underpins the emergence and development of innovative services and applications such as industry 4.0, automated driving and the Internet of Things.

The characteristics of spectrum in the 3.6 GHz band make it particularly suited to 5G. Moreover, existing spectrum usage rights in the band at 2 GHz – which were previously used for UMTS – are due to expire in the next few years. To ensure these spectrum usage rights are made available as early as possible and in line with demand, the Bundesnetzagentur announced in 2016 that it was preparing to hold 5G award proceedings. The President's Chamber set the necessary regulatory framework in Decisions I, II, III and IV from 2018, which contain the order for and choice of award proceedings, as well as the award conditions and the auction rules.

The announcement of the last Decision in November 2018 marked the start of the qualification procedure. Potential bidders had until 25 January 2019 to apply for admission to the auction proceedings. An in-depth examination of the applications and their compliance with the admission criteria resulted in a total of four companies being admitted to the spectrum auction. These comprised the incumbent mobile network operators Telefónica, Deutsche Telekom and Vodafone, alongside potential new entrant Drillisch Netz AG.

The spectrum auction began on 19 March 2019 and was held at the Bundesnetzagentur's offices in Mainz. It took the form of an open ascending simultaneous multiround auction. All frequency blocks in the respective bands were offered simultaneously in each round of the auction. Bidders received information on the bids placed by other participants in each round, enabling them at all times to form opinions on bidding behaviour and the relative value of individual frequency blocks, and to modify their own bidding strategy accordingly. The auction ended once no higher bids were submitted for any of the frequency blocks.

Distribution of frequency blocks acquired at auction

	2 GHz	3.6 GHz	Total	Total price bid
Drillisch Netz AG	2 x 10 MHz (both blocks only available from 2026)	50 MHz	70 MHz	**€1,070,187,00**
Telefónica Germany GmbH & Co. OHG	2 x 20 MHz (one block only available from 2026)	70 MHz	90 MHz	**€1,424,832,000**
Telekom Deutschland GmbH	2 x 20 MHz	90 MHz	130 MHz	**€2,174,943,000**
Vodafone GmbH	2 x 20 MHz (one block only available from 2026)	90 MHz	130 MHz	**€1,879,689,000**

The 41 frequency blocks in the bands at 2 GHz and 3.6≈GHz, comprising a total of 420 MHz, were auctioned to all four participating companies for an aggregate amount of €6,549,651,000. After 52 days of bidding, the auction ended in the 497th round on 12 June 2019.

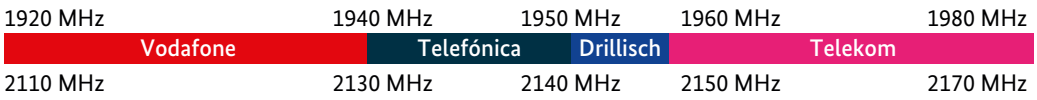
The 41 frequency blocks from the 2 GHz and 3.6 GHz frequency bands were mostly auctioned in an abstract manner with regard to their position in the spectrum. Only the top and bottom blocks in the 3.6 GHz band were auctioned off at a specific position. After the auction ended, the abstract blocks acquired were allotted to specific band positions in accordance with the allotment procedure laid down before the auction.

The four bidders had a time frame of one month to come to an agreement on the position of the abstract frequency blocks they had acquired in the bands. With the companies failing to reach an agreement on the allotment of these blocks by the end of the time frame given, this prompted ex officio action by the Bundesnetzagentur to allot the positions itself. It did this in consideration of the contiguous spectrum, existing assignments and underlying priorities. The Bundesnetzagentur decided on the final allotment on 2 August 2019.

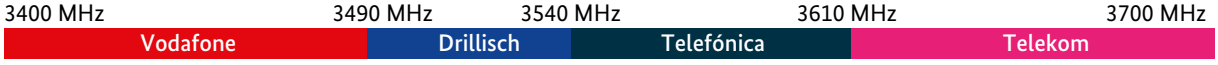
The spectrum can be assigned upon application by the companies and the first blocks in the 3.6 GHz band have now been assigned.

Allotments of 2 GHz spectrum for the period 1 January 2021 to 31 December 2025

Allotments of 2 GHz spectrum from 1 January 2026 (to 31 December 2040)



Allotments in the 3.6 GHz band



Meeting coverage obligations from 2015
The spectrum at 700 MHz, 900 MHz, 1800 MHz and 1500 MHz auctioned in 2015 was assigned in combination with a coverage obligation requiring the mobile network operators, using mobile transmission technologies, to provide broadband coverage to the population with a downlink transmission rate of at least 50 Mbps per sector. The intention is to ensure that households as a rule have access to data rates of 10 Mbps and over.

Each mobile network operator must reach 98% of households throughout Germany and at least 97% of households in each federal state. Additionally, full coverage is to be ensured along main transport routes where practicable and technically feasible. All mobile network operators must meet the coverage obligations as of 1 January 2020 and may opt to use their entire spectrum packages in order to do so.

The Bundesnetzagentur has overseen the expansion of mobile broadband coverage from the outset. Reporting obligations incumbent on the mobile network operators ensure that the Bundesnetzagentur is fully informed about the status of spectrum usage, the network expansion and rollout, as well as about expansion planning.

The Bundesnetzagentur has designed a concept for verifying compliance with the coverage obligation with respect to households and main transport routes, and set the definitive technical coverage parameters in each case. On the basis of these parameters, the mobile network operators regularly submitted coverage maps depicting the level of coverage available to households and on main transport routes.

Whilst recognisable progress has been made over the last few months with expanding mobile-based broadband coverage, the Bundesnetzagentur is unable to accurately assess whether the mobile network operators have fulfilled the coverage obligation until the reports and coverage maps are submitted in January 2020.

The Bundesnetzagentur will evaluate and review the information provided by the network operators. In selected reference areas, the radio monitoring and inspection service will perform supplemental measurements to review and verify the mobile network operators' coverage data.

Moreover, the Bundesnetzagentur will review individual cases in which the addition of base station sites as part of the network expansion is delayed or not realised at all.

Application procedure for local broadband networks
In addition to the nationwide usage rights for spectrum at 3400–3700 MHz that were awarded at auction, the Bundesnetzagentur is making available further spectrum at 3700–3800 MHz for deployment in local broadband networks (in particular for industry 4.0).

At the end of January 2019, the Bundesnetzagentur published draft framework conditions for the future application process based on feedback from the draft of August 2018 and consulted on the updated draft with interested parties. The basic framework conditions for the future application procedure for the band at 3700–3800 MHz for wireless access applications were published in March 2019. Spectrum is to be made available for local assignments, in particular for 5G applications.

In early July 2019 the Bundesnetzagentur published draft administrative rules on the use of spectrum for local broadband, setting out the application procedure. This document ensured that the exact rules and application forms were made transparent to the market as early as possible. Since the publication of the draft rules, the Bundesnetzagentur has held talks with various interest groups and potential applicants and answered a number of questions regarding the application procedure. In doing so, the Bundesnetzagentur laid the groundwork for a smooth start to the process itself.

The Federal Law Gazette published the eighth amendment to the Frequency Fee Ordinance on 20 November 2019. This amendment specifies the spectrum fees for local usages. The fees have been chosen so as not to create an obstacle for SMEs and are aligned with the Bundesnetzagentur's proposal.

The application procedure for local 5G campus networks opened on 21 November 2019. The path is now clear for these frequencies to be deployed in particular for industry automation (industry 4.0) and agricultural businesses. By providing spectrum for local usages, the Bundesnetzagentur is supporting the digital transformation of economy and society. Applications can be submitted electronically and the goal is to minimise the amount of red tape so as to ensure speedy processing.

Monitoring mobile network coverage
Given the array of new technologies and services coming onto the market, public interest in the best-possible nationwide mobile network coverage remains consistently high. Consumers and decision-makers alike are calling for a better overview of the mobile network coverage currently offered by each network operator.

Hence, the Bundesnetzagentur plans to introduce ongoing operator-specific coverage monitoring. This will form the basis for publishing an online map of 2G, 3G, 4G and in future also 5G coverage using the information provided by the mobile network operators. The Bundesnetzagentur has already started collecting data for the map. Data is to be validated using internal measurements, data from the Funkloch app via which consumers can report coverage gaps, and other sources such as consumer complaints.

The planned monitoring mechanism will compare demand for mobile network coverage with actual supply. One aim here is to determine the current network coverage status of each provider and identify action areas. Another aim is to help introduce or provide targeted support for measures to improve mobile network coverage.

Update and re-publication of the Frequency Plan
The Frequency Plan contains an overview of all frequency usages up to 3000 GHz within the Federal Republic of Germany. Pursuant to section 54 of the Telecommunications Act, responsibility for compiling the Frequency Plan falls to the Bundesnetzagentur. In 2018/2019, the Bundesnetzagentur decided to completely update the overall plan and coordinated the changes with the affected authorities at national and federal state level as well as affected parties and the public.

In anticipation of the planned revisions in 2019, the Bundesnetzagentur took the opportunity to implement a partial plan update by March 2019. As part of this partial update, the frequencies required for 5G in the band at 24.25–27.50 GHz were opened up for use in wireless access applications.

The final version of the updated Frequency Plan is expected to be announced in December 2019.

Radio equipment/physical protection

The procedure to ensure the protection of persons within the electromagnetic fields of radio equipment (certificate of safety) takes full account both of the rise in complexity of radio equipment sites and the introduction of new mobile communications technology (5G). To this end, the Bundesnetzagentur ordered the development and verification of a simplified near-field calculation method (the WattWächter program). WattWächter is a rapid, reliable and unbureaucratic method for determining compliance with physical protection thresholds at radio equipment sites without the need to take time-consuming field strength readings. The Bundesnetzagentur issued 17,963 certificates of safety in 2019. In addition, over 500 emissions tests were carried out at selected locations (these can be determined by the local authorities) across Germany in collaboration with the state environment ministries. Radio equipment sites covered by the certification requirement are published in the Bundesnetzagentur's EMF database along with the results of the measurements.

Market regulation

Process on the future regulation of access to the copper and fibre access network
In parallel to the publication of the draft consultation on a market determination stating that Deutsche Telekom and its affiliated companies still have significant market power on the market for wholesale local access provided at a fixed location (local loop), on 27 May 2019 the presiding Ruling Chamber opened a process to review the regulatory obligations incumbent upon Deutsche Telekom. A decision will be taken in the course of the process on whether, in response to the findings of the updated market definition and market analysis, the existing obligations on Telekom are to be retained, modified, or revoked, or new obligations imposed.

To this end, on 5 July 2019 the Bundesnetzagentur published initial key elements and discussion points for the future regulation of access to the copper and fibre access network. In a public consultation held on 12 July 2019, all market players and interested parties had the opportunity to debate these key elements and contribute their requests and suggestions to the process. Further opinions were submitted in writing afterwards and analysed thoroughly by the Ruling Chamber.

The review process comprises two central elements: Regulation of copper-based wholesale products – including layer 2 bitstream, which is allocated to this market for the first time – and the future regulation of the fibre access network. Rather than superimposing existing copper-network regulation as-is onto new fibre-optic lines, the Bundesnetzagentur intends to implement targeted regulation based on the findings of the market determination whilst keeping it to the minimum necessary. This will ensure minimal regulation where Deutsche Telekom readily grants access to its fibre-optic-based wholesale products. A serious and acceptable contractual offer from Telekom and corresponding access agreements with the competitor companies will reduce the likelihood of needing regulatory obligations and supervision by the Bundesnetzagentur in its role as arbitrator.

In principle, the Bundesnetzagentur can consider any of the options defined in sentence 1 of section 13 (1) of the Telecommunications Act as regulatory measures. If – as here – a company commands significant market power on a regulated market, the Bundesnetzagentur must impose at least one of the remedial measures listed in the Act. The Ruling Chamber decides on potential remedial action at its discretion, taking into consideration the regulatory objectives and principles along with further special criteria mentioned in the respective regulations. The precise measures that are suitable, necessary and reasonable to safeguard access to Telekom's copper/fibre access networks, and which can thus be included in the future regulatory order on Telekom, are currently being reviewed and evaluated.

Rates for fixed termination, call origination and interconnection

The Bundesnetzagentur adopted resolutions approving the fixed-line interconnection rates on 28 June 2019.

The approvals cover firstly Deutsche Telekom's tariffs for basic call termination services to lines within its own network and for routing calls from the Telekom network to competitors' networks, as well as the charges based on these rates for optional and additional services, such as calls to service numbers and freephone numbers (0800, 0180, 0900 numbers etc.), and secondly the rates for termination in the fixed networks of alternative access network operators and any related infrastructure services. The rate approvals cover calls still being routed via PSTN (public switched telephone network) interconnection points and calls via NGN (next-generation network) interconnection points.

A termination charge was approved for all providers of €0.0008/min. for 2019 and €0.0006/min. for 2020. The rates scheduled for 2021 (€0.0005/min.) and 2022 (€0.0003/min.) will only take effect provided the delegated act to be adopted by the European Commission on termination rates pursuant to section 75 of the European Electronic Communications Code is not yet in force (or will only take effect until the date of entry into force of the delegated act).

The termination rates were set in accordance with the pure LRIC model recommended by the European Commission in its Termination Rates Recommendation, which takes account of the incremental (ie purely supplementary) costs of providing call termination.

The call origination rate approved for routing calls from the Telekom network to competitors' networks is not covered by the pure LRIC model and drops from €0.0023/min. to €0.0013/min. The reduction mainly relates to the now prorated-only costs of the PSTN pursuant to section 32 (2) of the Telecommunications Act. This, in turn, is based on the fact that the number of PSTN lines has again declined significantly since the last rate review proceedings and the Ruling Chamber now only considers PSTN costs to be justified where they relate to approaches in connection with the PSTN interconnections.

In addition to the call charges, in several proceedings throughout the reporting period the Bundesnetzagentur approved the rates for other regulated fixed-network interconnection services that must be provided by companies with significant market power, such as the charges for interconnection access (ICA) and the switching and transmission technology required, for physical access for collocation, and for other configuration measures.

Mobile termination and interconnection rates and regulatory orders

The Bundesnetzagentur adopted resolutions on 28 November 2019 and 19 December 2019 on the termination rates for calls to mobile lines. In each case the rates applicable to the three mobile network operators Deutsche Telekom, Vodafone and Telefónica, as well as to four virtual mobile network operators, were approved effective 1 December 2019.

Effective 1 December 2019, the mobile termination rate (MTR) for all providers was set at 0.90 ct/min. (previously 0.95 ct/min.). From 1 December 2020, the MTR drops to 0.78 ct/min. and from 1 December 2021 to 0.70 ct/min. The rates scheduled for 2021 and 2022 will only take effect provided the delegated act to be adopted by the European Commission on termination rates pursuant to section 75 of the European Electronic Communications Code is not yet in force (or will only take effect until the date of entry into force of the delegated act).

The method of setting the MTR using the pure LRIC model recommended by the European Commission in its Termination Rates Recommendation is consistent with the method used to determine the fixed termination rate (FTR).

On 3 September 2019 the Bundesnetzagentur ruled to reverse the access obligation in the regulatory orders imposed on Telekom, Vodafone and Telefónica with respect to the termination of calls originating from non-EEA countries. As such, calls of this nature are now no longer subject to a corresponding rate approval.

The three companies had applied for the rate approval requirement to be lifted for the termination of calls originating in non-EEA countries on the grounds that the requirement for rate approvals for such calls was causing substantial discrimination and harming competition to the detriment of the German mobile network operators. Whilst the rates for calls within the EU/EEA were for the most part covered by consistent price regulation, this did not apply to calls in non-EEA countries. This, the companies said, had created a situation in which providers in non-EEA countries had unilaterally raised their termination rates by a significant margin whilst benefiting from regulated low MTRs for calls to Germany.

The Bundesnetzagentur reversed the corresponding access obligation with a view to countering this market trend, which runs contrary to consumer interests.

VHF regulatory orders

The Bundesnetzagentur fully and/or partially reversed the regulatory obligations previously imposed on Media Broadcast GmbH on the national markets for broadcasting analogue VHF radio signals and for the (joint) use of VHF antennas on the back of a market determination by the President's Chamber from the end of 2018 which concluded that the (individual operator) markets for the (joint) use of VHF antennas were no longer subject to regulation following the sale of VHF infrastructure by Media Broadcast GmbH in the meantime.
Following a further market determination specifying that the VHF sub-market for the provision of terrestrial transmitting facilities to content providers for broadcasting VHF radio signals was (also) no longer subject to regulation, the corresponding regulatory order was also repealed in this respect.

Repeal of Market 1 regulatory order

The Bundesnetzagentur has removed the telephone line market from the regulation and repealed the regulatory order. This lifts the obligation on Deutsche Telekom to allow indirect access and carrier preselection on its lines. Nevertheless, Telekom has signed an agreement with the Association of the Providers of Telecommunications and Value-Added Services and the German Association for Telecommunications and Media in which it commits to continuing to allow indirect access and carrier preselection for existing contracts until 31 December 2022.

Reference offer

Deutsche Telekom submitted a reference offer on 22 August 2018 for implementing leased lines on native Ethernet with bandwidths from 2 Mbps up to and including 150 Mbps. The presiding Ruling Chamber opened corresponding review proceedings pursuant to section 23 of the Telecommunications Act.

On 20 March 2019 Telekom submitted reference offers for the Wholesale Ethernet VPN, Wholesale Ethernet VPN 2.0, Wholesale Ethernet P2MP and Wholesale Ethernet P2MP HBS services. The presiding Ruling Chamber opened corresponding review proceedings pursuant to section 23 of the Telecommunications Act.

Ex post review of VPN 1.0, VPN 2.0
In a letter dated 11 June 2019, Plusnet GmbH filed a complaint against Deutsche Telekom and its charges for the Wholesale Ethernet VPN 1.0 product. In a letter dated 7 June 2019, the Association of the Providers of Telecommunications and Value-Added Services (VATM) filed a complaint against Deutsche Telekom and its charges for the Wholesale Ethernet VPN 2.0 product.

Abuse proceedings
Abuse proceedings were opened against Deutsche Telekom at the behest of VATM and member companies for delays in the provisioning of access-regulated products for Market 4.

Leasing charges for CLL-SDH, Ethernet-over-SDH
Deutsche Telekom filed an application on 31 July 2019 requesting approval of the current leasing charges for the carrier leased lines CLL-SDH and CLL-Ethernet-over-SDH from 2020.

Rate approval for native Ethernet (CLL 2.0) lease and provisioning
On 22 November 2019 Deutsche Telekom applied for the carrier leased line (CLL Ethernet 2.0) rates to be approved after it had withdrawn the rate approval application for carrier leased lines (CLL 2.0), the corresponding fast repair and other services.

Provisioning charges for CLL-SDH, Ethernet-over-SDH
Deutsche Telekom filed an application on 18 January 2019 to have the rates for provisioning, fast repair and other extra services for carrier leased lines CLL-SDH and for CLL-Ethernet-over-SDH approved effective 1 July 2019.

Decision on retail charges for fixed-line number porting
The presiding Ruling Chamber has been pushing for a market-wide reduction of the retail charge for porting a fixed-line telephone number. All companies contacted by the Chamber have now capped their charges for retail customers at €9.61 net (€11.44 gross).

Review of wholesale charges for mobile number porting
On 26 September 2019 the presiding Ruling Chamber ruled that the charge levied by Vodafone for porting a mobile telephone number at wholesale level in cases where the end user switched contracts to another provider of publicly accessible telecommunications services did not conform to the statutory requirements. Moreover, Vodafone was ordered to cap its price for this service at €3.58 (net).

Ex officio rate review proceedings were opened against Telefónica on 16 October 2019 and against Deutsche Telekom on 4 November 2019. Telefónica was ordered to cap its charge at €3.58 (net). The proceedings against Telekom are ongoing.

Review of retail charges for mobile number porting
In parallel to the review proceedings concerning the wholesale charges for porting mobile telephone numbers, preliminary proceedings were also opened against the mobile providers regarding a reduction in retail prices. If the mobile providers do not reduce their charges voluntarily, corresponding ex officio rate review proceedings will be opened.

Broadband subsidies

With efforts under way to build out high-bit-rate broadband lines Germany-wide, the government-assisted expansion is of great importance, particularly in rural areas. Subsidised networks must be organised such as to ensure they remain open to competition and sustainable in future so that private investment is not prevented or hindered by state aid. The Bundesnetzagentur gives an opinion on the access conditions specified in the agreements between the bodies granting aid and the network operator recipients. This process is intended to safeguard open network access for third-party providers and thus also give consumers in this sector a choice of providers. In 2019 the Bundesnetzagentur reviewed 275 agreements. In pursuit of the goals of the 2025 Gigabit Germany initiative, in 2019 the Federal Ministry of Transport and Digital Infrastructure drew up a new NGA framework to promote the expansion of broadband into "grey spots" in the future. Under the framework, projects to construct and operate high-speed networks with bandwidths of at least 1 Gbps are eligible for funding. The Bundesnetzagentur has issued an opinion on the planned new regulation, as well as on the plans to update the funding rules in Bavaria.

Infrastructure atlas – a single information point

The infrastructure atlas is an information portal operated by the Bundesnetzagentur. The portal contains georeferenced data on existing infrastructure – fibre-optic lines, ducts and trenches, carrier infrastructure and access points – which can be made available on request. Its goal is to enhance efficiency in broadband expansion projects and shorten lead times. The infrastructure atlas is based on data on existing infrastructure provided by a number of suppliers. The Bundesnetzagentur is continually working to expand the data basis. In 2019 it increased the number of infrastructure owners supplying data to almost 1,100. They transmit data based on a public-law agreement or ruling. With a further 349 infrastructure owners providing data on government-assisted infrastructure, the number of data suppliers at the end of 2019 stood at around 1,450. The federal government's mobile communications strategy underscores the importance of the information available in the infrastructure atlas: the strategy includes plans to consolidate the infrastructure and broadband atlases to create a single GIS-based information and planning portal. The infrastructure atlas is well positioned for this move and already meets some of the future requirements. Further technical and functional upgrades are planned for 2020. The infrastructure atlas was used extensively again in 2019; the number of users and their expansion areas grew overall. Network operators comprise the largest user group. They utilise the infrastructure atlas for both subsidised and non-subsidised expansion projects, whilst regional authorities predominantly use the platform in connection with government-assisted broadband activities.

Net neutrality

Zero-rating products

On 15 December 2017 the Bundesnetzagentur had prohibited certain elements of the StreamOn add-on option on the basis that inter alia the limiting of bandwidth used for video streaming – a process known as "bandwidth throttling" – violated the principle of net neutrality. Deutsche Telekom appealed against the Bundesnetzagentur's decision both in summary and in principal proceedings. Telekom modified its StreamOn add-on option once the summary proceedings were closed.

Summary examinations by the Administrative Court of Cologne and the Higher Administrative Court for North Rhine-Westphalia of the legality of the Bundesnetzagentur's order from December 2017 both upheld the immediate enforceability of the order. This placed Telekom under the obligation to implement the Bundesnetzagentur's order without delay. Telekom deactivated bandwidth throttling effective 9 August 2019. A judgment in the principal proceedings has yet to be handed down. In principle, principal proceedings can be heard in three instances.

Security filters and youth protection filters

Security and youth protection filters as bolt-on features to internet access services are gaining in importance. In the updated draft BEREC Guidelines, services of this nature are permitted provided certain criteria are met: the underlying internet connection must be application agnostic or unrestricted, ie not subject to blocking, bandwidth throttling or other traffic management measures. End users must also be able to activate and deactivate the filter function, for instance via an app, giving them full control over the use of the filter. Moreover, activating or deactivating the filter function may not affect the price for the end user or the other terms and conditions of their internet tariff. The requirements will be finalised once the revised BEREC Guidelines on net neutrality are adopted in the second quarter of 2020.

5G

The Bundesnetzagentur has been in talks with the three mobile network operators regarding the potential introduction of specialised services in 5G networks. This topic is the subject of intense debate, particularly in connection with new business models. The talks were prompted by the uncertainty amongst providers as to how these new business models and in particular the use of network slicing could be implemented in compliance with the TSM Regulation. By allowing providers to offer specialised services and implement reasonable traffic management measures, the net neutrality rules incorporate sufficient flexibility to realise innovative 5G business models.

Digitalisation activities

Regulating OTT communication services
The introduction of the European Electronic Communications Code established a basis for explicitly including OTT communication services in the current telecommunications regulatory framework. Updates to the German Telecommunications Act to implement the new requirements raised a number of questions, including in connection with new terms such as number-based and number-independent interpersonal communications services. For example, the comparability of the terms OTT-1 services and number-independent interpersonal communications services was analysed and criteria were identified for classifying services as number-based interpersonal communications services.

Moreover, in discussions on interoperability requirements for messenger services the Bundesnetzagentur highlighted the complex system of regulations on this subject in the Electronic Communications Code. Under the Code, the process for deciding on the need for regulatory intervention by the national regulatory authorities places the European Commission's decision upstream of the powers of the national regulatory authorities.

Dialogue on the significance of data in the network sectors
The digital transformation is precipitating far-reaching changes for all industries, and the regulated network sectors are no exception. At the core of these developments stands above all data as a factor of production. In October 2018 the Bundesnetzagentur kindled debate with the publication of a position paper on the significance of data as a factor in competition and value creation in the network sectors, followed up by an expert dialogue held in Bonn on 17 January 2019. The event was attended by representatives from all regulated network sectors, academia and the public sector. Discussions concentrated on the data-driven changes as well as the current and future challenges likely to be faced in the telecommunications, postal, energy and rail sectors.

Consultation on blockchain technology in the network sectors
The Bundesnetzagentur published a discussion paper in November 2019 on the subject of blockchain technology in the energy and telecommunications network sectors. In parallel, the Bundesnetzagentur started a consultation on the potential offered and challenges posed by the technology in the telecommunications, postal, energy and rail network sectors to gain deeper insights into the relevance of blockchain technology in all four sectors. Publication of the findings is expected in the first half of 2020.

Promoting M2M communication with numbering initiatives

The automated exchange of information between objects or with a central data processing unit (machine-to-machine (M2M) communication) continues to represent a major growth area for the telecommunications industry. The award of 5G spectrum and permission to realise local, on-site telecommunications networks (5G campus networks) is a crucial factor in the spread of M2M applications.

The Bundesnetzagentur provides the number resources needed for these M2M applications. For example, IMSIs (International Mobile Subscriber Identities) are necessary to assign technical addresses to mobile equipment. In order to continue orienting the conditions of use to the market and prevent the growth potential offered by 5G leading to a shortage of resources, the Bundesnetzagentur held a public consultation on this topic. The national IMSI regulations will be further refined following an analysis of the consultation and the findings from the work of international standardisation bodies in the reporting year.

Automated information procedure

The automated information procedure enables authorised bodies (police, state police, federal and state protection authorities, emergency dispatch centres) to request customer data, such as names, addresses and telephone numbers, via an automated and highly secure system 24 hours a day. The Bundesnetzagentur bundles the responses received from all the companies contacted and passes them on to the authorities.

Further modernisation of the process in 2019 resulted in the migration of all authorised bodies to an IP interface with end-to-end encryption. Furthermore, an option was set up enabling authorised bodies to use the automated information procedure via the federal government's high-availability network infrastructure. At present, the systems of 107 authorised bodies are registered, with 116 telecommunications companies required to take part

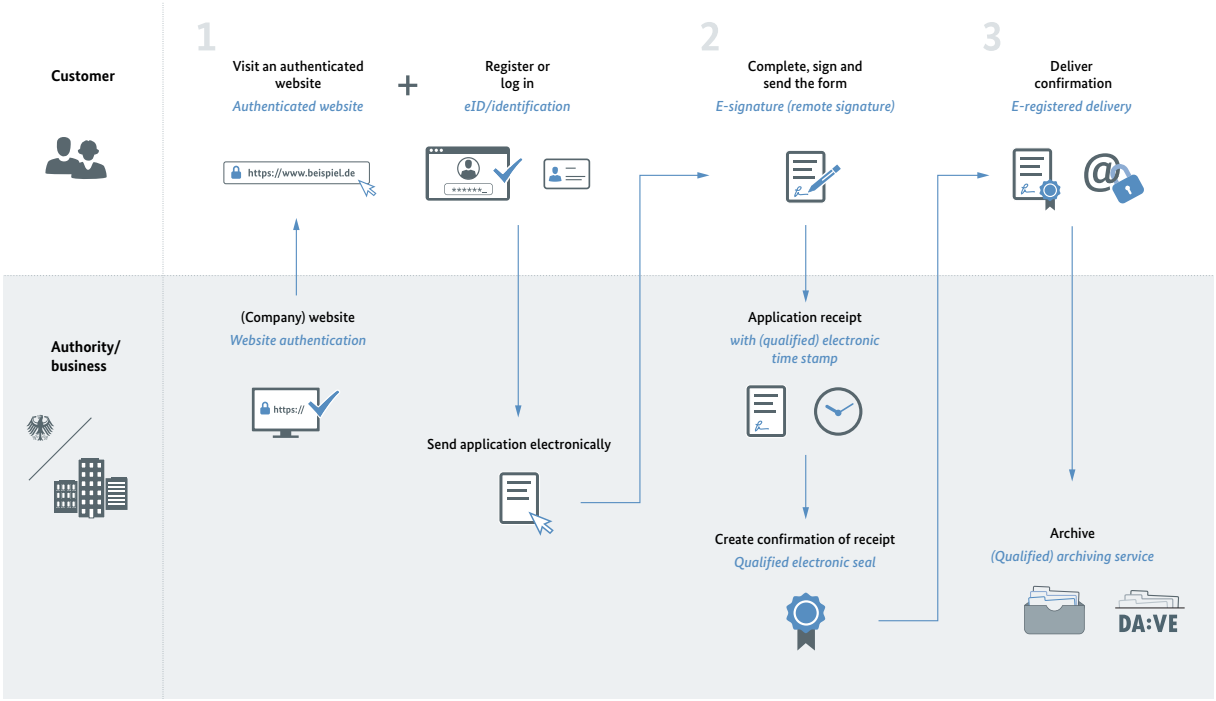
in the scheme. Information can now be provided extremely rapidly – if necessary, within a few seconds – thanks to technological improvements. The procedure has become a well-established investigative tool that receives up to 120,000 requests for names and telephone numbers each day. In 2016, the Bundesnetzagentur's systems processed 10.26 million requests. This number increased to 16.0 million in 2019, corresponding to growth of around 55% since 2016.

As part of its supervisory responsibility, the Bundesnetzagentur stepped up measures to improve issues with poor data quality in the responses provided by some telecommunications companies. With the number of complaints from authorised bodies reaching triple digits in the last year, the Bundesnetzagentur was prompted to open a corresponding number of administrative proceedings to review the problematic information. Moreover, in further administrative proceedings extracts from the customer files of participating telecommunications companies were analysed and a seven-digit number of customer datasets reviewed.

Digitalisation needs trust – the Bundesnetzagentur's DA:VE directory

Many processes, for instance civil records and land registers, depend on continuity and reliability over long periods of time. Particularly complicated or lengthy processes can stretch over hundreds of years. The Bundesnetzagentur launched its long-term directory DA:VE in 2019 to provide a reliable source of information on electronic signatures and seals that will stand the test of time and remain available to the digital society for many years to come. It represents a contribution by the Bundesnetzagentur to inspiring confidence in digital services.

The diagram below shows a typical use case for a consumer – starting with their visit to a website, the creation of an electronic signature, the addition by the public authority or company to confirm receipt, electronic routing, and finally archiving using the DA:VE directory. With DA:VE, a user's qualified electronic signature can be reliably verified even many years later.



International cooperation

The main focus of the Bundesnetzagentur's international activities in the telecommunications sector was its work on the Body of European Regulators for Electronic Communications, BEREC.

Both the new European Electronic Communications Code and the BEREC Regulation place several new responsibilities in the hands of BEREC, in particular the development of twelve new guidelines and the creation of two databases.

Work on international committees, notably BEREC

The Bundesnetzagentur's international activities in the telecommunications sector primarily comprise its work on the Body of European Regulators for Electronic Communications, BEREC. BEREC offers the European regulatory authorities a platform for multilateral exchange and acts as an advisory body to EU institutions.

On the basis of the BEREC work programme, the BEREC Working Groups prepare reports, common positions and opinions which are opened up for public consultation before being adopted by the Board of Regulators, comprising the heads of the national regulatory authorities. The Working Groups themselves consist of experts from the regulatory authorities who contribute their expertise in regulatory matters. The Bundesnetzagentur is represented on all BEREC Working Groups and provides one of the two co-chairs for two of these groups ("Fixed Network Evolution" and "Regulatory Accounting").

The new Electronic Communications Code

New legislation for the European telecommunications market was adopted in December 2018. Following the positive experiences with the existing BEREC Guidelines on international roaming and net neutrality, the EU legislators handed numerous new responsibilities to BEREC, in particular the development of twelve new guidelines and the creation of two databases. The aim is to safeguard the consistent application of the complex new Code with uniform guidelines Europe-wide. These include, for example, the BEREC Guidelines on intra-EU communications, on the definition of very high-capacity networks, on the criteria applicable to symmetric regulation, and on aspects of regulating co-investment agreements.

Work on the new guidelines began in early 2019 and is progressing at different rates on account of the varying time lines specified in the Code. Following public consultations, in 2019 the BEREC Guidelines on intra-EU communications, on the notification template for satisfying reporting obligations, and on the minimum criteria for a reference offer were adopted on schedule. Draft BEREC Guidelines on the common approaches to the identification of the network termination point, on the consistent application of geographical surveys of network deployments, on quality of service parameters, and on the common criteria for the assessment of the ability

to manage numbering resources and the risk of exhaustion were opened up for public consultation. Further market-relevant Guidelines, for instance on the conditions and criteria in the Code on Co-Investment Agreements, on the definitive criteria for symmetric regulation, or on the definition of very high-capacity networks, are currently being worked on by the BEREC Working Groups with the involvement of the Bundesnetzagentur.

Net neutrality

The European regulatory authorities have spent the last three years gathering a wealth of experience on the practical application of the European net neutrality rules. BEREC joined the public debate at an early stage to learn how the application of the regulation and Guidelines has been working from the perspective of market players, consumer protection associations and civil society. Once this discussion process comes to an end, BEREC will publish the updated Guidelines in the second quarter of 2020.

This revision of the Net Neutrality Guidelines dominated BEREC's work in 2019. A workshop held in May 2019 gave representatives of various interest groups the opportunity to relate their experiences of applying the regulation. In October 2019 a draft of the revised BEREC Guidelines was published for public consultation. The results from the analysis of this consultation are being incorporated into the updated Guidelines. Also in 2019, BEREC published a report on the implementation of net neutrality regulation.

The data economy

In spring 2019 BEREC published a report on the data economy with a view to gaining deeper insights into the workings of markets relevant to the data economy. The report incorporated market opinions from the public consultation in late 2018. It reviews the concept of the "data economy", the economic characteristics of data and the particularities of online competition, explains the regulatory framework and outlines the responsible authorities at the European level. Furthermore, it addresses the role that electronic communications networks play in the flow of data, and the promotion of competitive and innovative telecommunications service markets to make optimal use of the data economy. The report explores future opportunities and the experience that the national regulatory authorities have gained in dealing with the data economy. Moreover, it incorporated the findings from the Bundesnetzagentur's position paper published in October 2018 on the significance of data as a factor in competition and value creation in the network sectors.

Market analysis

The Bundesnetzagentur contributed to the formulation of two BEREC opinions in response to public consultations launched by the European Commission. One of these consultations related to a planned update to the Commission Recommendation on relevant product and service markets susceptible to ex ante regulation. The BEREC opinion, dated June 2019, focussed predominantly on the identification of new technological developments and market trends. In respect of the call termination markets, BEREC emphasised that deleting these markets from the Recommendation should not preclude the possibility of imposing alternative remedies in place of termination rates regulation. BEREC takes a critical view of the potential merging of the wholesale Markets 3a (wholesale local access at a fixed location) and 3b (wholesale central access for mass-market products) and considerations to add access to physical infrastructure as a new (separate) market.

The second consultation related to the delegated act which the European Commission is required to submit by the end of 2020 on standardised EU-wide maximum call termination rates for mobile and fixed-network voice calls ("eurorates"), on which BEREC had published an opinion in early November. BEREC proposes a technology-neutral definition of the termination markets based on the called number (fixed or mobile) and in the context of future market developments highlights the relevance of 5G and trends in OTT internet telephony services. BEREC remains in favour of a one-year transition period from the entry into force of the delegated act and the option to apply a glide path if the weighted average of maximum termination rates in the EU diverges significantly from the estimated level of efficient costs. The opinion also supports the option to be able to continue imposing regulatory orders (for instance access, transparency and non-discrimination) irrespective of the rates. BEREC feels clarification is required in particular with regard to the future need and option to continue performing its own analyses of the termination markets.

Fixed network evolution

The Bundesnetzagentur worked with BEREC on a report published in March 2019 on access pricing according to the Broadband Cost Reduction Directive. The report outlines the implementation of the Directive, the provisions of which are designed to simplify the (joint) use of existing physical infrastructure to enable a faster and more efficient deployment of broadband networks. It notes that the national laws adopted in most Member States contain

additional guidance that goes over and above the Directive's requirements on the methods for setting the prices for access to physical infrastructure. In the area of in-building infrastructure, many Member States had already adopted national regulations before the Directive took effect. By contrast, only a small number of Member States had adopted specific regulations on the coordination of civil works prior to the Directive being introduced.

Building on a BEREC report from late 2018 on the location of the network termination point in fixed and mobile networks, in 2019 BEREC drew up draft Guidelines on common approaches to the identification of the network termination point, which it then opened up for consultation. In the current draft, which considers multiple scenarios, the Bundesnetzagentur worked with several other regulatory authorities to first establish the network termination point as passive, in line with the nationally accepted approach. The draft Guidelines stipulate that the inclusion of active components such as routers when identifying the network termination point is only possible where an objective technological necessity exists. The final version of the Guidelines is expected in early 2020 once the responses have been evaluated.

Wireless network evolution
In mid-2019 BEREC published a position paper on mobile infrastructure sharing with the aim of promoting effective competition, better connectivity and efficient use of spectrum. The paper describes the central common positions in connection with the shared use of mobile infrastructure. These are: a common understanding of the definitions of the different infrastructure sharing types, the objectives to be considered by the national regulatory authorities when assessing sharing agreements, and the minimum criteria that should be examined by the national regulatory authorities in assessing mobile infrastructure sharing agreements.

End users
The Bundesnetzagentur also contributed to the opinion on the contract summary template, in which BEREC responded to the European Commission's questions on central elements of a contract summary, the possibility of using hyperlinks and pop-ups, the information required on bundled services, the inclusion of distinguishing features of the company (logo, font and colours etc.) and the incorporation of behavioural insights. Moreover, as part of the public consultation BEREC published its opinion on the concrete draft of the implementing act. This was discussed by the Communications Committee (COCOM) and adopted by the European Commission on 17 December 2019.

BEREC also began drawing up the Guidelines on quality of service parameters, which are scheduled for publication by 21 June 2020 after evaluation of the responses from the public consultation. The Guidelines set forth the definitive parameters for quality of service, relevant parameters for end users with disabilities, and the measurement methods to be applied for these parameters, and include statements on the content and format of the published information and the quality certification mechanisms.

BEREC also began working on the report on best practices to support the defining of adequate broadband internet access service under the new universal service rules. The report is scheduled for publication on 21 June 2020 and covers primarily the experiences of nine Member States which have to date introduced broadband under a universal service obligation.

Regulatory framework
In December 2019 BEREC adopted the Guidelines for the notification template for companies, which specify the minimum requirements permitted under the Electronic Communications Code for notifications by providers of electronic communication services. BEREC also began setting up the Union database of the notifications transmitted to the relevant authorities as required by the Code. It incorporated the Bundesnetzagentur's practical experience of handling national provider notifications, as well as current plans to improve online access

International roaming
Some two years after the definitive abolition of roaming surcharges with the introduction of the "roam like at home" principle, the European Commission was required to present its first report to the European Parliament and Council by 15 December 2019. This report acknowledges the general success of roam like at home, basing its conclusions in part on BEREC studies on roaming in the EU, which also incorporated insights from the Bundesnetzagentur.

Intra-EU communications and national enforcement

On 15 May 2019 a price cap was introduced for providers of regulated intra-EU communications of €0.19/min. excl. VAT for voice calls and €0.06/message excl. VAT for text messages from Germany to other Member States.

International
The new rules on intra-EU communications place the responsibility for drawing up the relevant guidelines with BEREC. Given the novelty of the regulation on intra-EU communications, the BEREC Guidelines adopted in March 2019 cover the parameters to be considered by the national regulatory authorities when assessing sustainability, as well as statements on the general application of the rules. The aim is to ensure consistent application Europe-wide.

Domestic
In Germany, the responsibility for monitoring and enforcing the rules falls to the Bundesnetzagentur.

Prior to the introduction of the regulation on intra-EU communications, on 21 February 2019 the Bundesnetzagentur held a workshop with providers and associations with the goal of implementing the rules promptly and compliantly. To coincide with the start on 15 May 2019, the Bundesnetzagentur then published a list of frequently asked questions and answers on its website. The fixed-network and mobile providers who account for over 80% of the market adjusted their tariffs in time for the new rules.

The Bundesnetzagentur continues to monitor the market and intervene where it identifies non-compliant tariffs, for example those of various dial-around service providers. Whilst the Bundesnetzagentur's intervention has resulted in the adjustment of several tariffs to comply with the regulation, the review in particular with respect to the partial raising of metering intervals to bring them in line with the rules is still ongoing.

Moreover, the Bundesnetzagentur took steps against a number of city carriers with non-compliant pricing in their published materials or missing price information altogether. The providers in question responded by adjusting their prices for regulated intra-EU communications. The Bundesnetzagentur will closely monitor the situation and where necessary initiate administrative proceedings to put a stop to violations and safeguard consumer interests.

Spectrum management

ITU Radiocommunication Sector
The ITU's work in 2019 was dominated by the World Radiocommunication Conference (WRC-19), which took place at the end of the year. A preparatory CPM report containing proposals on potential regulatory decisions was accepted by the ITU Conference Preparatory Meeting CPM19-2 in February 2019. As the coordinating body for Europe, the Bundesnetzagentur successfully campaigned extensively on the global level in the lead-up to WRC-19 to communicate numerous approaches requiring consensus. In the focal areas 5G/IMT-2020, the bands above 24 GHz were harmonised with 26 GHz, 40 GHz and 66–71 GHz worldwide. In the field of intelligent transportation systems for road, rail and aviation, a large measure of agreement had already been reached at WRC regarding the approach. Despite intense debate on the use of satellites or high-altitude platform stations for broadband coverage purposes, the participants were able to agree on global solutions. Moving forward, the Bundesnetzagentur will focus on implementing the results achieved at WRC at the European and national level and begin preparations for WRC 2023.

CEPT's Electronic Communications Committee (ECC)
The Bundesnetzagentur cooperated with other European regulatory authorities in 2019 to offer support with numerous technical and regulatory studies and assisted with the subsequent drafting of Europe-wide spectrum rules.

In MFCN, notable ECC decisions included those to bring the technical specifications in line with 5G requirements for the bands at 900 MHz, 1800 MHz, 1920–1980/2110–2170 MHz, 2500–2690 MHz, 3400–3800 MHz and 24.25–27.50 GHz. Here, the ECC took account of the coexistence of MFCN with other radio applications in these and neighbouring frequency bands, as well as aspects of synchronisation and coordination at borders.

Moreover, the Bundesnetzagentur co-worked on spectrum regulations for intelligent transportation systems in the band at 5.9 GHz and between 63.72–65.88 GHz, short-range device and ultra-wide band applications, microwave radio, technical studies on future Wi-Fi systems in the band at 5925–6425 MHz, future radio applications for rail operators and satellite communications, and the definition of thresholds for unwanted/spurious emissions.

Radio Spectrum Committee (RSC)
The European Commission's Radio Spectrum Committee draws up binding implementing decisions EU-wide with the aim of harmonising radio spectrum policy.

In the reporting year, in view of future 5G deployment the RSC harmonised the conditions for wireless broadband electronic communications services for the bands at 3400–3800 MHz and 24.25–27.50 GHz.

It also updated the implementing decisions for short-range device and ultra-wide band applications. These harmonised inter alia the band at 57–71 GHz for broadband radio applications and the bands at 3.8–4.2 GHz and 6.0–8.5 GHz for vehicular access systems Europe-wide.

Radio Spectrum Policy Group (RSPG)
In 2019, the RSPG worked with the Bundesnetzagentur to prepare an opinion on EU coordination at WRC-19, an opinion on 5G implementation challenges, a report on a European spectrum strategy, and a report on the impact of Council Directive (EU) 2018/1972 of the European Parliament and European Council on the European Electronic Communications Code on the work of the RSPG.

Standardising 5G

The 3rd Generation Partnership Project (3GPP) makes a definitive contribution to standardising 5G. In the reporting period, 3GPP adopted Release 15, containing several additions, and stepped up its work on Release 16. It continues to pursue the ongoing improvement of existing 5G performance requirements and the incorporation of 5G user demands. The Bundesnetzagentur makes an active contribution to the work of 3GPP and helps to ensure compliance with regulatory frameworks in the course of 5G standardisation.

The Bundesnetzagentur also moderates a 5G dialogue platform (AP5G) to give 5G user businesses and industries in Germany a direct channel to 3GPP to voice their standardisation needs. Focal areas in 2019 included addressing the current status at 3GPP, for instance with respect to private mobile communication networks, participant key notes and the preparation of 3GPP submission papers. 3GPP, with the strong support of the Bundesnetzagentur, is currently seeking to incorporate thresholds into the generic ECM standards with the primary aim of protecting radio services. The signalling effect this will have on product and product family standards should ensure that 5G products can work as intended in their operating environment.

POST

Strong postal markets

Digitalisation and e commerce are affecting the various postal markets in different ways. While letters volumes and revenues are declining, the parcels market is experiencing dynamic growth, with steadily increasing volumes and revenues further strengthening its position at the forefront of the markets.

Content

Strong and competitive postal markets are extremely important for both the economy and society as a whole. The letters and CEP (courier, express and parcels) markets are currently benefiting from favourable economic conditions but are responding differently to the digitisation of the economy.

Parcel volumes are increasing, driven by the boom in online trading. An end is not yet in sight, with significant growth momentum still anticipated for the CEP sector. But the continued digitalisation is also creating real challenges for service providers. One is the noticeable shortage in the labour market; here, the whole industry must remain attractive for a qualified workforce. Another is pollution and the high levels of traffic in towns and cities, two current key issues; while electric delivery fleets could help improve the emissions balance, city hubs, micro depots, cargo bicycles and smaller electric vehicles could help alleviate the traffic situation.

The letters market presents a different picture. Letters volumes are declining. Digital communications are continuing to erode the traditional letters business. Yet physical letters still play an important role in Germany. They stand as a valuable guarantee of legally binding communications, especially for authorities and judicial bodies. Postal secrecy, which is anchored in law, and the unabated use of letters for advertising also add to their importance.

In a digital world, the nationwide availability of fully functional postal services is of particular interest for the common good. People expect a reliable supply of services throughout the country. In the debate about the future shape of a basic postal service, or universal service, it needs to be decided in line with the statutory requirements which postal services are essential and will be part of the universal service and, importantly, which quality standards these services will need to meet.

Market watch

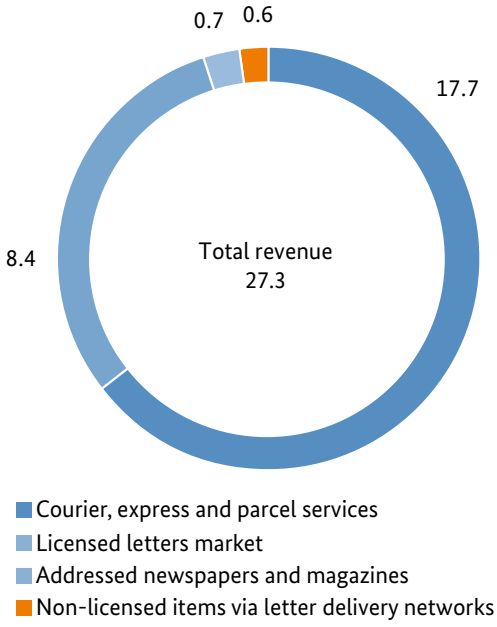
The spread of digital technology remains the key driver behind developments in the postal markets. The sustained growth in the CEP market has been mainly due to the steady increase in online sales. The letters market recorded noticeable declines compared with the previous years.

Markets in the postal sector

The markets in the postal sector comprise CEP services, the (licensed) conveyance of letters weighing up to 1,000g, the delivery of addressed newspapers and magazines (press distribution), and the (non-licensed) conveyance of other postal items, usually via letter delivery networks.

In 2018 the postal markets generated total revenues of €27.3bn, marking an increase from the previous year of €26.9bn or around 1.5%. The letters and CEP markets showed opposing trends, with the CEP market the main growth driver. In 2018 revenues in the CEP market rose by around 6.4% from €16.6bn to €17.7bn. E commerce is not only the driver of considerable growth in the domestic mail postal market, but is also seen by providers as having above-average potential for growth in the cross-border market. By contrast, licensed letter mail revenues fell by 4.7% from around €8.8bn in 2017 to approximately €8.4bn in 2018.

Revenues in the postal markets 2018
€bn



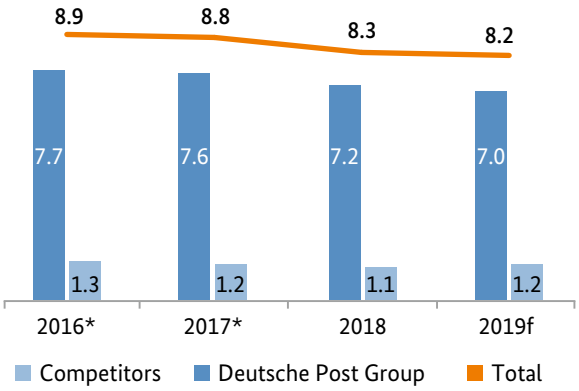
The overall trend is expected to continue in 2019. Increasing revenues and volumes, driven by further growth in online trading, are anticipated in the CEP market, while a further decline in revenues and volumes is expected for licensed letter services.

Letters market

Revenues and volumes

Licensed letter services (letters up to 1,000g) reported a fall in revenues of 4.7% from €8.8bn in 2017 to €8.4bn in 2018. Decreasing revenues and a further decline in volumes are expected in 2019 across the licensed market.

Letters market revenues
€bn



f = Forecast figures
*Validations have led to corrections to the figures for previous years. The figures as from 2016 are not fully comparable with the figures for preceding years, thus only the figures as from 2016 are shown.

The competitors to Deutsche Post Group in the licensed letters market reported a slight decline in revenues of about 2.1% from around €1.2bn in 2017 to €1.1bn in 2018. For 2019, the competitors are anticipating a modest increase in revenues to just under €1.2bn, as well as a slight rise in volumes.

Deutsche Post Group achieved revenues of around €7.2bn in 2018, compared with around €7.6bn in 2017. A decline in revenues of about 2.4% has been forecast for 2019, while volumes are expected to stay largely stable. It remains to be seen, however, if this forecast holds good in view of the increases in letter stamp prices introduced by Deutsche Post AG with effect from 1 July 2019.

Overall, the percentage of the licensed letters market revenue accounted for by Deutsche Post Group was broadly unchanged in the period under review, increasing slightly from 86.4% in 2017 to 86.5% in 2018. In terms of revenue, the market share of Deutsche Post Group's competitors consequently fell from around 13.6% in 2017 to around 13.5% in 2018.

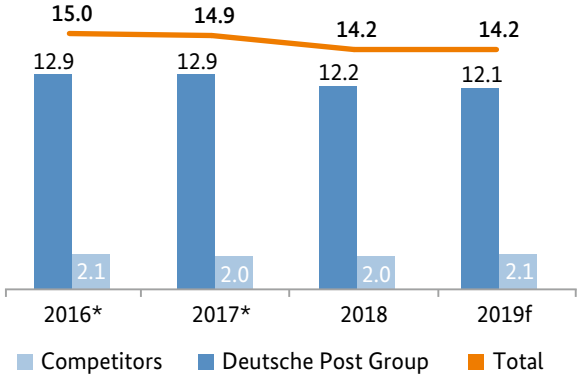
Revenue-based shares in the letters market
%

Year	2016*	2017*	2018	2019f
Deutsche Post Group	86.5	86.4	86.5	85.4
Competitors	13.5	13.6	13.5	14.6

f = Forecast figures
*Validations have led to corrections to the figures for previous years. The figures as from 2016 are not fully comparable with the figures for preceding years, thus only the figures as from 2016 are shown.

The total volume fell by about 4.8% from 14.9bn items in 2017 to 14.2bn in 2018. At Deutsche Post Group the volume fell by 5.5% from around 12.9bn items in 2017 to 12.2bn in 2018. By contrast, licensed letter volumes for its competitors remained practically unchanged. The number of items the competitors transported was still at around 2.0bn, representing a year-on-year decrease of 0.5%.

Letters market volumes
Billion items



f = Forecast figures
*Validations have led to corrections to the figures for previous years. The figures as from 2016 are not fully comparable with the figures for preceding years, thus only the figures as from 2016 are shown.

Deutsche Post Group is anticipating a slight drop in volume in 2019, whereas its competitors are expecting a small increase.

Deutsche Post Group remains by far the most dominant company in the licensed letters market, accounting for a large percentage – just under 87% – of revenues and around 86% of the volume in 2018. No fundamental shift in market shares is expected in the near future in light of the downward trend in volumes.

Competitive structure

The competitors to Deutsche Post Group largely rely on specific customer groups, offering their services primarily to business customers. In 2018 the percentage ratio of business to private customers served by the competitors in the letters market was 97% to 3%. Proportionally high wage costs and continued low margins make it difficult for the competitors to expand their position in the end-to-end letters market to any considerable extent. Setting up and maintaining alternative nationwide delivery networks is difficult on account of the downward trend in volumes and the consequently low degree of usage of the networks.

The number of companies in the letters market with an annual revenue of up to €500,000 increased from 329 in 2017 to 365 in 2018, while the number of companies with an annual revenue of more than €500,000 fell slightly from 156 in 2017 to 135 in 2018. In total, 500 companies reported that they generated revenues in the letters market. The number of licensees registered with the Bundesnetzagentur is considerably higher at more than 1,000. One reason for this is that some licensees are not actually active in the market; another is that the figures for company groups are usually reported to the Bundesnetzagentur collectively by just the parent company.

National stamp prices

In 2018 Deutsche Post AG's standard letter stamp price was €0.70. The price had been approved with effect from 1 January 2016 until 30 June 2019. The Bundesnetzagentur approved an increase in the postal charge to €0.80 with effect from 1 July 2019. The accompanying benchmarking decision applies until 31 December 2021.

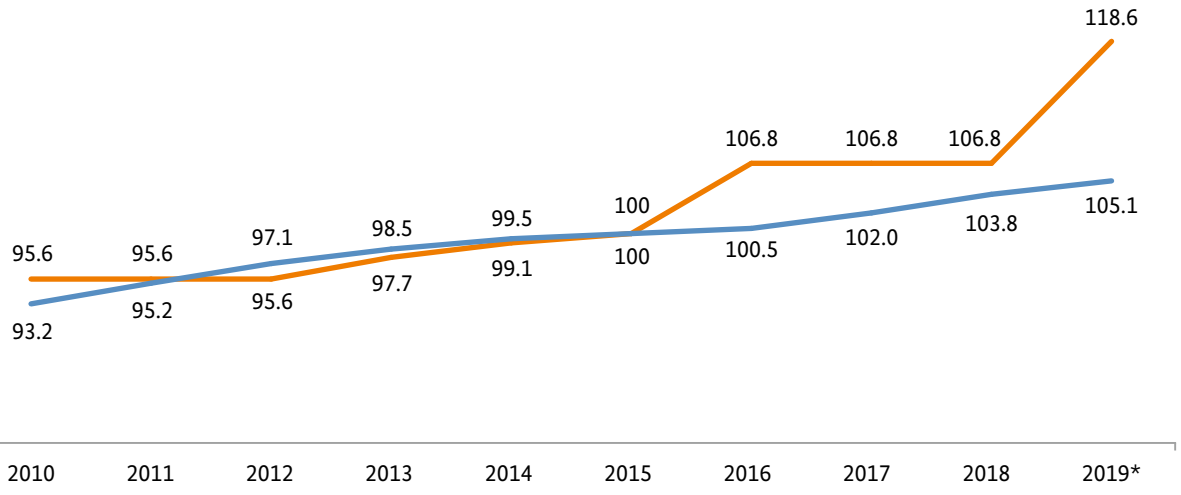
Stamp prices for letters* 2010-2019

€

Year	2010–2012	2013	2014	2015	2016-2018	2019**
Standard letter up to 20g	0.55	0.58	0.60	0.62	0.70	0.80
Compact letter up to 50g	0.90	0.90	0.90	0.85	0.85	0.95
Large letter up to 500g	1.45	1.45	1.45	1.45	1.45	1.55
Maxi letter up to 1,000g	2.40	2.40	2.40	2.40	2.60	2.70
Postcard	0.45	0.45	0.45	0.45	0.45	0.60

* As at 1 January each year
** From 1 July 2019

General price trend and DP AG letter prices



Consumer price index (expenditure on products in basket of goods for private households in Germany); basis: 2015 = 100%; source: Federal Statistical Office

Deutsche Post AG letter price index (single-piece standard, compact, large and maxi letters and postcards); basis: 2015 = 100%

* = forecast taking into account price increases as from 1 July 2019

The letter price increase introduced in 2016 was the first to be considerably higher than the increase in the consumer price index. With the postal charges unchanged between 2016 and June 2019, the difference between the general consumer price index and the letter stamp price index narrowed to three points. The gap is expected to widen again on account of the price increases approved with effect from 1 July 2019. A clear rise in the letter stamp price index to 118.6 is anticipated in the second half of 2019 following the increases.

European stamp price comparison

In June 2019 the Bundesnetzagentur published another comparison of the prices for standard, compact, large and maxi letters for private customers. The prices were compared with those for comparable products offered by the universal service providers in other European countries.

The comparison covered a total of 31 different countries – all 28 EU member states as well as the EFTA member states Iceland, Norway and Switzerland. In many countries, unlike in Germany, there are two 20g (inland) standard letter products – premium with D+1 delivery and standard with D+X delivery – which were therefore taken separately in the comparison.

The comparison shows that Deutsche Post AG's standard and compact letter stamp prices are above the European averages. By contrast, the large and maxi letter stamp prices are well below – around 33% lower than – the European averages.

Average prices for letter products in Europe
€

Standard	Comparison D+1	Comparison D+1	Comparison D+X	DP AG price
Average for whole comparison group	0.97*	0.74**	0.72	0.78
Average for companies listed on the stock exchange	0.98*	0.74**	0.70	0.78
Average for companies not listed on the stock exchange	0.97*	0.74**	0.65	0.78

Compact letter	0.89	0.93
Large letter	2.26	1.52
Maxi letter	3.97	2.65

Prices are real prices (adjusted for inflation).
* Without IS, NO, SE
** Without IS, NO, SE and with correction for DK, IT, ES

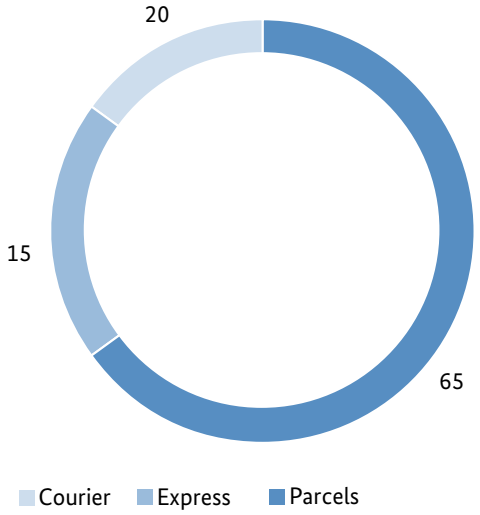
Courier, express and parcel (CEP) services

In light of the increasing importance of CEP services in Germany's postal sector, the Bundesnetzagentur decided to widen the scope of its market survey to cover CEP services and collect its own data from market participants in order to gain a better insight into market activities. In 2018 the Bundesnetzagentur carried out its first own market survey of CEP services, collecting data on revenue, volume and market structures.

The Bundesnetzagentur's survey set out clear definitions of the CEP market and its segments, and in particular the item weight. To take account of international regulations and make a clearer distinction between the postal market and the freight and logistics markets, the survey only covers CEP services for items with an individual weight of up to 31.5kg. Limiting the survey to this more closely defined CEP market may lead to differences between the results of the latest survey and previous surveys.

Revenues and volumes
In 2018 the parcels market again accounted for the largest share of revenues at 65%, compared with around 61% in 2017. The express market generated 15% of revenues and the courier market around 20%, compared with around 17% and 22% respectively in 2017.

Revenue shares in the CEP segments 2018
%



In 2018 total revenues in the CEP market amounted to €17.7bn, thus continuing the upward trend of previous years. Revenues of €18.8bn have been forecast for 2019, representing an increase of just under 6.4%..

CEP market segment revenues
€bn**

Year	2017	2018	2019f
Courier	3.6	3.6	3.7
Express	2.9*	2.6	2.6
Parcels	10.2	11.4	12.5
Total	16.6	17.7	18.8

*The figure for the express segment for 2017 is not comparable with the figures for the following years. The decline shown in the table is due to the application of more exact definitions.
**Discrepancies in the table are due to rounding.

In 2018 a total of around 3.0bn express and parcel items were transported. As with revenues, volumes continued to follow the upward trend of previous years. Further increases are anticipated for 2019, with an expected rise of 8.1% to a forecast 3.2bn items.

Parcel and express volumes
Billion items

f = forecast figures
*The figure for the express segment for 2017 is not comparable with the figures for the following years. The trend shown is due to the application of more exact definitions.

The volume of items in the courier market cannot be determined as accurately as for the parcels or express market. Courier service providers do not always record individual items but rather the number of journeys made, hence no figures for volumes in the courier market are presented..

Parcel services

In 2018 revenues in the parcels market (domestic and international parcels) increased year-on-year by around 12.4% from €10.2bn in 2017 to €11.4bn.

The main factor behind the huge rise is the strong growth in the volume of international parcels, which are considerably more expensive compared with domestic parcels. A detailed examination of the individual figures provided by various large companies showed that some of the volume data supplied for 2017 were incomplete.

Domestic parcel revenues increased by 6.6% year-on-year from €8.0bn in 2017 to €8.6bn in 2018.

Total parcel volumes increased by 8.2% year-on-year from 2.7bn items in 2017 to 2.88bn items in 2018. Domestic parcel volumes increased at a slightly slower rate of just under 7.1% from 2.4bn items in 2017 to 2.5bn items in 2018. Total revenues across the parcels market (domestic and international parcels) have been forecast to grow substantially in 2019 by 8.9% to nearly €12.5bn.

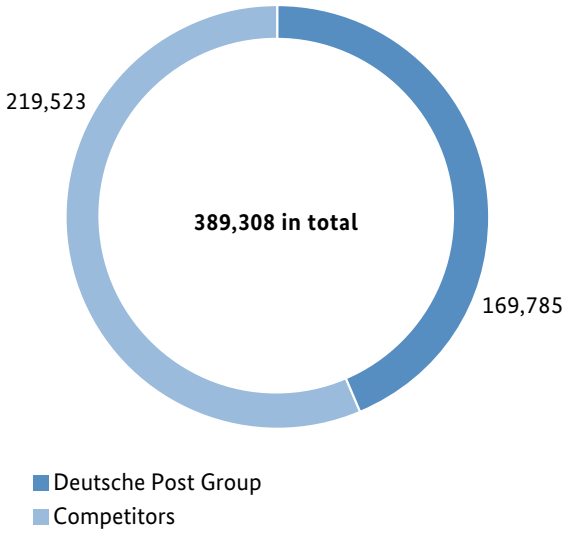
Market structure and competition
The parcels market is largely characterised by competition. Although the market has recently recorded particularly high growth rates, from which most of the parcel service providers have benefited, there is still a large gap between the market leader and the next biggest competitor.

Alongside the five major service providers – Deutsche Post DHL, DPD, GLS Germany, Hermes Logistikgruppe and UPS – there are a large number of other, smaller providers in the market with considerably lower volumes and revenues. These companies include those whose main business is in other areas (such as express delivery) or operating only in market niches (for example delivering outbound international parcels to particular countries), as well as delivery companies subcontracted by Amazon, for instance.

Employment trend

In 2018 a total of 389,308 people were employed in the postal sector. This figure comprises employees in Germany providing services that are subject to licensing or notification plus the estimated number of employees at subcontractor companies. It does not include employees performing tasks other than postal services or employees in other countries.

Employment in the postal sector markets 2018*



*As at 30 June 2018

The number of employees is forecast to rise in 2019 due to the continued upward trend in e commerce, which is the driver of strong growth in both revenues and volumes, particularly in the parcels market. The convergence of letter and parcel delivery services (in particular because of joint deliveries and smaller parcels that fit through letterboxes) makes it increasingly difficult to distinguish clearly between the employees in the two markets.

Market access

Licensing
During the period from 1998 to 2019, the Bundesnetzagentur issued about 3,200 licences to individuals and companies for the conveyance of letters weighing up to 1,000g. In 2019, 23 new licences were issued and 98 licensed operators withdrew from the market, compared with 32 new licences and 30 licensed operators withdrawing in 2018. Thus the number of licensees withdrawing from the market was several times higher than the number of new licensees. One reason behind this was the batch of letters sent by the Bundesnetzagentur to licensees, which revealed a number of companies that were no longer active in the market and that were consequently asked to return their licences. More than 1,000 valid licences were in use on the market as at 31 December 2019.

This year an electronic application form was introduced on the Bundesnetzagentur's website, enabling companies to apply for new licences online. Existing licensees can now also apply for changes to their licences or return their licences online as well as on paper or electronically by email.

Designated operators
The Designated Operators Ordinance entered into force in Germany on 1 July 2019. A designated operator is an entity officially designated to fulfil the rights and obligations arising for the Federal Republic of Germany out of the Universal Postal Convention. In the past these rights and obligations were fulfilled by Deutsche Post AG. Now other companies in the postal market are also able to apply to the Bundesnetzagentur for official designation as a designated operator.

Administrative offence proceedings
The Postal Act (PostG) provides for fines to be imposed for various breaches. In 2019 all of the violations prosecuted were in relation to the notification obligation and for the most part were treated as minor cases of non-compliance. In total the Bundesnetzagentur issued 15 warnings and imposed three fines (in some cases following warnings). The total amount of fines in 2019 was approximately €800.

Bulk mailers and mail consolidators

In 2019 the Bundesnetzagentur published its first report on the conditions and rates for bulk mailers and mail consolidators.[1] The report provides a comprehensive overview of the contractual agreements offered by Deutsche Post AG for access to partial services and lists the contractual terms and conditions for network access. The report also presents the development in rates for bulk mailers and consolidators. The following table lists the rates payable by bulk mailers and consolidators handing over volumes eligible for the maximum refund.

[1] https://www.bundesnetzagentur.de/DE/Sachgebiete/Post/Unternehmen_Institutionen/Marktbeobachtung/EntgelteTeil/EntgelteTeil-node.html

The rate for standard letters payable by bulk mailers and consolidators transporting mail to inward mail centres (including the refund for using their own infrastructure) is more than 50% lower than the rate payable by private customers. The maximum possible refund is 51% – at present therefore €0.408 of the standard letter stamp price of €0.80.

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Rates for bulk mailers and consolidators 2019
€

	Rates		Rates including refund for use of own infrastructure			Postage rate
	Mail transported to outward mail centre	Mail transported to inward mail centre	Franking	Partial service rate with maximum refund (outward mail centre)	Partial service rate with maximum refund (inward mail centre)	
Standard letter	0.456	0.432	0.040	0.416	0.392	0.800
Compact letter	0.618	0.590	0.048	0.570	0.542	0.950
Large letter	1.039	0.992	0.078	0.961	0.915	1.550
Maxi letter	1.863	1.782	0.135	1.728	1.647	2.700
Postcard	0.342	0.324	0.030	0.312	0.294	0.600

Postal market checks and postal secrecy

The Bundesnetzagentur has comprehensive rights under the Postal Act to monitor and ensure compliance with postal secrecy by carrying out checks on the premises of postal operators and issuing orders to enforce compliance.

In total the Bundesnetzagentur carried out 3,353 on-site checks in the year under review, 1,366 of which were prompted by specific circumstances. Where the Bundesnetzagentur's previous checks of postal operators have revealed shortcomings in relation to postal secrecy, this is regularly viewed as a reason to carry out a repeat check. Consumer complaints about breaches of postal secrecy are a further reason for carrying out a check. During the reporting period 1,987 routine checks were carried out.

In 2019 the Bundesnetzagentur's checks at parcel shops again revealed shortcomings in parcel storage. Parcels were stored in such a way in the customer area of the premises that the recipient's and sender's address were visible to anyone. Repeat checks of these parcel shops showed that a clear improvement in the situation had been made, for instance through more frequent collection runs and larger storage areas.

In 2019 the Bundesnetzagentur registered almost three times as many complaints about breaches of postal secrecy or data protection. The Bundesnetzagentur processed 145 such complaints, compared with about 50 in 2018. The increase in complaints is likely to be mainly the result of the rise in parcel volumes, due to online shopping, and in the number of service providers.

Most of the complaints concerned wrongly delivered parcels or letters. In some cases, redirected mail had been wrongly delivered either because incorrect information had been given or information had been incorrectly processed. The Bundesnetzagentur's advice here is for customers to check the information they give carefully when having their mail redirected. Complaints were also frequently made about letters having been opened before delivery and some or all of their contents sometimes being missing.

The Bundesnetzagentur consults with the postal operators concerned, which itself usually leads to an improvement in the situation. The operators consulted mostly stated that names on letterboxes and doorbells were not always clear, in particular at multi-occupied addresses, and that mail might then sometimes be delivered to the wrong person.

In one instance, a customer sending a parcel complained that they had to give their email address or mobile phone number when handing over their parcel for posting in order to get digital proof of posting and track the parcel. When asked, the parcel carrier told the Bundesnetzagentur that the customer could alternatively be given printed proof of posting. In response to the enquiries made by the Bundesnetzagentur and the Federal Commissioner for Data Protection and Freedom of Information, the carrier instructed all its partners to offer customers this alternative as well.

Consumer protection and advice

The number of complaints reached a new high. Repeated lack of deliveries and delivery delays again caused dissatisfaction. Interest in consumer dispute resolution was stronger. Most major parcel service providers still declined to take part in dispute resolution procedures.

Consumer advice

In 2019 the Bundesnetzagentur's postal consumer advice team was a frequent point of contact for customers whose complaints had not met with any response from their postal operator. This is reflected in the continued marked increase in the volume of complaints. The complaints show customers feel that operators do not always adequately deal with their issues.

Complaints

In 2019 there was another marked rise in the number of complaints. In 2018 complaints more than doubled from 6,100 in 2017 to 12,615, and in 2019 the consumer advice team again recorded a distinctive increase, with a total number of 18,209.

Complaints often involve more than one matter, thus the number of issues of complaint is frequently higher than the actual number of complaints received. In 2019 the 18,209 complaints received involved 20,738 issues. More than half of these issues – 11,138 or 53.7% – related to letter services, closely followed by parcel services, which accounted for 7,149 or 34.5%.

The number of complaints made by telephone increased again. In 2019 there were 4,554 telephone complaints, compared with 3,451 in 2018.

The complaints often involved recurring, regional problems, especially concerning postal deliveries. Postal operators, Deutsche Post AG in particular, did not appear capable of implementing and guaranteeing the promised uninterrupted service throughout Germany.

The Bundesnetzagentur is following this development closely, especially in light of the requirements laid down in the Postal Universal Service Ordinance (PUDLV). In view of the delivery problems described, the Bundesnetzagentur considers it appropriate to monitor the quality of postal services even more closely.

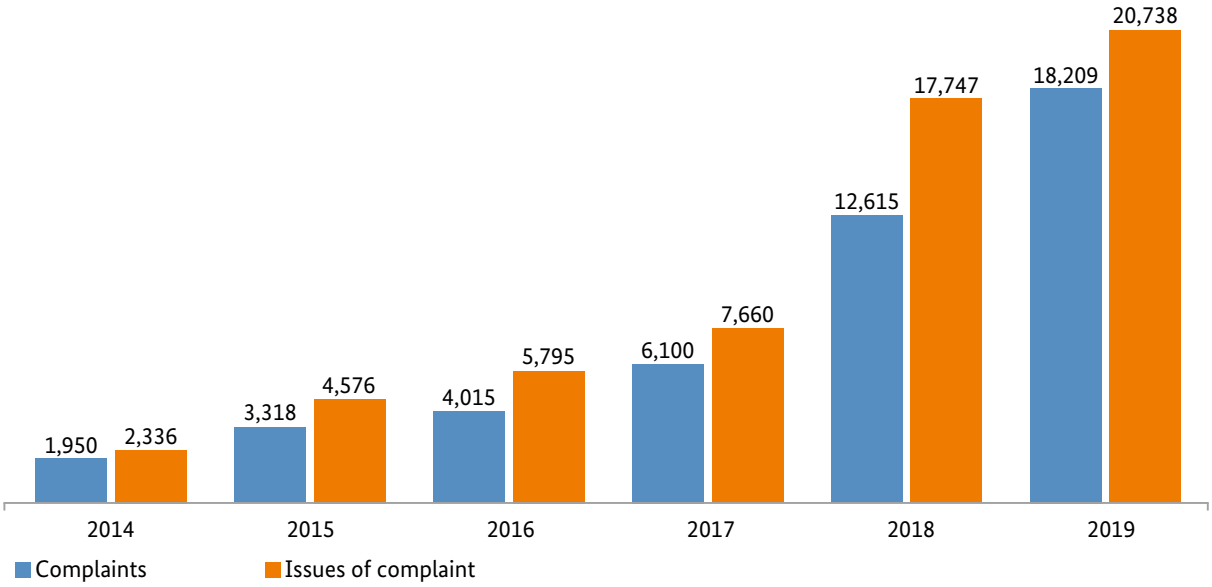
In addition, the Bundesnetzagentur had occasion several times last year to request detailed reports and comments from Deutsche Post AG. This was prompted not only by the complaints situation but also by greater media coverage as well as by a rise in the number of requests at federal and local political levels.

Complaint issues

Letters and parcels

The breakdown of reasons for complaint is similar to that in previous years. Letter services generated the most frequently expressed criticisms, being the reason for complaint in 11,138 instances. Parcel services accounted for 7,149 instances, followed by newspapers and magazines with 778, service quality with 624, fixed-location facilities with 560 and postboxes with 144; other reasons for complaint – including registered/special formats, charges and damages – accounted for 345.

Complaints and issues of complaint 2014-2019

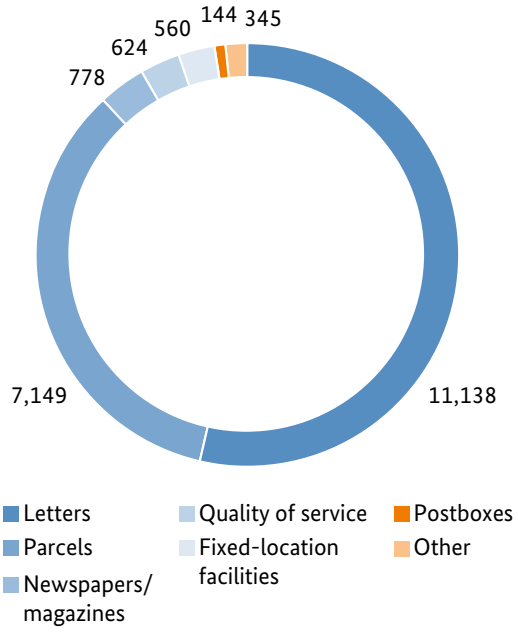


Letter complaints

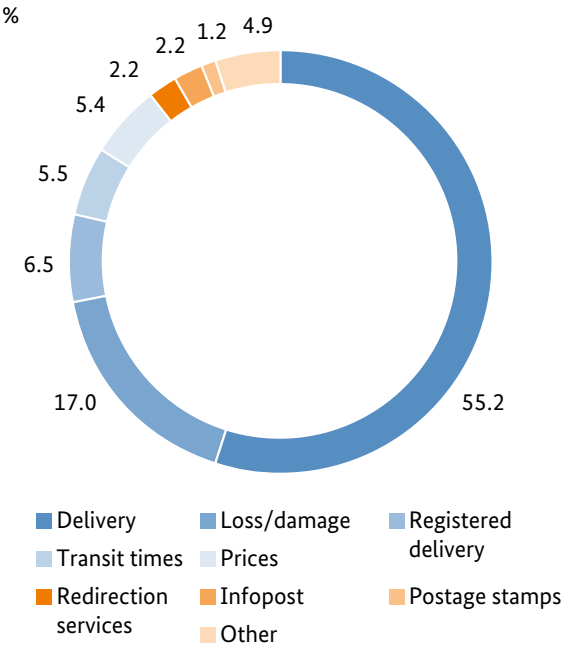
The most frequent reason for complaint in 2019 was letter deliveries, accounting for 55.2%. The majority of the complaints concerned repeatedly late delivery and or a lack of delivery occurring over a period of days or even weeks. Further complaints concerned the lack of letter delivery on certain days of the week, for instance on Mondays and Saturdays, which lasted for a long period of time. According to a substantial amount of feedback, the delivery situation changed short-term following the Bundesnetzagentur's demands. Within a few weeks or months, the regional delivery shortcomings occurred again and were again bemoaned.

Other grounds for complaint were lost or damaged items (17.0%), shortcomings with registered deliveries (6.5%) and transit times (5.5%). Prices (5.4%), redirection services (2.2%), "Infopost" (2.2%) and postage stamps (1.2%) also gave cause for complaint.

Reasons for complaints 2019



Reasons for complaints - letter deliveries 2019

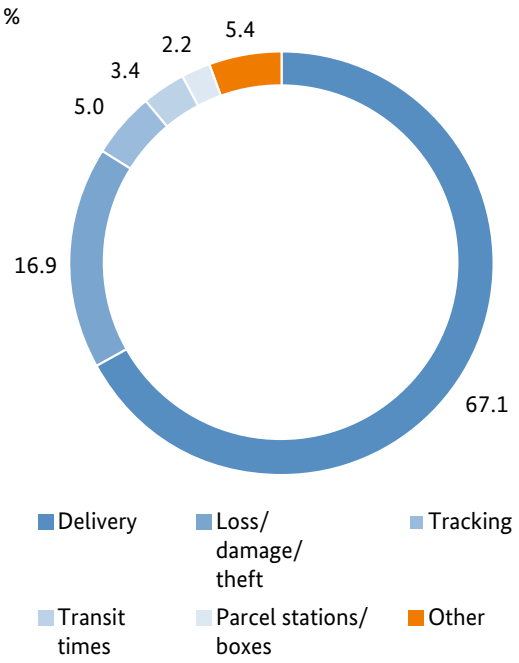


Parcel complaints

The most frequent cause of annoyance for consumers were problems with the delivery of parcels. In fact, this area of complaint alone accounted for 67.1% of all parcel complaints in 2019. The main criticism expressed by parcel customers was often finding a missed delivery card in their letterboxes giving instructions for them to collect a parcel even though no attempt had actually been made to deliver the parcel to their address.

Increasingly dissatisfied customers complained about lost, damaged or stolen parcels (16.9%), incorrect or inaccurate tracking systems (5.0%) and long transit times (3.4%). A further 2.2% of parcel complaints concerned parcel stations or parcel boxes and 5.4% other matters, including parcel service providers' complaints management.

Reasons for complaints - parcel deliveries 2019

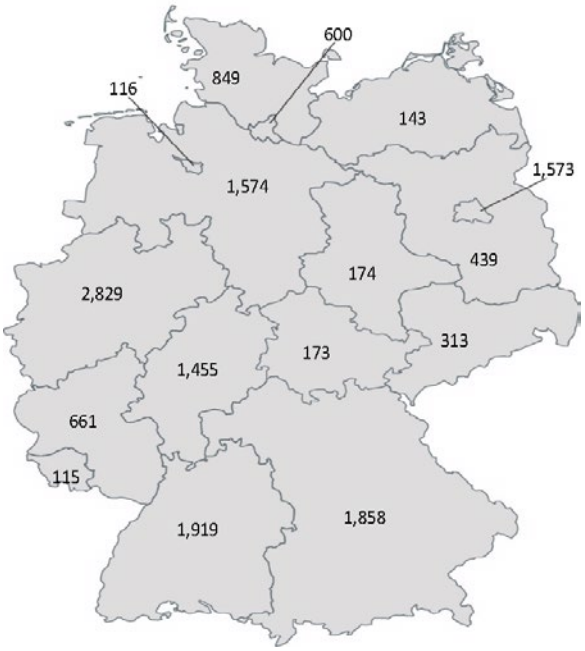


Complaints by federal state

As in previous years, North Rhine-Westphalia topped the list of federal states in 2019 with 2,829 complaints. Baden-Württemberg was second with 1,919 complaints, followed by Bavaria with 1,858, Lower Saxony with 1,574, Berlin with 1,573 and Hesse with 1,455. The fewest complaints came from Saarland and Bremen with 115 and 116 respectively.

Putting the number of complaints in relation to the population of the federal states yields a completely different picture. With 4.34 complaints per 10,000 inhabitants Berlin had by far the worst performance in 2019. Hamburg was in second place with 3.27, followed by Schleswig-Holstein with 2.93 and Hesse with 2.33. North Rhine-Westphalia and Baden-Württemberg were in the middle of the field with 1.58 and 1.74 respectively.

Complaints by federal state* 2019

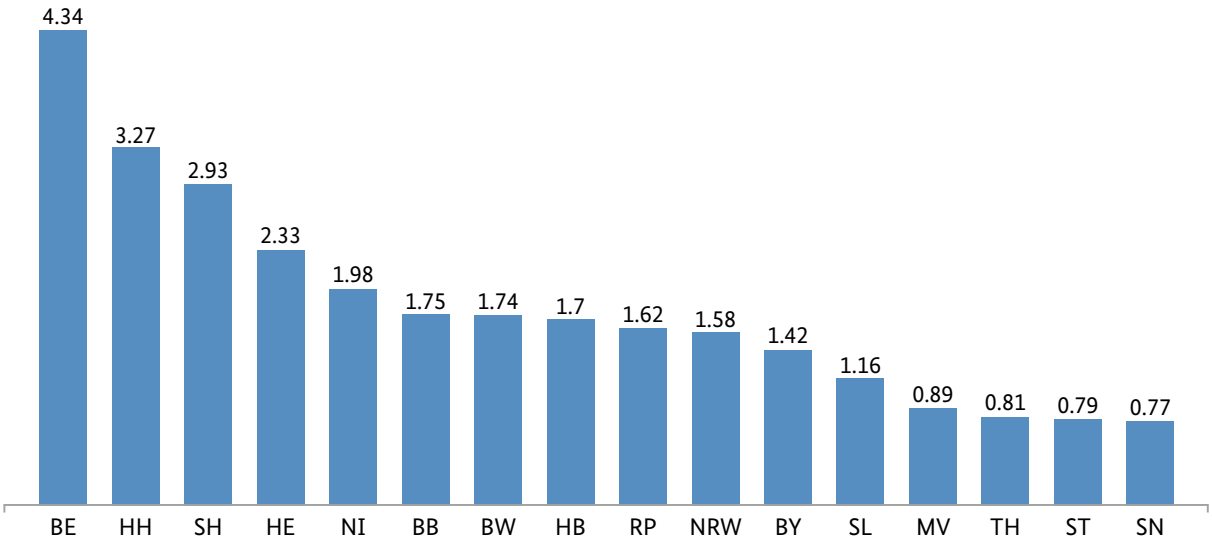


* 3,418 complaints could not be allocated to a specific federal state

Top ten regions for complaints 2019

Postcode region	Region	Issues of complaint
10	Berlin	611
12	Berlin	559
22	Hamburg	541
24	Kiel and surrounding area	476
13	Berlin	462
14	Berlin, Potsdam and surrounding area	371
76	Karlsruhe, Baden-Baden, Rastatt rural district	370
65	Wiesbaden and surrounding area	355
38	Braunschweig, Wolfsburg and surrounding area	352
31	Hildesheim, Hanover region and surrounding area	334

Complaints per 10,000 inhabitants 2019



Universal service

An important task of the Bundesnetzagentur is securing infrastructure. The Bundesnetzagentur is by law and of itself an infrastructure authority. To secure the postal services of general interest for the public, the legislator has set minimum standards for basic postal service provision – the universal service – in the Postal Universal Service Ordinance.

Delivery

Letters and parcels must be delivered at least once every working day – even on Saturday. Provided no other form of collection has been agreed, letters are to be posted through the letterbox or handed to the addressee. If this is not possible, the mail may be left with another person – unless the sender or addressee has issued instructions to the contrary. Parcels are likewise to be handed to the addressee personally or to a neighbour.

Overall, from a national perspective, the requirements of the ordinance were met in 2019. Nevertheless, there has been a further rise in complaints relating to these requirements and consequently the Bundesnetzagentur has concerns as to whether the provision of the universal service in certain parts of the country and at all times can be secured.

Post offices/postal retail outlets and postboxes

Under current legislation there must be at least 12,000 fixed-location facilities (post offices or postal retail outlets) in Germany where customers can conclude contracts for the conveyance of letters and parcels. In municipalities with more than 2,000 inhabitants, there must be at least one fixed-location facility. Moreover, for any urban area where the respective municipality has more than 4,000 inhabitants, or if it has the function of a central location, customers must be no farther than 2,000 metres from a fixed-location facility.

The requirement for the number of fixed-location facilities was met in the year under review. In 2019 Deutsche Post AG alone operated a total of 12,766 post offices or postal retail outlets for letter and parcel services.

However, the Bundesnetzagentur receives repeated complaints about irregular opening hours and temporary, unannounced closures of particular post offices or postal retail outlets operated by Deutsche Post AG. This meant that customers were not able to send postal items or collect notified items. The ordinance sets out, however, that fixed-location facilities must be operational on working days in line with demand. The Bundesnetzagentur closely follows the effectiveness of the countermeasures announced by Deutsche Post AG.

According to data supplied by the five major parcel carriers (Deutsche Post DHL, DPD, GLS Germany, Hermes Logistik Gruppe and UPS), a total of 41,177 parcel shops were operating in Germany in 2017 in addition to post offices and postal retail outlets. These broke down into 14,838 parcel shops operated by Hermes Logistik Gruppe, 11,883 by Deutsche Post DHL, 6,121 by DPD, 4,903 by GLS Germany and 3,423 by UPS. Figures for 2018 and 2019 were not available at the time of going to print.

Another of the statutory requirements is that sufficient postboxes must be provided in Germany so that customers in urban areas are, as a rule, within 1,000 metres of a postbox. In 2019 Deutsche Post AG had 109,330 postboxes located across the country. As there has been a steady but only small decrease in the number of postboxes, the requirements of the ordinance are still met. The competitors to Deutsche Post AG operated around 8,850 postboxes in 2018 (figures for 2019 were not available). These postboxes are not, however, bound by the ordinance.

As postbox collection times are still important today for many private customers, as well as for small and medium-size enterprises, the Bundesnetzagentur examined changes to collection times. Postbox collection times in the morning only are becoming more frequent. In 2011 there were 60,213 afternoon collections, but in 2019 only 47,163 postboxes still had an afternoon collection time.

Transit times/quality measurements
Under the ordinance an annual average of at least 80% of all national letters must be delivered on the working day after deposit (D+1), and 95% of national letters must be delivered within two working days (D+2).

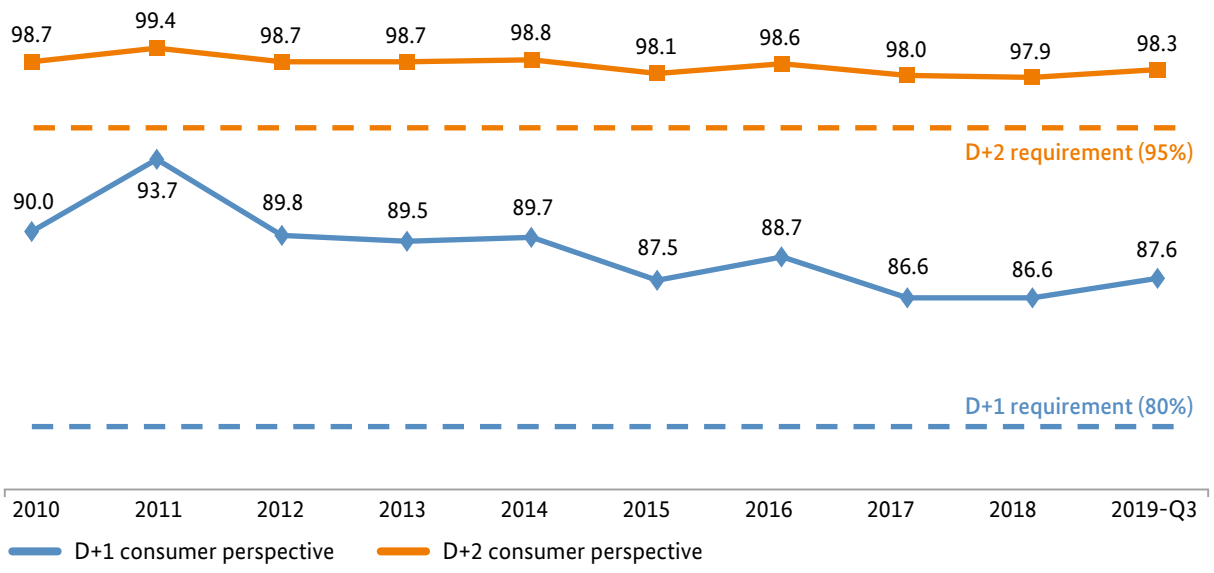
Deutsche Post AG commissions an external independent quality and market research institute certified by TÜV Rheinland to measure its letter mail transit times. The results are presented to the Bundesnetzagentur on a regular basis. The measurements include transit times from a consumer perspective, ie transit times for all items posted in a postbox or handed over at a post office by 5pm on a working day, measured from that working day.

The statutory transit time requirements for D+1 and D+2 were again met, with a rate of 87.6% and 98.3% respectively (as at the third quarter of 2019). Since 2012, however, there has been a slight decrease in the rates.

Postal dispute resolution panel

Statutory mandate
The postal dispute resolution panel at the Bundesnetzagentur conducts dispute resolution procedures to resolve disputes between postal operators and their customers. The postal dispute resolution panel is an official dispute resolution entity within the European Economic Area and is recognised by the European Commission as such.

Deutsche Post AG letter mail transit times from a consumer perspective
%



Dispute resolution requests and procedures

In 2019 there was a marked increase in the number of dispute resolution requests. By the end of the year the postal dispute resolution panel had received 1,493 requests, compared with 1,092 in 2018, which represents a year-on-year increase of 36.7%.

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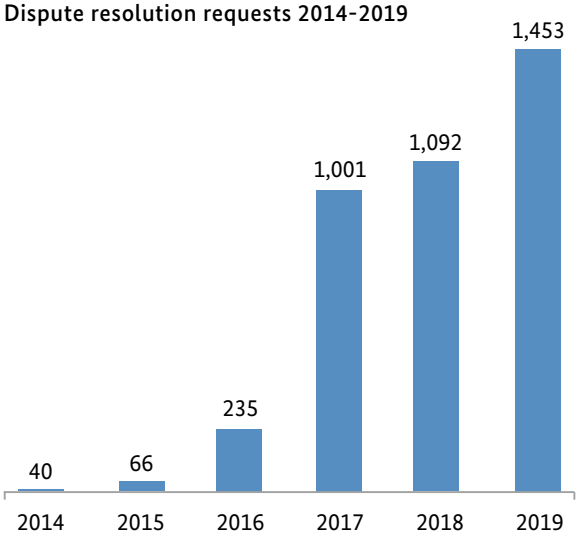
Dispute resolution requests 2014-2019

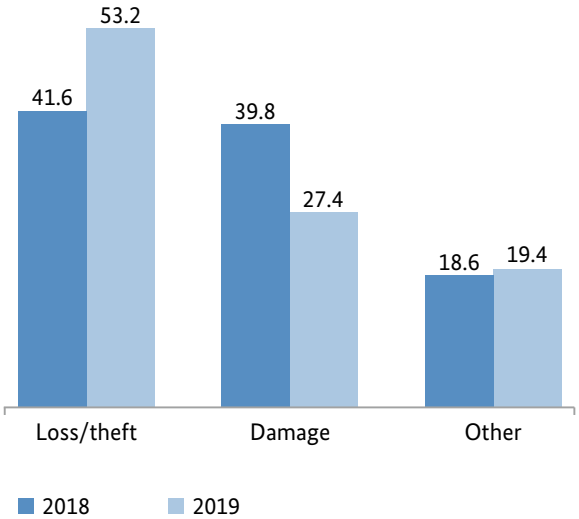


Reasons for dispute resolution requests

In 2019 the majority of requests for dispute resolution procedures – 53.2% – concerned the loss or theft of postal items. The next largest proportion of requests – 27.4% – concerned damaged items. The remaining requests (19.4%) concerned matters including long transit times and delivery irregularities. The breakdown of reasons for requests was therefore similar to that in the previous year.

Reasons for dispute resolution requests 2018 and 2019

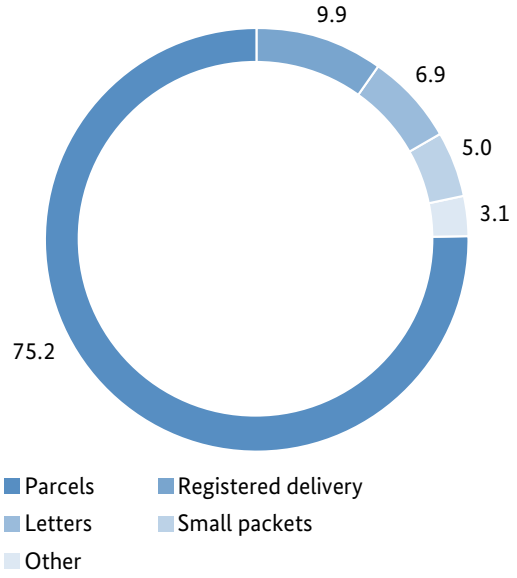
%



In 2019 a total of 75.2% requests concerned problems with parcel delivery services. Far fewer of the requests – 6.9% – involved letter deliveries.

Breakdown of dispute resolution requests according to type of item 2019

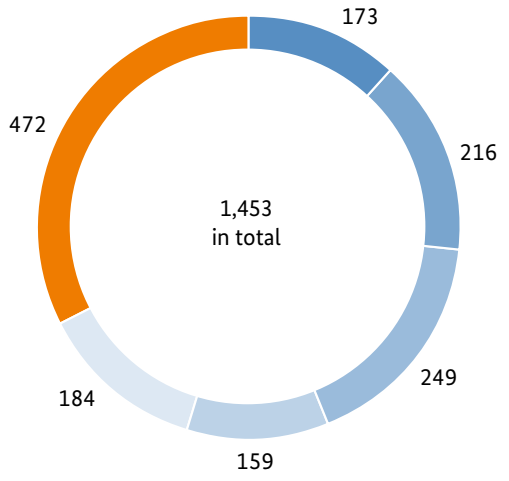
%



Dispute resolution cases

In 2019 an agreement was reached in all 173 of the cases in which a conciliation procedure was initiated. An amicable agreement without resorting to a conciliation procedure was reached in 216 instances. Requests for mediation were refused in 249 cases where the rights set out in the Postal Services Ordinance (PDLV) had been violated, for instance where customers had merely complained about long transit times or postal items being returned without the postage being refunded. A total of 159 requests were withdrawn, and postal operators refused to cooperate in 472 cases of mediation. At the end of the year, a total of 184 cases were still ongoing.

Dispute resolutions 2019



Rulings, activities and proceedings

The key benchmarking procedure to set the prices for single-piece letters carried on from 2018 into 2019. A legislative amendment and various summons in the subsequent price-cap, price-approval procedure meant that a final decision on the postal rates could not be made until December 2019.

Ruling chamber decisions

Price-cap benchmarking

On 3 June 2019, Ruling Chamber 5 set the benchmarks for the standard letter products (including standard, compact, large and maxi-size letters, postcards, outbound international letters, as well as special services such as registered delivery and cash-on-delivery). The benchmarking decision provides the framework for defining the scope for changes in letter prices in the years ahead. The rate of price changes is derived from the rate of inflation and the company-specific rate of growth in productivity, or "X factor", which is calculated on the basis of the change in costs and volumes at Deutsche Post AG.

The Bundesnetzagentur calculated a price increase rate of 8.86% for the period from 1 January 2019 to 31 December 2021 based on a negative Deutsche Post AG X factor of 5.41% with a 3.45% inflation adjustment. As Deutsche Post AG was unable to increase the prices with effect from 1 January 2019, the rate of price changes was additionally corrected by around 0.3 percentage points per month to compensate for economic disadvantages from the "delayed" increase in prices. Deutsche Post AG was therefore allowed to increase its letter prices with effect from 1 July 2019 based on a maximum price increase rate of 10.63%.

The decision also took account of the effects of the restructuring measures and efficiency gains announced by Deutsche Post AG in mid-2018 after the price-cap procedure had begun. According to Deutsche Post AG, its plans would entail higher costs, for instance from taking on around 5,000 more delivery staff. The Bundesnetzagentur has placed reporting obligations on Deutsche Post AG to check that the company is actually recruiting these new staff.

The Bundesnetzagentur launched the benchmarking procedure with its letter of 6 February 2018 asking Deutsche Post AG to submit documentary proof of its costs and volumes, etc. Deutsche Post AG responded with various letters, but some of the information provided was contradictory due to developments at the time.

The Bundesnetzagentur consequently issued an interim ruling on 31 October 2018 to the effect that the prices for standard letter products approved for the period up to the end of 2018 should continue to apply beyond 31 December 2018. This interim ruling served to bridge the period until final approval of the new

letter prices, which was provisionally given in another interim ruling on 19 June 2019. This was necessary because the cost information originally submitted needed to be updated due to a profit warning issued by Deutsche Post AG in June 2018, combined with its announcement of extensive restructuring, technical innovations and staffing measures.

Once Deutsche Post AG had submitted the updated cost data at the end of November 2018, it was sent the draft decision in mid-January 2019 with the statutory right to comment. This decision provided for a maximum price increase of (just) 4.8%. In March 2019, the legislature decided to expand on the benchmark set in 2015 for determining the appropriate profit markup. As a result, Deutsche Post AG was to be allowed higher profits. The Bundesnetzagentur presented a revised draft decision in mid-April 2019, giving competitors, consumer protection organisations and other interested parties the opportunity to comment, and, having taken into account the responses and conferred with the Bundeskartellamt, officially completed the benchmarking procedure on 3 June 2019.

Price-cap price approvals

Deutsche Post AG applied for approval of its prices on 3 June 2019, the same day that the applicable benchmarks were set.

On 19 June 2019, the Bundesnetzagentur approved the new letter prices proposed by Deutsche Post AG with effect from 1 July 2019 but only gave provisional approval in the form of an interim ruling. It was not possible to conclude the procedure within the statutory two-week period because of the need to consult other parties. This was particularly necessary to enable secondary revision of the benchmarks set.

The Bundesnetzagentur assessed the applicant's documents within the two-week period and found that the planned price changes met the benchmark criteria. The Bundesnetzagentur therefore decided to give its provisional approval for the price increases, for which arrangements had already been made, and not to wait until the statutory consultation had been concluded.

If the Bundesnetzagentur had not given its approval until later, the price increases would have been higher. Deutsche Post AG had demonstrably incurred higher costs since the beginning of the year but had not been able to cover them immediately with its price increases (which were actually planned for 1 January 2019). This was balanced out in the benchmarking procedure with a monthly compensation. The interim ruling avoided customers having to pay even higher prices and also enabled the Bundesnetzagentur to verify new objections raised by the parties consulted and take account of these in its final approval.

The most significant change under the provisional approval was the increase in the postage rate for standard-size national letters from 70 cents to 80 cents. Prices for the other letter sizes also went up by 10 cents each to 95 cents for compact letters, €1.55 for large letters and €2.70 for maxi letters. The stamp price for postcards rose from 45 cents to 60 cents.

A final decision confirming the provisional approval was made on 12 December 2019. The Bundesnetzagentur acknowledged the old and new written responses from the parties consulted and the findings of the public hearing, but did not make any changes to the prices provisionally approved in June 2019. The final approval expires at the same time as the benchmarking decision at the end of 2021.

E Postbrief mit klassischer Zustellung

On 6 November 2019, Ruling Chamber 5 approved the tenth application submitted by Deutsche Post E POST Solutions GmbH (DP EPS) for its *E Postbrief mit klassischer Zustellung* service for the year 2020.

E Postbrief customers send electronic messages that are printed, folded, inserted into envelopes and franked as letters by DP EPS. The letters are then passed on to Deutsche Post InHaus Services GmbH – a mail consolidator that hands them over to Deutsche Post AG as access mail– for delivery to the addressee.

The prices are the charges for only that part of the service provided by DP EPS that involves physically transporting the letters and are therefore not the full rates payable by the customers.

Senders also have to pay the costs for electronically posting and producing the letters, as well as the applicable VAT. The current price payable by private customers for a standard *E Postbrief* letter, for example, is not the approved rate of 46 cents, but 80 cents.

All the proposed rates were approved, with the exception of the rate for a large E Post letter, which is 1 cent less than that proposed. The new rates for all the letter sizes are 0.5% to 5% higher than those last approved. The price increases are mainly the result of higher basic service rates introduced on 1 July 2019.

Price approval for *HIN + WEG* service

On 21 October 2019, the ruling chamber issued a decision replacing the approval that was due to expire on 31 December 2019 for Deutsche Post AG's *HIN + WEG* collection and delivery service.

Deutsche Post AG introduced the *HIN + WEG* service in 1997. The prices for the service need to be approved even though each batch of mail usually comprises more than 50 letters, since the service has no minimum batch size and is available to anyone wanting to have one or more items collected or delivered.

As in the past, the price was approved using a price formula. The key parameters in the formula are the distance covered for each individual customer (or "run") and the time required per customer. These parameters are multiplied by a factor that varies for each branch.

A monthly flat-rate price is calculated based on the weekly average number of runs, taking into account the number of runs per week and the time and costs per run. This cost-based method of calculation ensures that the monthly flat-rate price is fair for all customers (with comparable lengths of time and runs). The prices will apply from 1 January 2020 until 31 December 2021.

Charges for access to change of address information

On 29 October 2019, the Bundesnetzagentur approved Deutsche Post AG's charges for competitors' access to its change of address information for the period from 1 January 2020 to 31 December 2022. The new net charge payable by Deutsche Post AG's competitors for each successful address request (or "hit") is €0.228.

Deutsche Post AG is required to offer other postal operators access to the change of address information sourced from its redirection service, and may charge for this. The service is used solely by competitors to Deutsche Post AG. Seven approvals for charges for access to change of address information have been issued in the past few years. This time, there were only minor material changes compared to the previous decision issued on 21 October 2016.

Deutsche Post AG proposed a charge of €0.26 per hit, compared with €0.203 approved in 2016. The reason given for the increase was that fewer hits were expected in the new approval period. The ruling chamber's view of the future situation, based on current user numbers, was slightly less pessimistic than Deutsche Post AG's assessment.

Harmonisation of books and goods items

In April 2019, Deutsche Post AG announced it would be simplifying its range of services by combining its books and goods mailing services. As from 1 July 2019, there were to be two products instead of six – for books/goods items up to 500g and up to 1kg. Combining the two mailing services would increase the prices for books, which had historically been cheaper, to match the prices for goods items.

The resulting large price increases and the changes in weights and sizes, in particular for books, prompted the Bundesnetzagentur to investigate whether the pricing measure conformed with the criteria of the Postal Act (PostG).

In the course of the investigation, Deutsche Post AG announced it was postponing the planned changes until the end of the year.

This gave publishers, booksellers and antiquarian bookshops time to explore new business models in the changing markets and react by, for example, introducing or increasing postage or choosing other mailing options. They could accommodate any changes in their budget plans and also look into alternative delivery services, which would be in the interests of promoting competition.

It also gave the Bundesnetzagentur time to examine the pricing measure in detail and in particular to find out which costs relating to books and goods items – apart from the wage and transport costs already set out by Deutsche Post AG – had increased but had not been included in the company's cost calculations.

There are ultimately no cost-related reasons why books and goods mailing products cannot be combined. An examination shows that, simply because of the contents, there are hardly any differences in the transport costs for books and goods items. The distinction made between books and goods is historical; the introduction of cheaper postage rates for books as a "cultural asset" at the time when Deutsche Bundespost was the postal operator was politically motivated. No such special regulations for particular items based on their contents were included in the new Postal Act. The current legal situation and the strict principle of cost-reflectivity enshrined in the Postal Act do not allow the Bundesnetzagentur to insist on the cheaper book postage rates being retained if sending books involves the same costs as sending other goods. The original political aim of promoting books as a cultural asset served merely to justify charging different rates for books and goods involving the same costs.

Other proceedings

The Activity Report 2018/2019 contains details of other proceedings, in particular for the *Digitale Kopie* service, international goods items, changes to the Dialogpost conditions with effect from 1 January 2020, and price approvals for the service of documents.

International cooperation

The national and international postal markets are in transition. This transition also needs to be reflected in the legislative framework. ERGP, in which the Bundesnetzagentur is also represented, published an Opinion in 2019 presenting its recommendations for changes to the Postal Services Directive 2002/8/EC.

ERGP

The European Regulators Group for Postal Services (ERGP) was established in 2010. Its main task is to advise and assist the European Commission in promoting the internal market for postal services. ERGP's focus is on ensuring the consistent application of the regulatory framework for postal services across all member states. ERGP serves as a forum to facilitate consultation and cooperation between the regulatory authorities and coordinate the development of common positions in joint reports and position papers. ERGP comprises regulatory authorities from EU member states, EEA countries and EU candidate countries, with the European Commission participating as an observer and providing secretarial services.

In 2019, the Portuguese regulatory authority ANACOM chaired ERGP. The plenary meetings in 2019 took place in Ponta Delgada in Portugal and The Hague in the Netherlands. Implementation of ERGP's 2019 work programme was entrusted to five sub-groups, in which the Bundesnetzagentur was also represented: regulatory framework, regulatory accounting, market indicators, cross-border parcel delivery, and access regulation. The Bundesnetzagentur and the Greek regulatory authority EETT co-chaired the sub-group for cross-border parcel delivery. The two regulatory authorities also led the task force responsible for drafting the ERGP Medium Term Strategy 2020 2022.

The sub-groups produced various reports and joint position papers for adoption by the national regulatory authorities at management level and for subsequent publication. These included the latest annual reports on quality of service, consumer protection and complaint handling and on core indicators for market monitoring.

Implementation of the EU Parcel Regulation, which entered into force in 2018, continued to be a key issue in 2019. Work began on two reports on the implementation of the regulation's articles by national regulatory authorities. The reports will provide an overview of the authorities' experiences with the provision of information and an assessment of tariffs. The deliverables and conclusions, due at the beginning of 2020, will feed into the European Commission's routine evaluation under the Parcel Regulation.

One important document published in 2019 was the "ERGP Opinion on the review of the regulatory framework for postal services", which builds on the ERGP report on "Developments in the postal sector and implications for regulation". The opinion presents ERGP's recommendations for changes to the Postal Services Directive that are necessary because of changes in market conditions. In particular, ERGP recommends that the focus of the regulatory framework be shifted from universal service provision to a proper functioning of competition. In 2019, ERGP also published its "Report on the development of postal networks and access practices regarding infrastructure related to the parcel market", which deals with changes in access to postal networks in light of changes in letter and parcel volumes.

ERGP's draft Medium Term Strategy 2020 2022 identifying three strategic pillars for ERGP's activities – revisiting the postal sector, promoting a competitive EU postal single market, and empowering end-users and ensuring a user oriented universal service – was put out for consultation after the first plenary meeting in 2019. The final version was adopted at the second plenary meeting and published on ERGP's website. The first strategic pillar focuses on work to review the regulatory framework, the second looks at regulatory measures to promote a competitive market and market developments, and the third includes work on application of the Parcel Regulation as well as issues relating to changes in consumer behaviour and their consequences for regulation and the universal service. The ERGP Work Programme 2020, which was also adopted at the second plenary meeting, is based on the Medium Term Strategy 2020 2022. ERGP restructured its sub-groups to facilitate implementation of the work programme.

ERGP held a Stakeholders Forum in Brussels on 18 September 2019, providing the opportunity for discussion with stakeholders and European associations on particularly topical issues, the Medium Term Strategy 2020 2022 and the future work programme. Even though ERGP's reports and position papers have no direct legal effect and are not legally binding, they have value in terms of consistent application of the regulatory framework for postal services across member states ("soft law"). Further information on ERGP's reports and consultations is available at *http://ec.europa.eu/growth/ sectors/postal-services/ergp/index_en.htm*.

European and international standardisation

The national, European and international standardisation bodies have committed to comply with the TBT Code of Good Practice of the World Trade Organization (WTO). This means: no preferential treatment for domestically-produced products, no barriers to trade through national standards, adoption of relevant international standards, participation of national delegations, no unnecessary duplication of work, national consensus-building, coherent standards, publication of work programmes, public complaints procedure, and fair treatment of comments.

The European Committee for Standardization (CEN – Comité Européen de Normalisation) is responsible for developing European standards for the postal sector. CEN's 34 national members are the national standardisation bodies from the 28 EU countries, three EFTA countries and Serbia, Turkey and North Macedonia. The CEN Technical Committee for postal services is CEN/TC 331.

CEN/TC 331 currently comprises four working groups, which are mirrored within the German Institute for Standardization (DIN) and its "Postal services" committee. The working groups consist of representatives of postal and logistic operators, courier, express and parcel operators, online traders, industry, regulatory authorities, ministries, trade associations and consumer organisations. Around 60 experts work permanently within CEN/TC 331.

The Bundesnetzagentur was elected to chair CEN/TC 331 at the end of 2016, and also currently chairs the relevant DIN committee. CEN/TC 331's standardisation activities are closely coordinated with the standardisation body at the Universal Postal Union (UPU), the "Standards Board". Cooperation between the two bodies is based on a memorandum of understanding aimed at avoiding duplication of work and jointly developing urgently required technical standards. There is also an increasing degree of cooperation with both the European Telecommunications Standards Institute (ETSI) and the International Organization for Standardization (ISO).

European standardisation activities in 2019 were again shaped by the European Commission's standardisation request M/548[2], which aims to:

- eliminate product and weight silos;
- create a differentiation of postal items based on content (documents versus goods);
- provide a seamless 0-31.5kg weight range;
- develop technical interfaces compliant with security and customs clearance requirements for electronic advanced data in line with standards adopted by the World Customs Organisation (WCO) and UPU; and
- promote interoperability of parcel-delivery operations, for example through standard labelling, and thereby contribute to promoting the creation of a digital single market for the EU.

Work is in progress on a total of eleven projects requested by the European Commission relating to quality of services, interoperability, digital postal services, and physical process and associated data; the work is to be completed by August 2020. Work on three further projects was driven forward by the industry in 2019: first, standardised (particularly robust) packaging for letterbox-sized items (this type of standard is of interest to enable more items bought online to be delivered as parcels that fit through letterboxes); second, temperature-controlled food parcels, in light of the increase in trading with food products forecast by relevant associations; and third, transaction assurance in e commerce, which aims to guarantee the authenticity and integrity of online retailers' and suppliers' identification data in the interests of suppliers and consumers.

Universal Postal Union (UPU)

The Bundesnetzagentur is active within the UPU under the leadership of the Federal Ministry for Economic Affairs and Energy. The UPU today has 192 member countries. Its meetings are attended by governments, regulatory authorities and postal operators. Every four years, a Universal Postal Congress sets the UPU's strategic and financial course. The UPU held an Extraordinary Congress in Geneva from 24 to 26 September 2019, the third in its history.

USA's intent to withdraw

An Extraordinary Congress already took place in 2018; one of the aims was to develop an improved remuneration system for bulky letters and small packets containing goods – also known as the "terminal dues" system – but no solution was found. This led the USA, a key UPU member, to notify the UPU of its intent to withdraw from the organisation unless a solution to the terminal dues system was found within a year, ie before its withdrawal took effect.

As no agreement was reached at the UPU's regular meetings, and to avoid other member countries potentially following the USA's example, a third Extraordinary Congress was convened.

Numerous regional and bilateral talks were held with the aim of keeping the UPU and its single postal territory intact, with the USA and Germany playing a special role. In the end, it was possible to agree on key points and thus avert the USA's exit from the UPU and safeguard the global single postal territory. However, the UPU still faces major structural challenges even with this agreement in place.

[2] M/548 = COMMISSION IMPLEMENTING DECISION of 1.8.2016 on a standardisation request to the European Committee of Standardisation as regards postal services and the improvement of quality of service in support of Directive 97/67/EC of the European Parliament and of the Council of 15 December 1997.

Financial situation

The UPU's financial situation is critical, in particular due to member contribution arrears and a re-evaluation of the pension fund for International Bureau staff. Adjustments to the pension fund were necessary because of new international public sector accounting standards.

In 2018, general changes were made to the UN salary system that led to a reduction in staff salaries. Staff at five other UN organisations appealed against the changes and had their appeals upheld. The UPU's Council of Administration therefore decided to withdraw the salary cuts because a probable defeat in court would have cost more than reinstating the salaries.

The Council of Administration is currently working, under German leadership, on a new contribution system with the aim of widening the basis for financing the UPU and thus stabilising the financial situation.

Terminal dues

The decision made at the Extraordinary Congress in Geneva to allow the USA to self-declare its remuneration rates for goods items as from 1 July 2020 without a transition period, enabled the USA to remain in the UPU. Other countries will be able to follow starting in 2021, with self-declared rates being applied on a reciprocal basis. Work will still continue within the UPU on consolidating the Integrated Product Plan and the Integrated Remuneration Plan.

An expert group is also tasked with examining the operational and economic impact of the decisions of the Geneva Congress. Any changes proposed by the group will be assessed by the Council of Administration and, if appropriate, presented for adoption at the next regular Universal Postal Congress scheduled for 2020.

As the USA and several supporting countries have already said they would also like to be able to apply self-declared rates for letters, the remuneration system will continue to be a topic of discussion for the UPU's members.

RAIL

In the course of numerous individual proceedings, the Bundesnetzagentur defined the parameters for competition in the rail sector. The Bundesnetzagentur thereby ensures planning certainty while providing important momentum and improving the conditions for market entrants in the long-distance passenger rail transport segment.

Content

Rail freight transport performance increased again in 2018 by more than 3%. It reached 132bn tonne-kilometres. The share of competitors in the rail freight transport segment rose for the first time to more than 50%.

In 2018, transport performance stagnated in the regional passenger rail services segment. As in 2017, it remained at around 57bn passenger kilometres. The share of passenger kilometres that competitors accounted for declined slightly.

With a total of 43bn passenger kilometres, the long-distance passenger rail transport segment set a new record. However, nearly all – 99% – of the transport services were provided by Deutsche Bahn AG undertakings.

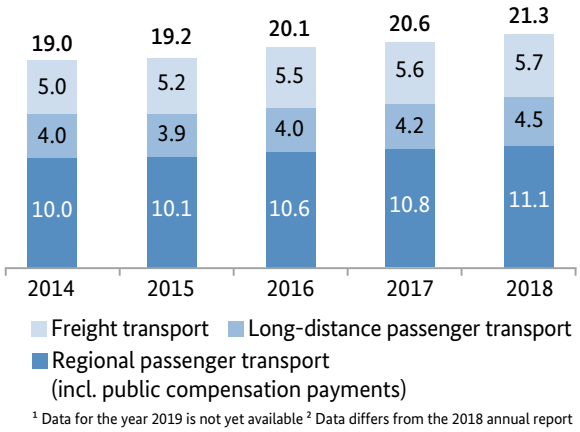
Market watch

The share of competitors in the rail freight transport segment rose for the first time to more than 50%.

Traffic volume in the long-distance passenger rail transport segment also set a new record with 43bn passenger kilometres. With the market entry of Flixtrain and the takeover of the night trains by Österreichische Bundesbahn, there were new competitors in the long-distance passenger rail transport segment.

Key trends in the railway market

Revenue development in the rail market by type of transport in billions of euros[1,2]

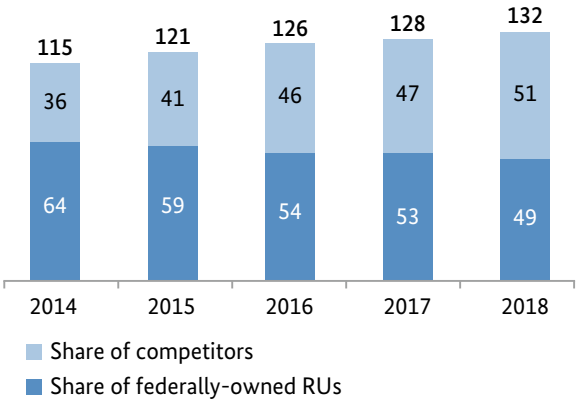


[1] Data for the year 2019 is not yet available [2] Data differs from the 2018 annual report

All segments of the rail market reported revenue growth in 2018.

In 2018 revenue increased by more than 3% compared to the previous year. Railway undertakings generated €21.3bn in revenue in 2018. In the rail freight transport segment, revenue rose from €5.6bn to €5.7bn. Revenue in the regional passenger rail services segment increased from €10.8bn to €11.1bn. Revenue in the long-distance passenger rail transport segment increased as well: by 7%, from €4.2bn to €4.5bn.

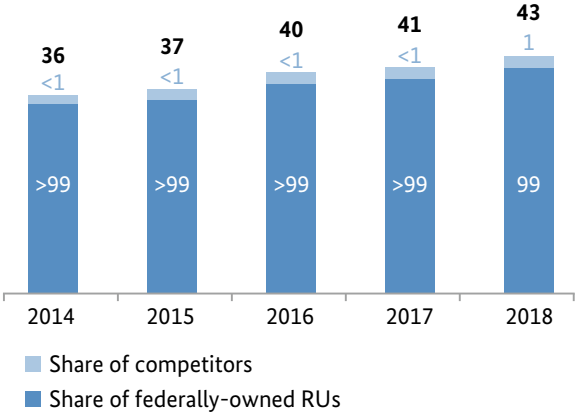
Competition in rail freight transport
by traffic volume, share in percent



Rail freight transport performance in 2018 was 132bn tonne-kilometres. This represents an increase of a little more than 3% compared with 2017. For the first time, competitors were able to increase their market share to more than 50%.

Rail freight transport performance grew by more than 14% from 2014 to 2018. During the same period, rail freight transport increased its share of the modal split[1] from 18.4% to 19.1%.

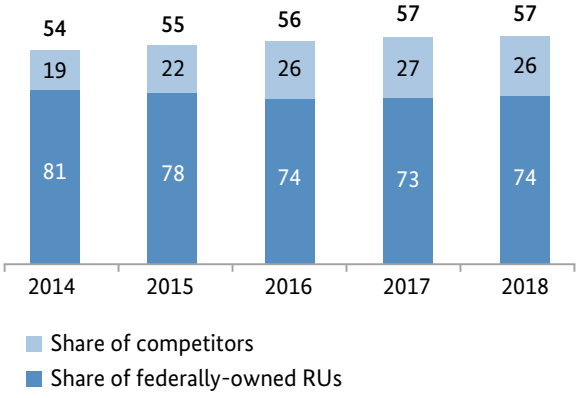
Competition in long-distance passenger rail transport
by traffic volume, shares in percent



[1] Transport volume, broken down by mode of transport

Long-distance passenger rail transport performance has seen continuous growth since 2014. A new record was set in 2018 with 43bn passenger kilometres. However, nearly all – 99% – of the transport services are provided by Deutsche Bahn AG undertakings. The competitors Flixtrain and Österreichische Bundesbahnen (ÖBB) constitute a little more than 1% of the competitors' share in the segment. The market share for both competitors will increase with the addition of more connections.

Competition in regional passenger rail transport
by traffic volume, shares in percent



Transport performance in the regional passenger rail transport segment stagnated in 2017 and 2018. As in the previous year, it remained at around 57bn passenger kilometres. The share held by the competitors declined slightly in 2018. Looking ahead, however, the share held by the competitors is expected to increase again since competitors were awarded a number of routes with potential for large numbers of passengers.

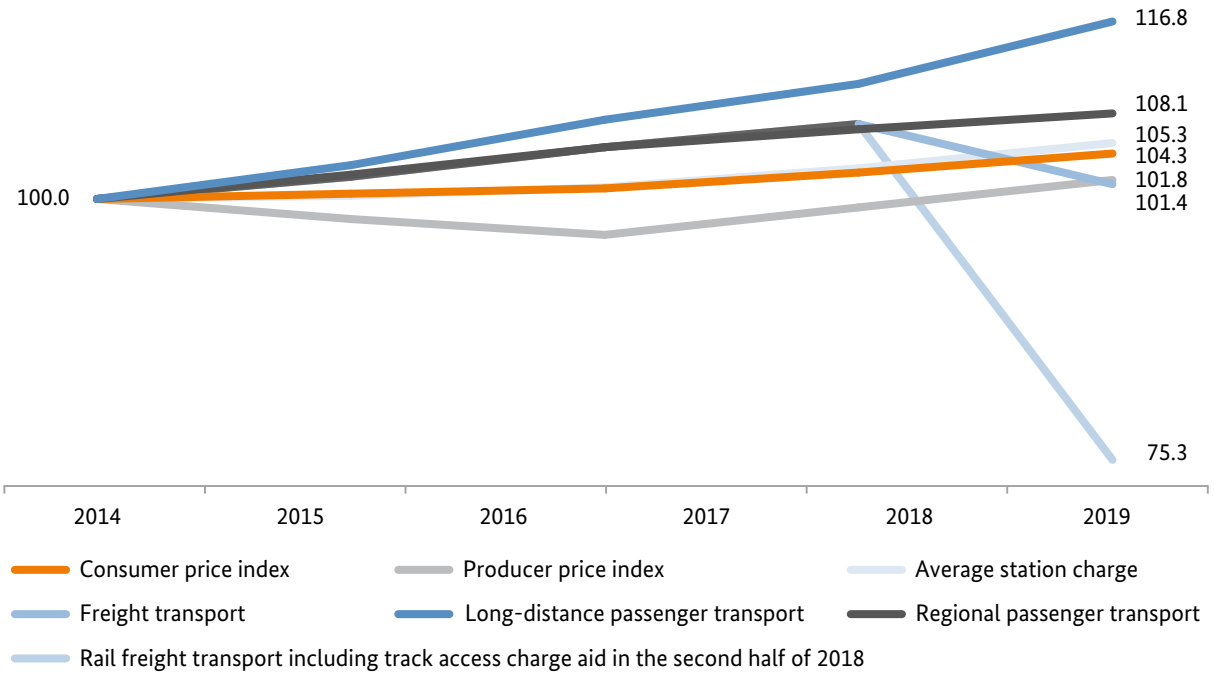
Between 2014 and 2018, the passenger rail service saw its share of the modal split increase from 8.1% to 8.8%.

Infrastructure charges

Between 2014 and 2018, the consumer price index rose by more than 4% while track access charges increased by more than 16% in the long-distance passenger rail transport segment and by more than 8% in the regional passenger rail transport segment. Using 2014 as a base year, track access charges in the rail freight segment have increased by slightly more than 1%. Taking the track access charge aid into account in the rail freight transport segment in the second half of 2018, there was a decrease of around 25%.

The average charge for using passenger stations increased by more than 5%. By contrast, there was only a slight increase in the producer price index for industrial products over the same time period.

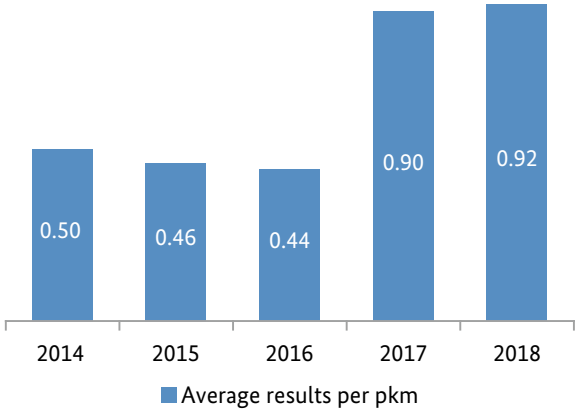
Infrastructure charges
Indexed



Operating results of the railway undertakings

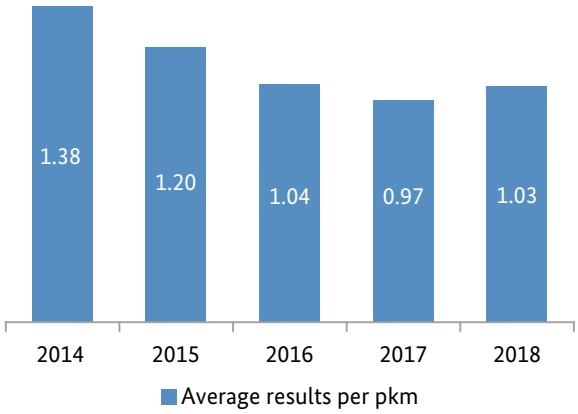
In 2018 there was an increase in the number of railway undertakings generating a positive operating result.

Specific results of RUs in long-distance passenger
in euro cents per passenger kilometre



Measured in terms of one passenger kilometre, the long-distance passenger transport segment reported an average operating result of 0.92 cents per passenger kilometre in 2018, a somewhat higher operating result than in 2017 when this figure was 0.90 cents per passenger kilometre.

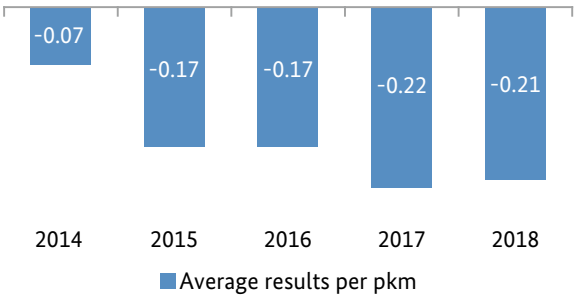
Specific results of RUs in regional passenger transport*
in euro cents per passenger kilometre



* Data differs from the 2018 annual report

In the regional passenger rail transport segment, the average operating result in 2018 was 1.03 cents per passenger kilometre travelled, slightly higher than in 2017.

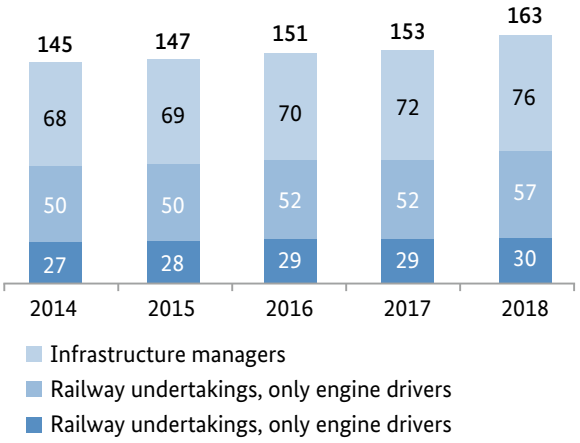
Specific results of RUs in rail freight transport
in euro cents per tonne kilometre



The railway undertakings reported an average loss of 0.21 cents per tonne-kilometre in the rail freight transport segment in 2018. This loss is only slightly less than that of 2017 despite the track access charge support.

Employment trend

Development of employment in the railway market
thousands of full-time equivalents



In 2018 there was a rise in the number of employees at infrastructure managers and railway undertakings. A total of 160,000 full-time positions[2] were filled.

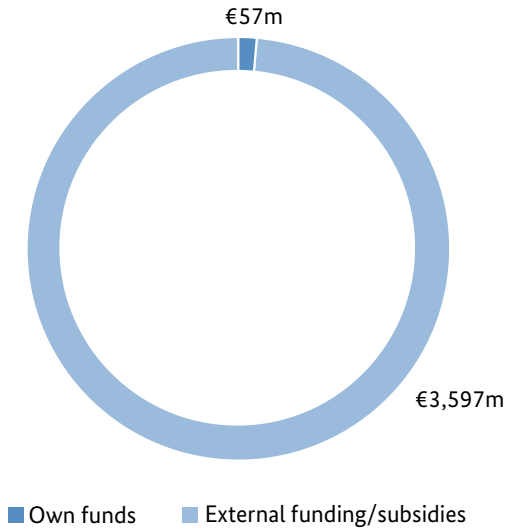
[2] For calculating the number of full-time equivalents, the hours worked in a part-time position are counted toward a full-time position.

Financing of investments

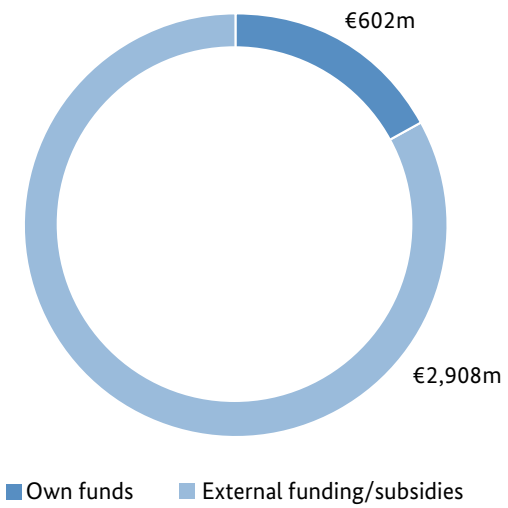
In 2018, the railway line infrastructure operators received around €3.6bn in external funding to invest in the existing railway network. In the same time frame they invested €57m of their own funds in the existing railway network.

In 2018, €2.9bn of external funding and €0.6bn of railway line infrastructure operators' own funds were spent on new construction or expansion of already existing infrastructure.

Existing network infrastructure investment



Construction and expansion of infrastructure



Rulings, activities and proceedings

In the course of numerous individual proceedings, the Bundesnetzagentur defined and improved the parameters for competition in the rail sector. And in 2019, the Bundesnetzagentur approved for the first time a DB Netz AG incentive system for passenger rail service.

Track access

DB Netz AG 2021 network statements

In one proceeding, the Bundesnetzagentur denied approval of changes that DB Netz AG intended to make to their network statements. Among other things, the changes concerned the implementation of the Rail Noise Protection Act and the introduction of a network travel advisory service. Subject to review by a court, the arrangements that were rejected cannot take effect.

According to the Rail Noise Protection Act, the use of "loud" freight wagons – or freight wagons that have not been modernised to reduce noise – is prohibited as from 13 December 2020. In the opinion of the Bundesnetzagentur, some of DB Netz AG's proposed arrangements for implementing the legal requirements in the network statements went beyond the law or fell short of fulfilling the requirements. In doing so, they restricted the right of access to railway infrastructure. This involved, for example, the introduction of self-disclosure for anyone with access rights as a precondition for using the railway network, how they intend to comply with the legal requirements, or the comprehensive review of wagon lists by DB Netz AG. It is the view of the Bundesnetzagentur that the Federal Railway Authority is primarily responsible for overseeing whether or not the legal requirements are being fulfilled. Conversely, DB Netz AG had not included any arrangements for the Rail Noise Protection Act's provision that the operation of "loud" freight wagons is still permissible if, for example, there are no adverse effects caused by rail noise because noise protection measures have been implemented or there is ample distance between the freight wagons and homes.

With reference to the cessation of the framework agreements and an acceleration of the timetabling process, DB Netz AG was also planning to expand the leeway from +/- 3 minutes to +/- 30 minutes in rail passenger service and from +/- 30 minutes to +/- 60 minutes in rail freight transport for those train paths that have been identified as congested railway infrastructure. However, regular interval services and/or traffic services listed in the timetable should be granted the opportunity to receive a confirmation when the desired train paths could have worked feasibly for the purposes of providing network travel advisory services. With a confirmation the original leeway should continue to apply. Setting leeway in the range that was planned by DB Netz AG is not compatible with the legal requirements for compliance with reasonable limits. Especially for rail

passenger service, even significantly smaller leeway than the requested +/- 30 minute leeway can result in the train path no longer being feasible for rail passenger service. Overall, however, the Bundesnetzagentur considers the provision of a train path advisory service to be a useful instrument prior to submitting a train path request.

Refusal of a path request due to individual operating days

A plan of DB Netz AG to reject a path request was also denied. DB Netz AG was planning to reject a competitor's registration in the long-distance passenger rail transport segment. In northern Germany there was a conflict with other traffic services of established providers. The actual conflict, however, was limited to individual operating days. Following an adjustment to the applications for registration, the applicant's operating days were no longer in conflict since one party with access entitlements limited itself to the weekend and the other wanted to operate during the work week. DB Netz AG was of the opinion that the train paths were generally in conflict and that the individual operating days were not relevant. The Bundesnetzagentur rejected the planned refusal, citing that railway law obligates the infrastructure manager to approve all applications to the extent possible. Due to the decision, both applicants received train path offers.

Proceeding concerning non-scheduled rail services

There was also a proceeding concerning the regulations for non-scheduled rail services in DB Netz AG's network statements. Non-scheduled rail services are rail services that are registered outside of the working timetable. This affects, on the one hand, special trains in the passenger rail transport segment and, on the other hand, a larger portion of the freight traffic, which is based on short-term transport needs. As capacity allocation has already been set for the traffic services listed in the working timetable, these traffic services frequently only have back-up capacities at their disposal that are comprised of trains not regularly in use. Railway line infrastructure operators are required by railway law to provide information on reserve capacities to the parties with access entitlements. The railway line infrastructure operators must also examine whether or not it is necessary to maintain reserve capacities when creating the working timetable. To date DB Netz AG has not adequately fulfilled its obligations. Therefore the Bundesnetzagentur has required DB Netz AG to do so. The decision also addressed turnaround time for train path requests outside the timetabling process.

Compliance with turnaround times on train path requests

The Bundesnetzagentur has required DB Netz AG to include in its network statements promises to pay financial penalties in instances where it does not comply with turnaround times laid out in the network statements. An evaluation has shown that in 6.5% of the cases a four-week deadline is not met and in 22% of the cases a 48-hour deadline is not met. The Bundesnetzagentur has placed a requirement on DB Netz AG to include in its network statements a two-tiered financial penalty of 2.5% and 5% of the train path request fee. This requirement ensures DB Netz AG takes the needs of the parties with access entitlements into account, as they are reliant on dependable processing of the train path requests. Claims under civil law for damages are not useful in this constellation due to proof of specific damage.

Description of the infrastructure

Another proceeding addressed the transparency of the description of the infrastructure in the infrastructure register. DB Netz AG operates railway infrastructure (railway lines and their assigned tracks and platforms) and service facilities (eg storage sidings), for which each has its own charging scheme. The railway infrastructure is contained in the infrastructure register (ISR). DB Netz AG maintains a list for each service facility with each track individually identified. An exact allocation, however, is not possible in every instance. Therefore the Bundesnetzagentur has required DB Netz AG to clearly identify infrastructure allocations.

Construction measures

Construction measures are a main area of activity in access issues. The number of construction sites and their operational effects on DB Netz AG's network continue to rise. Nevertheless the Worksite Management round table ceased its operations in 2019. However, Working Group 3 (AG 3) of this round table continues operating. It will take time for the working group to deal with all the topics it has been assigned.

With regard to the new provisions for the planning and coordination of construction measures of the delegated decision 2017/2075 of the EU Commission for the Replacement of Annex VII of Directive 2012/34/EU, proceedings were initiated against DB Netz AG. Within the next year DB Netz AG's network statements should be adapted to the provisions of the delegated decision.

Capacity management and congestion
In 2019 this problem became a key topic of discussion in railway circles. For the first time since the end of the year, three railway infrastructures were, at the same time, declared to be congested; two centrally located in Hamburg and Berlin, and one in the Aachen area. Furthermore, DB Netz AG has launched the Capacity round table, which includes a steering committee and three working groups that sometimes work parallel to the "Zukunftsbündnis Schiene", a partnership for rail between politics, business and associations that was established in 2018 by the German Federal Ministry of Transport.

The core of the capacity problems is no longer just the congestion, which makes specific routes and node-centred additional traffic virtually impossible, but also the threat to operational quality as the number of trains that are not punctual grows. The capacity problems are aggravated by the fact that traffic flows are growing while at the same time the railway network is shrinking, with, for example, half of the switches having been removed over the course of the past three-plus decades.

Due to long implementation times, the most sustainable solution to providing more infrastructure cannot quickly be put into practice. The question is constantly raised as to who has to finance which infrastructure measures. Further problems arise from a shortage of planning and building capacity, as well as further impairment of operational quality caused by the numerous construction measures.

The Bundesnetzagentur's task is to ensure fair network access for all modes of transportation and parties with access entitlements in spite of the capacity issues, both by regulating current conflicts and by playing a part in future concepts such as a nation-wide synchronised timetable, with the aim, amongst others, of reducing congestion problems long-term.

Access to service facilities

As part of its activities to regulate access to service facilities and services, the Bundesnetzagentur monitors access to important hubs in the railway system such as marshalling yards, interfaces with other modes of transport such as (container) terminals or passenger stations or railway workshops and other services pertaining to railway transport. More than 100 investigations and proceedings relating to this issue were conducted in 2019.

Ruling by the European Court of Justice (ECJ): Legal classification of railway station platforms with the minimum access package
On 10 July 2019 the ECJ ruled that passenger platforms belong to the railway infrastructure and thus are a part of the minimum access package. The German Rail Regulation Act contradicts this ruling since railway station platforms are classified as part of the passenger station service facility and not part of the railway infrastructure. The ruling thus has significant ramifications for future regulatory practice, for charging practices of railway line infrastructure operators and operators of passenger stations and possibly for their allocation of tasks and responsibilities as well. The Bundesnetzagentur is assessing the ruling's ramifications.

One essential question is the definition and delineation of the passenger platforms from the other furnishings and fixtures of a service facility, from the clock to the waste bin. There is also a need to clarify which services are provided by which operator. This decision cannot be made in isolation since it also directly affects pricing and market stability.

Besides DB Station&Service AG there are around 100 other passenger station operators in Germany, of which around 10 operate solely the passenger station but not the adjacent railway infrastructure. For this reason the chosen solution must be applicable for different forms of operator.

Implementing Regulation (EU) 2017/2177: What it means for the market

On 1 June 2019, the new implementing regulation on access to service facilities entered into force.

Initial communication and presentation of what is new in the regulation regarding conditions of use and capacity management took place at the market dialogue event. Guidelines were created and published on the provisions now in force and the contents of network statements, especially for the operators of service facilities but also for other market participants. Particularly significant changes involve the following topics/procedural points: setting time limits, decommissioning, coordination decisions and testing of viable alternatives.

In accordance with the powers assigned to it, the Bundesnetzagentur set the time limits for responding to requests for access. After receiving responses from railway infrastructure managers, railway undertakings and associations, there was early consensus that the existing time limit arrangements are feasible for the market and the operators. The Bundesnetzagentur followed this consensus for the most part in setting the time limits, according to which a response to requests for access should be provided "without undue delay".

For coordination and decisions concerning conflicts, operators of service facilities should likewise update and communicate their network statements in line with the changes to the implementing regulation. In doing so, the operators of service facilities are to set priority criteria themselves – for example, using the classic "first come, first served" prioritisation – provided that the criteria remain transparent and non-discriminatory. In 2020 the Bundesnetzagentur will more closely examine the implementation of the provisions.

Regarding decisions on decommissioning, it was decided that, as already established as a process, this will remain the responsibility of the Federal Railway Authority and the competent federal state authorities, according to regulations in accordance with the General Railway Act. The Bundesnetzagentur will be consulted about requested closures.

Capacity crises and initial experience with Implementing Regulation (EU) 2017/2177.

Initial experience in applying the Implementing Regulation (EU) 2017/2177 was gained just after the regulation entered into force, in late summer when requests to use infrastructure in non-scheduled rail services and 15 other requests for the 2019/2020 working timetable period were denied in service facilities of DB Netz AG. As in previous years, this involved capacity constraints at depots for long-distance passenger rail transport – most of them in Berlin and Hamburg. This is a good example of how the Implementation Regulation set new trends. The Implementation Regulation contains rules on capacity allocation and conflict resolution procedures with subtle differences from the previous rules of the German Rail Regulation Act. Essentially this entails a more transparent presentation and a more intensive search for viable alternatives with all parties involved. The last resort, on a case by case basis, would be the authority of the Bundesnetzagentur to correct a decision on capacity allocation. However, its influence has been limited by the decision of the Higher Administrative Court in late summer 2019 to capacities that have not yet been utilised or allocated. In all other cases, such as for utilised capacity through long-term contracts, the ruling renders the Bundesnetzagentur incapable of acting.

The current capacity crisis in densely populated areas and a forecasted increase in traffic volume continue to suggest that the capacity allocation situation will continue to remain tense. The situation is not expected to improve in the medium term as carrying out the necessary construction and maintenance measures means that any additional capacity is then tied up with and being used for the construction phase and is therefore also not available to the market. Therefore, in 2020, the Bundesnetzagentur will focus more strongly on a capacity management that is in line with the market conditions.

Infrastructure charges

DB Station&Service AG's station charges for 2020
DB Station&Service AG's station charges were approved by the Bundesnetzagentur for the year 2020. DB Station&Service AG is the largest passenger station operator in Germany. Charges at the approximately 5,400 stations will rise an average of 2.18% compared with the previous year. This increase is moderately more than the increase from the previous period, in which charges were increased by an average of 1.11%.

Within the context of the review, reductions were made by the Bundesnetzagentur for various items. This subsequently led to a slight reduction of the charges submitted for approval.

Proceedings to set an upper limit on total costs
Since the Rail Regulation Act came into force, all operators of standard-gauge railways require approval of their charges. They are to include incentives in their pricing system unless an exception has been made or an exemption has been granted. This applies to DB Netz AG and seven other undertakings.

Prior to the start of the first regulatory period, which runs from 2019 to 2023 for most of the undertakings, the base level of total costs for each undertaking concerned was determined on a one-off basis in a ruling. Using this base level, an upper limit on the total costs was set for each undertaking concerned for the 2020/2021 working timetable period. The annual determination of the upper limit on total costs takes into account the general inflation rate on the one hand and the general productivity growth rate on the other. The productivity growth rate is based on time series published by the Federal Statistical Office or the German Council of Economic Experts. The respective annual upper limit on total costs restricts the charges to be requested and approved for the various working timetable period in the first regulatory period. The determination of the 2021 upper limit on total costs for the 2020/2021 working timetable period is the third determination of an upper limit on total costs in the first regulatory period.

The Bundesnetzagentur set DB Netz AG's 2021 upper limit on total costs to €5.193bn. DB Netz AG's upper limit on total costs for 2021 is €47m (around 1%) less than the 2020 limit (€5.24bn).

The key dynamic behind the lowering of the upper limit on the total costs was the fact that during the relevant period the inflation rate that fuels rising prices was lower than the productivity growth rate which acts to lower costs. The fact that the reduction rate was not applied to DB Netz AG resources whose use DB Netz AG agreed to undertake within the context of Service Level and Funding Agreement I and II had the effect of slightly dampening the lowering of the upper limit on the total costs. DB Netz AG had undergone respective recognition procedures to determine whether Service Level and Funding Agreement I and II could be taken into account when calculating the upper limit on total costs. This resulted in the recognition of the agreement as a qualified regulatory agreement.

In 2019 the Federal Republic of Germany and Deutsche Bahn AG also negotiated Service Level and Funding Agreement III for the time period 2020-2029. Should Service Level and Funding Agreement III provide for a more than slight change in the amount that DB Netz AG is to contribute from its own resources, this would, under certain conditions, need to be taken into account when determining the upper limit on total costs for 2021. For this reason the decision on setting the upper limit on total costs for 2021 also contains a rider allowing Service Level and Funding Agreement III to be taken into account as a qualified regulatory agreement prior to approval of the 2021 track access charging system.

DB Netz AG's 2020 track access charging system
The Bundesnetzagentur approved the usage charges for the railway infrastructure of DB Netz AG for the 2019/2020 timetable period (2020 track access charging system). For the most part, DB Netz AG's request was granted. The approval was, however, tied to several changes.

In the Point-to-Point segment, used especially by market entrants, the charges in the long-distance passenger transport segment were reduced by 19% compared to the amount proposed. This means there was a price decrease of around 11% compared with the price from the previous year. In addition, DB Netz AG was ordered to make clarifications to the associated network statements.

In the rail freight transport segment the ruling chamber reduced track access charges in the Standard market segment by 5% compared to the amount proposed by DB Netz AG. The reason for this remains the special intermodal competitive and margin pressure in the rail freight transport segment. Because the ruling chamber had already decided on a reduction by a similar amount in the previous year, there is a price increase of around 2% in this segment compared to the previous year.

With no significant adjustments and only making minor corrections, the ruling chamber approved the track access charges in regional passenger rail transport proposed by DB Netz AG for 2020. The charges for regional passenger rail transport were calculated on the basis of the average charges per Land (federal state) in 2017 and then increased annually by 1.8%. The rate of increase is based on the legally prescribed coupling to the development of the funds available for regional public transportation.

DB Netz AG incentive system

In 2019 the Bundesnetzagentur approved for the first time a DB Netz AG incentive system for passenger rail service effective from 1 June 2019.

Arrangements for charges for using rail infrastructure must offer railway undertakings and the respective infrastructure managers incentives through performance-based elements to minimise disruptions and increase the efficiency of the railway network. The approved incentive system is designed in such a way that train delays lead to the payment of contractual penalties. For this purpose, the difference between the scheduled and actual arrival time is measured. When a specified threshold is exceeded, the particular train is considered to be delayed. The delay is assigned to the event that caused it and, based on this, to the ambit of the respective infrastructure manager, the ambit of the respective railway undertaking, or neither of the two. Delays that are assigned using this method trigger reciprocal payment obligations.

Prior to the approval DB Netz AG had an arrangement with the passenger rail service parties who have access entitlements covering the key points of the proposed incentive system. A similar agreement on all points could not be reached, however, with the rail freight transport parties who have access entitlements.

A request for approval of an incentive system for both types of traffic in the 2021 timetable year is currently still pending with the ruling chamber.

Charge approval procedure for other railway line infrastructure operators

Besides DB Netz AG there are currently seven other railway line infrastructure operators undergoing the regular charge approval procedure. Therefore these undertakings are subject to statutory incentives for reducing costs and increasing rail traffic volume. By the end of 2019, most of these companies had submitted a request for the approval of their charges. A simplified charge approval procedure will be sufficient for this, provided that the conditions for exceptions or exemptions have been fulfilled. These infrastructure managers' charges are to be approved when they are calculated so that they are reasonable, non-discriminatory, transparent and do not exceed the cost of providing the services plus a reasonable profit. For this purpose, the Bundesnetzagentur wrote to approximately 70 infrastructure managers in summer 2019 and informed them about the legal basis for this and the steps involved in the procedure. For the approval of the charges, the Bundesnetzagentur placed greater focus in 2019 on further improvements through simplifications, standardisations, and more services for the railway line infrastructure operators. The objective was to minimise the administrative burden of the affected railway line infrastructure operators and to support the companies throughout the administrative proceedings. For this purpose, the Bundesnetzagentur continued its development of, among other things, the electronic questionnaire, and explained early on in letters and in teleconferences the course of the proceedings and the approval requirements.

The Bundesnetzagentur assumes that all proceedings concerning regular and simplified charge approval can be finalised by spring 2020 at the latest.

Complaints about charges from the past

The Bundesnetzagentur has determined that a retroactive review of infrastructure usage charges is barred in certain cases.

Some parties with access entitlements had opposed earlier DB Netz AG and DB Station&Service AG arrangements for charges that had gone into force under the old version of the General Railway Act. Under the old law, the railway infrastructure managers' track access and station charges were not subject to approval by the Bundesnetzagentur. In fact the charges automatically took effect if the Bundesnetzagentur did not object to them within a legally binding time limit. Furthermore, once the charges had entered into force, the Bundesnetzagentur could only alter or declare them invalid for the future.

The complainants nevertheless sought a retroactive review by the ruling chamber after the European Court of Justice had decided in 2017 that a fairness check of the applicable charges by the civil courts without a prior objection from the competent regulatory authority is barred. However, even under the Rail Regulation Act, which has in the meantime come into force, the ruling chamber's decision does

not enable a retroactive review of charge arrangements that were not yet subject to approval under the Rail Regulation Act. Subsequent charge approvals, on the other hand, can generally be repealed or revised to include having a retroactive effect in accordance with the general principles for repealing or revoking administrative acts.

Other issues

Market consultation pursuant to section 67(3) of the Rail Regulation Act

The Rail Regulation Act provides that the Bundesnetzagentur consult at least every two years with representatives of the users of services in the rail freight and passenger rail transport segments. The Bundesnetzagentur conducted a market consultation with representative associations in the field of rail freight transport for the first time in 2019. With the help of a preliminary survey, relevant rail freight transport topics could be identified in advance. The next step was an in-depth survey, which provided the participants with the opportunity to share their views on the railway market with the Bundesnetzagentur. The selected topics included information management and time management. The results of the consultation have been published on the Bundesnetzagentur's website.[3]

Market dialogue 2019

With Implementing Regulation (EU) 2017/2177 entering into force on 1 June 2019, the legal situation for access to service facilities has changed significantly. The changes range from the exemption regulations for service facilities to procedures for granting access, to firm publication requirements of the network statements for service facilities.

So that the new legal requirements could be discussed with the market and particularly with the service facility operators affected and the parties with access entitlements, the Bundesnetzagentur hosted a market dialogue in June 2019 devoted to the topic of access to service facilities. The event provided a framework for intense discussions with and between the market participants.

Overall, it was evident that the "market dialogue" format in its second edition is growing in popularity with the market participants. As a platform for exchange, the event makes a valuable contribution to regulatory activity in the rail sector.

Railway Law Research Days 2019

As a symposium for rail regulation and planning law topics, "Railway Law Research Days 2019: Current Problems in Railway Law" took place in Berlin and was the 25th anniversary of this event series. Organised by the Bundesnetzagentur and the Universität Regensburg, the event provided an exchange opportunity for railway legal experts along with experts from the areas of science and law, and professionals in the field.

Central topics of the event were how to approach current railway law, the continued development of railway law through European legislative acts and the implementation of the 4th Railway Package in national law, as well as the "perspectives on future capacity management" field of topics. The symposium will be held in Regensburg in 2020.

[2] See https://www.bundesnetzagentur.de/DE/Sachgebiete/Eisenbahnen/Unternehmen_Institutionen/Marktbeobachtung/marktbeobachtung-node.html

The Bundesnetzagentur approved DB Station&Service AG's charges for the use of its passenger stations for regional and long-distance passenger rail transport for the year 2020.

The Bundesnetzagentur slightly reduced the 2020 station charges requested by DB Station&Service AG.

With moderate increases in station charges, the Bundesnetzagentur is creating planning certainty for market participants. For the third time, the Bundesnetzagentur's examination of the station charges took account of the requirement anchored in legislation to slow the rate of increase in the charges.

The legislation states that the station charges for short-distance rail passenger transport services must be linked to the annual development in regionalisation funds since 2017. Deviations in the charges are conditional on an agreement between the station operator and a territorial authority such as a federal state.

The station charges for long-distance rail passenger transport services are based on the development of charges for short-distance passenger services. The charges will be applicable as from 2020.

The ruling has been final since 2019.

International cooperation

International cooperation is becoming increasingly important in the area of railway regulation. For example, the Bundesnetzagentur emplaced the regulation of infrastructure in ports for the European Commission. The Bundesnetzagentur is also carrying out key work in redesigning capacity planning and establishing the annual working timetable in Europe.

Working groups at IRG-Rail and ENRRB

Thematic focuses of the international cooperation in 2019 were classifying and dealing with service facilities including their usage charges, as well as cooperation along the European rail freight corridors.

The Bundesnetzagentur focused on the regulation of infrastructure in ports for the European Commission in the European Network of Rail Regulatory Bodies (ENRRB).

Within IRG-Rail, the European independent regulators' group for the railway sector, the Bundesnetzagentur championed better cooperation among the regulatory authorities in monitoring the European rail freight corridors.

Within the framework of IRG-Rail, the Bundesnetzagentur also gathered and analysed data on the costs of providing the minimum access package in various European countries over the past year, and the data reflected widely differing cost structures.

Additionally, the Bundesnetzagentur led the way in considering proposals for redesigning capacity planning and establishing the annual working timetable in Europe, the so-called timetabling redesign (TTR).

Access issues, corridors and service facilities

Corridors
In addition to exchanging ideas within IRG-Rail, the Bundesnetzagentur was active along the European rail freight transport corridors on various levels.

Last year the Bundesnetzagentur represented the interests and concerns of the regulatory authorities at the executive council meetings for two corridors: the Rhine – Alpine Corridor and the North Sea – Baltic Corridor. To this end, the Bundesnetzagentur worked with the participating regulators to coordinate the various standpoints amongst them, including approaches for the continued development of collective collaboration. The Bundesnetzagentur also organised a meeting with the so-called Corridor One Stop Shops of the Rhine – Alpine Corridor and the North Sea – Baltic Corridor, which made it possible for all regulators involved with these corridors to meet and exchange thoughts and ideas directly with the corridor operators. At this meeting the regulatory authorities were, among other things, trying to learn more about how capacity demand along the corridors has developed and how corridor operators are further developing their capacity in order to meet the demand for corridor train paths even better.

In addition to meeting with the Rhine – Alpine Corridor and the North Sea – Baltic Corridor, the Bundesnetzagentur also met with representatives of the Austrian and Swedish regulatory authorities for the first time, together with the corridor operator of the Scandinavian – Mediterranean Corridor. Lastly, the Bundesnetzagentur was represented at the joint meeting of the executive councils of the Rhine – Alpine Corridor and the North Sea – Mediterranean Corridor, which took place for the first time in the year under review.

An important topic for the operation of the corridors continued to be international fault management. The fault management handbook that was developed in response to the Rastatt line fault has now also been adopted by the other corridors. The handbook has been used in two cases to date. Simulations were also conducted to practice using the handbook.

Quality improvement in international rail freight transport was also an important focus of the individual corridors' work. The Bundesnetzagentur supports this sector along with its work in the corridors, including within the IRG-Rail and in the European Commission working group for international rail freight transport corridors.

Passenger platforms as part of the minimum access package
ÖBB-Infrastruktur and a transport company in Austria had differing views on the issue of whether passenger platforms are part of the minimum access package or if they fall under the passenger stations as service facilities. The case was prompted by the transport company's argument that the charges for the passenger platform were already settled when the payment of the track access charges was made. The ECJ ruled in favour of the transport company. According to the wording of Directive 2012/34/EU, passenger platforms are railway infrastructure and thus part of the minimum access package.

With this classification the authors of the directive wanted to ensure that a railway undertaking is not only facilitated in regard to train movement on the railway line, but that all other essential and vital infrastructures such as passenger platforms are provided and available in order to provide transport services. In return for the minimum access fees, these essential assets are to be provided and essential services are to be rendered. With its ruling, the ECJ decisively focuses on the clear wording of the directive and its recitals.

This ruling has a substantial regulatory effect at the national level.

Market monitoring at the European level

The Bundesnetzagentur plays an active role in market monitoring at the European level. As a member of IRG-Rail, the European independent rail regulators' group, the Bundesnetzagentur is particularly active in the market monitoring working group as a pacemaker for cross-border market monitoring. A comprehensive data survey on the railway market from 29 countries is the foundation for the annual report, which contains detailed and comprehensive market information on infrastructure, charges and market sectors in the passenger and freight transport market. As its primary points of focus, the latest report takes a closer look at the allocation of public transport and the strategies of the former state-owned railways for market entry in other countries. The IRG-Rail working group is also a platform for cooperation between regulatory authorities on various issues regarding the railway market, with the aim of achieving consistent regulation in Europe.

The Bundesnetzagentur's core tasks and organisation

Tasks and structure

The Bundesnetzagentur, originally known as the Regulatory Authority for Telecommunications and Post, was set up on 1 January 1998 as a separate higher federal authority under the then Federal Ministry of Economics and Technology. It took over the responsibilities of the former Federal Ministry of Post and Telecommunications and the Federal Office for Post and Telecommunications. In 2005, on being assigned responsibilities under the Energy Industry Act and the General Railway Act, the Regulatory Authority for Telecommunications and Post was renamed the Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen.

First and foremost, the Bundesnetzagentur's remit is to promote competition through regulation in the energy, telecommunications, postal and rail sectors and to guarantee non-discriminatory network access. Alongside regulatory measures in the energy sector, as the national planning authority the Bundesnetzagentur is also responsible for electricity transmission lines crossing national or federal state borders in the context of the energy transition. In the telecommunications and postal sectors it ensures appropriate, adequate and nationwide services and, on the basis of various pertinent laws and ordinances, provides regulations for the use of frequencies and numbers. Furthermore, the Bundesnetzagentur is the competent authority under the Electronic Signatures Act (SigG).

The Bundesnetzagentur's tasks are complex and highly diverse. They range from cases addressed in quasi-judicial proceedings in regulation areas, reporting requirements and planning authority responsibilities, consumer protection and information activities in the regulated sectors, to the nationwide investigation and processing of frequency interference complaints.

Below the management level the Bundesnetzagentur comprises ruling chambers and departments. The President's Chamber takes decisions in specific cases, in particular on award proceedings for scarce radio spectrum resources and on the imposition of universal service obligations. In the telecommunications sector it determines which markets require regulation and which companies have significant market power in these markets. On the basis of these determinations, the ruling chambers then decide on the regulatory measures to be imposed on companies with significant market power. Decisions are made on, for example, specific details of obligations in fields such as network access conditions or ex ante or ex post price reviews. In the postal sector the ruling chamber focuses on (ex ante and ex post) rates approval and the control of anti-competitive practices, including the regulation of access to the postal network. In the energy sector the ruling chambers have decision making powers on general and individual issues regarding access to electricity and gas networks and network charges.

The departments perform specialised and central administrative functions. These include economic and legal policy issues in the various areas of regulation and the relevant international coordination, as well as technical aspects of frequencies, standardisation, numbering and public safety. The Bundesnetzagentur is involved in international standardisation bodies, cooperating in the development of next-generation networks and new radio systems.

In the energy sector the Bundesnetzagentur has been assigned key market supervisory tasks resulting from electricity and gas network development planning, from the Market Transparency Unit for Wholesale Electricity and Gas Markets set up in 2013, and from its responsibility for safeguarding security of supply. A major departmental function is to give ruling chambers specialist assistance in their decision-making.

All of the Bundesnetzagentur's responsibilities have a strong international element. Coordination at European level, in particular, has always been an important aspect of its regulatory activity. This is reflected by the fact that the international activities are mostly concentrated and dealt with in one department.

In the telecommunications sector the Bundesnetzagentur is mainly responsible for the key decisions and objectives that promote investment, innovation and competition for the benefit of all citizens. In the context of Industry 4.0, ideas are being developed to promote the spread of digital technology and internetworking in key future-oriented fields; at the same time economic opportunities offered by the digital revolution and internetworking are being assessed with respect to growth, employment and competitiveness in the national economy.

Consumer protection remains another key focus area in the telecommunications sector. In this regard, particular emphasis is placed on investigating problems that hinder a smooth change of supplier. Furthermore, the Bundesnetzagentur continues to vigorously combat misuse as regards the unlawful use of telephone numbers, anti-competitive behaviour and cold calling. In protecting the consumer, particular attention is given to preventing the illegal billing of call queues. Another primary function is to ensure transparency of consumer contracts, especially with respect to the bandwidth guaranteed in the contract.

The Bundesnetzagentur also maintains a database of sites of fixed transmitters operating above a specified power level. Also of particular importance for consumers are the resolution of radio interference, the dispute resolution procedure and general consumer services. Moreover, the Bundesnetzagentur plays an essential role in ensuring public safety. Its tasks include checking the technical protection measures for critical telecommunications infrastructure, protecting personal data and telecommunications privacy, the technical implementation of interception measures, and implementing and safeguarding information procedures.

In the energy sector it is the Bundesnetzagentur's duty to create and secure the basis for efficient competition in the electricity and gas markets. This is done in particular through unbundling and regulating non-discriminatory access to the energy networks, including rates regulation. In addition, the statutory decision in 2011 to phase out nuclear power as part of the *Energiewende* and the continued expansion of renewable energy require state measures with respect to the various market players, including monitoring the electricity and gas wholesale markets and intervening where necessary to safeguard security of supply. The Bundesnetzagentur also monitors the development of upstream generation and import markets along with consumer markets.

One of the major tasks for the Bundesnetzagentur in the context of the energy transition is the fast, large-scale expansion of the electricity transmission networks. To achieve this, the Bundesnetzagentur has been given wide-ranging authority in network development planning and in approving network expansion measures. This includes implementing the federal sectoral planning for extra-high voltage lines crossing federal state and national borders and, as of 2013, their planning approval. As part of the statutory planning process, the network development plan is constantly being updated to take account of the latest developments. This also involves network planning and connection in the offshore sector.

In rail regulation the Bundesnetzagentur monitors compliance with the legislation on rail infrastructure access. A core task here is to ensure non-discriminatory use of the rail infrastructure by railway undertakings and other access beneficiaries. The term rail infrastructure includes the infrastructure and services connected with both tracks and service facilities (eg stations, freight terminals). Rates regulation includes the examination of the level and structure of infrastructure charges and of other charges levied by the infrastructure managers.

A nationwide presence is vital for the Bundesnetzagentur to perform its duties. To ensure consistency the Bundesnetzagentur's regional offices, the contact point with consumers and industry, are managed and coordinated centrally by a single department.

The regional offices are mainly responsible for technical matters. They provide information, for example, on compliance with regulations on electromagnetic environmental compatibility and telecommunications. They are also in charge of frequency assignment, for instance for private mobile radio systems, for granting site certificates and for sampling equipment under their market surveillance duties. Another important area is the investigation and processing of radio interference using state-of-the-art measuring equipment, monitoring compliance with regulations generally and carrying out radio monitoring and inspection tasks.

Additional executive tasks are carried out by specific regional offices. In particular, this involves activities in number administration, number misuse and cold calling, consumer protection and information, the core energy market data register and the registration of railway infrastructure. They also carry out some human resources management functions for other government bodies and institutions, primarily those falling under the Federal Ministry for Economic Affairs and Energy.

Human resources management

Human resources management is a top priority at the Bundesnetzagentur. It is important both to assign staff optimally and to recruit new qualified staff. This is only possible when human resources management takes account of work requirements and staff skills and preferences in equal measure. Only a combination of pro-active, appropriate staff deployment and motivated employees will allow the Bundesnetzagentur to perform its responsibilities in an efficient and cost-effective way even in times of tight budgets. Aspiring to modern human resources management, the Bundesnetzagentur offers not only corporate health schemes, but also models for balancing work and family life.

In recruiting new staff the Bundesnetzagentur requires excellent specialist knowledge as well as the ability to structure and address complex new tasks in an interdisciplinary team quickly and with a flair for practical solutions.

Given its diverse areas of activity, the Bundesnetzagentur attaches particular importance to an interdisciplinary work approach. In total the Bundesnetzagentur employs about 3,000 specialists, including legal experts, economists, engineers and scientists from various fields, to ensure the efficient, proper performance of tasks in all areas.

Retirements and posts created as a result of new tasks have opened up numerous opportunities for new recruits in the fields mentioned above, providing interesting career prospects for new arrivals.

The Bundesnetzagentur has been offering apprenticeships since 1999. In view of the recruitment of future staff and the challenges of demographic change, the training qualifications offered by the Bundesnetzagentur have become ever more diverse. In 2019, a total of 183 trainees and students were trained at the Bundesnetzagentur in various vocational training and study programmes. Vocational training is available for office management trainees, electronic equipment and systems trainees, and for IT trainees in applications development and system integration. Since 2011 the Bundesnetzagentur has also offered a practice oriented study programme, now available at five locations, for students to gain a Bachelor of Engineering/Electrical Engineering or Bachelor of Science to qualify them to work as technicians for electronic equipment and systems at the Bundesnetzagentur. In 2016, the Bundesnetzagentur introduced a similar programme with further places for computer science students (Bachelor of Science) in combination with posts as IT trainees. Moreover, each year since 2012 civil servants preparing for the rank of Regierungsinspektor have been selected to take a university degree in IT in public administration. Vocational training courses are offered at a total of eight Bundesnetzagentur locations, in particular at the regional offices.

Budget

The Bundesnetzagentur's income and expenditure is budgeted for in the federal budget as part of the departmental budget of the Federal Ministry for Economic Affairs and Energy.

The table below shows the income for 2019 (target and performance) and 2020 (target).

Type of income	Target 2019 €'000	Performance 2019 €'000	Target 2020 €'000
Fees, contributions and other charges in the telecoms sector	24,739	48,862	25,588
Fees and other charges in the postal sector	38	23	30
Fees and other charges in the rail sector	0	-67	0
Fees and other charges in the energy sector (electricity, gas, EEG)	6,854	15,226	2,550
Fees and other charges under the Grid Expansion Acceleration Act	42,980	8,520	53,420
Other administrative income, eg fines and rental and sale income	2,723	3,221	2,762
Administrative income	**77,334**	**75,785**	**84,350**

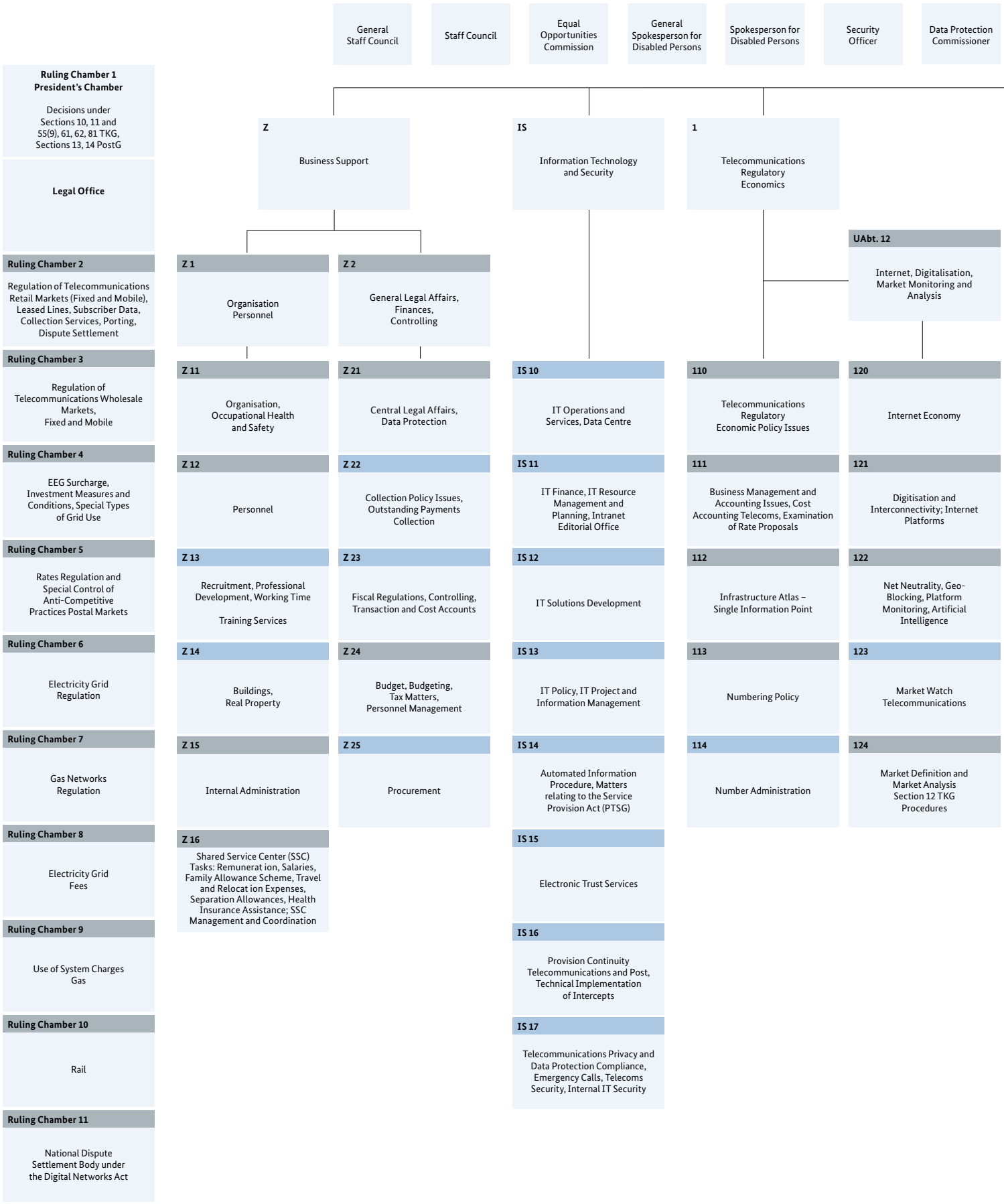
The higher than expected income generated in the telecommunications sector is mainly due to contributions for the protection of interference-free frequency usage being collected for 2015 and 2016. The energy sector has seen another increase in income, too, which is also due to fees being collected from previous years. Given the lack of a fee ordinance, however, no income can be budgeted in the rail sector currently. The difference in income with regard to grid expansion is related to the progress in planning and procedures for power line projects. Delays in expanding the grid thus also lead to a deferral in revenues in the Bundesnetzagentur's budget.

The table below shows the expenditure for 2019 (target and performance) and 2020 (target).

Type of expenditure	Target 2019 €'000	Performance 2019 €'000	Target 2020 €'000
Staff costs	168,444	145,867	170,805
General administrative expenditure, appropriations and special financing expenditure	57,228	63,927	61,350
Investment	13,630	9,969	15,486
Total expenditure	**239,302**	**219,763**	**247,641**

The increase in budgeted expenditure for 2020 is attributable to building up and extending the human and material resources in organisational units in response to the assignment of additional tasks.

Organisation Chart



Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen

President

Vice President

Vice President

B

Office-Berlin „Energy of the Future" Administrative Unit

Press

Press, Public Relations

Management Office

01 Office of the President and Vice Presidents, Procedual Issues

02 Consumer Protection Policy

03 Advisory Councils and Commit tee of Federal States Representatives; Office Chambers Office

2 Legal Telecommunications Regulation Issues, Frequency Regulation

UAbt. 20: Spectrum Regulation

211 Legal Issues, Sector-Specific Control of Anti-Competitive Practices Telecoms

212 Spectrum Management Procedures, Market and Competition Aspects

213 Frequency Award and Assignment Policy

214 Mobile Communications Monitoring

215 Trunked Radio, 450 MHz Wireless Access, Special Award Proceedings, Use of Public Ways, Business Register

216 Universal Service, Public Affairs, Consumer Issues, Dispute Resolution Panel

220 Technical and Regulatory Aspects of Efficient and Interference-Free Use of Radio Frequencies, Radio Compatibility

221 Radio Frequency Utilisation Concepts International Affairs Frequency Plan Innovative Radio Applications

222 Broadcasting

223 Satellite Services, Fixed Services below 30 MHZ, Short Term Usage, Civil/Military Frequency Coordination

224 International Mobile Radio Frequency Coordinat ion, Digital Cellular Networks, Public Paging Networks, Railway and Public Safety Authorities and Organisat ions, Civil/Military Site Coordinat ion, Maritime Mobile and Inland Waterways Services

225 Non Public Radio Applications Amateur Radio

226 Radio Relay, Aeronautical, Radionavigation and Radiodetermination Services

3 International Relations/ Postal Regulation

311 Policy Issues and Strategic Regulatory Approaches for International Affairs, International Postal Affairs Coordination, Language Services

312 International Coordination Telecommunications and Rail

313 International Coordination Energy

314 Notification Requirement, Postal Privacy and Data Protection, Standardisation

315 Economic Policy Issues of Postal Markets Regulation; Market Surveillance and Market Definition in the Postal Sector

316 Network Access, External and Internal Accounting

317 Legal Policy Issues of Postal Markets Regulation; Licensing Policy; Licensing

318 Universal Service, Consumer Issues and Dispute Resolution Panel Post, Quality of Service Measurement

4 Technical Telecommunications Regulation

411 Market surveillance under the EMC and Radio Equipment Acts, Office of the German market surveillance forum (DMÜF); International market surveillance issues

414 Environmental Impact of Radio Equipment, EMF Database, Energy Efficiency in Information and Communications Technology

415 Recognition of Conformity Assessment Bodies; ICT Standardisation – Smart Grids and Industry 4.0

416 Legal and Economic Policy Issues, Dept 4 Legal Affairs

421 Technical Regulation and Standardisation Issues for Fixed and Special Radio Services

422 Innovative Communication Services and Networks, Numbering and Security Aspects of ICT Standardisatio n and ETSI; Focal Point to ITU-T and ETSI

423 Technical Regulation and Standardisation for EMC, Broadcasting and other Audiovisual Media

424 Technical Regulation and Standardisation Issues for Mobile Services; 5G Exchange Platform; Radio Interference Suppression Ordinance

425 Technical Regulation and Standardisatio n Issues for Universal Services and Open Network Provision, Securing Billing Accuracy under the Telecoms Customer Protection Ordinance

426 Coordination Office for ICT Standardisation

5 Regional Offices, Misuse of Numbers

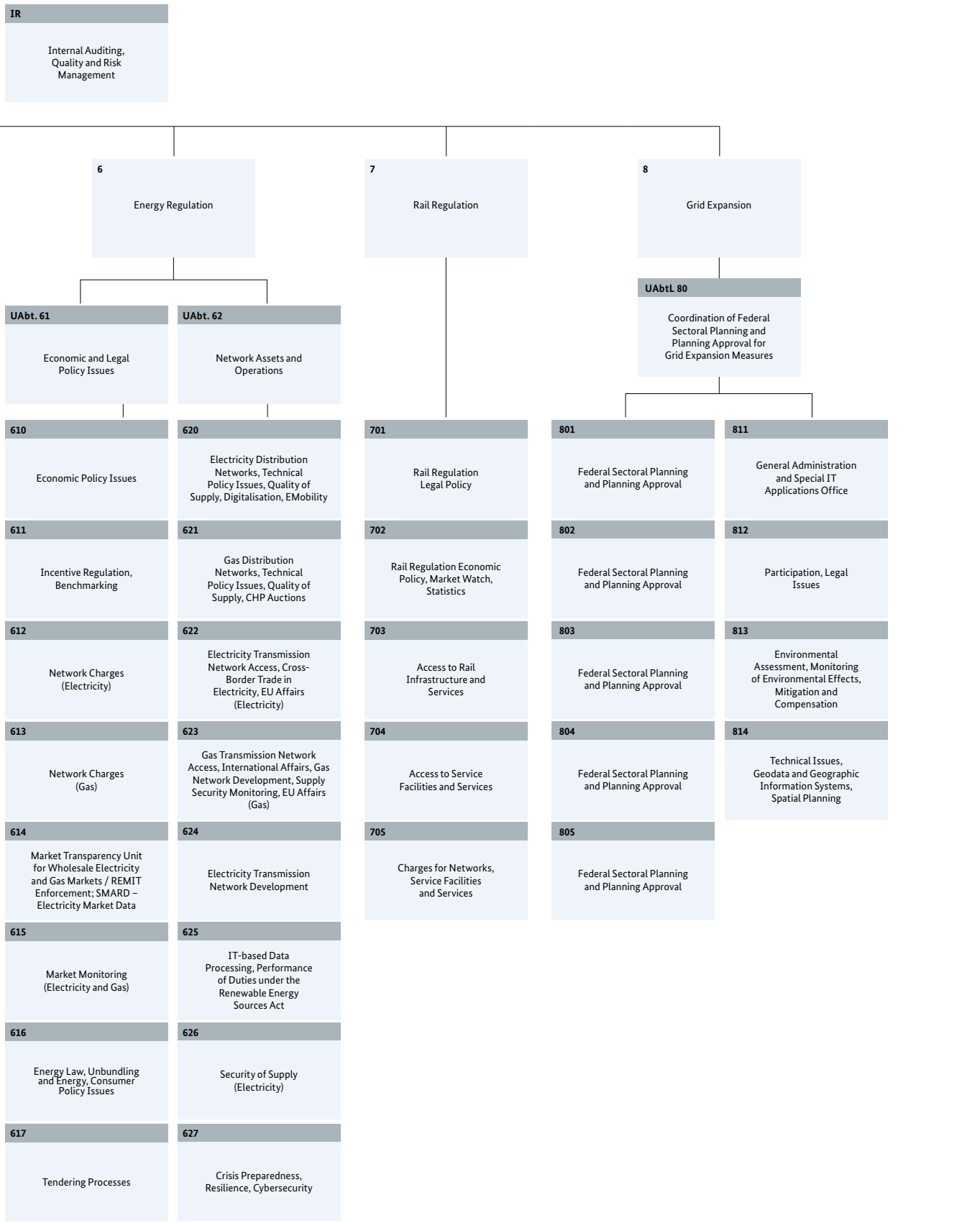
511 Radio Monitoring and Inspection Service, Measurement Equipment

512 Numbers Misuse Investigation, Combating Violations of Competition Law and Spam

513 Combating Violations of Competition Law incurring Administrative Fines

ASt-Bereich	Standorte
- Augsburg	Landshut, München
- Berlin	Magdeburg, Kollberg
- Dortmund	Kassel, Meschede, Münster
- Eschborn	Neustadt, Saarbrücken, Darmstadt, Leeheim
- Hamburg	Kiel, Itzehoe
- Hannover	Bremen, Göttingen
- Karlsruhe	Konstanz, Reutlingen
- Köln	Mülheim, Krefeld
- Leipzig	Dresden, Chemnitz, Erfurt
- Nürnberg	Fulda, Schwäbisch Hall, Würzburg

*The Chair of Ruling Chamber 5 will be in charge of Department 3's tasks for Sections 314-318 until further notice.



1. February 2020

List of abbreviations

3GPP	3rd Generation Partnership Project
A	
AC	alternating current
ACER	Agency for the Cooperation of Energy Regulators
AEG	General Railway Act
aFRR	automatic frequency restoration reserves
ARegV	Incentive Regulation Ordinance
B	
BBPlG	Federal Requirements Plan Act
BEREC	Body of European Regulators for Electronic Communications
BGH	Federal Court of Justice
BMVI	Federal Ministry of Transport and Digital Infrastructure
BMWi	Federal Ministry for Economic Affairs and Energy
bn	billion
BWA	broadband wireless access
C	
Capex	capital expenditure
CEER	Council of European Energy Regulators
CEN	European Committee for Standardization
CEP	Clean Energy for All Europeans Package
CEP	courier, express and parcels
CEPT	European Conference of Postal and Telecommunications Administrations
CHP	combined heat and power
CLL	carrier leased line
ct/kWh	cents per kilowatt hour
CWE	central western Europe
D	
DC	direct current
DIN	German Institute for Standardization
DSL	digital subscriber line
DSO	distribution system operator
DTAG	Deutsche Telekom AG
E	
ECJ	European Court of Justice
EEA	European Economic Area
EEG	Renewable Energy Sources Act
EFTA	European Free Trade Association
EMC	electromagnetic compatibility
EnLAG	Power Grid Expansion Act
EnSaG	Omnibus Energy Act
EnWG	Energy Industry Act
ERGP	European Regulators Group for Postal Services
EU	European Union

F

FEP	site development plan
FIMM	feed-in management measures
FTR	financial transmission right
FTR	fixed termination rate
FTTB	fibre-to-the-building
FTTH	fibre-to-the-home

G

GasNEV	Gas Network Charges Ordinance
GasNZV	Gas Network Access Ordinance
GB	gigabyte
Gbps	gigabits per second
GHz	gigahertz
GIS	geographic information system
GSM	Global System for Mobile Communications
GW	gigawatt
GWh	gigawatt hour

H

HFC	hybrid fibre-coax
HVDC	high-voltage direct current

I

ICA	interconnection access
IoT	Internet of Things
ISDN	integrated services digital network
IMSI	International Mobile Subscription Identities
IP	Internet Protocol
IT	information technology
ITU	International Telecommunication Union

K

KapResV	Capacity Reserve Ordinance
km	kilometre
kWh	kilowatt hour

L

LRIC	long run incremental cost
LTE	Long Term Evolution

M

m	million
M2M	machine-to-machine
Mbps	megabits per second
MFCN	mobile fixed communications network
mFRR	manual frequency restoration reserves
MHz	megahertz
MRC	multi-regional coupling
MTR	mobile termination rate
MW	megawatt
MWh	megawatts per hour

N

NABEG	Grid Expansion Acceleration Act
NC CAM	network code on capacity allocation mechanisms
NC TAR	network code on harmonised transmission tariff structures for gas
NDP	network development plan
NetzResV	Grid Reserve Ordinance
NGA	Next Generation Access
NGN	next-generation network

O

OLG	Higher Regional Court
OTT	over-the-top

P

PC	personal computer
pkm	passenger kilometre
PTB	National Metrology Institute
PSTN	public switched telephone network
PV	photovoltaic

R

REMIT	Regulation on wholesale energy market integrity and transparency
RU	railway undertaking

S

SDH	Synchronous Digital Hierarchy
SigG	Electronic Signatures Act
SIM	subscriber identity module
SME	small and medium-sized enterprises
SMS	short message service
StromNEV	Electricity Network Charges Ordinance

T

tkm	tonne-kilometres
TSM	Telecoms Single Market Regulation
TSO	transmission system operator

U

UMTS	Universal Mobile Telecommunications System
UN	United Nations
UPU	Universal Postal Union

V

VAT	value added tax
VDSL	very high speed digital subscriber line
VHF	very high frequency
VIP	virtual interconnection point
VoIP	Voice over Internet Protocol
VoLTE	voice over LTE (Long Term Evolution)

W

WRC	World Radiocommunication Conference

Contacting the Bundesnetzagentur

The Bundesnetzagentur provides reliable information and advice to anyone who wants help or has a complaint.

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