Bundesnetzagentur

Annual Report 2015

Stimulating competition. Expanding networks. Protecting the consumer.

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The Bundesnetzagentur looks back in this annual report on another year's activities directed towards developing infrastructures, promoting competition and protecting the consumer. Modern infrastructures are the lifeblood of our society – they provide the basis for our country's prosperity. We want it to stay that way. And that means encouraging competition in the energy, telecommunications, postal and railway sectors even further. In this context the Bundesnetzagentur ensures accessibility to networks on fair terms, which is key to effective competition. Competition is not an end in itself: a good variety of choice and innovative services benefit consumers too. Given the competition in the markets, consumer protection issues are a frequent focus of our work. The report in front of you presents a clear picture of the Bundesnetzagentur's challenging and diverse range of tasks.

Bundesministerium
für Wirtschaft
und Energie

A message from Sigmar Gabriel, Federal Minister for Economic Affairs and Energy

Growth and a high standard of living need the foundation of a viable and highly efficient infrastructure to be secure in the long term. That is why the federal government is working hard at improving framework conditions for the investments needed to speed up infrastructure expansion – one of our top priorities.

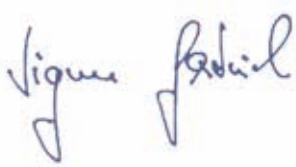
This is particularly true for the further rollout of the energy transition. Today renewable energy already accounts for around one third of our electricity supply, and its portion will continue to increase in the future. The electricity market needs to balance electricity generation and consumption even with the growing proportion of wind and solar energy. To achieve this, the market has two functions to perform. One is to make sure that sufficient capacity is readily available, and the other is to synchronise use of this capacity so that the right amount of electricity is available at the right time. We are working to create this modern electricity market which guarantees a secure and cost-effective electricity supply even with the increasing amount of renewable energy.

The networks are crucial for the success of the energy transition. Ensuring a secure electricity supply involves not only optimising and strengthening our existing networks but also building several thousand kilometres of new power lines. The federal government has paved the way for faster network expansion with the acceptance of the people. The new rules for power line construction that came into force at the end of 2015 significantly broadened the scope for underground cabling in both direct and alternating current projects. Now we need to keep up the pace if we want to attain our goal of fast grid expansion. The project promoters and the national and regional authorities are all called upon to achieve cost-effective network expansion in line with the requirements and in good time.

Networks are also a fundamental requirement of highly efficient telecommunications markets and thus of successful digitisation. That is why we are driving forward the expansion of high-speed broadband networks. And it is why the Bundesnetzagentur has a crucial role to play in the development of both fixed line and mobile communications networks, as seen with the spectrum auctions and LTE expansion. With its intelligent internetworking strategy the federal government is putting the spotlight on its interdisciplinary approach with regard to digitisation.

The German postal market ultimately underpins the dynamic development of e commerce, playing a leading role in Europe. We intend to maintain and strengthen this standing with the support of the Bundesnetzagentur.

Both the energy transition and broadband expansion are societal responsibilities which are key to our competitiveness and which require attention at all political levels as well as a high degree of private commitment. Having enterprises make the investments necessary for the future sustainability of the networks must therefore continue to be our goal as this will enable us to push ahead with expanding the infrastructure.



Sigmar Gabriel
Federal Minister for Economic Affairs and Energy

Bundesministerium
für Verkehr und
digitale Infrastruktur

A message from Alexander Dobrindt, Member of the German Bundestag, Federal Minister of Transport and Digital Infrastructure

We can see from the life cycle of active progressive societies that every couple of decades innovations decide which country remains prosperous and which country stagnates. The viability of a society is measured by its ability to foster and accommodate innovation. Nations that democratise innovations stay at the top because technological progress can only lead to growth, prosperity and employment if it is made accessible to everyone.

This requires modern infrastructures. In the past this meant electricity networks for electrification, roads and railways for mobility, and telephone lines and radio for telecommunications. Today it means superfast broadband.

That is why we have launched an initiative for the future to strengthen our infrastructure – and make it fit for the future growth in traffic, for globalisation and for digitisation. The starting point for our initiative is our investment ramp-up: we are increasing our funding for infrastructure by 40% to an annual €14bn in the period up to 2018. This is an absolute record and means more money than ever before.

The Bundesnetzagentur is making a vital contribution and is supporting us in organising, coordinating and implementing our initiative, with three main points of focus:

- We have negotiated a new performance and financing agreement with Deutsche Bahn: over the next few years €28bn will be spent on modernising our rail network.
- The Bundesnetzagentur works to make sure that the provision of rail services runs smoothly and to guarantee fair competition for all the players in the market.
- We are the first country in Europe to have auctioned the Digital Dividend II spectrum at 700 MHz – with all the proceeds going towards rolling out broadband and connecting rural areas. The Bundesnetzagentur enabled the auction to take place, carried out the award proceedings and – with its coverage obligations – established the right framework for the national high-speed network.
- We are making the leap to the gigabit society and are equipping our infrastructure for the bandwidths of the future. Innovations like telemedicine, "Industrie 4.0" and automated and connected driving need real-time internet connections with minimum latency. Together with the Bundesnetzagentur we are driving forward the international standardisation of next-generation mobile technology.

This shows just how the Bundesnetzagentur is taking responsibility for our infrastructure and is helping Germany to remain an active progressive society.

I would like to thank the Bundesnetzagentur for the excellent cooperation.

Alexander Dobrindt,

Member of the German Bundestag, Federal Minister of Transport and Digital Infrastructure

The President and Vice Presidents of the Bundesnetzagentur (from left to right):
Dr Wilhelm Eschweiler, Jochen Homann and Peter Franke

»The term "infrastructure" covers all the elements that are vital for our economy and society to function – for instance transport, energy and telecommunications networks.«

The Bundesnetzagentur has had another eventful and exciting year. The Bundesnetzagentur's activities in the energy, telecommunications, postal and railway sectors have focused not only on ensuring fair competitive conditions for undertakings but also on safeguarding the interests of the consumers.

A central issue in 2015 was again the energy transition. The aim to shut down all nuclear power plants by 2022 can only be accomplished if an increasingly large proportion of the electricity demand is met by renewable energy. To be able to transport this energy, expansion of the electricity grid at all network levels is urgently needed. Alongside this, new paths are being taken to make renewable energy competitive with the auctions for ground-mounted PV installations. Together with a secure supply of electricity, affordable electricity prices are of primary importance to the consumers.

The federal government has charted a new path with the legislation passed at the end of the year giving priority to underground cables. The large DC power lines, which transport the electricity generated in the north to the consumption centres in the south, are now primarily to run underground instead of overhead. As far as possible the underground cables are to run in a straight line to reduce costs and any intervention in the natural surroundings and landscape. At the same time this will lessen the impact on those citizens affected by network expansion, with the aim of increasing the population's acceptance of the measures needed to expand the electricity grid.

Since May 2015 work has been in progress to convert German gas supplies. The goal is for all areas still supplied with low calorific L gas to be converted to H gas, which has a higher calorific value, by 2029. The switch is necessary because the sources of L gas in Germany and the Netherlands are exhausted. H gas supplies mainly come from Norway, Russia and Great Britain. The large gas network operators included a planned timetable for the network areas concerned in the Gas Network Development Plan 2015.

Regulation in the telecommunications sector was marked by the fourth mobile broadband spectrum auction held by the Bundesnetzagentur in June 2015. The auction was a response to the urgent need for new frequencies to accommodate rapidly growing data volumes. Wireless data connectivity plays a special role as it will allow smaller towns and rural areas to be provided with high-speed internet, making them more attractive as a business location.

After 16 days of bidding in Mainz the three participating network operators Vodafone, Telekom and Telefónica successfully acquired frequencies totalling 270 MHz. The spectrum in the 700 MHz, 900 MHz, 1500 MHz and 1800 MHz bands was auctioned for some €5bn. A significant portion of the proceeds is to be used for network expansion.

The Bundesnetzagentur's activities in connection with the rollout of vectoring also aim to promote faster internet access and secure competition.

»The federal government has charted a new path with the legislation passed at the end of the year giving priority to underground electricity power lines. This will lessen the impact on those citizens affected by grid expansion.«

In 2015 Telekom submitted an application for the deployment of vectoring near its main distribution frames. The Bundesnetzagentur's competent ruling chamber considered Telekom's application very carefully in transparent proceedings and in light of the aims. A decision is expected in 2016.

Another important topic in 2015 was increasing digitisation, which is also influencing the business models of established telecommunications companies more and more. Over-the-top (OTT) providers such as Amazon, Google and WhatsApp are increasingly competing with conventional telecommunications products. In this context the Bundesnetzagentur is focusing on developing a regulatory framework which strikes a balance between the obligations of OTT service providers and conventional telecommunications service providers.

The digitisation process once again marked the postal market in 2015. Positive changes were seen in particular in the parcels market. Guaranteed delivery periods, pre-arranged delivery times and nationwide services were just some of the responses to the growth in online retail sales. Developments in the letters market were generally stable.

By contrast, problems with letter or parcel deliveries increased significantly – numerous complaints about delivery were received by the Bundesnetzagentur. The Bundesnetzagentur's postal consumer advice team offers advice and active support and at the same time monitors the availability of basic postal services.

The Bundesnetzagentur also approved Deutsche Post's new letter prices as from 1 January 2016, using new statutory (price cap) calculation methods. The most important change was the increase in the postage rates for standard and maxi letters. This is to enable Deutsche Post to respond to the decline in postal volumes caused by electronic communications. The new stamp prices will remain unchanged for three years.

Progressive digitisation is also shaping the impact on the provision of basic postal services. Given the dynamic developments in the market, viable concepts for the future design of the postal universal service should be developed. A key factor here is to strengthen consumer protection.

The Bundesnetzagentur once again worked in 2015 to increase competition in the railway sector, monitoring the sector to ensure that all undertakings are able to use the railway system on fair terms and at reasonable prices.

The share held by competitors in the rail freight transport segment continued to grow and now stands at around one third. The share of the regional passenger transport segment held by competitors also developed positively. Deutsche Bahn AG undertakings

continue to handle most of the traffic in the long-distance transport segment. However, several enterprises have announced that they will be entering the market in this segment in 2016.

The shuttle train service to and from Sylt was another issue addressed by the Bundesnetzagentur in 2015. For the first time one of Deutsche Bahn AG's competitors – RDC Deutschland GmbH – sought to establish its own car train service to the island of Sylt and acquire the infrastructure capacity required for its planned service. In 2015 the Bundesnetzagentur was involved in the allocation of this railway capacity in the course of numerous network access proceedings. As a result of these proceedings RDC will be able to use the line and offer a car train service to Sylt.

These and many more topics will remain on the Bundesnetzagentur's agenda beyond the year 2015. But one thing is certain: we shall continue working for competition and the availability of all the necessary infrastructure for everyone across the country.

Jochen Homann

President, Bundesnetzagentur

»Over-the-top (OTT) providers such as Amazon, Google and WhatsApp are increasingly competing with conventional telecommunications products.«

ENERGY

Diverse measures to achieve a single goal — the *Energiewende*

The Bundesnetzagentur is playing an active part in mapping the energy market's new course.
Forward-looking planning and regulatory reviews are the instruments we use to act.

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The course of the Energiewende continues to be the driving force behind the electricity and gas markets in Germany in its fifth year of implementation. The plan is to shut down all of the nuclear power plants in Germany by 2022 and generate the majority of electricity from renewable energy sources by then. To reach these targets, more installations generating electricity from renewable sources must be constructed at locations best suited for this purpose. Additionally, electricity grid expansion must be pushed forward on all network levels.

In line with the above, the regulatory framework conditions are further being adapted to the energy sector's ongoing transformation. In addition to extensively safeguarding security of supply in the years affected by conversion, new procedures are being introduced with the new auctions to determine the level of financial support for ground-mounted photovoltaic installations. Of course, ensuring that electricity and gas remain affordable for consumers is an important indicator of success here.

Market watch

In 2014, there was another increase in options for consumers choosing an electricity supplier. On average, consumers could choose between 106 suppliers in each network area. The trend towards greater choice of supplier also strengthened for customers in the gas sector. In nearly 74% of the network areas there was a choice of more than 50 active gas suppliers. In over 22% of the network areas customers had a choice of more than 100 active suppliers.

Changes in conventional and renewable energy generation

In 2014, the year under review, power generation was characterised by further growth in capacity from renewables. Altogether, growth in renewables capacity amounted to 6.5 GW. Onshore wind and solar energy recorded the highest growth with increases of 4.0 GW and 1.9 GW respectively. The total installed generating capacity thus rose to 196.2 GW. This comprises 106.2 GW from non-renewables and 90.0 GW from renewables.

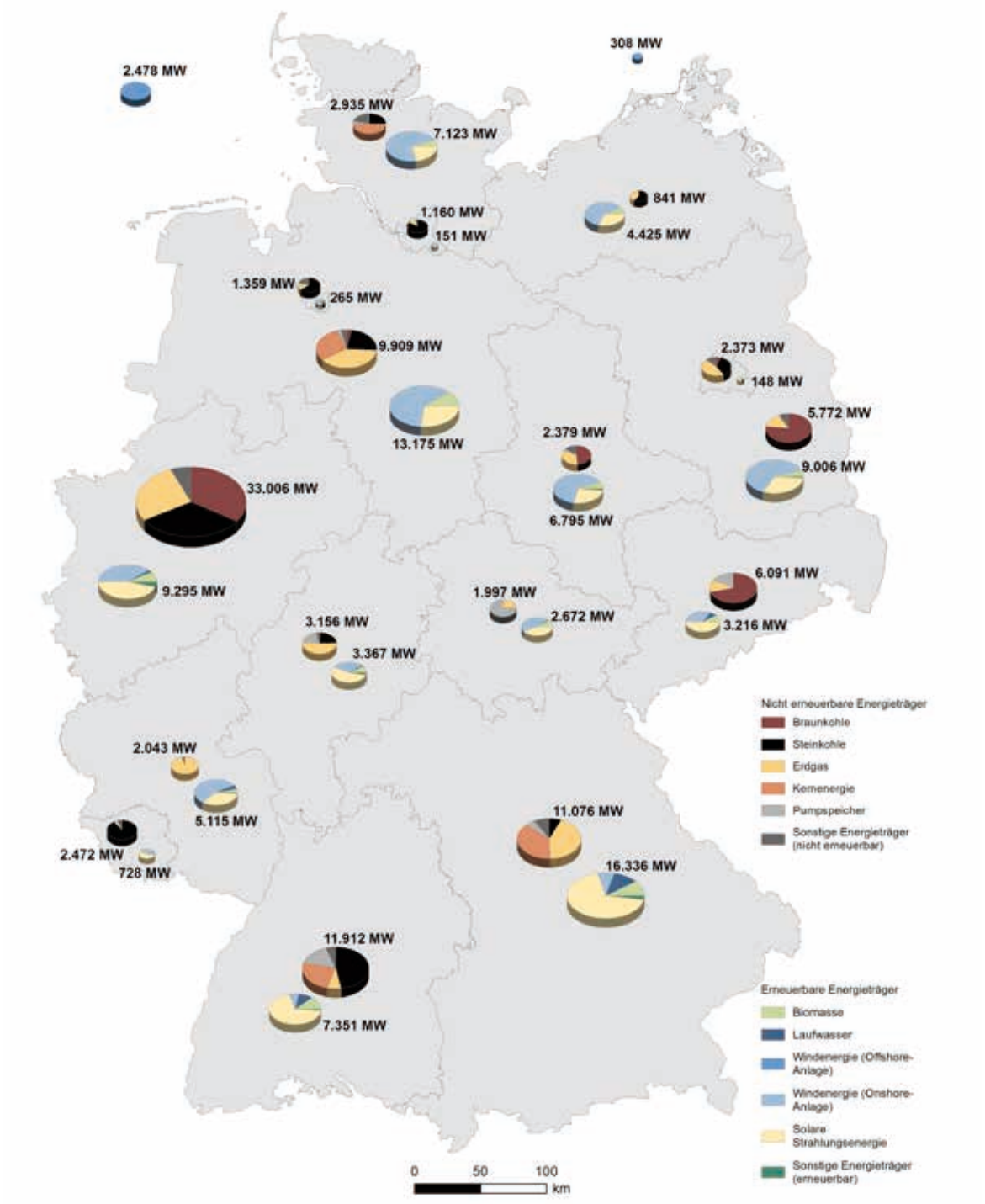
Net electricity generation in Germany in 2014 amounted to 581.3 TWh, representing a decrease of 12.2 TWh compared to the previous year. One particular reason for the decrease is the relatively mild winter. The volume of electricity generated using non-renewable sources decreased by 4.6% compared to the previous year. The largest decreases were recorded in natural gas and hard coal power plant generation. In contrast to past years, the volume of electricity generated using brown coal fell for the first time in 2014.

The net volume of electricity produced from renewable energy sources increased by 8.4 TWh to 154.8 TWh in 2014. This is an increase of 5.7% compared to the prior year. The largest increase was recorded in onshore wind electricity generation with a volume of 55.9 TWh. At 60.2%, offshore wind showed the largest percentage increase. This was due to the installed capacity being doubled in 2014.

Household customers and electricity supply

The number of electricity suppliers from whom final customers can choose increased again. In 2014, final customers could choose between an average of 106 suppliers in each network area.

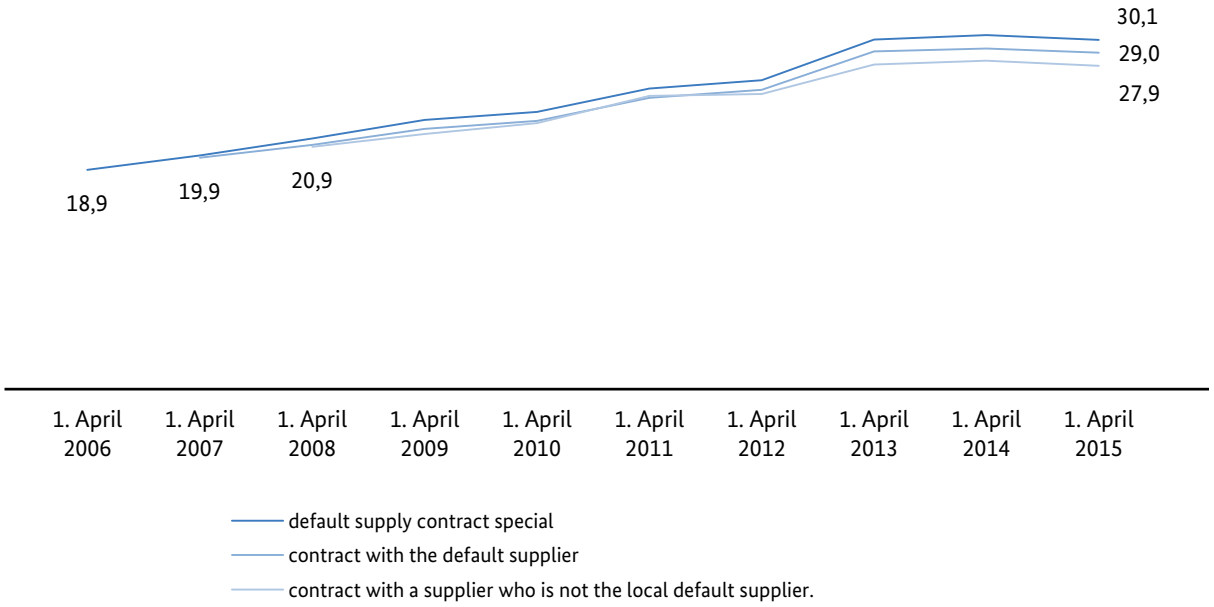
The number of household customers switching supplier has increased significantly since 2006. In 2014, a relative majority of 43.2% of household customers concluded a special contract with the local default supplier. The percentage of household customers with a standard default supply contract is 32.8%. Thus the percentage of default supply customers has fallen by 1.3% when compared with the prior year 24% of all household customers are now served by a company other than their local default supplier.



Thus the strong position that default suppliers still have in their respective service areas weakened further in the year under review.

Following large increases in the past few years the prices for household customers showed a slight decrease in the period under review. The average price for household customers with a default contract and an annual consumption of 3,500 kWh fell by 1.4% to 30.08 ct/kWh. Prices for the two other customer groups also decreased slightly. Electricity prices for customers with a special contract with their default supplier and an annual consumption of 3,500 kWh averaged 28.96 ct/kWh and for those with a contract with a supplier other than the local default supplier 27.85 ct/kWh. In a European comparison only Denmark had higher electricity prices than Germany. Germany's high prices are caused by a heavy burden of surcharges, taxes and levies. The total share of the state-controlled price components amounts to about 74%. The competitive component of the electricity price found in "energy procurement, supply, other costs

Change in household customer prices per contract category with an annual consumption of 3,500 kWh (volume-weighted average)
in ct/kWh

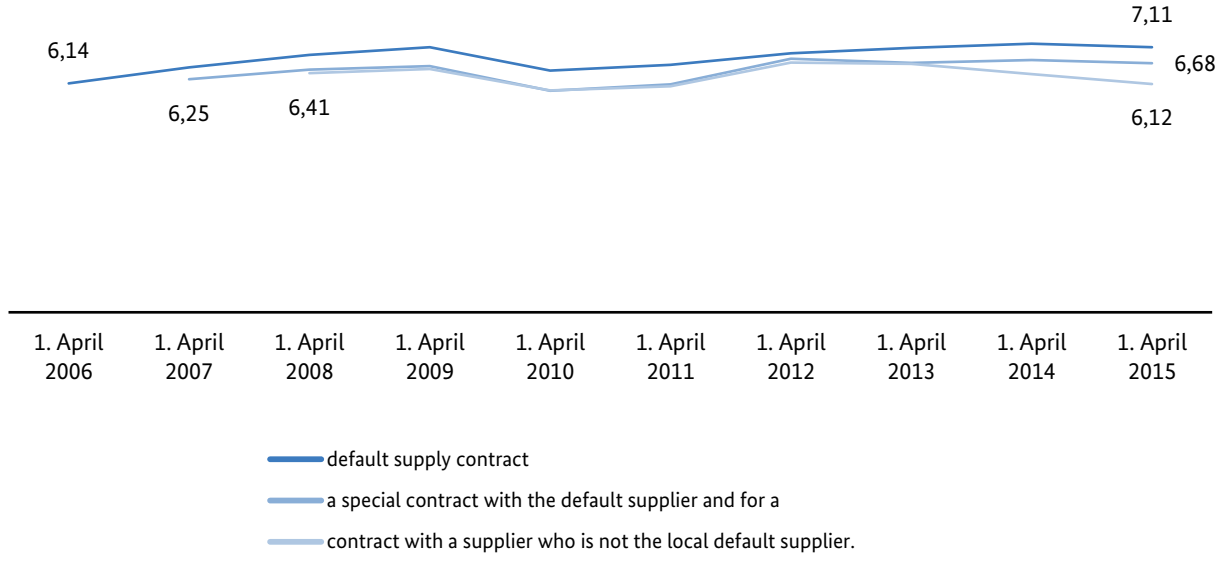


and margin" now comprises only about 26% of the average total price. There was a reduction of around 4% in the "energy procurement, supply, other costs and margin" component of the price, leading to a dampening effect on total prices. The decrease could be related in particular to the reduction in wholesale prices.

Household customers and gas supply

One indicator of a greater degree of choice for gas customers is the number of gas suppliers available per network area. In 2014, the year under review, the trend towards greater choice of provider strengthened. In nearly 74% of the network areas there was a choice of more than 50 active gas suppliers. In over 22% of the

Change in gas prices for household customers with an annual consumption of 23,269 kWh (volume-weighted average)
in ct/kWh



network areas customers even had a choice of more than 100 active suppliers.

The trend of customers switching from their local default supplier to a supplier operating in more than one region has strengthened. The share of household customers supplied under a special contract with a supplier other than the local default supplier is now 18.8% after increasing by 5%.

The number of household customers switching supplier when moving home increased by almost 10% in 2014. Overall, around 1m or 8.4% of all household customers switched supplier. This is more or less the same as in previous years.

The slight downward trend in gas retail prices continued.

The average price for household customers with a standard contract with the default supplier fell by 1.3% from 7.2 ct/kWh to 7.11 ct/kWh. The average price for household customers with a special contract with their default supplier also fell by 1.3% from 6.77 ct/kWh to 6.68 ct/kWh. The average price for household customers who have a contract with a supplier other than the local default supplier sank significantly by over 4% from 6.39 ct/kWh to 6.12 ct/kWh. A comparison with the gas prices across Europe shows that household customers in Germany continue to pay average gas prices.

Grid overloading: High costs resulting from interventions in plant schedules

Renewable electricity feed in and delays in grid expansion present the electricity grid with challenges. Operators are increasingly forced to intervene in the schedules of power plants or restrict the feed-in of renewable energy to prevent overloading of the grid.

The gradual exit from nuclear power and RES generation far from consumption affect flows in the electricity grid. As a result, the transmission system operators (TSOs) that are responsible for the security of supply and stability of the electricity grid are more frequently required to intervene in the schedules of power plants.

If a line is overloaded, the output fed in by the energy producer ahead of the congestion must be reduced – conversely, an energy producer on the other side of the congestion has to raise output. This intervention measure taken by the network operators is called redispatching. Power plants receive compensation provided they are disadvantaged by such an intervention measure. The costs are incorporated in the network charges, meaning that consumers help to bear the financial burden. It is estimated that the costs of these and other network and system security measures will amount to at least €1bn for 2015.

Where generation from renewables, mine gas and combined heat and power are concerned, the same process is called feed-in management. The other name clarifies, first, that restriction is only admissible if it is not possible to restrict feed-in from conventional

power plants. Moreover, the economic and technical implementation of the process differs slightly.

The Bundesnetzagentur monitors these measures and keeps a record of them in its annual monitoring report. Due to an increase in network and security measures in 2015 the Bundesnetzagentur began to publish its findings on a quarterly basis. For the first time, a detailed presentation of feed-in management volumes and estimated costs is possible for every federal state. Additionally, conclusions from the report can be drawn on the seasonal fluctuations of all network and system security measures.

Security of supply and grid expansion

The change in the power generation landscape and delays in expanding the network place heavy demands on the power grids. Recent years have seen a particularly large increase in the scope of security measures for the grid and the system.

The future shape of the electricity market

The degree of liberalisation of the European electricity markets and the growth in renewable energy sources raise questions as to the future design of the electricity market. The main issue, given declining wholesale prices and the fluctuation in electricity generation from renewable energy sources, is whether the electricity market will be able to guarantee sufficient electricity at all times to meet demand in the future.

The Bundesnetzagentur has been very involved in the discussion about the design of the electricity market, for instance, by playing an active role in discussions of the Federal Ministry for Economic Affairs and Energy on the electricity market platform and by stating its position on the Green Paper "An electricity market for the energy transition".[1]

Some of the Bundesnetzagentur's suggestions on developing the electricity market have been included in the draft Electricity Market Act. Hence some key features of the capacity reserve reflect the standby capacity strategy that was developed by the Bundesnetzagentur and introduced into the discussion. As an example, while the capacity required is procured through competitive bidding, it is also kept on standby outside the electricity market and only used once the transmission system operators have concluded all market transactions. This standby capacity is first made use of by the transport system operators to maintain security of supply once all available capacity on the market has been transacted and exhausted, that is to say, in the absence of any market clearing. This allows all market transactions to be carried out without hindrance and without distorting market price signals. The Bundesnetzagentur's suggestions have also been incorporated in the revised reserve capacity arrangements. The latter are necessary to continue alleviating network congestion successfully.

A commitment to permitting prices on the electricity market to be freely set has been anchored in the Electricity Market Act in line with the Bundesnetzagentur's recommendation. As such, the free setting of prices is a pre-condition for scarcity-induced prices to occur, which in turn are a requirement for capital investment in power plant capacity. If the electricity market is to ensure security of supply, then scarcity-induced prices must be made possible.

[1] http://www.bmwi.de/BMWi/Redaktion/PDF/Stellungnahmen/ Stellungnahmen-Gruenbuch/150228-bundesnetzagentur, property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf

The Bundesnetzagentur has designed an independent market simulation to support the expert discussion on the future organisation of the electricity market. This market simulation makes it possible to generate data and information that can help answer the questions posed above. Constant enhancement and maintenance of the simulation model ensure its suitability to cope with the complex issues of security of supply and future developments in the market. This model not only permits the Bundesnetzagentur to make its own evaluation of market outcomes but also permits independent appraisers to evaluate the simulation outcomes.

Moreover, preparatory work has started on the introduction of a market master data register and a national information platform. A systematic, user-friendly compilation of electricity market data will increase transparency in the market by making the latest electricity market data public.

The drafts of the Electricity Market Act and the Capacity Reserve Ordinance allow for an extensive range of tasks for the Bundesnetzagentur in both procuring and determining the extent of reserve capacity. The Bundesnetzagentur will assume responsibility for these tasks in 2016. More information on the Bundesnetzagentur's additional tasks arising out of the Electricity Market Act can be found in the chapter "Strategic Plan" starting on page 124 (German Version).

Expansion in the transmission system

Expansion of the electricity grid is a key element of the Energiewende and a core infrastructure project. The electricity that is generated in northern Germany on land and at sea from renewable energy sources has to be transported to the main consumption areas in the south. The current electricity grid was not designed for this. The transmission system needs to be expanded to integrate renewable energy sources and to maintain system and supply security. The aim is to prepare the network landscape for the switch to renewable energy sources quickly where possible while at the same time reaching any necessary decisions together with society as a whole. The Grid Expansion Acceleration Act (NABEG), the Energy Act (EnWG) and the Planning Approval Responsibilities Ordinance have assigned an extensive range of new tasks to the Bundesnetzagentur all of which involve the expansion of Germany's extra-high voltage networks.

Establishing requirements

In a first step to establish requirements, the transmission system operators (TSOs) predict changes and growth in electricity consumption and generation in the future by outlining a number of possible scenarios. The findings are put together in what is known as a "scenario framework", which the TSOs forward to the Bundesnetzagentur. The latter then verifies the findings, makes them available for public consultation and, after taking account of the comments received, approves them.

The actual network development plan (NDP) is then drawn up on the basis of the framework scenario. The NDP contains all the measures necessary for secure and reliable network operation in light of the changes expected in power generation and consumption. It also adheres to the "NOVA" principle by which network optimisation potential must first of all be exhausted before grid reinforcement (Verstärkung) and only after that can grid expansion (Ausbau) be considered. The NDP only lists the network points of origin and destination between which the power has to be transported. Specific power line routes will first take shape during the subsequent planning approval procedure.

Since 2013, the Bundesnetzagentur has also consulted on and approved an offshore network development plan (O-NDP) on the basis of the scenario framework. The O-NDP determines demand for grid connection lines and the time sequence to be followed in connecting each offshore wind farm cluster to the grid on the mainland.

On 27 February 2015 the Bundesnetzagentur published its provisional due diligence findings on the Draft Network Development Plan for 2024 and the Draft Offshore Network Development Plan for 2024, which were submitted by the TSOs. Governmental bodies, professional associations and the general public were given an opportunity to comment on these drafts until 15 May 2015. As part of the consultation, four information events were held in Munich, Erfurt, Stuttgart and Hanover.

Moreover, even at this early stage the Bundesnetzagentur started examining any possible impact of the grid expansion on the public and on the environment. The findings from this strategic environmental assessment have been published in an environmental report.

Some 34,211 responses were received during the public participation. However some letters were signed jointly signed by several people thus the total number of those participating in the consultation was actually much higher at 39,093. The issues referred to in all the responses were recorded and evaluated, and the arguments put forward were also taken into account in the decision making. Many of the responses referred to specific projects, in particular to the south-east direct current path, the SuedLink, the Ultranet and the Raitersaich to Altheim project (measures M350 and M54).

The Bundesnetzagentur took part in all the Bavarian energy dialogue meetings on issues relating to network expansion in spring 2015. The technical findings were included in full in the confirmation of the Network Development Plan 2024.

Based on the "Principles for a successful implementation of the energy transition" of the coalition government of 1 July 2015, the Bundesnetzagentur also examined a high-voltage direct current (HVDC) connection between Wolmirstedt in Saxony-Anhalt and Isar/Landshut as an alternative to the HVDC connection applied for by the TSOs between Wolmirstedt and Gundremmingen in Bavaria (south-east direct current path). It can be seen that the alternative connection effectively corrects the line overloads. As shifting the grid connection point to Isar/Landshut causes increased network loads in south-east Bavaria, it will also be necessary to reinforce the mains AC grid supply between Oberbachern and Ottenhofen.

During its examinations the Bundesnetzagentur assumed a slower rollout of power generation by offshore wind farms as well as peak shaving of wind feed-in on land. This approach is in line with the requirements that arose out of the public consultation. Both factors lead to lower demand for grid expansion. Despite this, the number of measures and their total kilometre length still increased when compared with previous network development plans due to the ongoing expansion in renewable energy sources.

On 4 September 2015 the Bundesnetzagentur approved the Network Development Plan for 2024 with 63 of the original 92 measures proposed by the TSOs. This results in about 3,050 km of existing lines that will be reinforced or optimised and around 2,650 km of new lines.

In addition, the Bundesnetzagentur approved only three of the seven proposed grid connection lines in the Offshore Network Development Plan for 2024 as the speed of growth of offshore wind power plants must be reduced by law. Those grid connection lines that have been approved are two 900 MW systems in the North Sea and one system in the Baltic Sea with two times 250 MW.

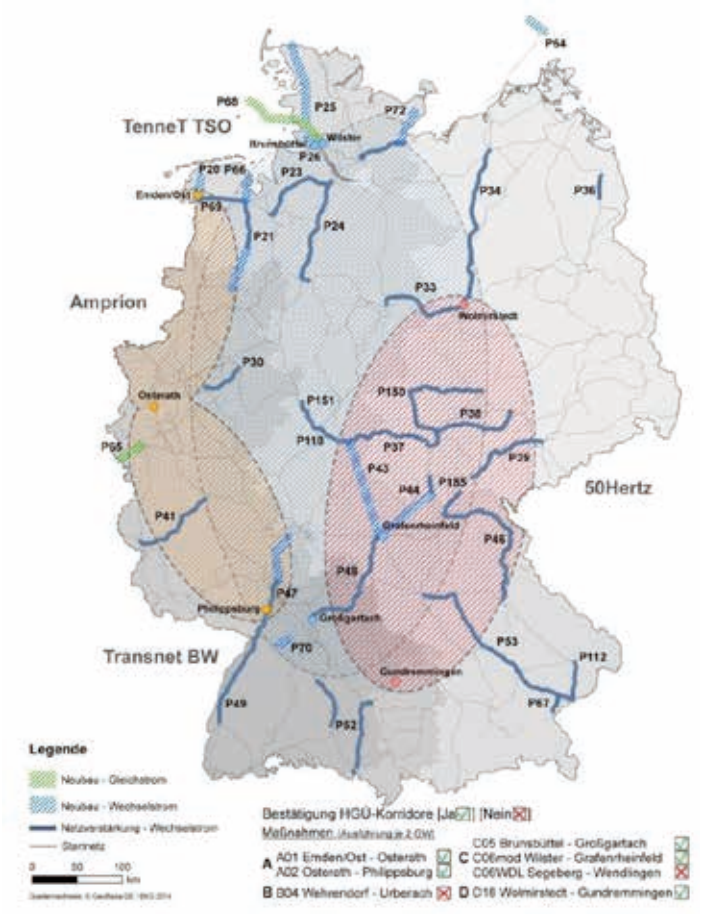
In future the Bundesnetzagentur will require the TSOs to give one overall alternative plan plus one specific alternative for each appropriate individual measure or bundle of measures and will require the TSOs to provide a comprehensive account of the technical network-related grounds for the final choice of the measures proposed.

The Bundesnetzagentur submitted the approved Network Development Plan for 2024 to the federal government as a draft for the Federal Requirements Plan. The projects contained in the Federal Requirements Plan are urgently needed to ensure energy supply and therefore are to be given priority. The Act to amend the provisions of the right to construct power lines[2] entered into force on 31 December 2015, leading to newly approved measures being incorporated into the Federal Requirements Plan and unapproved measures being deleted. Contrary to the confirmed Network Development Plan for 2024, the legislature decided against including Project P44 from Altenfeld via Schalkau to Grafenrheinfeld in the Federal Requirements Plan. Isar was fixed as the Bavarian grid connection point for the HVDC line originating in Wolmirstedt and the ensuing necessary grid reinforcement between Oberbachern and Ottenhofen was included in the Federal Requirements Plan.

As scheduled, the next round of network development planning started in the year under review. On 30 October 2015 the TSOs published their first drafts of the Network Development Plan for 2025 and of the Offshore Network Development Plan for 2025. They are based on the 2025 scenario framework, which was approved by the Bundesnetzagentur on 19 December 2014.

In view of an amendment to the Energy Act, which changed the previous annual network development planning to every two years, no new scenario framework was initiated in the year under review

[2] Federal Law Gazette I, page 2,490 ff



responsibility of the Bundesnetzagentur. The Bundesnetzagentur carries out both the federal sectoral planning for these projects and the subsequent 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. The aim of federal sectoral planning is to define route corridors 500m to 1,000m wide that are environmentally sustainable and compatible with regional planning. The outcome of federal sectoral planning is legally binding on any subsequent planning approval procedure.

Federal sectoral planning begins with an application submitted by a TSO as the project promoter. The application contains the proposed route corridor and any possible alternatives, and also provides details of the impact on people and the environment. The application as per section 6 NABEG provides the basic information that is used at the public scoping conference. The conference provides a venue to discuss the scope and the object of the federal sectoral planning tions and the interested public.

Kilometre overview

	NDP 2024 TSO application	NDP 2024 confirmed	NDP 2023 confirmed	BBPlG 2015	BBPlG 2013
AC new power lines	650 km	648 km	600 km	550 km	650 km
DC corridors	2,300 km	1,750 km	1,600 km	1,750 km	1,600
km DC new power lines Interconnectors	250 km	250 km	250 km	250 km	250 km
AC network reinforcement	3,700 km	2,750 km	2,500 km	2,800 km	2,000 km
AC/DC conversion	300 km	300 km	300 km	300 km	300 km
Total	**7,200 km**	**5,698 km**	**5,250 km**	**5,650 km**	**4,800 km**

Federal sectoral planning

On 31 December 2015 an amended version of the Federal Requirements Plan Act (BBPIG) entered into force. The federal requirements plan contained in the act covers 47 projects that are based on the confirmed Electricity Network Development Plan for 2024. Of these projects, 17 are designated as crossing federal state or national borders within the meaning of the Grid Expansion Acceleration Act and fall under the responsibility of the Bundesnetzagentur. The Bundesnetzagentur carries out both the federal sectoral planning for these projects and the subsequent 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. The aim of federal sectoral planning is to define route corridors 500m to 1,000m wide that are environmentally sustainable and compatible with regional planning. The outcome of federal sectoral planning is legally binding on any subsequent planning approval procedure.

Federal sectoral planning begins with an application submitted by a TSO as the project promoter. The application contains the proposed route corridor and any possible alternatives, and also provides details of the impact on people and the environment. The application as per section 6 NABEG provides the basic information that is used at the public scoping conference. The conference provides a venue to discuss the scope and the object of the federal sectoral planning with the project promoters, public agencies, industry associations and the interested public.

Once the scoping conference has been concluded, the Bundesnetzagentur defines a scope of assessment, which also determines the supplementary documents and reports required from the project promoters. The Bundesnetzagentur displays the documents for a month at its office in Bonn and at other suitable locations. On the basis of the documents provided by

Overview of the estimated network expansion costs

	Total	Start network	Additional network (NDP)
2. Draft NDP 2024 (TSOs)	€23bn	€5bn	€18bn (excl. cabling)
confirmed NDP 2024 (BNetzA)	€18bn	€5bn	€13bn (excl. cabling)
1. Draft NDP 2025 (TSOs)	€24-35bn	€5bn	€19-30bn (depending on share of cabling)

the TSOs and the environmental report, the Bundesnetzagentur then holds official and public participation proceedings. Objections received are dealt with at a hearing.

The federal sectoral planning ends with the decision of the Bundesnetzagentur on a specific route corridor after it has weighed up all the arguments put forward. The aim is for a technically and environmentally feasible corridor that impacts people and the environment as little as possible. The route corridors determined in the federal sectoral planning are binding for the subsequent planning approval and are included in the Federal Grid Plan for information purposes.

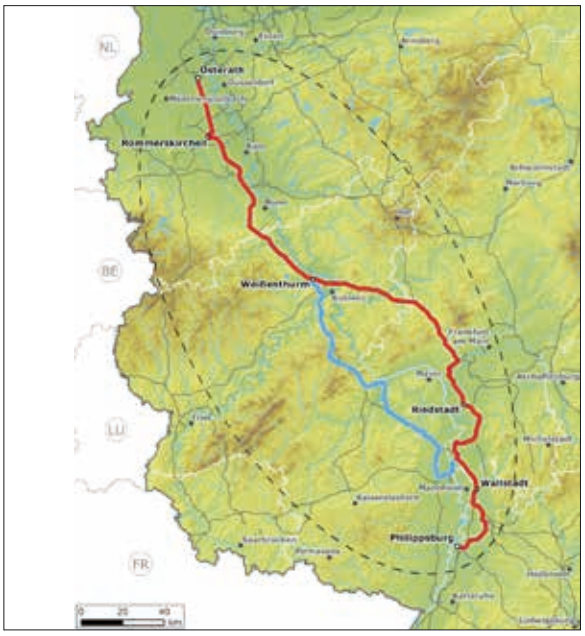
Application for federal sectoral planning for project no 11 BBPIG (Bertikow – Pasewalk)

In August 2014 the transmission system operator 50Hertz submitted an application for federal sectoral planning for a power line from Bertikow to Pasewalk (no. 11 of the Federal Requirements Plan Act), which started the first formal proceedings.

On 24 September 2014, the Bundesnetzagentur held a public scoping conference in Torgelow, after which it defined the scope of assessment. This was based on the application documents, however also taking account of the scoping conference findings and the information subsequently received on the spatial and environmental sustainability of the proposed route corridor and information on any possible alternatives. The scope of assessment was published on 18 November 2014 and can be accessed at the Bundesnetzagentur website www.netzausbau.de/vorhaben11. At the end of July 2015 the project promoter submitted documents for the planning evaluation and the strategic environmental assessment of the route corridor under section 8 NABEG.

Application for federal sectoral planning for project no 2 BBPIG (Ultranet)

The project promoters Amprion and TransnetBW have submitted an application for federal sectoral planning to the Bundesnetzagentur for all five sections of project no 2 BBPlG from Osterath to Philippsburg.



The application for section A between Riedstadt in Hessen and Mannheim-Wallstadt in Baden-Wuerttemberg was submitted on 2 December 2014. A scoping conference was held on 24 February 2015 in Weinheim and on 3 March 2015 in Bingen. It was necessary to hold two conferences to consider the choice between Bürstadt and Weißenthurm. The Bundesnetzagentur has used the findings of the scoping conferences to define the scope of further assessments. It published its defined scope of assessment on 25 June 2015, at the same time specifying the details required in the documents to be submitted by the project promoter.

The project promoter TransnetBW submitted a further application for federal sectoral planning for section B of the project between Mannheim-Wallstadt and Philippsburg to the Bundesnetzagentur on 29 December 2014. The Bundesnetzagentur held a scoping conference in Hockenheim on 14. April 2015 on the proposed route corridor and the alternatives for this section, and on this basis published the defined scope of assessment for this section on 3 September 2015.

At the beginning of October 2015 Amprion submitted an application for federal sectoral planning for section C from Osterath to Rommerskirchen. A scoping conference for section C was held on 11 and 12 January 2016 in Neuss.

On 29 October 2015 Amprion submitted an application for federal sectoral planning for section D of the project between Weißenthurm and Riedstadt. A scoping conference took place on 23 and 24 February 2016 in Mainz. Amprion further submitted an application to the Bundesnetzagentur for federal sector planning for section E from Rommerskirchen to Weißenthurm on 18 December 2015, which is currently being checked for completeness.

Application for federal sectoral planning for projects nos 3 and 4 BBPIG ("SuedLink")

On 12 December 2014 the project promoter TenneT submitted an application for federal sectoral planning for project no 4 (BBPIG) from Wilster in Schleswig-Holstein to Grafenrheinfeld in Bavaria. The Bundesnetzagentur checked the application in terms of content and legal conformity and informed the project promoter on 9 February 2015 that the documents were found to require revision. At the end of December 2015 the legislature introduced a priority requirement for underground cables for DC power lines (see the section on "underground cables"). Previously the project promoters' planning was based on primarily using overhead power lines and underground cables only being used in exceptional cases.

Following the "Principles for a successful implementation of the energy transition" of 1 July 2015 issued by the party chairmen of the government coalition and based on statutory regulation, TenneT stated that giving priority to underground cables would entail a reorientation in planning possible route corridors. No application has yet been submitted for project no 3, which also forms part of the "SuedLink“ and lies between the grid connection points Brunsbüttel in Schleswig-Holstein and Großgartach in Baden-Württemberg. However, the political agreement contains the aim for "SuedLink" to have both projects following a joint main route as far as possible. In this respect the project promoters have already announced their intention of submitting the newly drawn up application for project no 4 BBPIG and the application for project no 3 to the Bundesnetz-agentur at the same time in the hope of speeding up the process.

Underground cables
The law that entered into force on 31 December 2015, which amends the laws governing power grid expansion, gives priority to underground cables for DC power.

In future, DC power lines are to be installed using underground cables in preference to overhead power lines. Previously priority had been given to overhead power lines and underground cables were the exception. Nevertheless, overhead power lines can still be considered in exceptional cases for nature conservation, for use in existing routes and at the request of any municipalities affected insofar as no general exclusion applies to overhead lines due to their proximity to housing.

With respect to extra-high voltage AC power lines, priority will continue to be given to overhead power lines on technical grounds. Additional pilot projects for underground cables in this area should permit further knowledge to be acquired in underground transmission cabling and should help drive its technical development.

In addition to regulations on underground cabling, the law contains the federal requirements plan, updated on the basis of the confirmed network development plan, which stipulates with binding effect the points of origin and destination of the extra-high voltage lines that are necessary to meet energy supply requirements.

The Bundesnetzagentur welcomes the priority given to underground cable for DC power lines, especially as this opens up the possibility of reaching a consensus on a solution with the citizens concerned. Overall, it must be assumed that there will be fundamental new planning premises for the sectoral planning procedures, for which the Bundesnetzagentur will be responsible. The previous planning of the network operators will have to be completely revised. To this end the Bundesnetzagentur drafted a position paper early in the legislative procedure that defines the new statutory requirements with respect to legal and methodical aspects and provides a technical framework for planning DC power lines with priority underground cabling as provided for by law.

Underground cable priority for DC projects

At the end of 2015 the legislature introduced a basic principle giving priority to underground cables for high voltage direct current transmission (HVDC projects). In future those projects designated with an "E" in the Federal Requirements Plan will be implemented using underground cables in preference to overhead power lines.

Up to now underground cables have been the exception – masts and power lines above ground had had priority. According to the new legislation, any such overhead power lines can only be installed in exceptional cases for nature protection, for use in existing routes and, for instance, at the request of any municipalities affected – but only if this occurs at a legally stipulated distance from housing.

If existing routes are used, overhead lines can only be made use of if no further significant impact on the environment is expected. According to the new legislation, a requirement for straight lines has become particularly important. This requirement states that the route corridor should follow a straightline as far as possible between the point of origin and the termination point of the project for the later installation and deployment of underground transmission cables. A route corridor is a strip of land 500m to 1000m wide, which the actual future power lines will run along. Apart from economic aspects, this would also reduce the impact on nature and the countryside. Moreover, this would also ease the impact on those citizens affected by the grid expansion.

Monitoring – Documentation of progress made
Attention was already being focused on expediting grid expansion at the extra-high voltage level upon the Grid Expansion Acceleration Act (EnLAG) entering into force in 2009.

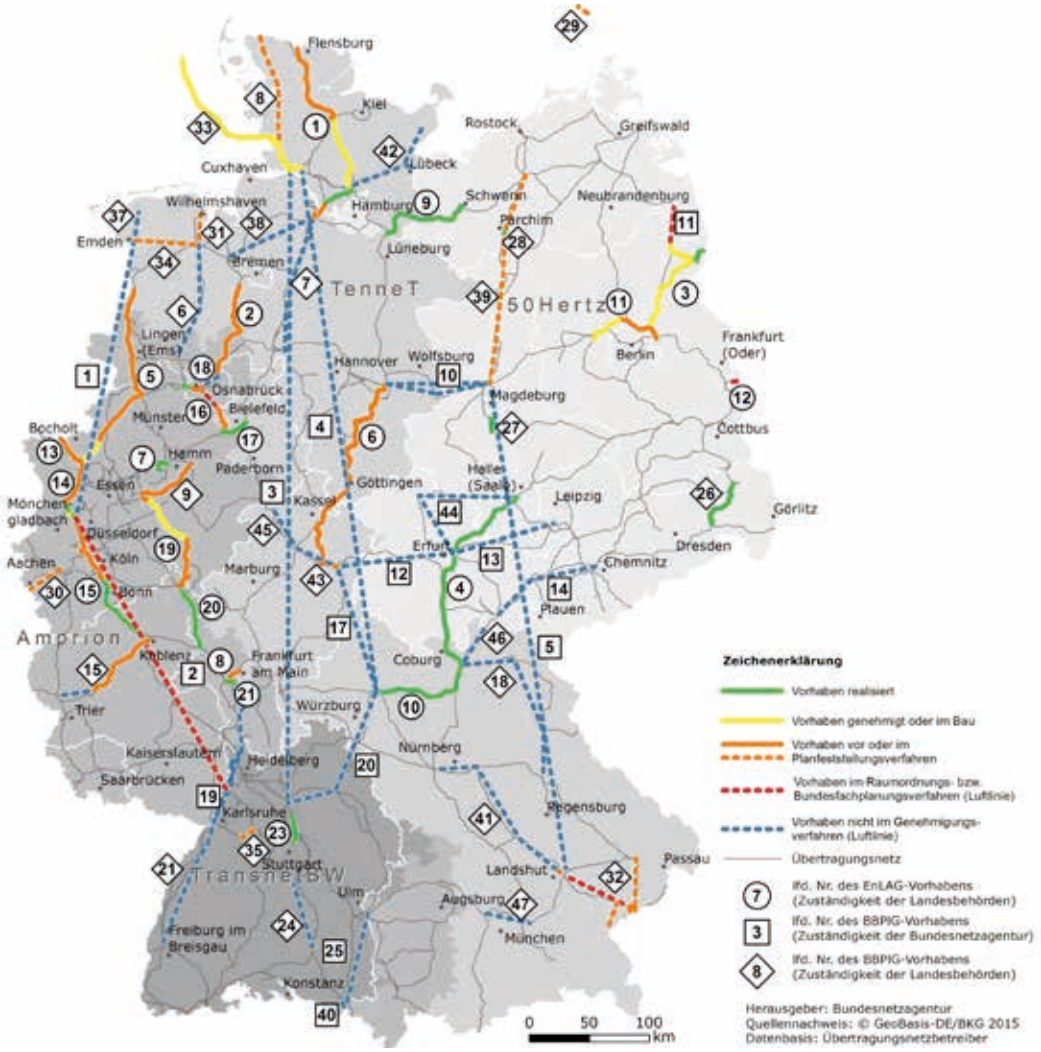
The current version of the law contains 23 projects that require urgent implementation in order to meet energy requirements. Project no 24 under the EnLAG is no longer deemed necessary for energy requirements in the Network Development Plan for 2024 due to alternative operational solutions put forward by the transmission system network operators.

The power lines to be installed have a total length of 1,816km; the regional planning and planning approval procedures for these power lines are the responsibility of the individual federal state authorities. Of the 614 kilometres of route that have now been constructed, factoring in those in the fourth quarterly report of 2015, about 150km were completed in 2015. The TSOs expect around 55% of the power line routes under the EnLAG to be completed by 2017. So far, none of the underground cable pilot lines have been put into operation.

The TSO Amprion is currently preparing tests under operating conditions for the first 380 kV underground cable pilot project in Raesfeld.

To remain aware of the status of the EnLAG projects, the Bundesnetzagentur has implemented an EnLAG monitoring process. For this purpose the four German TSOs, TenneT, 50Hertz, Amprion and TransnetBW, forward quarterly reports on the planning and construction progress of the projects in their control areas. The progress status of any of the construction projects can be viewed at the Bundesnetzagentur's website at www.netzausbau.de/enlag.

Alongside the EnLAG project monitoring, the Bundesnetzagentur also publishes the procedural status of expansion projects under the Federal Requirements Plan Act on its website at www.netzausbau.de/bbplg. More detailed information about specific projects is also available.



Participation and dialogue
To increase transparency and gain public acceptance for increasing the number of power lines, the Bundesnetzagentur not only offers the opportunities for participation that are prescribed by law but also arranges informal events and information opportunities that are tailored to the specific stakeholders.

Technical dialogue on "Underground cables and overhead power lines - opportunities and risks"
On 24 June 2015 the Bundesnetzagentur discussed the opportunities and risks of underground cable and overhead lines with experts in the field and with an interested public. Information was also shared on the latest state-of-the-art technology and on health and environmental issues.

Science and research dialogue
On 17 and 18 September 2015 the second science and research dialogue took place in Bonn. As in previous years, the event provided a platform for an academic exchange on the grid expansion with the aim of encouraging the relevant research findings being put into practice. The event's main focus were the challenges associated with expanding the grid and these were addressed in two ways: as papers presented by selected authors and in discussions between panels of experts.

Technical dialogue on converters
The technical dialogue on 17 November 2015 in Cologne dealt with legal consent issues, technical aspects and the search for an appropriate site for a converter.

Information events for network development plan consultation and for the environmental report
The Bundesnetzagentur's consultation on the Network Development Plan for 2014 and on the environmental report included four information events. The aim of these events was to promote open dialogue on the network expansion required and its expected impact on the environment.

The netzausbau.de website, which provides background details and the latest information on current developments in grid expansion, was completely overhauled in November regarding its technical functionality and content. The page now has a better, more cohesive information layout and the additional photos and graphics improve clarity. A wide range of publications, plus short films on YouTube and presentations on Slideshare, round off the information on offer. In 2015 the animated film series "The grid expansion in five steps" was completed alongside the films on plan approval and on the scenario framework. The animated films were recognised at the European Best Practice Award of the Renewables Grid Initiative as being worthy of note and were amongst the best cases from the 2015 "Good Practice of the Year" competition.

In addition, the general public can obtain information from our public advice service. This is staffed by employees from the network expansion department who are available to provide information over the telephone or will answer post and email enquiries.

Expansion in the electricity distribution system
Alongside the TSOs it is primarily the distribution net-work operators (DSOs) who face the most challenges from the strong growth in renewable energy sources. More than 98% of renewable energy generation plants are still connected at a voltage level below that of the extra high voltage network. This is confirmed by the results of the Bundesnetzagentur's survey of the annual network expansion and network status reports from the DSOs. An analysis and comparison of the distribu-tion network structure with the transmission networks show that the former is much more extensive and complex than the transmission networks as regards network length and the number of connections. Evaluations also point to the important role of the distribution network in integrating renewable power generation plants although the load placed on the individual distribution networks fluctuates enormously. More than 70% of the renewable generating capacity is connected to just 20 of the 813 distribution network operators. Details of the investments planned over the next 10 years give reason to believe that the network operators concerned will meet their network expansion obligations and their investment in the network will be at an appropriate level.

With respect to the deployment of intelligent operating equipment, growth rates can be seen in the number of controllable distribution transformers and innovative measures such as reactive power feeding. This means that the move towards intelligent distribution network operations is in full flow.

A comparison of the installed renewable generating capacity per federal state with the average length of interruption (SAIDI – System Average Interruption Duration Index) per federal state shows that there is no obvious connection between the two. This refutes the theory that the quality of supply in Germany has worsened due to the increased number of renewable energy installation.

More information on interruptions to the electricity supply can be found at www.bundesnetzagentur.de/SAIDI-electricity.

The Bundesnetzagentur has continued to implement the aim of the 27 November 2013 coalition agreement in setting up a system of capping the renewable energy installation feed-in peaks in order to reduce the costs of network expansion. Together with the Federal Ministry for Economic Affairs and Energy, the Bundesnetzagentur has developed a policy system to simulate the capping of up to 3% in the network flow plan of the energy volume that is generated annually by each wind power and photovoltaic installation. Renewable installations will only be disconnected once all other possibilities have been exhaused in normal network operations. This allows optimum aggregate network expansion to be achieved without scaling back renewable electricity too much. This system has been implemented in the latest draft Electricity Market Act.

Network expansion in a European context

In 2013 the European Union created a new legislative framework to expand cross-border energy projects at the European level.

The Regulation of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure (TEN-E Regulation) has been directly applicable since June 2013. In addition to a functioning internal energy market, the Regulation aims to achieve the EU's energy policy targets and to contribute to security of supply. Amongst others, it sets out the process for selecting projects of common interest (PCI). The second Union List of PCIs was published as an attachment to the TEN-E Regulation on 18 November 2015. This second list contains 19 PCIs in the electricity sector plus one pumped storage unit in the gas sector and two in the oil sector. A new addition in the electricity sector is the designation of 11 German projects as e-highways. In total, approximately 195 PCIs from all over the EU were included in the Union List of PCIs. The TEN-E Regulation establishes the measures and tools that can be used to speed up the permit granting process. Moreover it establishes the regulatory framework that offers investment incentives and financially supports energy infrastructure projects. The Bundesnetzagentur actively contributed to the PCI selection process and worked closely with European institutions and other regulatory bodies on further areas where the TEN-E Regulation is application.

The timely execution of a PCI is a joint, European priority. For this reason the TEN-E Regulation has introduced strict requirements on permit granting procedures so as to speed them up, yet at the same time taking account of the strict environment regulations and of EU legislation. In Germany the Bundesnetzagentur has been designated the competent authority and has taken on responsibility for coordinating the decision in a comprehensive way in accordance with the "collaborative scheme". The state and federal authorities' previous responsibility for conducting permit granting procedures for PCIs remains unchanged. The Bundesnetzagentur acts as a "one-stop shop" authority and thus as the central point of contact for the competent state and federal authorities in Germany, those of the other EU Member States and for the European Commission. This makes the coordination of PCI permit granting procedures more efficient. In addition the Bundesnetzagentur published a PCI Manual of Procedures on the internet in May 2014. The list of PCIs is updated every two years. The Bundesnetzagentur publishes up-to-date information on its website. This gives the public an opportunity to obtain information about the importance of network expansion and the latest developments within a European context.

Implementation of the TEN-E Regulation requirements (EU 347/2013)

In 2014 the Bundesnetzagentur decided on three German project developers' applications for cross-border cost allocation for PCIs in the gas sector under the TEN-E Regulation. As a result, the investment costs were allocated in line with the application. In the electricity sector the Bundesnetzagentur has only dealt so far with one application for cost allocation for PCI 4.5.1 LIT POL LINK. The cost-benefit analysis submitted by the applicant was not transparent and therefore a cost participation was not considered appropriate. As the regulatory authorities who were involved from Lithuania, Poland, Finland, Germany, Latvia, Sweden and Norway could not agree on a cross-border cost allocation, the Agency for the Cooperation of Energy Regulators (ACER) took over the procedure in December 2014 and issued a decision in April 2015. The project costs were allocated in full to Lithuania with the Lithuanian network operator, Litgrid AB, placed under an obligation to finance the investment costs from the Lithuanian network charges.

The assumption of costs by foreign parties was refused. Thus ACER was of the same view as the Bundesnetzagentur in key aspects of its decision. This was decisive in ensuring that the German network users were not negatively affected by the decision.

Network and system reliability

Redispatch, feed-in management and emergency measures

The change in the power generation landscape and delays in expanding the grid place enormous demands on the power grids. In particular, the extent to which measures have been introduced to ensure security of supply has greatly increased in recent years. An important part of the Bundesnetzagentur's work is analysing the measures employed by the network operators and checking them for plausibility. These measures are split into two distinct groups: redispatch and feed-in management measures. The first redispatch measures are triggered if sections of the circuit have to be protected against congestion. Redispatching includes any interventions in generating capacity that are necessary to protect those sections of the lines affected. Feed-in management intervention occurs if network capacity is inadequate. This second measure can temporarily scale back the feed-in priority that is given to electricity from renewable energy sources, mine gas, and combined heat and power plants (CHP). This measure only comes into effect when the grid capacity is no longer adequate.
The previous annual data collection on measures became insufficient given the dramatic increase in network and security interventions. In response, the Bundesnetzagentur set up several data submission procedures allowing it to collect data at shorter intervals and decided to publish its findings on a quarterly basis. For the first time a detailed presentation of feed-in management and estimated costs is possible for every federal state. Additionally, the report allows conclusions to be drawn on the seasonal fluctuations of all network and system security measures. The quarterly reports can be downloaded from the Bundesnetzagentur's website at www.bundesnetzagentur.de/systemstudie.

Reserve capacity, system-relevant power stations and expression of interest procedures

If the power plant capacity available on the market is insufficient to correct the network congestion, the TSOs are instructed to procure the missing redispatch capacity from the reserve capacity. For this purpose the TSOs examine the reserve capacity requirement every year taking the requirements previously defined by the Bundesnetzagentur into consideration. In this connection, the critical situations at the border for network operation are defined by the TSOs in agreement with the Bundesnetzagentur. These involve specific weather and consumption situations, such as full load scenarios, namely high consumption and strong winds, which place particularly high demands on the safe operation of the transmission networks. The Bundesnetzagentur examines the relevant input parameters from the load, generation, trade and network areas for Germany and neighbouring countries and, following any necessary adjustments, releases these to the TSOs for further calculations. Once the demand requirements have been identified, the results are checked by the Bundesnetzagentur, are defined as binding and are published in a report on the demand identified.

The relevant report from the Bundesnetzagentur on identifying the reserve power plant capacity demand for the 2015/2016 winter, as well as that of 2016/2017 and 2019/2020, was published on 4 May 2015. A reserve requirement of a minimum amount of 6,700 MW to a maximum of 7,800 MW has been identified by the Bundesnestzagentur for the 2015/2016 winter. The reserve requirement for the 2016/2017 winter falls within a 6,600 MW to 7,700 MW range. The reserve requirement for the 2019/2020 winter is 1,600 MW on the assumption that a congestion management procedure will be introduced at the German-Austrian border.

The reserve capacity comprises national and international reserve power plants that are deployed as needed by the TSOs to ensure system reliability for an increase in input capacity. The national reserve power plants used for reserve capacity are power plants intended for closure that may not be shut-down as they are systemically relevant for the grid. The increase in input capacity from these power plants removes congestion in the extra-high voltage lines when wind power feed-in from northern and eastern Germany is high.

Following the closure notifications received by the Bundesnetzagentur as of 18 January 2016, of those power generation units notified for final shut-down so far 11 power generation units of 2,727 MW in total have been designated as systemically relevant by the TSOs and approved as such by the Bundesnetzagentur. By this means the Bundesnetzagentur prevents the closure of systemically relevant plants in order to maintain system reliability. These plants then become an integral part of the reserve capacity as of the date of the intended final closure. In addition, six power plants with total output of 1,788 MW, whose operators have notified a provisional shut-down, have been designated as systemically relevant by the TSOs. These power plants will become an integral part of the reserve capacity as of the date of the notified provisional closure and will also be available to the TSOs exclusively for reliable system management.

Foreign power plants for reserve capacity are examined by means of several expression of interest processes. The starting point for any such process is the requirement identified in each demand identification report or the range of reserve capacity required for the period examined. In addition to the total demand spread identified, the potential reserve capacity already available from national power plants and the situation at foreign power plants are decisive for the specific demand requirement. The more relief from congestion that can be provided by the power plants put forward for the examination process, the less total power has to be contracted within the demand spread identified.

In the call for expressions of interest this year (IBV) 1,107 MW was secured from abroad in addition to the capacity already contracted for the 2015/2016 winter. Reserve capacity for winter 2015/2016 totalled 7,515 MW. Of this, 2,995 MW are contracted domestically and 4,520 MW internationally. The international power plants are located in Austria, Italy, Switzerland and France. For next winter, 2016/2017, an initial 3,925 MW have been contracted internationally. A further domestic 3,488 MW takes the total reserve capacity for winter 2016/2017 to 7,413 MW. The Bundesnetzagentur supported the TSOs during the contract negotiations and confirmed the offer combinations that had been previously agreed with them.

Reserve capacity is most often used in winter months when high wind infeed combines with a high consumption load. The reserve capacity has been increasingly called upon since the beginning of November 2015. The reason for this is the efficiency factor applied to the TSOs' weekly operations plan, which gives priority to power plants that are better at correcting any shortages. This can result in foreign power plants, especially those in Austria, being deployed before domestic power plants.

The preliminary contingency capacity costs for this reserve capacity amount to approximately €190m for winter 2015/2016 and about €192m for winter 2016/2017. These figures do not include the bill for the actual reserve capacity deployed because these costs are dependent upon deployment and the final figure is only available once winter is over.

Electricity transport between Germany and Austria

At the moment Germany and Austria form one price zone in the electricity market. This means there is uniform pricing in the two countries and electricity can flow unrestrictedly between the two countries according to availability and demand. The amount of electricity flowing from Germany to Austria has risen in recent years and will increase even more in the coming years according to calculations of the Bundesnetzagentur and the German transmission system operators. This will exceed the trading capacity that can be transported safely over the two power lines connecting the countries. Even with the completion of network expansion in 2024, trade will significantly exceed the grid's transport capacity.

The prevailing EU legislation provides for the amount of trade to be facilitated that can be safely transported along two cross-border power lines. To ensure this long-term, a process has already been initiated to examine the bidding zone configuration in the Commission Regulation establishing a guideline on capacity allocation and congestion management. Naturally, the Bundesnetzagentur will ensure that any capacity allocation at the German-Austrian border is legally compliant with European statutory requirements. More specifically, this means that no internal congestion can be pushed to the border.

The Bundesnetzagentur does not view possible alternative grid stabilisation measures, such as redispatch, to be sufficient as permanent measures to guarantee long-term security of supply in the region. It is therefore holding talks with the regulatory authorities and network operators directly concerned, including those of Poland, the Czech Republic and Austria. The talks aim to integrate the German-Austrian border into a joint Central European flow-based market coupling and to draw up other short-term solutions such as improved redispatch cooperation. These are expected to take place between Germany and Austria initially. To allow German transmission network operators to have recourse to suitable power plants for redispatch in the future, the redispatching amounts are to be reduced and at the same time the TSOs will be given more leeway. The precise details and the breakdown of the costs incurred are currently being discussed between the Bundesnetzagentur and E-Control, the Austrian regulatory authority, as well as with each transmission system operator.

Read more about this market coupling in "Market coupling" from page 43 onwards.

Gas network expansion

Gas network development plan

The gas network development plan contains measures for the appropriate enhancement, transmission gains and expansion of the gas supply network for the next ten years. Security of supply must be as equally guaranteed as a secure and reliable network operation. The annual duty to prepare a network development plan is prescribed by law. The plan is mainly concerned with expansion issues arising out of the connection of gas power stations – in light of the interface to the electricity market – and gas storage facilities. Furthermore, both the connections between the German gas transmission system and those of neighbouring European countries, as well as the capacity requirement in the downstream networks, are examined.

On 1 April 2015 the TSOs submitted the Gas Network Development Plan for 2015 to the Bundesnetzagentur. The latest plan essentially continues with the projects given binding effect by the Bundesnetzagentur in the 2014 plan. It also considers 37 new expansion measures to be necessary in the period up to 2025, of which a large number – 27 of the new measures – are connected with the market area conversion process and the resulting additional demand for H gas.

Read more about this market area conversion in "Market area conversion" from page 28 onwards.

From a security of supply perspective, market area conversion plays a vital role in the draft plan submitted. The outcome is a specific proposal for the gradual transformation of these sectors that goes beyond 2025 to cover the period until 2030. The draft plan contains two distinct models that differ in only one aspect in their scope and cost of the expansion. This difference arises from taking inequal amounts into account when calculating the capacity requirements for the downstream DSOs. The gas TSOs' proposed network plan selected from these two models resulted in a pipeline extension totalling 810km and a compressor expansion of 405 MW. Investments over the next ten years for all the 86 projects will amount to €3.5bn.

The Bundesnetzagentur's consultation on the plan ran from 14 April to 5 June 2015. Following evaluation of the responses, the Bundesnetzagentur issued a request for modification to the TSOs on 1 September 2015.

The proposed measures were confirmed in principle in the request. However, two unspecific projects relating to market area conversion and proposed by Open Grid Europe (OGE) and by Thyssengas, were not confirmed and one project proposed by Gasunie Deutschland (GUD) was modified.

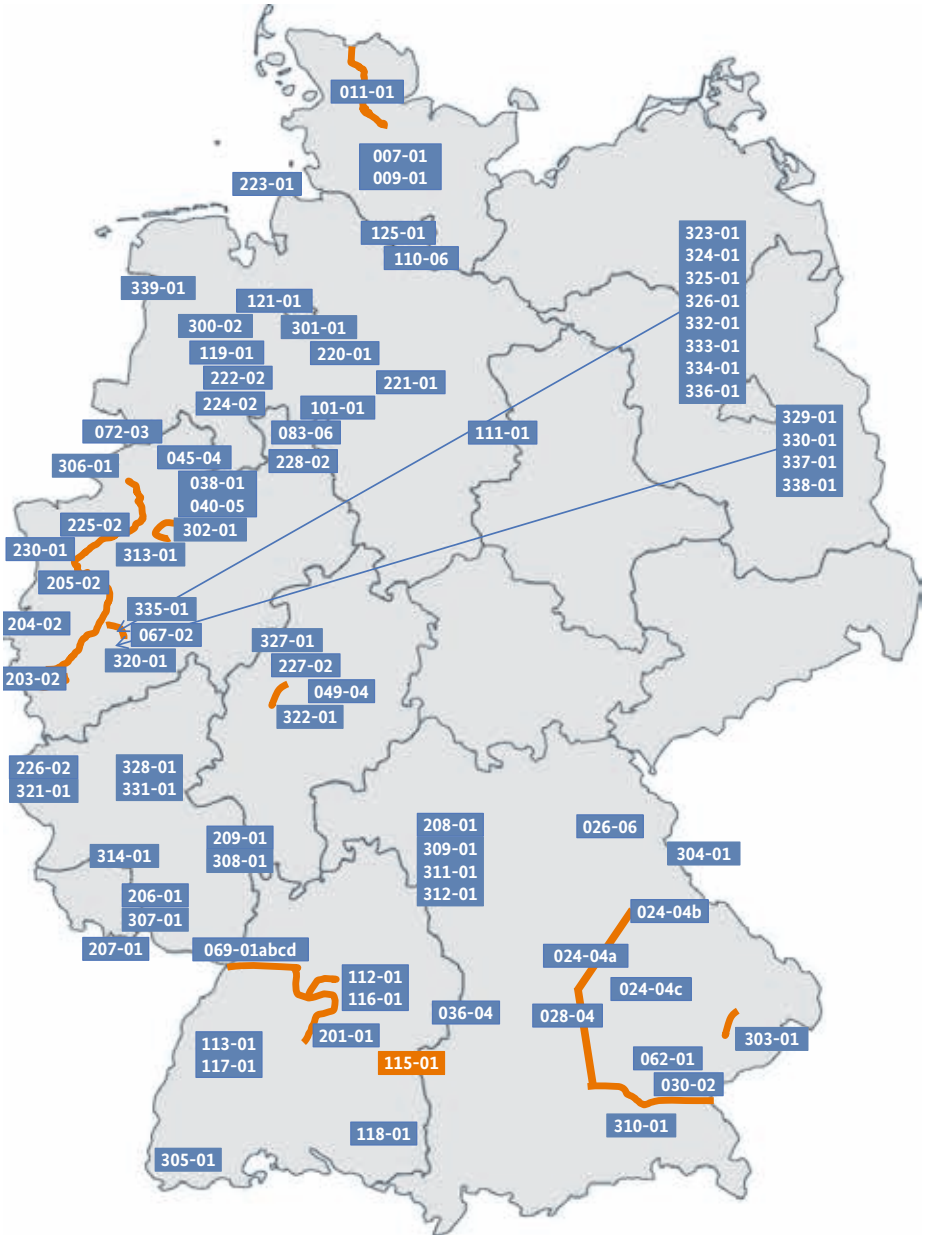
In the meantime the TSOs have carried out the recommended modifications and have published a modified Gas Network Development Plan for 2015. The binding measures include a 810km pipeline extension and a compressor expansion of 393 MW in the next ten years. Investments for all of the 84 projects will amount to €3.3bn. These include 204 MW compressor expansion and 294km additional pipelines to a value of €1.6bn that are related to the market area conversion at the transmission pipeline level.

Scenario Framework for the Gas NDP 2016

Following the implementation of the recommended modifications, the TSOs started work on modelling and drawing up the Gas NDP 2016. It is based on the gas scenario framework approved by the Bundesnetzagentur on 11 December 2015.

Meeting the capacity requirement of the distribution network operators is essential in ensuring security of supply. Uninterrupted supply to the DSOs is once again required in the 2016 scenario framework confirmation and should be taken into strong consideration in the Gas NDP 2016. The mandatory calculation model versions must be based on growing capacity requirements over the following five years. This approach must be continued for a further five years until 2026.

Graph showing the results of the Gas Network Development Plan for 2014 and 2015



The question of where the H-gas (high calorific gas) required in future originates plays an important role in the 2016 scenario framework. H-gas is intended to compensate for falling domestic production and lower import volumes of L-gas (low-calorific gas). The scale of the expansion necessary to ensure the gas network's continual robustness is to be determined in the Gas NDP 2016 based on two different forecasts on the distribution of H-gas sources..

Moreover, it is intended to create an improved connection to existing gas storage facilities. To this end, the Bundesnetzagentur requests the TSOs in the scenario framework 2016 to determine the costs and benefits of the required gas network expansion. Taking the scenario framework as a basis, the TSOs submitted a draft Gas NDP to the Bundesnetzagentur on 1 April 2016.

All documents relating to the Gas NDP 2015 and the Gas 2016 scenario framework, as well as extensive lists of all the storage facilities, network points and power plants can be found at the TSOs' website www.netzentwicklungsplangas.de.

Overview of the gas network development plan expansion measures

	Gas NDP 2012	Gas NDP 2013	Gas NDP 2014	Gas NDP 2015
Additional	640 km	522 km	748 km	810 km
Additional	357 MW	344 MW	343 MW	393 MW
Number of measures total*	32	27	51	84
Total costs	**€2.2bn**	**€2.2bn**	**€2.8bn**	**€3.3bn**

*The Gas NDP measures include gas pressure regulating and metering stations, reverse flow compressors and switching plants as part of the market area conversion, which have not been explicitly listed in this table.

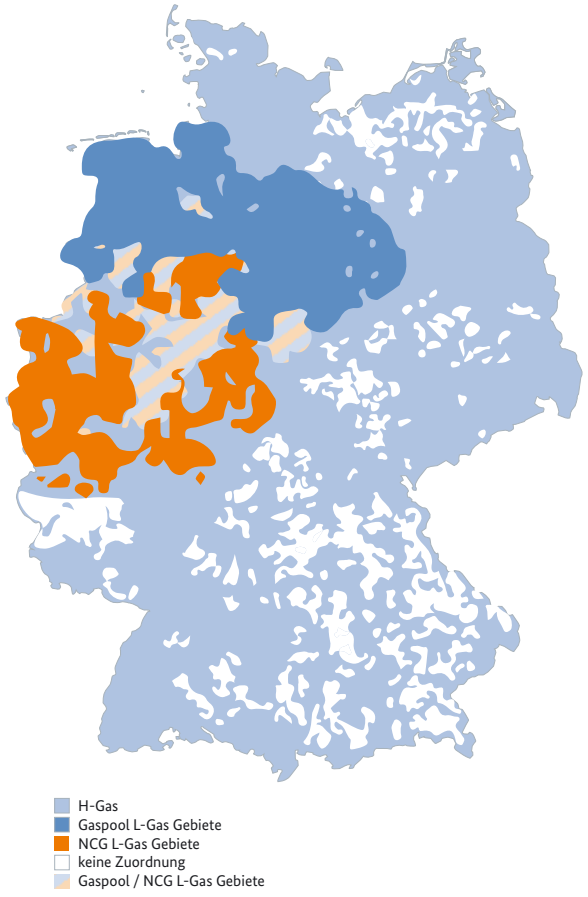
More information on gas network development, on the request for modifications to the Gas NDP 2015, the assessment of the consultation outcome and on the 2016 scenario framework can be found at www.bundesnetzagentur.de/gasnetzentwicklung. (in German)

Market area conversion

In 2015, Schneverdingen in Lower Saxony, was the first of many network areas to be converted from L-gas to H-gas. On 1 October 2015 the local municipal utility company successfully implemented the conversion for about 6,000 connected customers. This had been preceded by a year of careful planning by the network operator involved. Building upon the experience gained, plans for the market area conversion from L-gas to H-gas have been pushed ahead.

German L-gas outputs are declining and L-gas imports from The Netherlands will also decline from 2020 onwards. This makes it necessary to carry out a comprehensive changeover in the L-gas network areas. At present the supply of L-gas from The Netherlands to Germany is scheduled to end in 2029. Hence it is planned to carry out a gradual, extremely well-coordinated changeover in the L-gas network areas in Germany. By 2030, an estimated 4.3m consumers, traders and industrial enterprises, primarily in northern and western Germany will be re-fitted with some five to six million gas appliances. On the gas network operator side, five TSOs will be affected as well as numerous DSOs.

The gas TSOs included a planned timetable for the network areas to be converted by 2030 in the Gas Network Development Plan for 2015. Conversion of the first, as yet small areas started in 2015. Larger network areas, such as Bremen, will follow from 2017 onwards. The website of the German association of gas transmis-



Übersicht Maßnahmenzahl

	gesamt	bestätigt	nicht bestätigt
NEP Gas 2015	**86**	**84***	**3***

* Zwei Maßnahmen wurden nicht bestätigt, eine der Maßnahmen nur unter Anpassungen.

sion system operators (FNB Gas) provides an overview of the bindingly agreed dates for conversion that are accurate to the month for the next five years.

In recent years the Bundesnetzagentur has worked primarily on the interpretation and form of the regulatory framework as well as on dialogue with the regulatory authorities of the federal states, network operators, conversion service providers, associations and other market players. This dialogue covered various aspects such as costs, the technical organisation of the conversion and developments on the conversion service providers' market.

Internet pages on types of contract, the breakdown of gas and electricity prices, and power bills enjoyed a large number of visitors to year end 2015 and an especially high number also visited the FAQs page on the market area conversion. In fact, there was a sevenfold increase in use, especially once the conversion of gas quality from L-gas to H-gas got underway in the rural district of Soltau in Lower Saxony in summer 2015. The Bundesnetzagentur has put together the most important questions and answers on this topic and has drawn up an up-to-date brochure giving a brief overview, which can be ordered from the energy consumer advisor or press office, or can be down-loaded from the internet.

To provide information for those gas consumers affected, the Bundesnetzagentur has published a list of FAQs on the market area conversion as well as a flyer with the most important information.

www.bundesnetzagentur.de/marktraumumstellung

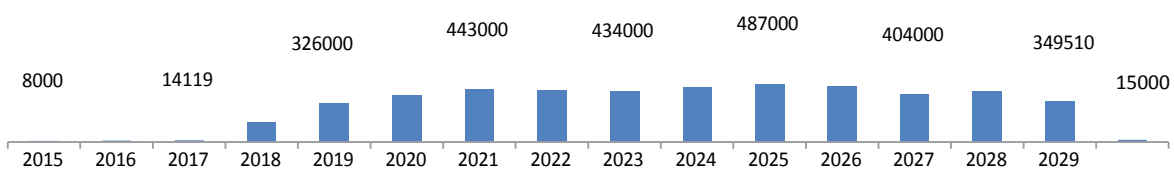
Conversion from L-gas to H-gas

One of the biggest infrastructure projects for German gas supply has been running since May 2015: By 2030 large parts of the natural gas network will have been converted one by one. This means that the low calorific L gas will be replaced with H gas, which has a higher caloric value.

Natural gas will be used in two different chemical compositions in Germany. As the transportation of L gas from sources in Germany and The Netherlands declines, regions that are currently supplied with L gas must be switched over to H gas, which is mainly supplied from Norway, Russia and Great Britain. The conversion primarily affects west and north-west Germany, specifically the federal states of Lower Saxony, Bremen, North Rhine-Westphalia, Rhineland-Pfalz, Saxony-Anhalt and Hessen. In these areas the gas quality will be converted in large parts of the network. To ensure safety and quality, new gas pipelines will be built and compressor stations enlarged. Overall five to six million pieces of equipment will be adapted.

The large gas network operators published a planned timetable for the network areas concerned in the Gas Network Development Plan 2015. Conversion of the first, as yet small areas started in 2015. Larger network areas, such as Bremen, will follow from 2017 onwards. The graph below shows the number of consumer appliances that will have to be converted in the next few years in the areas designated for conversion by 2030.

Number of consumer appliances to be converted
per year in the areas designated for conversion by 2030



Source: "The Draft Gas Network Development Plan for 2016" of the gas TSOs, published on 1 April 2016.

Consumer protection and advice

The Bundesnetzagentur keeps consumers informed, provides clear explanations of their rights as household customers as well as their right to apply for dispute resolution.

Energy consumer advice service

In 2015, the energy consumer advice service received a total of 10,368 queries and complaints. Most of the queries and complaints (5,644) related to electricity. 920 queries related to gas supply. In addition to this, the Bundesnetzagentur's energy consumer advice service received 3,804 queries about comprehensive issues and general legal and economic questions relating to the energy sector that only partially fall within the Bundesnetzagentur's remit.

Consumers can contact the Bundesnetzagentur's consumer advice service by letter, fax, email or by phone. Since October 2015, the Bundesnetzagentur expanded its consumer advice service telephone hotline: The service is now available to handle consumer queries – Mondays to Thursdays from 9am to 3pm and Fridays from 9am to 12pm.

As was the case in the past, questions regarding contracts and billing and complaints about the quality of service offered by suppliers was at the top of the list. The bulk of these queries and complaints concerned the same few companies. In particular, consumer complaints related to missing or delayed energy billing and delays in the payment or the settlement of balances and bonuses.

Supervisory proceedings against immergrün-Energie GmbH were discontinued in June 2015. The Bundesnetzagentur had initiated the proceedings in late November 2014 to investigate suspected breaches of the supplier obligations laid down in section 40 of the German Energy Act. The proceedings were discontinued because the number of complaints about delays in interim or final billing had fallen considerably.

The energy consumer advice service is only able to provide consumers with general information on the applicable law, their special rights as household consumers and dispute resolution proceedings, however. It cannot support or represent customers in the process of asserting their individual rights against an energy utility.

If complaining consumers are unable to achieve agreement within four weeks with an energy utility, meter operator or metering service provider, they have the option of turning to the energy dispute resolution panel – Schlichtungsstelle Energie e.V. – for redress as an alternative to taking their case to court.

Information online

The Bundesnetzagentur noticed strong public interest for subjects relating to energy and its tasks. In Germany alone, webpages in the energy section of the Bundesnetzagentur's website were visited over a million times. Per month over 15,000 different users were registered. The number of various downloads went up to over 1,000 a month. Data protection is at the heart of the Bundesnetzagentur's work, this is why individuals who visit the website are not tracked.

The Bundesnetzagentur offers comprehensive information for consumers on its website. The ever growing energy encyclopedia provides explanations for terms such as electricity labelling, smart meter and EEG surcharge (in German). There is also a FAQ section on the topics of supplier switching, energy prices, bills and network connection.

Gas and electricity suppliers

As of 2005, every supplier that supplies household customers with electricity and/or gas has to provide notification of its activity as a supplier to the Bundesnetzagentur as required by section 5 of the Energy Act. The list of suppliers that is updated on a monthly basis is available to the public on the website of the Bundesnetzagentur.

In 2015, the total number of gas and electricity suppliers registered increased at a constant pace. This list also includes suppliers that voluntarily provided notification, even though they were already active on the market before 2005.

Rulings, activities and proceedings

The allocation and transfer of offshore connection capacity and the new framework conditions for the allocation and use of transport capacity in the gas transmission systems are important examples of the Bundesnetzagentur's broad range of duties. Other examples of the Bundesnetzagentur's work in shaping framework conditions are the implementation of more recent tasks such as those of the Market Transparency Unit and the auctions for ground-mounted photovoltaic installations.

Allocation and transfer of offshore connection capacity
The amendments to the Energy Act (EnWG) which took effect on 1 August 2014 brought about fundamental changes in the regulations for connecting offshore wind installations to the grid. The maximum connection capacity that can be allocated up to 31 December 2020 for links connecting installations in the North Sea and the Baltic Sea is 6.5 GW. Starting from 2021, the maximum is raised by 800 MW per year. According to the transitional arrangement provided for in the Act, the Bundesnetzagentur, as the regulatory authority, can allocate up to 7.7 GW of capacity until 1 January 2018, however. Capacity is allocated following an objective, transparent and non-discriminatory procedure.

The Bundesnetzagentur published its determination with the rules for allocating offshore connection capacity on 13 August 2014. The determination lays down :

- the requirements to be met by operators applying for capacity allocation on existing transmission links or those under construction.
- the rules for auctioning connection capacity in the event of a shortage.

On the basis of this determination, the Bundesnetzagentur allocated a total of 1,511.6 MW to seven offshore wind farms in the North Sea and the Baltic Sea in the first quarter of 2015 through the first procedure for allocating connection capacity. After completion of the first procedure, 211.1 MW below the legal limit of 7.7 GW of connection capacity was still available for new links in the North and Baltic Seas, taking into account all of the unconditional grid connection commitments already in place. The Bundesnetzagentur launched a second procedure for the allocation of the remaining 211.1 MW of connection capacity on 25 March 2015. Demand for connection capacity exceeded the capacity offered in the second procedure. This lead to an auction being carried out by the Bundesnetzagentur on 3 November 2015 among all of the applicants that qualified. In the auction, five offshore wind farms were able to buy the right to allocation of the remaining 211.1 MW of connection capacity. This procedure ensured a quick and legally certain allocation of the remaining offshore connection capacity, meaning that the entire volume of 7.7 GW could be used.

On 23 March 2015, the Bundesnetzagentur concluded a procedure to transfer capacity. Through the transfer of 400 MW of capacity from the BorWin2 transmission link in cluster 6 to the BorWin3 transmission link in cluster 8, all of the unconditional grid connection commitments made under the old legal framework can be met without needing to construct a new transmission link. This saves the network user up to €250m in costs annually.

KARLA Gas 1.1.
On 14 August 2015, Ruling Chamber 7 issued a determination under the ref. BK7-15-001 on the adjustment of capacity arrangements in the gas sector ("KARLA Gas 1.1."). Subject of the proceedings were the framework conditions for the allocation and use of transport capacity in the gas transmission systems.

The European Network Code on Capacity Allocation Mechanisms (CAM) and its entry into force on 1 November 2015 triggered the determination. The CAM network code sets out new regulations that will apply in many areas. This determination was fundamentally addressed to gas transmission system operators.

The determination's major aim was to avoid duplication and rule out any possible inconsistencies between currently applicable national regulations and future European regulations and to thus provide legal clarity for all market participants in as timely a manner as possible. Moreover, the CAM network code sets out official approval requirements for the national regulatory authorities and provides them with some leeway for decision-making, all of which is integrated in the decision adopted by the Ruling Chamber.

The main focuses of the draft under consideration are, among others:

- Updating the the gas standard capacity contract.
- Determining reservation quotas for the provision of short-term capacity at interconnection points between two market areas.
- The revocation of the ban on renomination for day-ahead capacity.
- Information and reporting obligations on the TSOs in the case of a change of platform.

The determination is another component for the pan-European harmonisation of the legal framework concerning access to capacity and for the cross border cooperation of European gas transmission system operators.

GaBi Gas 2.0

On 19 December 2014 Ruling Chamber 7 adopted a decision on the redesign of the gas balancing regime ("GaBi Gas 2.0") under reference BK7-14-020. The determination fundamentally addressed all gas transmission system operators, distribution system operators and both market area managers. First and foremost, the European specifications from the network code on gas balancing were implemented by

More competition: Auctions set the level of support for ground-mounted photovoltaic installations

With the revision of the Renewable Energy Sources Act (EEG) in 2014, the German Government determined that the support for ground-mounted solar PV installations would in the future be determined through auctions. Support for electricity generated from such installations is to be determined competitively and in a cost-effective manner.

Today, energy from renewables makes a significant contribution to our energy supply. To ensure that supporting renewable energy generation is as cost effective as possible and to provide for better planning of the expansion of renewables, the EEG sets out that the level of support for ground-mounted PV installations is to be determined in a pilot auction. The goal of the pilot auction is to set the price of electricity from renewables at a level that ensures the economic operation of the given installation. At the same time, the administrative procedure involved is to be tested. Operators of installations can submit bids for a specific volume of capacity expansion at a price that they themselves set. The most favourable bids will be accepted. This model is also to replace the feed-in tariffs that are currently set out in legislation for the other renewable energy sources. In addition to improved planning for capacity increases and fostering competition, the diverse number of active players operating installations should be kept high.

In 2015, the Bundesnetzagentur successfully held three auction rounds for ground-mounted PV installations with a total capacity of 500 MW. Throughout the rounds, the average value of the bids went down to 8.00 ct/kWh. On average, 150 bids were submitted per auction. The large demand and decreasing price are evidence that the new auction model is a success.

1 October 2015 with this determination. It replaces the previous determination that, to a great extent, was repealed at this date.

The determination was issued after comprehensive public consultation. It includes a new methodology for calculating imbalance charges, changes to the existing within-day obligations and strengthening information obligations. Further progress will also be made with regard to the standardisation of balancing energy products and with it primary procurement through the exchange. At the same time, the new balancing system includes separate neutrality charges for standard load profile and interval-metered customers and an incentive mechanism for the daily assessment of accumulated differences.

Among other things, the determination sets out additional incentives for traders to actively balance out their balancing groups using flexibility instruments such as booked storage capacity.

Individual network charges

Final customers are entitled to agree an individual network charge with their immediate upstream network operator if, on the basis of existing or predicted consumption data or technical or contractual conditions, their peak load contribution is expected to diverge considerably from the simultaneous annual peak load of all offtake at the same network or transformation level. The individual charge agreed may not be less than 20% of the published network charge.

Moreover, final consumers are entitled to an individual network charge with their immediate upstream network operator if their own consumption of electricity drawn from the public supply network at one supply point reaches at least 7,000 hours and, additionally, exceeds 10 gigawatt hours. In this case, the individual charge is to reflect the final consumer's actual contribution to lowering or avoiding an increase in the costs at the respective network or transformation level to which the final consumer is connected. Up until the end of 2013, such individual network charges required approval from the competent regulatory authority.

Following the Bundesnetzagentur's ruling laying down the criteria for determining individual network charges in December 2013, contracts on individually agreed charges no longer require approval. As of 1 January 2014 they are effective provided they have been notified to the competent regulatory authority. These notifications apply in accordance with the duration set in each given contract. Most of the notifications submitted in 2014 were looked at in 2015. They were assessed gradually, prioritised according to financial impact, and checked retrospectively for compliance with the Electricity Network Charges Ordinance (StromNEV). The actual consumption data with regard to the submitted notifications are checked annually by the competent ruling chamber to determine whether benchmarks were met.

Individual network charges - total number of notifications in 2014

Legal basis	Notifications	Reduction according to notification
Section 19(2) first sentence StromNEV	1,929	approx €111m
Section 19(2) second sentence StromNEV	304	approx €295m
Total number of notifications up to and including 2015		

Legal basis	Notifications	Reduction according to notification
Section 19(2) first sentence StromNEV	4737	approx €312m [1]
Section 19(2) second sentence StromNEV	375	approx €344m

[1] The strong increase compared to the previous years is, among other factors, due to the expiry of around 2000 approvals of reduced individual network charges granted in 2012 in accordance with section 19(2) first sentence of the StromNEV.

Abuse cases concerning avoided network charges

Operators of distributed generation plants are entitled to a charge from the operator of the distribution network into which they feed electricity. The charge must correspond to the network charge avoided by feeding in electricity at the upstream network or transformation level.

With economic importance increasing for network operators, customers and operators of plants, this regulation causes an increasing number of problems that have been brought up in various applications for

investigation of abuse. The competent ruling chamber of the Bundesnetzagentur took various decisions on avoided network charges that are classified according to subject in the following:

- No avoided network charges for feeding in electricity in extra high voltage networks
- Operators of generating installations that are directly or indirectly connected to the extra high voltage network are not entitled to payment of avoided network charges from operators to whose networks the installations are connected. Generating installations that feed electricity into the extra high voltage network, either directly or via transformation, are not considered to be distributed generation plants.
- Relevant network or transformation level for the calculation of the charges for distributed feed-in.
- The calculation of the charges for distributed feed-in is done based on the network charges payable for the upstream network or transformation level above the actual connection situation. This is especially relevant when the network operator concerned operates the same network or transformation level as the upstream network operator (so called "pancaking") while distributed feed-in is simultaneously taking place on this level. In an abuse case, the Bundesnetzagentur decided that the "upstream" network or transformation levels are to be understood as comprehending all networks. According to this decision, two network operators that are upstream or downstream from one another on the same voltage level do not constitute different network levels within the meaning of section 18 StromNEV.
- No consideration of reserve capacity in the calculation of charges for distributed feed-in.

Some network operators offer so-called reserve capacity. This is not a service provided to the network operator but rather an accommodation vis-à-vis the network user to prevent a physical peak load from influencing the amount billed. It enables final consumers to protect themselves from being billed with the general charge in cases of short-term use of increased capacity. The contracting parties presume that peak loads outside of the annual peak load occur in a controlled manner. The network user defines the amount of reserve capacity to be ordered, which must be paid for regardless of the amount of it that is actually drawn upon.

There have been a few cases in which the consideration of reserve capacity in calculating the power avoided led to a higher amount of avoided network charges. This results from the fact that the physical offtake load, that increases strongly when reserve capacity is drawn upon, is not taken account of in the calculation of the avoided network charges.

In an abuse case, the Bundesnetzagentur therefore decided that the maximum offtake power may not be reduced by the given amount of reserve capacity. To determine the power avoided with regard to the calculation of charges for distributed feed-in, only the difference, measured in kilowatts, between the simultaneous annual peak load of all offtake at the network and transformation levels and the maximum offtake load at the upstream network and transformation levels is relevant.

Abuse cases concerning pooling
Two applications were submitted to the Bundesnetzagentur in 2015 to open abuse proceedings in accordance with section 31 EnWG with regard to the application of section 17(2a) StromNEV. In both proceedings the parties argued over whether the conditions for summarised billing of offtake points (known as "pooling") are fulfilled if the offtake points are not connected at the same network node but are connected to each other via a connection on the customer side.

In an abuse case, the Bundesnetzagentur decided that the conditions for pooling are met with regard to circumstances in the connection as described in that case. According to this decision, a connection within the meaning of section 17(2a) StromNEV is deemed to also exist if only an inductive connection is present which enables a large portion of the offtake to be shifted. The Bundesnetzagentur thus did not follow a strict technical interpretation of the concept of a "galvanic connection" since it is inconsistent with the provisions of EnWG and StromNEV.

Expansion factor for electricity
In accordance with section 10 of the Incentive Regulation Ordinance (ARegV), network operators can apply to the regulatory authority (by 30 June of each year) for an adjustment of their revenue cap based on an expansion factor if there is a lasting change in their supply services and if the operator's total costs, after deduction of the cost components that cannot be controlled on a long-term basis, rise by at least 0.5%.

Expansion factor for gas
In 2015, the distribution system operators were able to once again apply for an expansion factor for their investments in this area if there is a lasting change in their supply services. This factor ensures that costs resulting from a lasting change in the operator's supply

services during the regulatory period are taken into account when determining the revenue cap. A lasting change in supply services is deemed to have occurred if the parameters cited in section 10(2) sentence 2 of the Incentive Regulation Ordinance (ARegV) change on a long-term basis and to a significant extent. In 2015, a total of 85 applications for approval of an expansion factor were made.

By 30 June 2015, a total of 109 applications for an adjustment of the revenue cap were submitted for the 2016 year in the electricity sector.

Proceedings under section 26(2) ARegV

Transfer of electricity networks

As per section 26(2) ARegV, when part of an energy supply network is transferred to another operator and when networks are split, the revenue caps are to be set anew upon application by the operators concerned in accordance with section 32(1) para 1 ARegV. Seven applications were submitted to the Bundesnetzagentur in 2015 in the electricity sector to redefine the annual revenue cap in accordance with section 26(2) ARegV.

On 6 October 2015, the Federal Court of Justice rejected an appeal in an abuse case. The matter in dispute in this case was whether an entitlement to information arises from section 26(2) ARegV that can be executed through an abuse case in accordance with section 31(1) EnWG. The Federal Court of Justice decided that section 26(2) ARegV does not provide an entitlement to information.

Additionally, the Federal Court of Justice decided that, in accordance with section 54(2) fifth sentence EnWG, the regulatory authority that is responsible for redefining the revenue caps in accordance with section 26(2) ARegV is the same that set the revenue cap to be split in the first place. Only the regulatory authority that originally set the revenue cap has the key data that is required for the splitting process.

Moreover, the competent regulatory authority is obliged as per section 26(2) ARegV to split the revenue cap. According to the Court, the originally set revenue cap generally loses its basis if significant portions of the network are transferred. This ensues from section 26(2) first sentence in conjunction with section 32(1) para 1 ARegV. Consequently, the Court said that an application submitted by one of the network operators concerned is enough for revenue cap splitting to be implemented. Under section 26(2) second sentence and section 3 ARegV, the redefining of revenue caps may take place in such a way that the subnetworks concerned are each allocated a share of the set revenue cap.

In the future, the Bundesnetzagentur anticipates considerably more work in redefining the annual revenue cap as per section 26(2) ARegV.

Transfer of gas networks

In 2015, a total of 33 applications concerning network transfers, mergers and splits in the gas sector were submitted under section 26(2) ARegV to the Bundesnetzagentur. The operators should state in their applications which percentage of the revenues is to be assigned to the part of the network being transferred and which percentage is to be assigned to the remaining part. The Bundesnetzagentur and the regulatory authorities of the federal states (when they are involved) are to ensure in particular that the total of the revenue's parts after the split does not exceed the revenue cap that was already set. On 6 October 2015, a ruling adopted by the Federal Court of Justice confirmed that, in the event of a partial network transfer, the Bundesnetzagentur rightly denied the recipient operator's claim for obtaining information from the donor operator under section 26(2) ARegV.

With regard to section 26(2) ARegV, the Federal Court of Justice used this decision to put in concrete terms what the Bundesnetzagentur's duties are in its reviews. A joint application by the network operators concerned does not release the Bundesnetzagentur from the obligation to independently determine the appropriate allocation of the revenue cap. According to the Court, the network operators concerned are not allowed to set the division of revenue in such a binding way as to leave the regulatory authority to simply "rubber stamp" it.

Passing on costs horizontally

Gas transports between market area-wide transmission system operators are currently not charged for. This means that costs are not allocated to the interconnection points between the network operators even though they are incurred there. This, following the two-contract model, distorts pricing and provides the wrong price signals. This can create disincentives within the German capacity market.
Over the last few years, the competent ruling chamber noticed that increasing use is being made of the free of charge exchange of energy between transmission system operators and a danger that wrong price signals in the network charges will arise from this therefore exists. This is why the Chamber opened determination proceedings to adequately address the problem. The chamber is expected to issue its determination in 2016.

Pricing of entry and exit capacity ("BEATE")
In 2014, the competent ruling chamber opened determination proceedings with a view to properly determining network charges by stipulating requirements for converting annual capacity charges into charges for sub-annual capacity rights and to properly determining network charges. The aim of this determination, in addition to the requirements for calculating charges for sub-annual capacity rights also includes laying down the requirements for calculating charges for interruptible capacity and for entry and exit capacity at gas storage facilities. In 2014, several hearings had already been held with representatives of the gas sector on the potential content of the determination. Market participants were given several opportunities to make comments. The determination was issued in March 2015.

Efficiency benchmarking among gas transmission system operators (TSOs) and distribution system operators (DSOs) for the third regulatory period
In spring 2016, the competent ruling chamber will determine the requirements for data collection for efficiency benchmarking for the TSOs and DSOs for the third regulatory period (2018 - 2022).

To carry out efficiency benchmarking in accordance with section 22(3) first, second and third sentences, the TSOs provided the necessary load, structure and sales data for the 2015 business year including historic figures to the Bundesnetzagentur electronically by 1 April 2016.
The DSOs are to transfer their data to the Bundesnetzagentur by 1 August 2016.

Cost examination to determine the base level for operators of gas supply networks
By 1 July 2016, all gas network operators are obliged to submit data for the cost examination to the Bundesnetzagentur to establish the base level for setting revenue caps. 2015 is the base year here. In derogation of this, network operators taking part in a simplified procedure are obliged to submit cost data by 1 September 2016.

Auctions for ground-mounted photovoltaic systems
The Bundesnetzagentur has been tasked with carrying out the new auction procedures for determining the level of financial support for ground-mounted photovoltaic installations since 2015. Instead of being set by law, the level of financial support for these ground-mounted PV systems is now to be determined competitively through auctions.

The bidders must submit bids that are based on a defined value to be applied in cents per kilowatt hour (bid value) and that are based on the installation's capacity, which must be provided in kilowatts (bid volume): The lowest value bids will be accepted first until the volume of electricity set for the given round of bidding has been exhausted. Successful bidders must submit an application claiming entitlement to financial support once the installation has been built and has started operating.

The Bundesnetzagentur provided expert advice prior to the adoption of the FFAV (Ground-mounted PV Auction Ordinance). It was important not to set the requirements to be met by an applicant for participation in the proceedings too high to prevent potential bidders from being discouraged and, at the same time, to reach a high implementation rate for the planned projects. Certain material and financial requirements were therefore determined, whereby the financial requirements decrease as project construction (in legal terms) advances.

Furthermore, forms were created. They serve the purpose of facilitating administrative procedures, making it easier to review information concerning a bid. Moreover, the completion and submission of the forms, which is mandatory for bidders, serves the bidders' own interest, as all of the information required for the bid is taken from the forms.

In total, three rounds of auctions were held in 2015. Each round begins with an announcement in which the deadline for submitting bids, the volume that can be bid for and the forms to be filled out and submitted are all named. Bids are opened and reviewed once the deadline for bids has passed. In the process, attention is also paid to whether the required forms had been used and whether all of the required documents had been attached to the application. All bidders are obliged to meet both above-mentioned requirements upon the submission of a bid; corrections thereafter are not possible.

All requirements for the submission of a bid must be met upon submission. Upon review, bids are ranked and awards are granted – starting with the bid with the lowest value, until the set volume of the bid has been exhausted.

The pay-as-bid price rule applied for the first round in April, whereby bids are accepted at the pay as bid price stated in the actual bid. Bid volumes of 150 MW were auctioned. 170 bids with a volume of 715 MW were submitted on this date.
28 bids with an average value of 9.17 ct/kWh were accepted. The 150 MW set for the second round of bidding in August were once again oversubscribed with bids amounting to 558 MW. The process of determining the price is done through a uniform price auction, meaning that all successful bids had a price set at 8.49 ct/kWh. This value was once again underbid in the third round in December: The uniform price auction ended with a price set at 8 ct/kWh. The 127 bids received amounted to 562 MW, while 200 MW was set for the auction. The diverse structure of the bidders was also reflected in the successful bids. Even if the majority of the bids were submitted by limited liability companies, it was still possible for some of the bids that were submitted by cooperatives and private persons to be accepted. Geographically, contracts were awarded for projects in all large surface federal states. Most of the successful bids, however, concerned projects in Brandenburg, Bavaria and Mecklenburg-Western Pomerania. The first applications for entitlement to financial support were filed in December 2015.

Guidelines for self-suppliers
With the introduction of the Renewable Energy Sources Act (EEG) 2014 revision, an EEG surcharge must now essentially be paid for any type of electricity consumption. Therefore, even self-suppliers are now required to pay an EEG surcharge for electricity they produce and consume themselves. There are a few exceptions for certain cases of self-supply.
Several queries were submitted to the Bundesnetzagentur concerning this issue. The Bundesnetzagentur draftedguidelines to streamline these questions and answer them as comprehensively as possible. This draft sets out how the Bundesnetzagentur interprets the new regulations of the 2014 EEG in the area of self-supply. To increase the stakeholders' legal certainty, the fundamental legal principles of these new regulations alongside answers to several questions relating to their practical application are laid out in the guidelines. The guidelines were presented to interested parties and the public who also had the opportunity to comment on them over the course of a consultation. During a workshop, participants of the consultation were once again given the opportunity to state their views and discuss matters individually with competent Bundesnetzagentur staff. The guidelines are to be finalised and published in 2016.

Market Transparency Unit and REMIT tasks
Together with ACER, the Bundesnetzagentur's Market Transparency Unit (MTU) monitors trading in wholesale energy products to detect and prevent trading based on inside information and market manipulation.

With the registration of market participants in early March 2015, the Bundesnetzagentur created a base for data reporting to ACER. Market participants that have to report transaction and trade data to ACER are required to first register with the national regulatory authority. In 2015, the Bundesnetzagentur registered a total of 1,331 market participants using CEREMP[3] with each market participant receiving an ACER registration code.

The Bundesnetzagentur thus supported data reporting for standard contracts that was launched, according to schedule, on 7 October 2015. Non-standard contracts are to be reported from 7 April 2016. In the meantime, the Bundesnetzagentur established the necessary technical requirements on the IT side to be able to receive relevant data for the German market area from ACER. The future monitoring activity relating to the wholesale energy market is to be based on this data.

In 2015, the Bundesnetzagentur obtained seven notifications of suspicious behaviour according to Article 15 REMIT. All cases related to a possible breach of the prohibition of market manipulation. Investigations are still underway with regard to six cases. One of the breaches in question is a suspected illegal blocking of cross-border transmission capacity without the intention of actually using it. This behaviour can impact several market areas. This is why the case is being investigated together with the European regulatory authorities concerned. Two further cases also concern not just the German market area, but also the European market area. For this reason, data from several European market areas must be collected and evaluated for the purpose of investigation. The cases were transferred to ACER, which is coordinating the investigation with the Bundesnetzagentur and the other relevant regulatory authorities. With regard to three notifications from December 2015, the Bundesnetzagentur is still checking whether they are actually cases of suspected breaches. A case brought forward in 2014 was closed after being investigated in 2015. Manipulation of wholesale gas products could not be ascertained in this case.

[3] Centralised European Register for Market Participants (CEREMP)

Evaluation report on the application of Germany's Interruptible Loads Ordinance (AbLaV)

The Bundesnetzagentur's report presented to the Federal Ministry for Economic Affairs and Energy described and examined the use of interruptible loads in the period from January 2013 to March 2015. The key question here was whether and how far voluntary agreements – relating to interruptible loads – with transmission system operators on the basis of the Ordinance were suitable and essential as a means to remove threats or disruptions to the security and reliability of the electricity supply system. The report was published as a Bundestag printed paper[4]. The Bundesnetzagentur came to the conclusion that in the period under review interruptible loads were suitable but not essential as a means to remove threats or disruptions to the security and reliability of the electricity supply system. It was recommended that more appropriate ways be developed to identify potential for flexibility.

The report looked at how the loads from all the six framework agreements with interruptible load providers were used and whether other options to resolve the problem had been available at the time to the transmission system operators. With one exception, all of the loads contracted were used at least once. In around 60.3% of the cases (35 requests) the loads were used to maintain system balance, which is similar to using positive tertiary reserve. In the remaining 39.7% or so of the cases (23 requests) the loads were used as part of longer redispatching measures. The cases showed that interruptible loads are suitable for use for system services.

In those instances where interruptible loads were used to maintain system balance, the transmission system operators had already used relatively large amounts of balancing energy. The volumes of contracted balancing reserves together with the balances for the control areas show, however, that the transmission system operators still had sufficient reserves available and that use of the loads was useful but not absolutely necessary. The use of interruptible loads was therefore not essential to maintain system balance. In those instances where interruptible loads were used as part of redispatching, it was not clear which other potential options had been available to the transmission system operators. It was, however, clear that the requesting transmission system operator in the area concerned had not taken any measures as referred to in section 13(2) of the German Energy Act (EnWG) to stabilise the system. This indicates that there was no special threat to the transmission network.

Here again, the use of interruptible loads was not essential to eliminate the network congestion.

Evaluation report on individual network charges

The Bundesnetzagentur drew up an evaluation report as required by law on the effects on the operation of electricity supply networks of individual network charges for high consumption customers. The report looked at how far measures that serve to balance electricity consumption with supply should be taken into account when calculating the reduction in network charges, and at the scope for action. It also looked at the procedure and rules established in the German Electricity Network Charges Ordinance (StromNEV). The following conclusions were drawn: Some aspects of the current regime need to be revised in light of the energy transition. In particular, only those final consumers whose offtake patterns have a positive effect on the electricity supply networks should benefit from a reduction in charges. The changes in the power generation landscape and the high demands on the electricity networks mean that the flexibility of all market players is becoming increasingly important. The report's conclusions will feed into subsequent discussions on the future scheme for individual network charges.

Evaluating incentive regulation

Since 2009 the revenue that gas and electricity network operators are allowed to generate has been determined by Germany's Incentive Regulation Ordinance (ARegV). The Bundesnetzagentur was required by law in 2014 to draw up an evaluation report on incentive regulation. The evaluation focused on how network operators' investment behaviour had developed since the regulatory scheme came into force and on possible barriers to investment. It also looked at how the Ordinance affected efficiency, innovation and quality of supply and at the practicability of the Ordinance. In January 2015 the Bundesnetzagentur presented its report to the Federal Ministry for Economic Affairs and Energy. The report represents the first step in the process of devising and implementing changes to the German incentive-based regime. The evaluation showed that the basic concept of incentive regulation has essentially proven itself. With its fixed budget, efficiency benchmarking and additional expansion factor, the regulatory regime gives operators scope to fund necessary investments and apply efficient solutions to save costs.

[4] Printed paper 18/6096 of 22 September 2015

However, the report found that the present scheme is not absolutely ideal and identified a number of possible improvements to better reflect the challenges network operators will face in the future. One proposal is to abolish the time delay associated with the expansion factor.

The main challenge in the coming years is grid expansion. More than 97% of renewable installations are connected to the grid at distribution network level. The future regulatory framework therefore needs to ensure that the funds required to expand the distribution network are available to the operators in good time. At the same time, however, the framework needs to provide incentives so that potential savings in network expansion are realised through the use of intelligent and innovative solutions and procedures are streamlined further.

The Bundesnetzagentur, together with many of those involved in the evaluation process, is in favour of incorporating the proposed improvements into the current incentive regulation scheme and thus take account of the need of the operators and investors for continuity and stability. This does not rule out considering more fundamental alternatives in the long term as well.

However, the Bundesnetzagentur is not in favour of the investment cost difference model discussed as an alternative to incentive-based regulation. This model would lead to excess returns and would make the energy transition unnecessarily expensive, with additional costs of up to €8bn – depending on the design – compared to the consistent capital expenditure true-up model also discussed.

In the present discussions the Bundesnetzagentur has reaffirmed its vision for a future incentive regulation scheme, namely one which should create the right incentives for necessary network expansion, ensure ongoing replacement, deliver potential savings through innovative solutions, and enable congestion management.

As part of the evaluation process the Bundesnetzagentur also developed proposals to enhance transparency, a topic that has gained relevance in public discussions in the course of 2015.

The final report is available together with the accompanying studies at www.bundesnetzagentur.de/ARegVBericht. The report provides the basis for the ongoing discussions.

Further development of the electricity network charges scheme

In its evaluation report on incentive regulation the Bundesnetzagentur looked at how to shape the regulatory framework for recognising incurred costs. The next step required is to look at how to set the prices charged by the network operators on the basis of the approved costs.

A key factor here is the regional differences in network charges, which are due both to traditional factors such as the degree of network usage and population density and to the integration of renewable energy and the "avoided" network charges for distributed generation. Contrary to previous assumptions, volatile and increasingly surplus distributed feed-in mean that no upstream network infrastructure costs are avoided. The rules for avoided network charges should therefore be abolished. This would be an important step in reducing the differences in charges. Another possible way to level out the differences is to set the same charge for the whole of the transmission network level, although one general charge across all network levels would not be appropriate.

The Bundesnetzagentur also recommends taking a more cost-reflective approach to financing network costs by requiring people who generate their own electricity to make a fair contribution since they still use the general supply network to fall back on.
One further question to be looked at is how far variable network charges could help to synchronise electricity supply and demand. The Bundesnetzagentur is against variable network charges, which are beneficial primarily to the market and which could result in significant synchronisation of consumption and load behaviour, in turn leading to new network congestion.

By contrast, it welcomes the idea of consumers participating in the balancing market, which is beneficial to the network. To promote flexible loads being offered in the balancing market, the Bundesnetzagentur is in favour of excluding peaks resulting from negative balancing reserves when calculating the annual peak load of a provider that is used for billing.

The network charges scheme ensures that the costs are shared between the users on a relatively cost-reflective basis – and hence the network charge has a positive effect on the energy transition. And that is how it should stay. Above all, network charges should not be misused with the intention of influencing developments not connected with network usage. The Energiewende must remain coupled with a fair distribution of the burden.

The evaluation report on incentive regulation can be found at www.bundesnetzagentur.de/ARegVBericht.

IT security requirements catalogue

The protection of telecommunications and electronic data processing systems is becoming ever more important for the secure operation of the electricity and gas networks. The use of modern information and communications technologies has a number of advantages. Yet the growing dependence on these systems, in particular for network control, is not without risk to security of supply.

In August 2015 the Bundesnetzagentur therefore published a catalogue of IT security requirements drawn up in consultation with the Federal Office for Information Security (BSI). The catalogue is the first of its kind, laying down national IT security standards to be implemented by all electricity and gas network operators by the beginning of 2018 and requiring certification. The Bundesnetzagentur is developing a certificate together with the German accreditation body especially for this purpose.

The core requirement is the establishment of an information security management system (ISMS) with the purpose of ensuring that network operators' internal information security is seen not as a set of individual measures but as a permanent process to be continuously monitored and improved.

The IT security requirements catalogue can be found at www. bundesnetzagentur.de/it-sicherheitskatalog-energie.

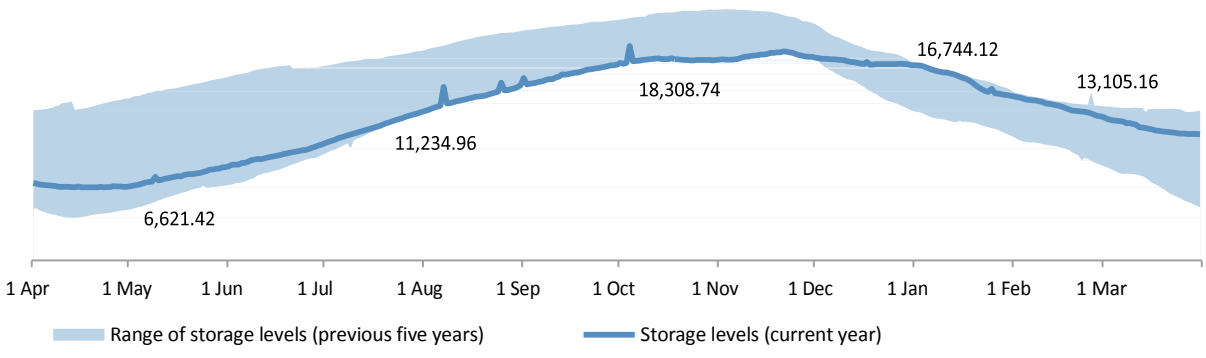
Analysis of storage facilities

The Bundesnetzagentur took an active part in 2015 in discussions on the security of natural gas supply in Germany. Natural gas storage facilities were a particular focus at both national and European level. The discussions analysed storage levels above all for natural gas storage facilities in Germany.

In some cases, supply contract prices for natural gas, in particular for Russian gas, are still linked to the price of oil, usually with a time lag of around six months. The large fall in the oil price at the end of 2014 meant that natural gas dealers expected gas from these supply contracts to be cheaper in summer 2015 and so emptied reservoirs in order to be able to fill them with the cheaper gas in the summer. The fact that the oil price remained low throughout the summer meant that there was no incentive for the dealers to inject gas into storage, with the result that the storage level at the beginning of the winter and the withdrawal period stood at only just under 80%. Hardly any of the gas has been withdrawn from storage during the winter period so far, however, because of the high liquidity and low prices in the trading markets. Gas prices in winter 2015 were more than €8/MWh lower than prices in the previous winter. This means that current storage levels – unlike levels at the beginning of the winter – are among the highest over the past five years, and thus the level of availability of natural gas for the rest of winter 2015/16 is very high.

Storage levels: 2015/2016 compared to previous years

Storage level (bn m³)



Source: GSE; own graph

International cooperation

Realisation of the internal electricity market and security of electricity supply in Europe are the driving forces behind international cooperation.

Work within the Agency for the Cooperation of Energy Regulators

The Bundesnetzagentur plays an active role on the committees of the Agency for the Cooperation of Energy Regulators (ACER), promoting viable solutions at European level.

Electricity network codes

The Bundesnetzagentur was again actively involved in 2015 in the work on the network codes and guidelines on demand connection, system operation, electricity balancing and forward capacity allocation. The network code on demand connection and the guideline on forward capacity allocation received a positive vote from the European Commission's comitology committee in 2015 and will enter into force in 2016. The network code on electricity balancing and the guideline on system operation are expected to be approved in comitology in 2016. In this context, the Bundesnetzagentur will provide close support and advice to the Federal Ministry for Economic Affairs and Energy. The guideline on capacity allocation and congestion management adopted at the end of 2014 entered into force on 14 August 2015 as the Commission Regulation establishing a guideline on capacity allocation and congestion management.

Gas network codes

The Bundesnetzagentur was involved in the work on the network code on harmonised transmission tariff structures for gas (TAR NC). The harmonisation of tariff structures for the use of the gas transmission networks is an important contribution to implementing the third internal energy market package and achieving the aim of the free movement of goods and services in the energy sector through promoting cross-border (gas) trade.

The network code includes rules on the application of uniform price methodologies to ensure transparent, cost-reflective and non-discriminatory transmission tariffs at interconnection points.

The use of specified multipliers aims to achieve cost-reflective pricing and promote short-term trade. The network code sets out detailed publication requirements (allowed revenue, regulatory account details, parameters used for pricing, etc) to enable network users to better understand how the tariffs for the different transmission services are set and forecast how they may change.

The network code is also to include rules on applying economic tests and pricing new capacities at new and existing interconnection points. The recommendation on the network code issued by ACER to the European Commission was supported by the Bundesnetzagentur but failed to obtain a majority vote from the Board of Regulators, hence the Commission is now responsible for final work on the network code. The comitology procedure is due to begin in April 2016.

In 2015 work was done on supplementing the current network code on capacity allocation mechanisms in gas transmission systems with rules for a market-based allocation procedure for incremental capacity at interconnection points and for the creation of new capacity. The Bundesnetzagentur was actively involved as co-chair of the ACER CAM Task Force in developing, reviewing and consulting on the proposal for amendments to the Commission Regulation. In October 2015 the proposal was sent to the Commission with the recommendation that the Regulation be adopted with the amendments.

The comitology procedure for the amendment is set to take place in the first half of 2016 together with the procedure for the network code on harmonised transmission tariff structures. The Bundesnetzagentur will support and advise the Federal Ministry for Economic Affairs and Energy in these procedures.

Market coupling
A key component of the European internal electricity market is market coupling. Market coupling enables all available cross-border capacities to be taken into account automatically when electricity volumes are traded, without the need for market players to separately acquire cross-border capacity. This in turn enables losses from miscalculating trade flows to be avoided.

At the beginning of 2015 coupling of the day-ahead electricity markets in Europe was extended to include the northern borders of Italy and thus in total cover 85% of European electricity consumption. Together with its Danish and Italian colleagues the Bundesnetzagentur, as the regulatory authority with lead responsibility, supports the plans to progressively extend the market coupling project to cover further regions and markets. Key joint decisions from all the European regulatory authorities are anticipated in 2016 and beyond to gradually formalise the projects currently established on a voluntary basis.

Capacity allocation and congestion management guideline
Alongside the coupling of the day-ahead electricity markets the Commission Regulation establishing a guideline on capacity allocation and congestion management provides the legal basis for coupling the intraday electricity markets and organising cross-border congestion management (redispatching). The first step in 2015 was to designate a nominated electricity market operator (NEMO). The Bundesnetzagentur designated EPEX Spot as the NEMO for Germany. The task of a NEMO is to perform market coupling and guarantee that the relevant criteria are met. NEMOs are designated for a term of four years.

Market coupling depends crucially on the allocation of cross-border capacity. In May 2015 the Central Western Europe (CWE) market coupling partners introduced the flow-based method for capacity calculation, replacing the available transfer capacity (ATC) based method. The flow-based method takes account of the whole grid instead of only cross-border transmission capacity. Better coordination between the transmission system operators involved is also essential so that more capacity can be made available for cross-border trade.

Flow-based capacity calculation is set to be introduced in the Central Eastern European (CEE) region together with coupling of the day-ahead electricity markets in 2018. The Bundesnetzagentur supports all those involved in both projects in finding a way to enable the use of a common method as early as possible.

Council of European Energy Regulators
Since 2005 the Bundesnetzagentur has been an active member of the independent Council of European Energy Regulators (CEER). Since ACER was established in 2011, CEER has concentrated on consumer protection, regulatory aspects of retail markets, promoting renewable energy, and international cooperation. In addition, CEER supports ACER in many aspects of its work.

Florence School of Regulation
The Florence School of Regulation (FSR) and the Bundesnetzagentur held their seventh joint forum on legal issues of energy regulation in Berlin in February 2015. The main issues of discussion were transmission system operator certification, the future role of distribution system operators, and projects of common interest (PCIs)

TELECOMMUNICATIONS

Digital networks in transition

Fast and efficient internet access makes smaller towns and rural regions more attractive to companies. To accommodate growing data volumes in mobile networks, the Bundesnetzagentur auctioned off additional frequencies in summer 2015. In the fixed network it is promoting the broadband rollout process through investment-friendly regulation.

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The Bundesnetzagentur laid the groundwork for improving the rollout of broadband in 2015. Growing data volumes in mobile and fixed networks are highlighting the importance of high-speed blanket broadband coverage for Germany. The spectrum auction in summer 2015 will contribute to significant investments in networks. The Bundesnetzagentur is also overseeing the process of introducing vectoring technology, with the aim of facilitating the broadband rollout process and safeguarding competition.

Digitisation is also influencing the business models of established telecommunications companies. Over-the-top (OTT) providers such as Amazon, Google and WhatsApp are increasingly finding themselves in competition with conventional telecommunications products. In this context, the Bundesnetzagentur is focusing on developing a regulatory framework which strikes a balance between the obligations of OTT service providers and conventional telecommunications service providers. In doing so, it must ensure that all companies benefit from a reliable and consistent legal framework which provides a stable basis for long-term investment decisions.

In 2015 the Bundesnetzagentur's Consumer Advice service once again received numerous enquiries regarding increasingly complex information and communication technologies, diversified business models and dubious practices. In total it received 178,000 enquiries and complaints relating to telecommunications – and was able to provide assistance to many consumers.

Market watch

Optical fibre connections were available to more than two million households in 2015, but were only used by just under 20% of this number. This ratio will only improve with new services requiring higher bandwidths. At the same infrastructures need to be future-proofed now.

Telecommunications market as a whole

External revenue

According to the Bundesnetzagentur's preliminary calculations, external revenue in the telecommunications market increased to around €57.2bn in 2015. This represents a year-on-year increase of €0.4bn (0.7%).

Both alternative providers and Deutsche Telekom AG (DTAG) achieved revenue growth in 2015. With external revenue up €0.3bn to €32.1bn, alternative providers achieved a slight improvement in the positive development of the previous year (compared with an increase of €0.2bn in 2014). For the first time since 2005, DTAG's external revenue (€25.1bn) exceeded the level of the previous year by €0.1bn.

As in the previous year, alternative providers accounted for a market share of around 56% in 2015.

A breakdown of revenue by conventional telecommunications networks[1]), HFC networks[2]) and mobile networks shows that there was a further reduction in revenue in conventional telecommunications markets in 2015. According to initial calculations, external revenue in 2015 fell by almost 6% compared with the previous year. Some 76% of this revenue was generated from retail business. This includes external revenue generated from services for private, commercial and public sector subscribers. Wholesale services for fixed-network and mobile operators and service providers outside of the DTAG group accounted for just under one fifth of external revenue. These services include wholesale products for voice traffic/telephony, broadband/internet and infrastructure services.

External revenue generated in HFC networks continued to grow. In 2015 it increased by almost 7% on the previous year to €5.09bn. However, its market share was still around 9% less than that of conventional telecommunications networks (38%) and mobile services (47%). The lion's share of this revenue (92%) was attributable to retail.

[1] Conventional telecommunications networks are defined as networks based on copper or optical fibre cables.

[2] HFC networks are defined as networks with a hybrid fibre coaxial (HFC) architecture.

External revenue by segment	2013		2014		2015	
	2013[1]		2014		2015[2]	
	€bn	%	€bn	%	€bn	%
External revenue in the telecommunications market	57.0		56.8		57.2	
External revenue in conventional telecommunications networks	23.69	100	23.19	100[3]	21.89	100[3]
Via retail	18.47	78	17.97	77	16.68	76
Via wholesale	4.69	20	4.66	20	4.70	21
Other external revenue	0.53	2	0.56	2	0.51	2
External revenue in HFC networks	4.48	100	4.77	100	5.09	100
Via retail	4.12	92	4.41	92	4.70	92
Via wholesale	0.12	3	0.09	2	0.09	2
Other external revenue	0.24	5	0.27	6	0.30	6
External revenue from mobile services	26.22	100	26.12	100	26.98	100
Via retail (excluding terminal equipment)	18.81	72	18.48	71	18.56	69
Via wholesale	3.07	12	3.14	12	3.02	11
Via terminal equipment	3.27	12	3.44	13	4.32	16
Other external revenue	1.07	4	1.06	4	1.08	4
Other external revenue	2.60		2.68		3.23	

1) Updated figures

2) Forecast figures

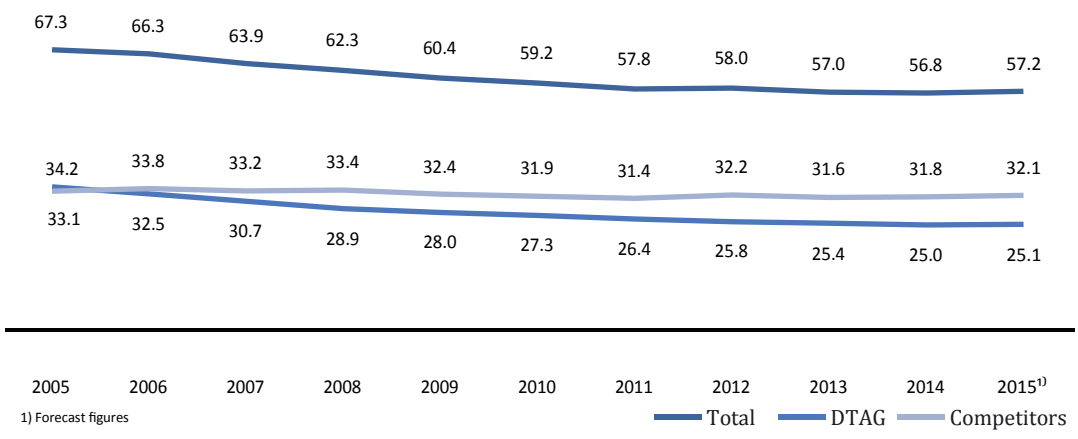
3) Totals may deviate from rounded cumulative figures.

In 2015 external revenue from mobile services is expected to amount to €26.98bn, which represents an increase of more than 3%. This is primarily due to the positive development of revenue from terminal equipment.

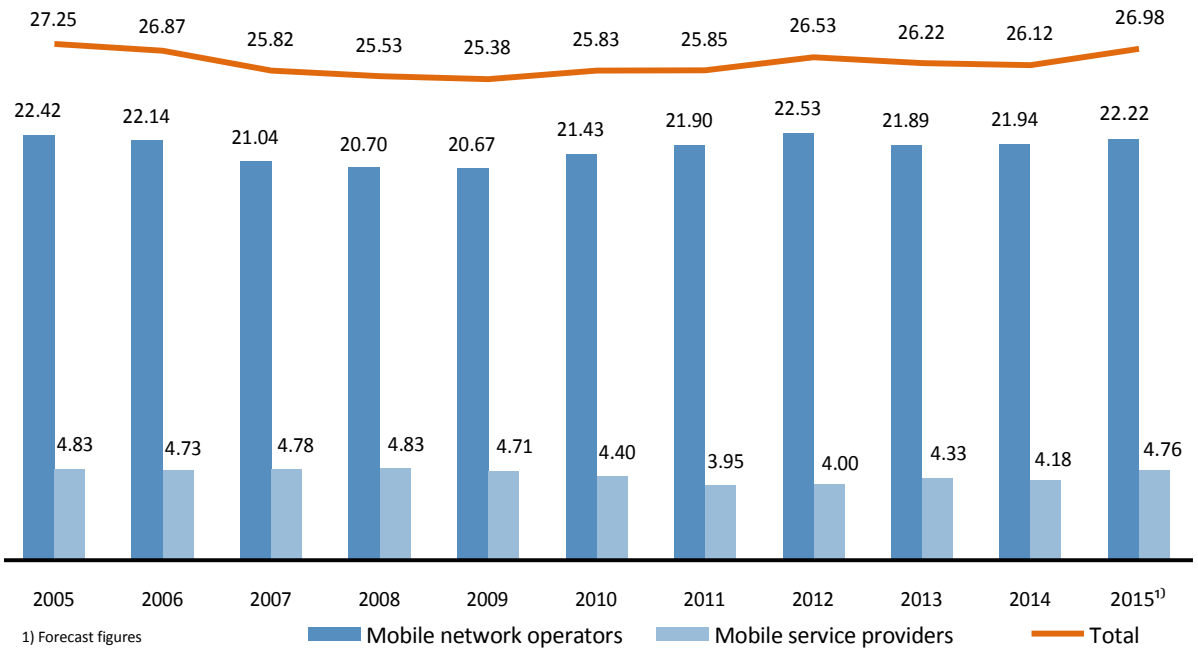
Mobile network operators generated external revenue of around €22.22bn in 2015, while service providers generated around €4.76bn. Service providers increased their share from 16% in the previous year to almost 18% in 2015.

External revenue in the telecommunications market

€bn



External revenue of mobile network operators and service providers



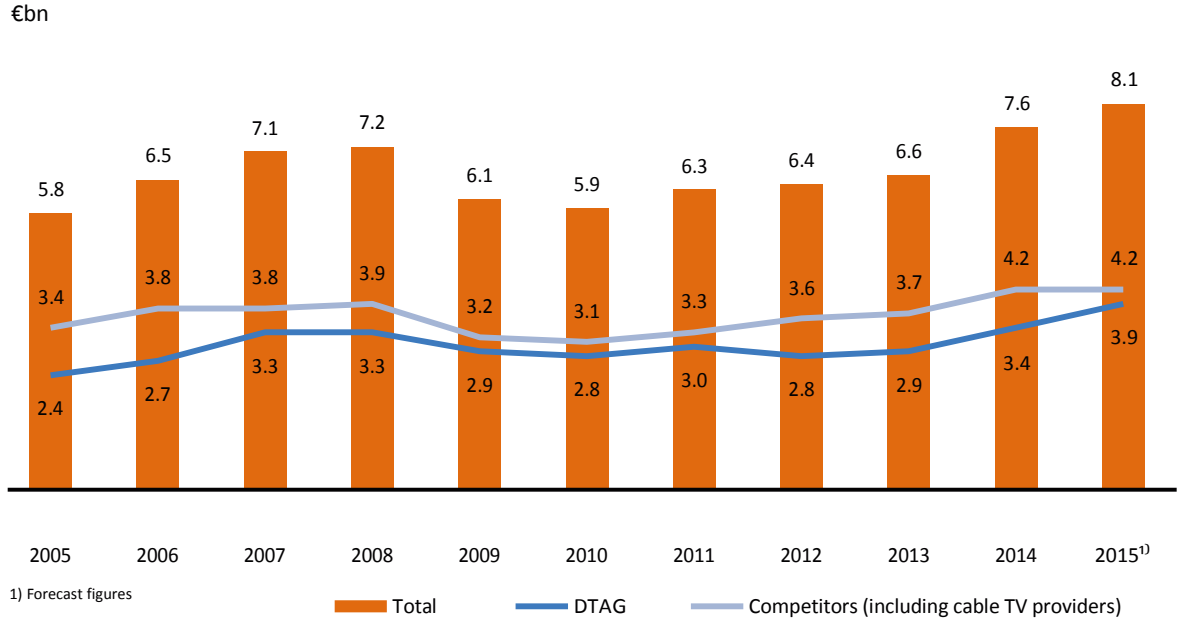
Investments in fixed assets

Investments in fixed assets in the telecommunications market amounted to €8.1bn in 2015, the highest level since 2005. This corresponds to an increase of €0.5bn compared with 2014. This increase was driven by higher investments by DTAG, which invested €3.9bn in 2015 compared with €3.4bn in 2014. Investments made by alternative providers remained constant at €4.2bn in 2015.

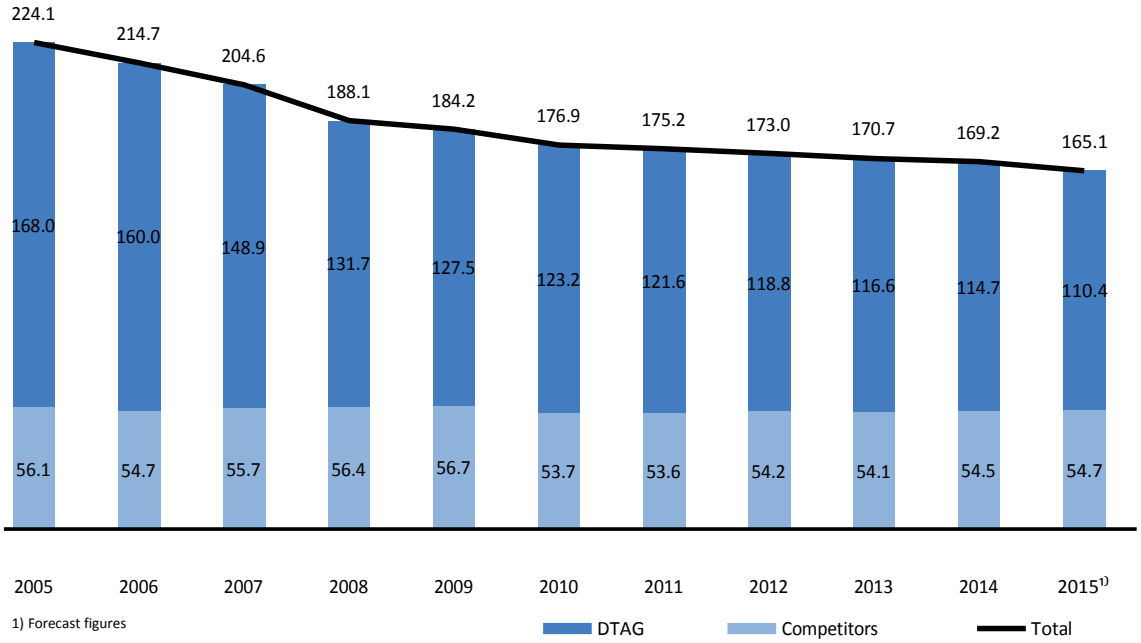
For the first time since 2010, investments in the cable TV infrastructure fell. Amounting to €1.05bn in 2015, they were down slightly on the level of the previous year (€1.10bn). In 2015 they accounted for 13% of all investments in the telecommunications market.

Companies invested mainly in the rollout of optical fibre networks, the changeover to IP-based networks and the rollout of LTE networks.

Investments in fixed assets in the telecommunications market



Employees in the telecommunications market
Thousand



1) Forecast figures

In the period from 1998 to 2015 a total of €128.3bn was invested in fixed assets in the telecommunications market. Of this amount, €67.5bn (around 53%) was invested by alternative providers and €60.8bn by DTAG.

Employees
Some 165,100 employees were employed by companies in the telecommunications market at the end of 2015, which is 4,100 or 2.4% less than at the end of 2014 (169,200). The number of employees employed by alternative providers increased by 0.4% to 54,700 compared with the previous year. Staff numbers at DTAG fell by 3.7% year on year to 110,400 at the end of 2015.

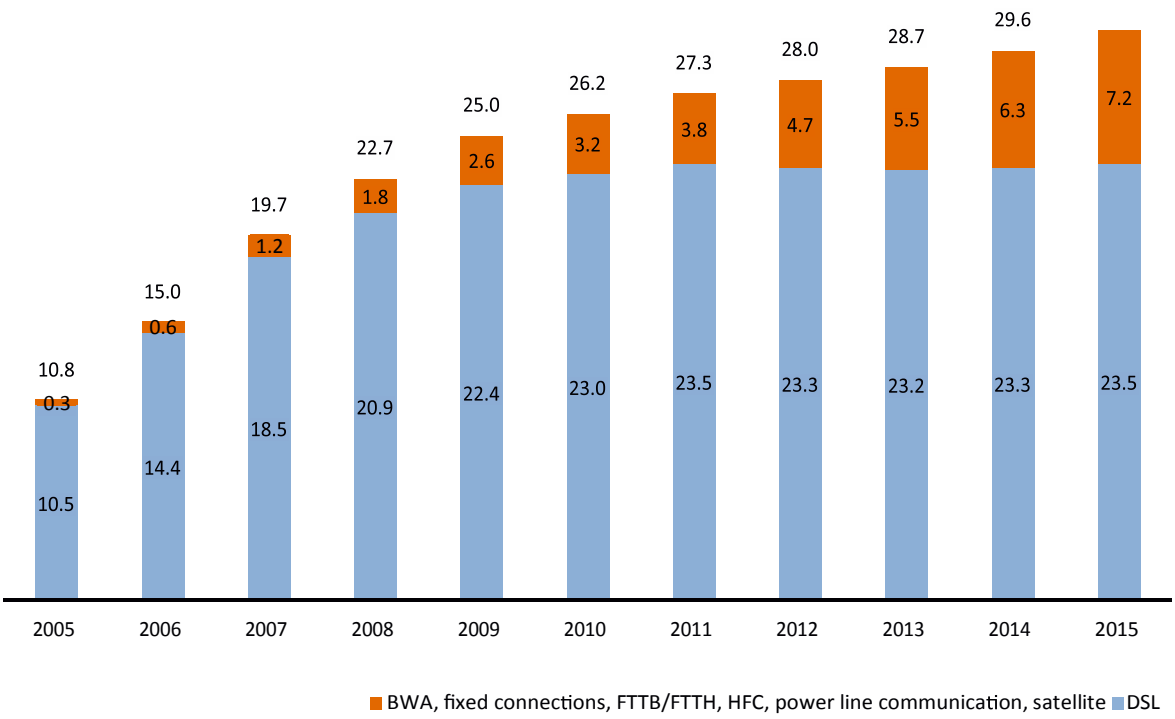
These developments have been influenced by two factors. First, companies are being forced to realise efficiency potential due to increasing competition. Second, recent years have been characterised by technological advances, the innovative potential of which is best realised in a competitive investment. 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 and strengthens the competitiveness of the German economy.

Fixed network

Broadband connections and bundled products
The total number of fixed-network broadband connections rose again in 2015 by approximately 1.1m year on year to around 30.7m.

The majority (77%) of broadband connections continued to be based on copper pairs (DSL). Together, all other technologies accounted for approximately 7.2m connections. Most of these were based on HFC networks (6.6m), while around 0.4m were based on fibre-to-the-building (FTTB) or fibre-to-the-home

Broadband connections in fixed networks
m



The remaining 0.2m or so connections were broadband wireless access (BWA), fixed connections and power line or satellite connections.

Demand for high-speed broadband connections increased in 2015.

The relative growth was highest – albeit starting from a relatively low level – for connections with transmission rates of at least 100 Mbit/s, which saw growth of around 44% compared with 2014. By contrast, there was a marked decline in the number of broadband connections with data rates of less than 10 Mbit/s.

Distribution of fixed-network broadband connections by speed
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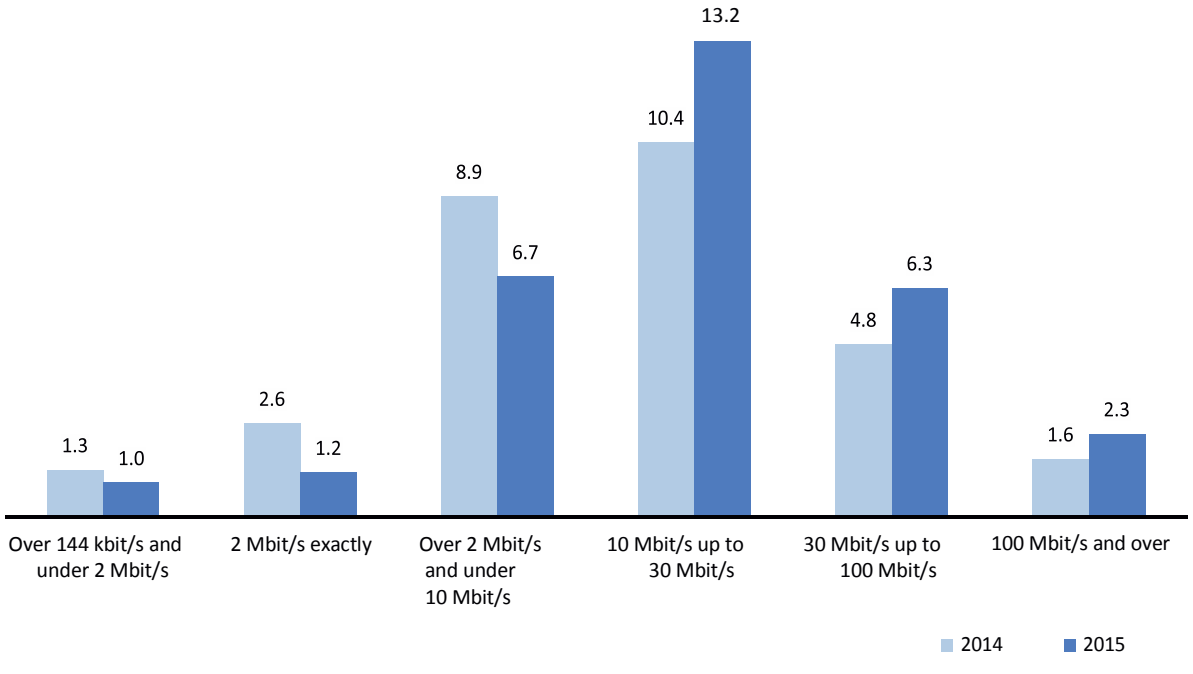
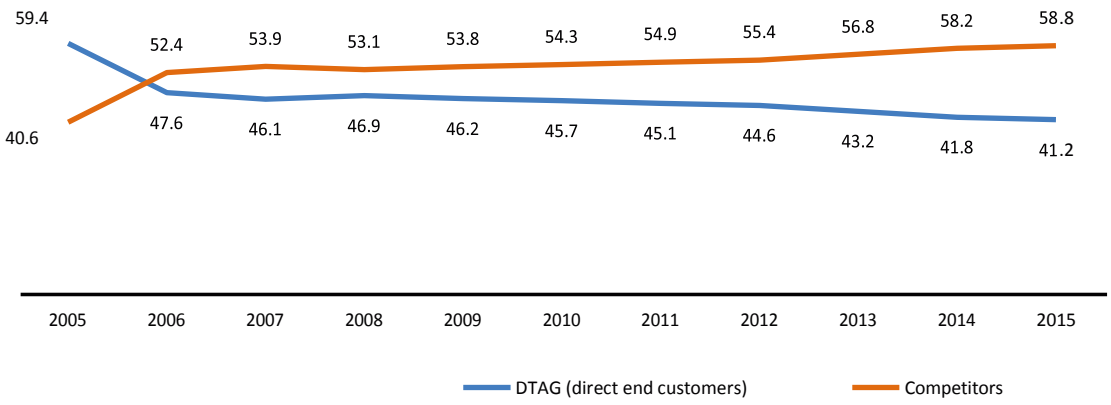


Share of broadband connections in fixed networks
%



Due mainly to the market shares gained by HFC network operators, DTAG's competitors were able to expand their share of the broadband market slightly.

With regard to retail business, DTAG's competitors had achieved a market share of just under 59% of all broadband connections by the end of 2015.

The importance of bundled products continued to grow in 2015. In addition to broadband internet access, such bundled products currently comprise a maximum of three[3]) additional telecommunications services (fixed-network telephony, TV and mobile services) and are usually marketed to end customers in the form of a single contract. In fixed networks, such offers are now considered the norm. For new customers, it is therefore becoming increasingly difficult to purchase the above-mentioned services separately.

At the end of the first quarter of 2015 DTAG and its competitors provided approximately 29.5m bundled products based on fixed-network services. The most common type of bundled products are offers comprising two or three services, which account for around 22.0m and around 7.1m connections, respectively.

DSL connections

The overall number of DSL connections has essentially stagnated since 2011. While DTAG once again improved its position slightly, with around 12.6m DSL connections, its competitors recorded slight year-on-year losses. Alternative providers provided approximately 10.9m connections (compared with around 11m in 2014) which were marketed either directly or indirectly to their own customers, giving them a market share of around 46% at the end of 2015.

[3] Contrary to earlier publications, a distinction is no longer made between mobile voice and mobile data services.

DSL connections

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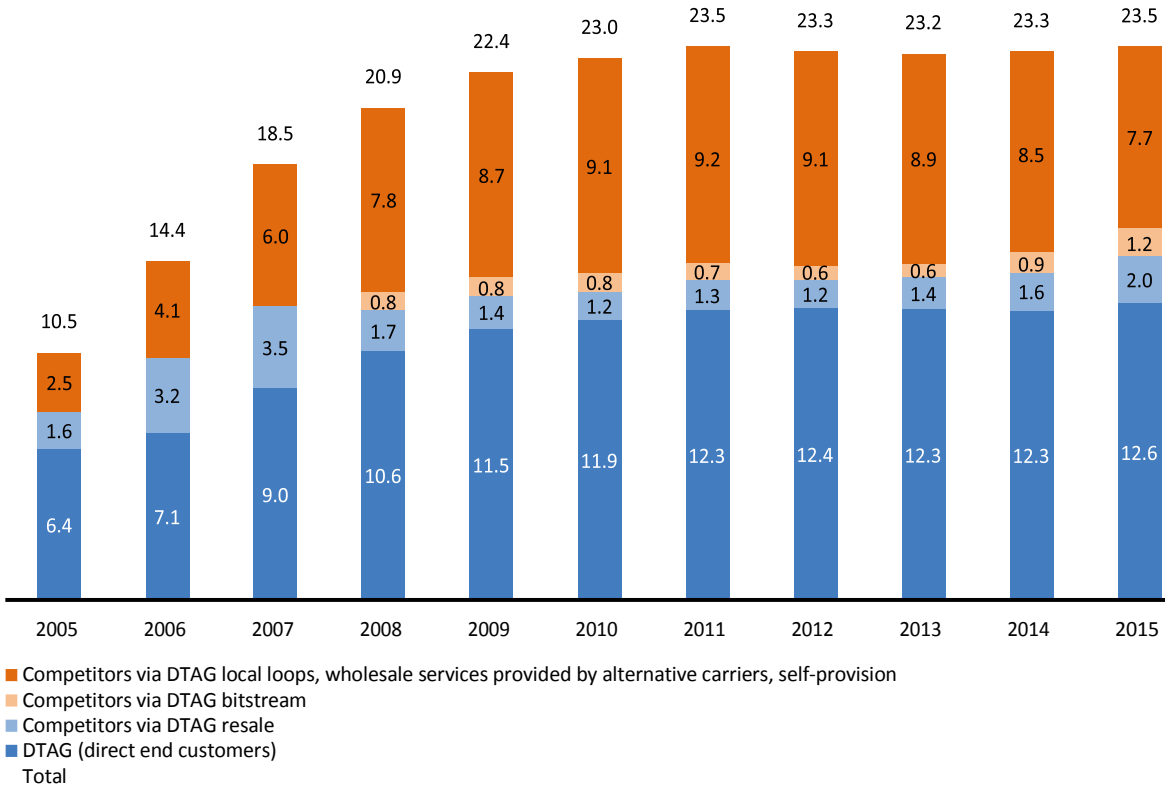

The number of VDSL connections continued to rise in 2015, with both DTAG and its competitors recording significant increases in the number of VDSL connections. Of a total of approximately 4.8m VDSL connections, some 2.9m were provided by DTAG and around 1.9m by competitors. VDSL therefore accounted for a share of around 20% of all DSL connections.

It is currently expected that vectoring technology will lead to a further rise in the importance and spread of VDSL. In theory, this technology currently enables transmission rates of up to 100 Mbit/s based on VDSL connections. According to preliminary estimates by the Bundesnetzagentur, around 4% of existing VDSL connections were capable of such data rates at the end of 2015.

Broadband connections via HFC networks

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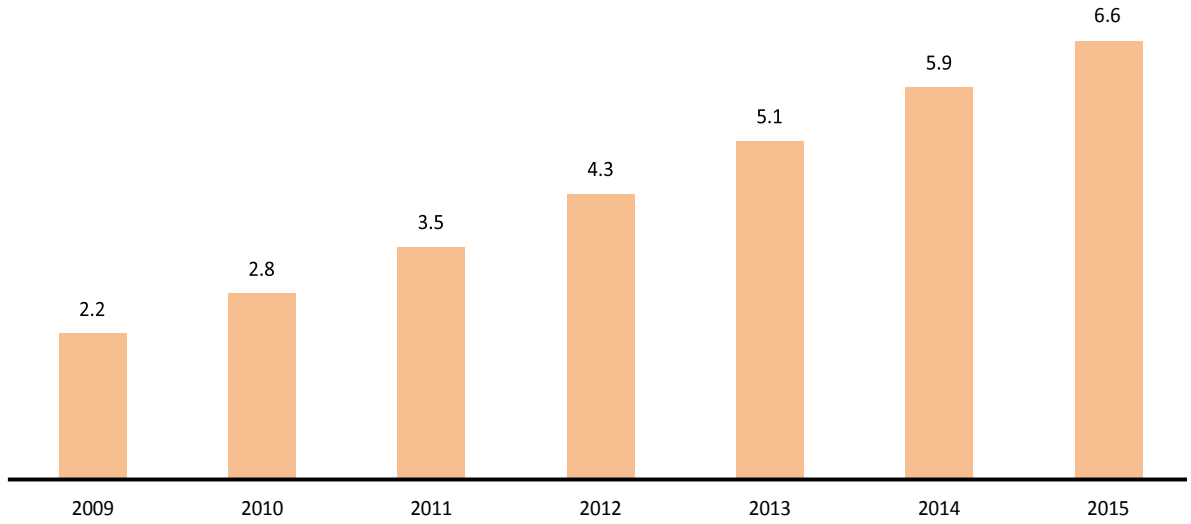
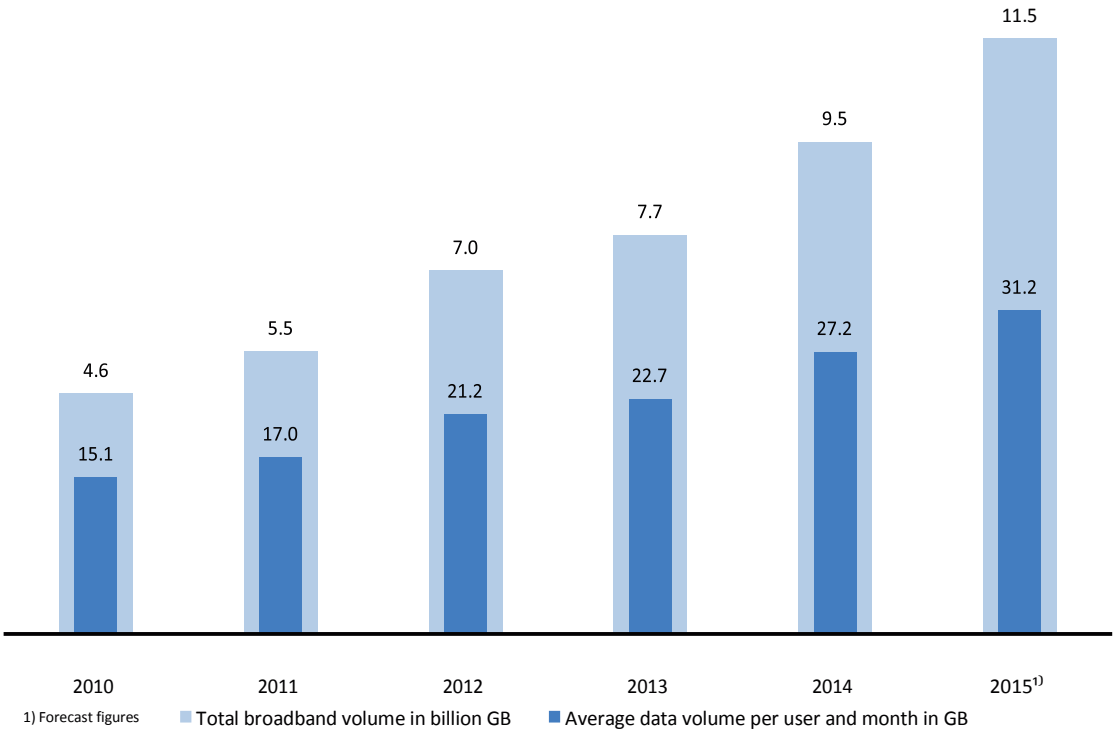


Broadband data volumes in fixed networks



At the wholesale level, the increasing significance of VDSL led to a considerable rise in demand for DTAG's VDSL wholesale products. Here, demand for both bitstream and resale wholesale products increased by 0.7m.

Broadband connections via HFC networks
The combination of optical fibre and coaxial cables, in conjunction with the DOCSIS 3.0 transmission standard, enables broadband services with download speeds of up to 400 Mbit/s. At the end of 2015 there were 6.6m connections via HFC networks, including 1.9 with delivering speeds of over 100 Mbit/s. In recent years HFC broadband customer numbers have grown at a consistent rate of between 700,000 and 800,000 per year.

Broadband connections via FTTB/FTTH
Thanks to their outstanding transmission properties, optical fibres are considered to be the ideal transmission medium for telecommunications. Limited by geographical availability, demand for both FTTB and FTTH is still relatively low, with around 277,000 customers accessing the internet via FTTB and just under 137,000 doing so via FTTH at the end of 2015. With around two million connections available to customers, the potential offered by this infrastructure is much greater.

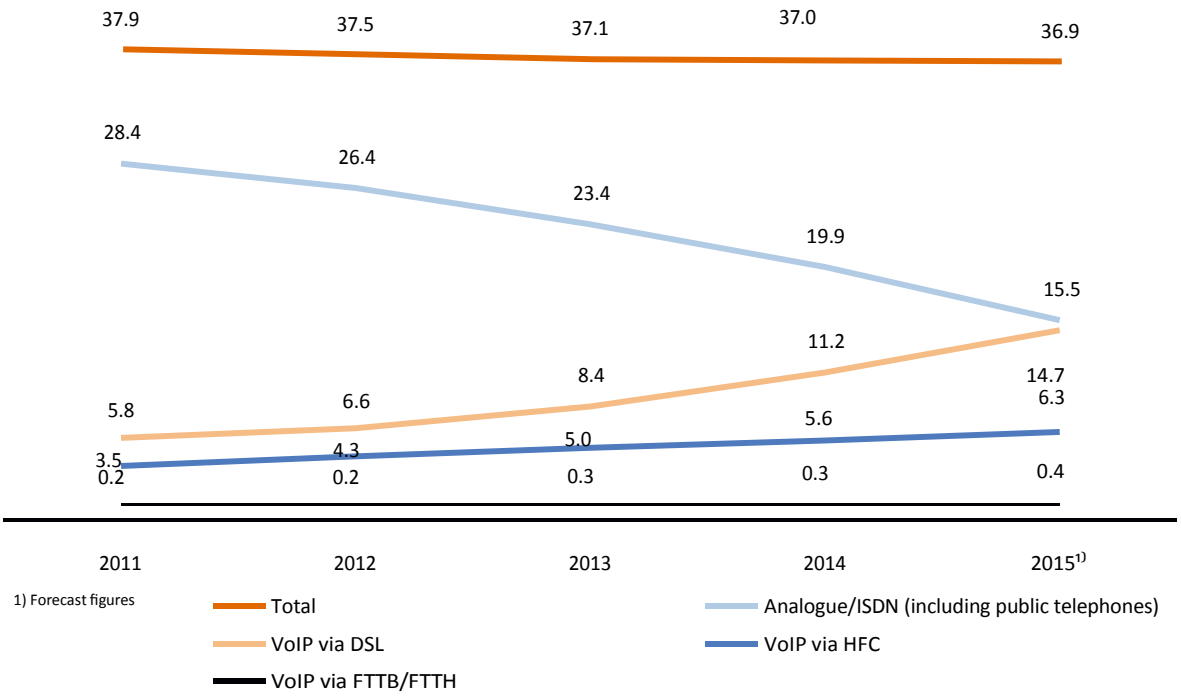
Satellite broadband connections
Satellite systems make it possible to access the internet from virtually any location. Just under 28,000 customers were using this technology at the end of 2015. User numbers remain low due to the price advantage and higher speeds of cable-based alternatives. However, satellite internet connections can make a contribution to ensuring full broadband coverage in regions where other technologies are not, or not sufficiently, available.

Broadband traffic volumes
According to initial estimates by the Bundesnetzagentur, the data volume per fixed-network broadband connection rose significantly once again in 2015 to around 11.5bn GB at the end of the year. The average data volume per broadband connection was therefore approximately 31 GB.

The figures shown do not include traffic volumes from DTAG's internet-based TV service.

Telephone connections
The last few years have seen contrasting trends in voice communication using conventional telephone lines (analogue/ISDN) on the one hand and DSL and HFC networks on the other.

Total number of telephone connections
m



While demand for DSL and HFC telephone services has increased, there has been a decline in the use of conventional telephone lines. Optical fibre telephony (FTTB/FTTH) continues to play only a marginal role. There was a slight overall decrease in demand for voice communication connections in fixed networks.

In fixed networks, the number of DSL lines used for VoIP rose by 31% year on year to an estimated 14.7m in 2015. This was mainly due to changes at DTAG. The number of HFC connections used for telephony increased by approximately 12% to 6.3m.

By the end of 2015 the number of voice lines in optical fibre networks had also risen to approximately 0.41m. At the same time, the number of analogue lines, the most common connection type in 2014, fell to around 9.5m and the number of ISDN basic rate lines fell to around 5.9m. The total number of ISDN primary rate lines4) stagnated at approximately 87,000. conventional fixed-line connections are gradually being replaced by IP-based technologies, which now account for around 58% of connections. The total number of public payphones (coin- and card-operated) stood at around 29,000 at the end of 2015.

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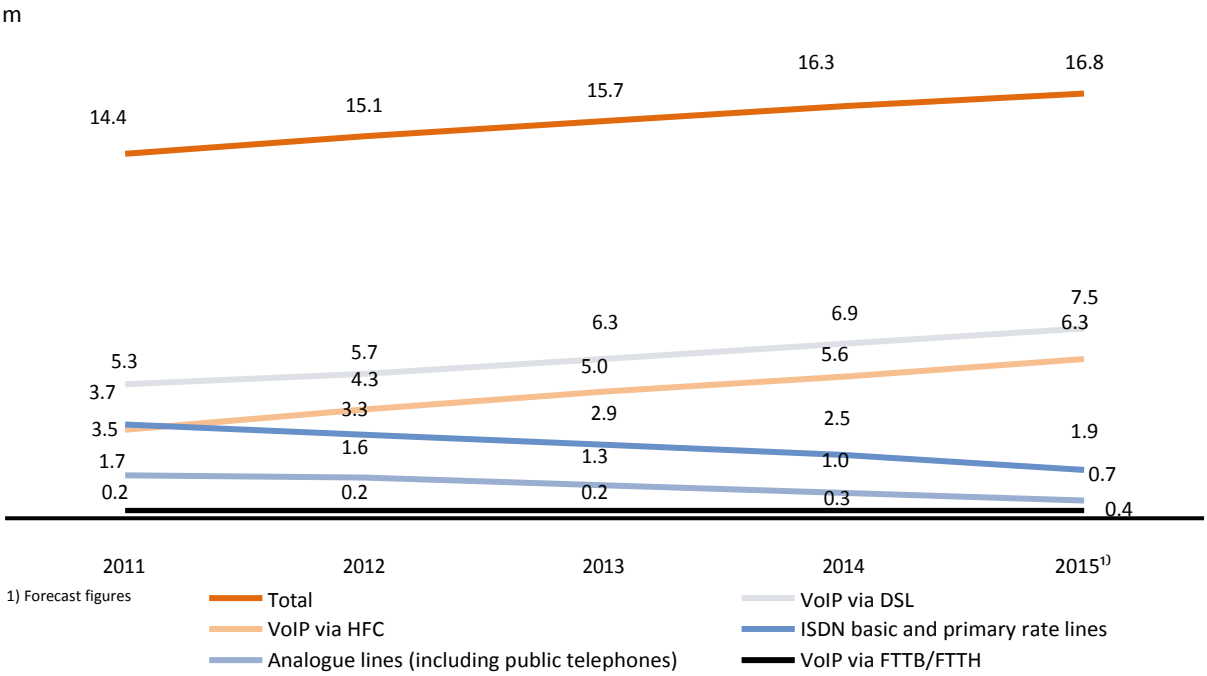
	2013			2014			2015¹⁾		
	Total stock	Competitors' share		Total stock	Competitors' share		Total stock	Competitors'	share
	m	m	%	m	m	%	m	m	%
Analogue lines	14.29	1.26	8.8	12.04	1.01	8.4	9.53	0.74	7.8
ISDN basic rate lines	9.06	2.88	31.8	7.72	2.50	32.4	5.89	1.89	32.1
ISDN primary rate lines	0.087	0.03	34.5	0.087	0.03	34.5	0.087	0.03	34.5
Public telephones	0.040	0.001	2.5	0.031	0.001	3.2	0.029	0.001	3.4
VoIP via HFC	4.95	4.95	100.0	5.62	5.62	100.0	6.27	6.27	100.0
VoIP via FTTB/FTTH	0.252	0.240	95.2	0.321	0.300	93.5	0.413	0.376	91.0
VoIP via DSL	8.43	6.30	74.7	11.21	6.85	61.1	14.72	7.46	50.7
Total connections	37.11	15.66	42.2	37.03	16.31	44.0	36.94	16.77	45.4

1) Forecast figures

4 Figures for ISDN primary rate lines are based on estimates.

Telephone connections from alternative subscriber network operators



DTAG's competitors had an estimated 16.8m telephone lines at the end of 2015. Although this represents an increase, it is around 0.5m below the increase in the previous year. While the number of analogue and ISDN basic rate lines provided by alternative subscriber network operators decreased further, their share of DSL lines for VoIP and voice lines in HFC and optical fibre networks continued to rise.

Relative to the number of fixed-network telephone connections provided by DTAG's competitors, DSL lines for VoIP accounted for a share of around 45% in 2015, which is significantly more than that of conventional analogue and ISDN lines (approximately 15%). At the same time, the share of DSL lines for VoIP was significantly higher than that of voice lines in HFC networks (around 38%). Voice lines in FTTB/FTTH networks accounted for a share of roughly 2%. Overall, around 85% of all competitors' lines were based on IP technologies. Within just a few years the importance of conventional telephony via analogue and ISDN lines has dwindled for alternative subscriber network operators.

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

Call minutes in fixed networks

The volume of call minutes[5]) within conventional telephone networks and IP-based networks continued to decrease. According to the Bundesnetzagentur's estimates, the total volume of call minutes in fixed networks amounted to around 141bn minutes.

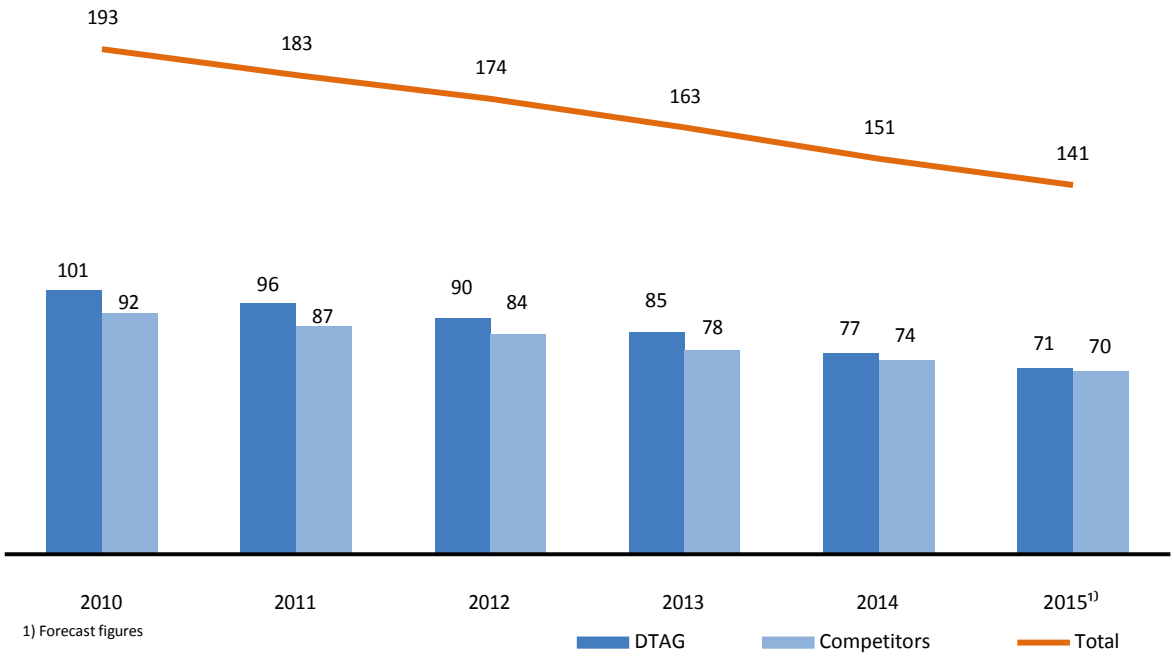
This decrease is likely to be due, among other things, to the increasing shift in traffic volumes to mobile networks. Use of internet mobile communication services (over-the-top services) has also increased in recent years.

Calls within German fixed networks amounted to an estimated 120bn minutes in 2015, while calls to national mobile networks accounted for around 9.8bn minutes and calls to foreign fixed and mobile networks for 10.7bn minutes.

According to initial estimates by the Bundesnetzagentur, around 70bn call minutes had been handled by DTAG's competitors by the end of 2015. The majority of these calls (52bn minutes) were made via IP-based networks. The volume of calls made via conventional analogue or ISDN lines

[5] Calls within Germany, international calls, and calls to German mobile networks

Outgoing call minutes in fixed networks
bn



Due, among other things, to DTAG's ongoing switch to IP-based network technology, this trend was also increasingly evident at DTAG. At the end of 2015 an estimated 25% of the 71bn call minutes handled by DTAG were handled via IP technology.

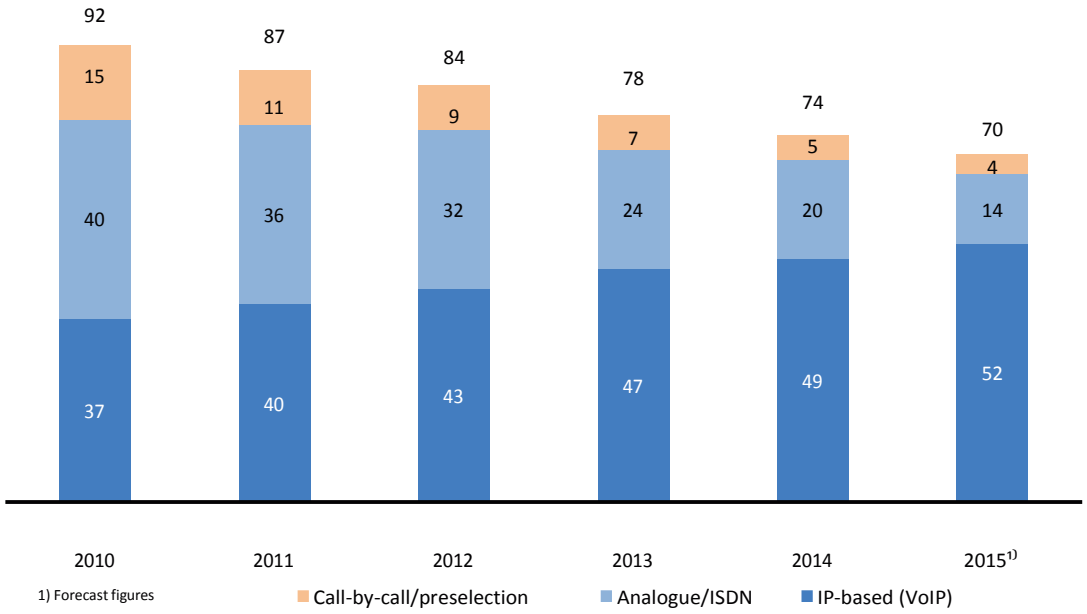
The Bundesnetzagentur estimates that just under 50% of all calls – ie every second call minute within fixed networks – was being handled via IP technology by the end of 2015.

Based on initial forecasts, indirect call-by-call and preselection calls handled by alternative providers accounted for a total of 4bn minutes, or around 6%, of all calls handled by competitors at the end of 2015 compared with approximately 7% in the previous year.

Despite a decrease in the number of lines with preselection in the DTAG network, preselection call volumes continued to exceed call-by-call. There were 0.9m lines with preselection at the end 2014. An estimated 0.7m DTAG customers had an alternative provider set as their default provider at the end of 2015.

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 which do not operate their own fixed-network lines or telecommunications networks and which offer internet-based services independent of network infrastructure (eg DSL, HFC or optical fibre).

Call minutes via alternative providers
bn

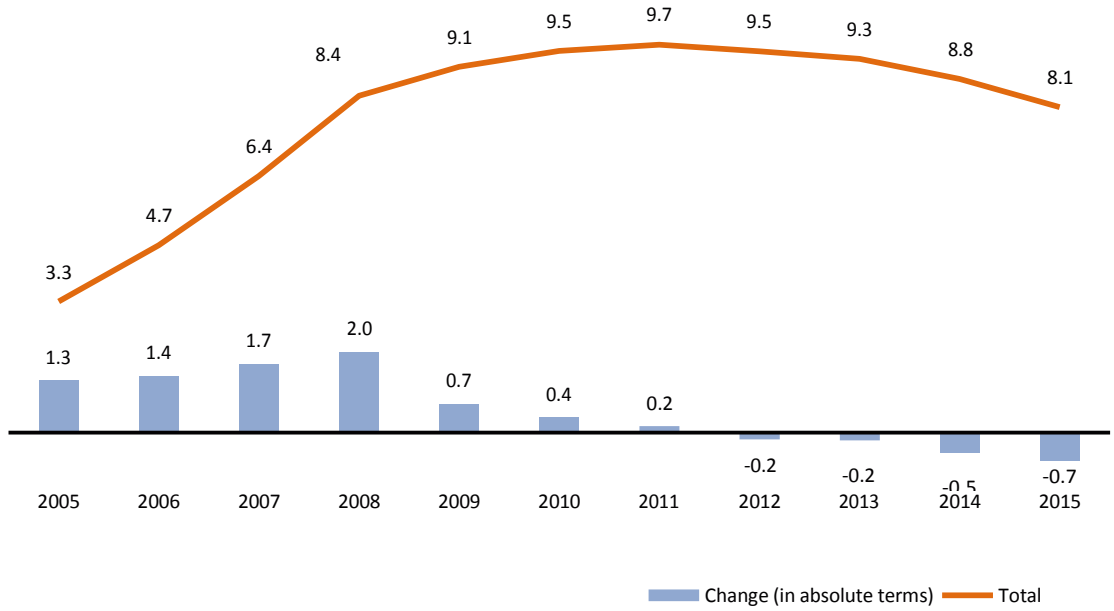


Subscriber lines

The number of local loops leased by DTAG's competitors continued to decrease in 2015, falling by approximately 0.7m year on year. In total, around 8.1m local loops were being leased at the end of 2015.

This decrease is due to a shift in demand for wholesale services to DTAG's bitstream and resale products on the one hand and the fact that end customers are increasingly using the services of cable providers on the other. Because cable providers have their own infrastructures for subscriber lines, they do not generally need to use DTAG's subscriber loops.

Volume of leased subscriber lines
m



Mobile communications

Subscribers

At the end of 2015 there were 113.8m SIM cards activated by network operators[6]. A share of 6.6m SIM cards were used for data communication between devices (M2M) (end of 2014: 5.2m)

Statistically speaking, each inhabitant has around 1.4 SIM cards. However, the use of two or three devices means that these devices are not in constant use. If only active SIM cards are taken into account, the actual number is lower. 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. On this basis, data collected by the Bundesnetzagentur suggest that there were 108.0m active SIM cards at the end of 2015 (end of 2014: 107.8m), 22% of which were attributable to service providers (2014: 21%)

Around 630,000 SIM cards were used at a fixed location. The number of LTE SIM cards in active use had increased to more than 27m by the end of 2015 (end of 2014: 17m).

An increasing share of active SIM cards are postpaid cards. At the end of 2015 they accounted for 60% compared with 58% at the end of 2014.

Traffic volumes and usage

Mobile broadband

Mobile data volumes continued to rise sharply. In 2015 591m GB of data were transmitted via mobile communication networks (2014: 395m GB).

In order to use mobile data transmission services, the number of SIM cards being employed in UMTS- and LTE-enabled devices once again rose considerably to 74.3m in 2015 compared with 52.6m in 2014.

Text messaging

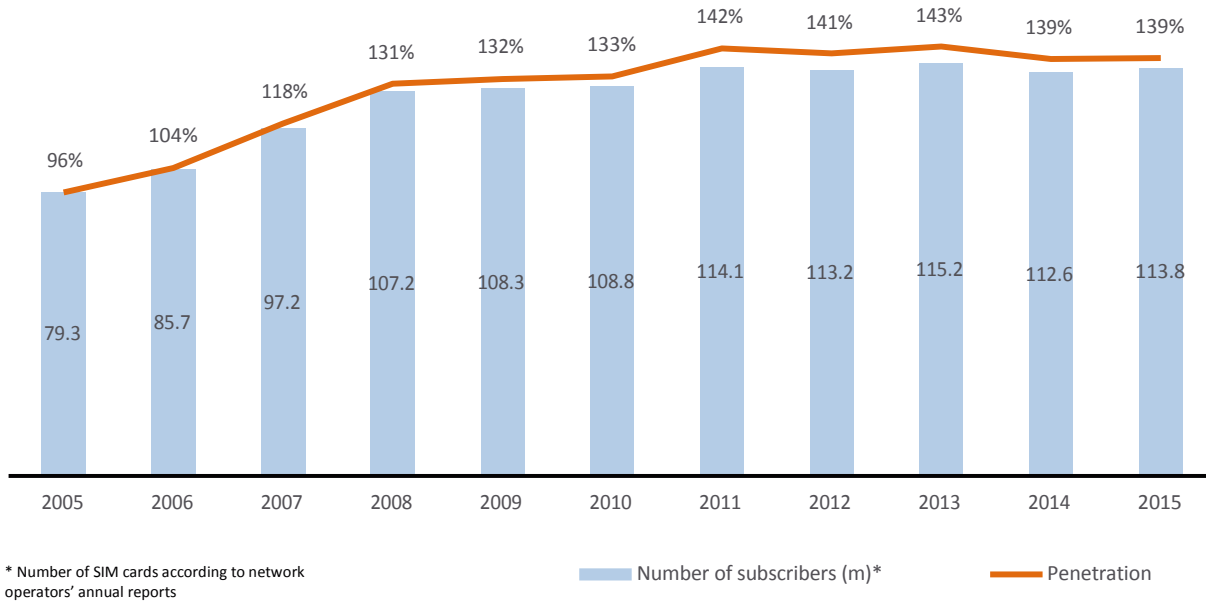
Another decline in the use of the Short Message Service (SMS) was observed in 2015. The number of text messages sent fell to 16.6bn in 2015 compared with 22.3bn in 2014. Owing to the growing number of smart phones, text messages are increasingly being replaced by messaging apps.

Call minutes

The volume of outgoing calls made by mobile subscribers in Germany in 2015 (115bn minutes) was higher than in recent years.

In previous years monthly revenue (excluding terminal equipment and VAT) per registered SIM card was around €14. The average data volume used per month has increased almost sixfold since 2011.

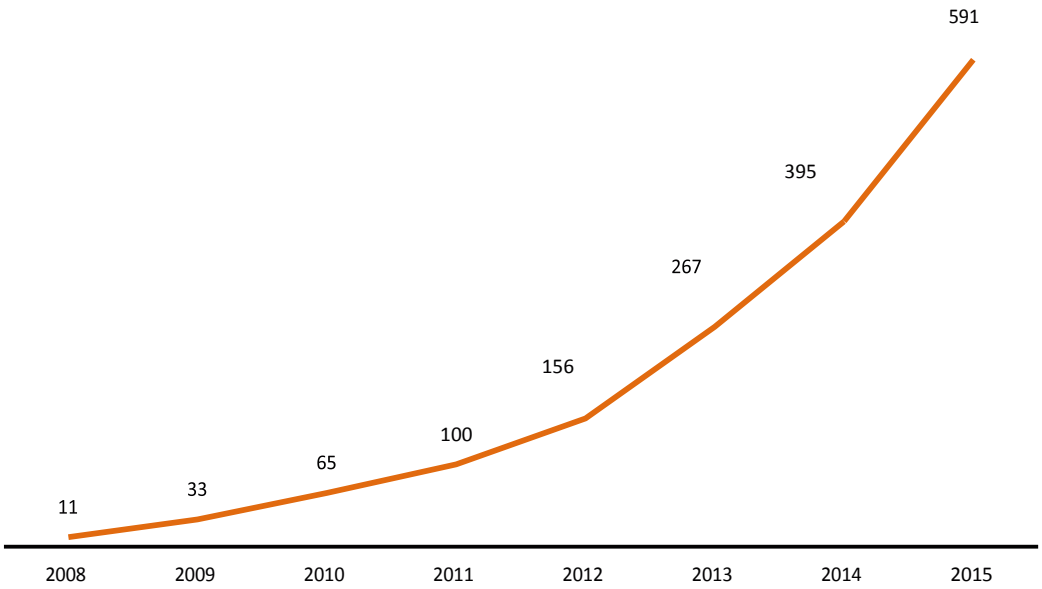
Subscribers and penetration in mobile communication networks



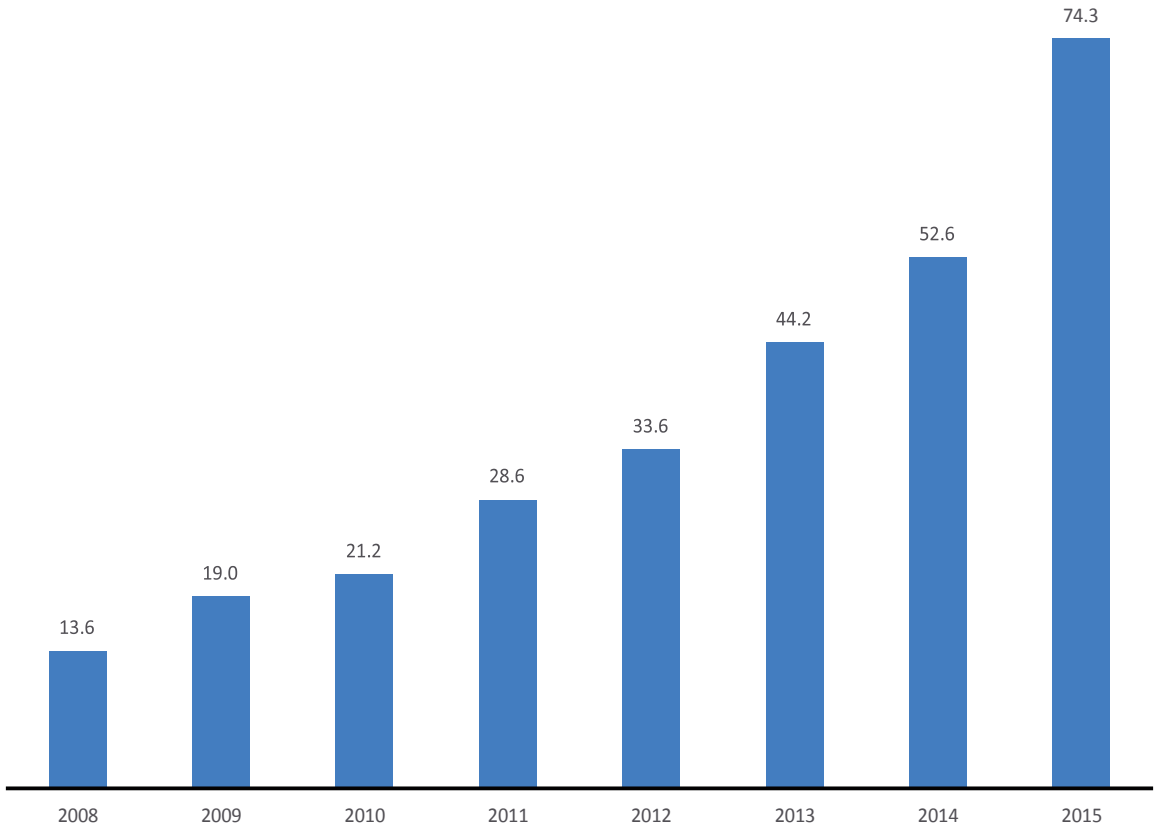
* Number of SIM cards according to network operators' annual reports

6 There is no uniform definition of the number of SIM cards specified in the annual reports of network operators. Each company decides independently how to count SIM cards and when adjustments are required.

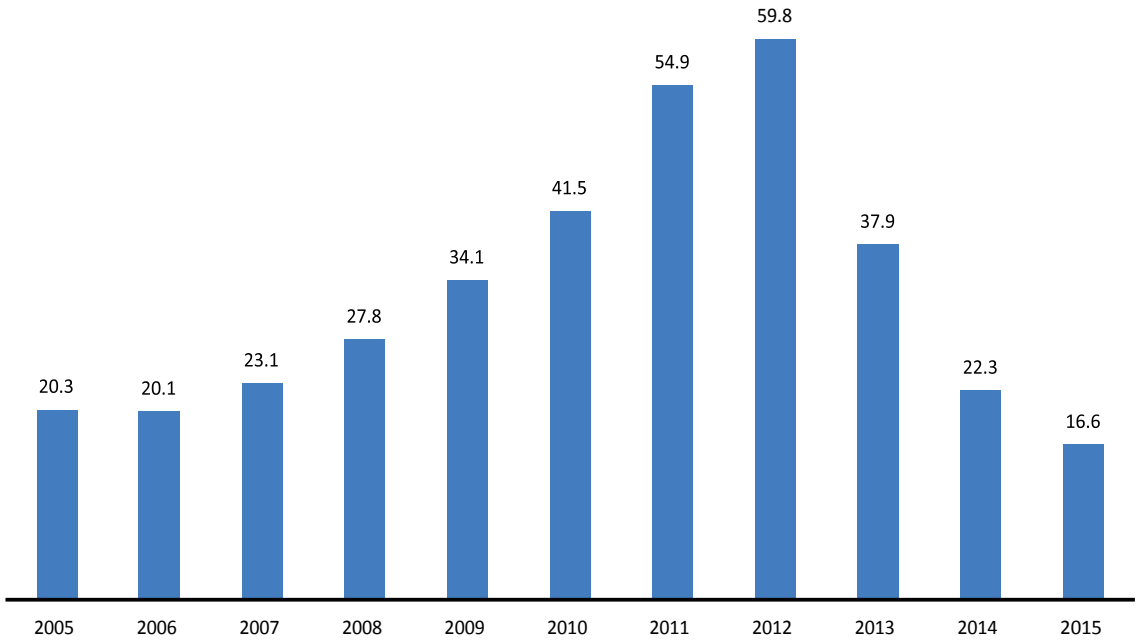
Mobile data volumes
m GB



Number of regular UMTS and LTE users
m

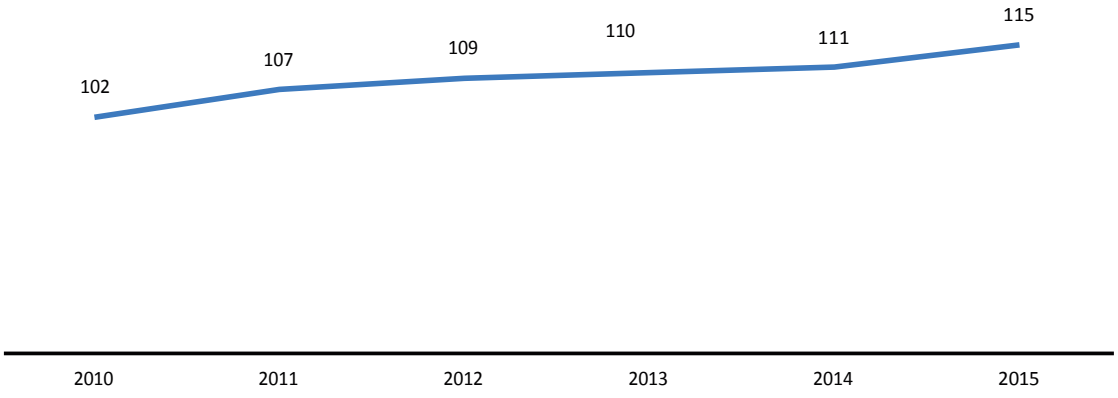


SMS sent
bn



Infrastructure and network coverage
The LTE rollout continued at a brisk pace. At the end of 2015 there were 38,800 LTE base stations (2014: 28,700). DTAG had achieved LTE network coverage in relation to the population of 90% by the end of 2015 compared with 84% for Vodafone and 75% for Telefónica Germany.

Outgoing call minutes in mobile networks
minutes (bn)



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 2013 to 2015.
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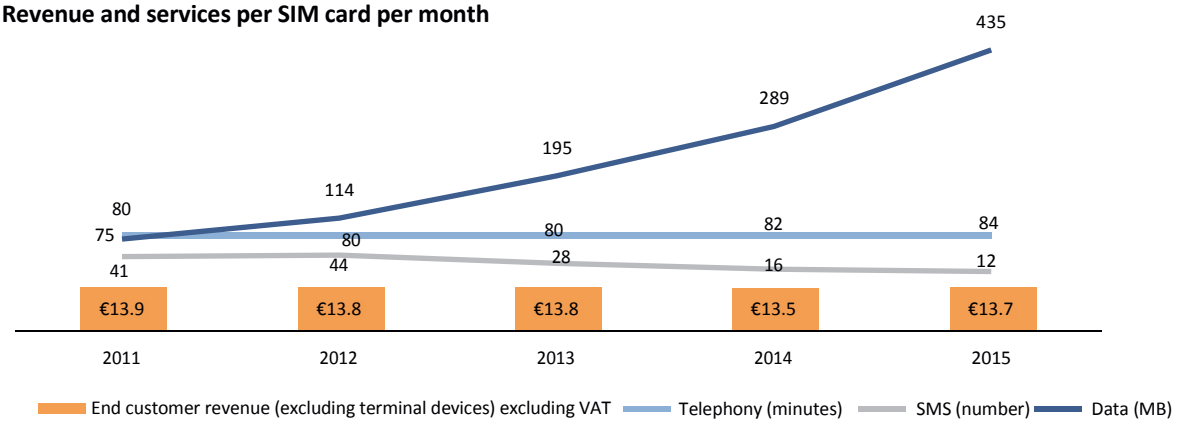
Revenue and services per SIM card per month



Key figures

Revenue (€bn)	57.2[1]
Investments (€bn)	8.1[1]
Employees	165,100[1]
Total fixed broadband connections (m)	30.7
- DSL	23.5
- HFC	6.6
- FTTB/FTTH	0.4
- Other	0.2
Broadband penetration rate (% of households)[2]	77
Total fixed telephone lines/access points (m)	36.9[1]
Analogue/ISDN (including public telephones)	15.5[1]
- VoIP via DSL	14.7[1]
- VoIP via HFC	6.3[1]
- VoIP via FTTB/FTTH	0.4[1]
DTAG leased subscriber lines (m)	8.1
Mobile subscribers (SIM cards in m)[3]	113.8
Mobile penetration rate (% of inhabitants)[3][4]	138.9

Competitors' shares %

Revenue	56[1]
Investments	52[1]
Fixed broadband connections	59
DSL	46
Fixed telephone lines/access points	45[1]

1) Forecast figures
2) Number of households according to Eurostat
3) According to network operators' annual reports
4) Number of inhabitants according to the Federal Statistical Office (DESTATIS).

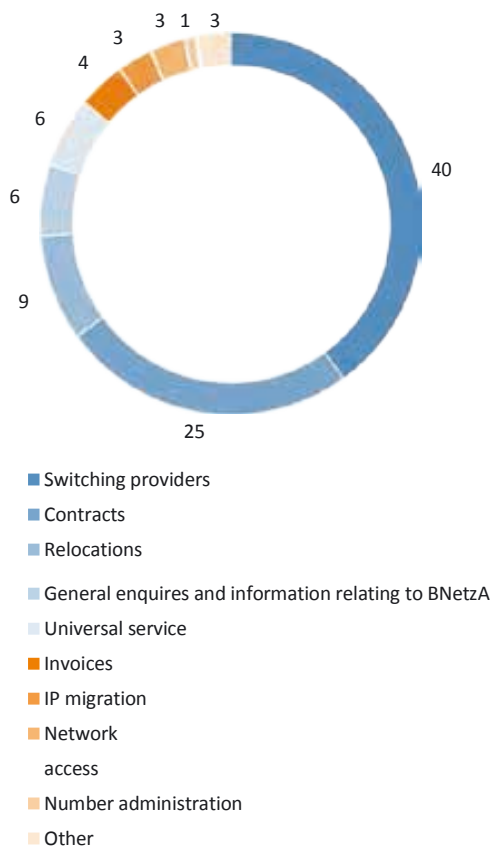
Consumer protection and advice

The Bundesnetzagentur received around 178,000 consumer enquiries and complaints in connection with telecommunications in 2015, approximately 21,000 more than in 2014. Most of these related to problems of switching providers and questions about the content of contracts. In 2015 fines totalling €467,350 were imposed due to unsolicited marketing calls and cold callers hiding their identity.

In 2015 the Bundesnetzagentur's Consumer Advice service received around 74,000 enquiries and complaints. 61% of all enquiries were sent by e-mail and 15% by post or fax. Around one quarter were resolved by telephone.

The main subjects of enquiries and complaints were switching providers, contracts, relocation issues and general questions relating to the Bundesnetzagentur.

Main subjects of enquiries and complaints in connection with telecommunications
%



General consumer enquiries and complaints

It is not always easy for consumers to keep abreast of innovative products and services in the telecommunications market. The Bundesnetzagentur's Consumer Advice service is therefore an important point of contact for individual consumer enquiries and complaints relating to telecommunications. It strives to listen to consumers' concerns and to provide competent and timely support in asserting consumer rights. The Consumer Advice service also seeks to evaluate consumer market information and counteract undesirable market developments. Effective consumer protection ensures that consumers achieve an equal standing in the telecommunications market.

When switching providers, statutory regulations guarantee consumers the right to uninterrupted service and to retain their existing number. However, the process of switching providers does not always run smoothly, as evidenced by the high number of enquiries regarding this issue. Most complaints and enquiries related to timely service provision by the new provider, and the provision of information on the prerequisites and procedure for switching providers and number porting. Particular difficulties arose when customers terminated the contract themselves rather than via the new provider, or when customers wanted to change providers again due to delays in the switching process.

To quickly assist those affected by service interruptions, the Bundesnetzagentur's Consumer Advice service has set up an escalation point of contact for switching providers. It contacts the relevant companies directly and resolves any problems which have arisen.

Of particular interest to consumers are answers to contractual issues, whereby the advice provided by the Consumer Advice service is limited to issues pertaining to telecommunications law in accordance with the Legal Services Act. Often the advice provided by companies, or a lack of transparency with regard to services or order confirmation, leads to misunderstandings when a contract is concluded. Many complaints also related to the implementation of the content of contracts, including prices and performance data. Consumers' primary grievances were additional unanticipated costs or major discrepancies between the transmission speeds promised in the contract and those actually provided. It is therefore important to obtain as much information as possible before concluding a contract. This is why the Bundesnetzagentur plans to provide a product information sheet containing key contractual information.

Consumer complaints in connection with the relocation process related to the failure to meet installation deadlines, long waiting times, and a lack of communication and cooperation on the part of telecommunications providers. According to the provisions of section 46 of the of the German Telecommunications Act (TKG), the contract must be continued under the same conditions at the new location. If the contractually agreed service cannot be provided after the relocation, the contract may be terminated by the consumer before the end of the contract term, subject to the three-month notice period.

"General enquiries" include all consumer enquiries relating to the Bundesnetzagentur's processes, responsibilities and other issues within the Bundesnetzagentur's remit. One particularly contentious issue at present is Deutsche Telekom's planned migration of the entire telephone network to IP telephony (VoIP) by 2018. Those seeking advice wanted to know whether this is permitted by law, and what advantages and disadvantages are associated with VoIP. Information about network access was another important topic. Common problems in this connection include the realisation of agreed appointments with technicians, port rental and general network expansion.

Many consumers also contacted the Consumer Advice service about billing complaints. They queried individual invoice items where they were unsure about a fee-based contractual relationship. Most of these queries related to subscription agreements concluded by consumers on the internet. Further enquiries related to call-by-call connections, international roaming and premium SMS services.
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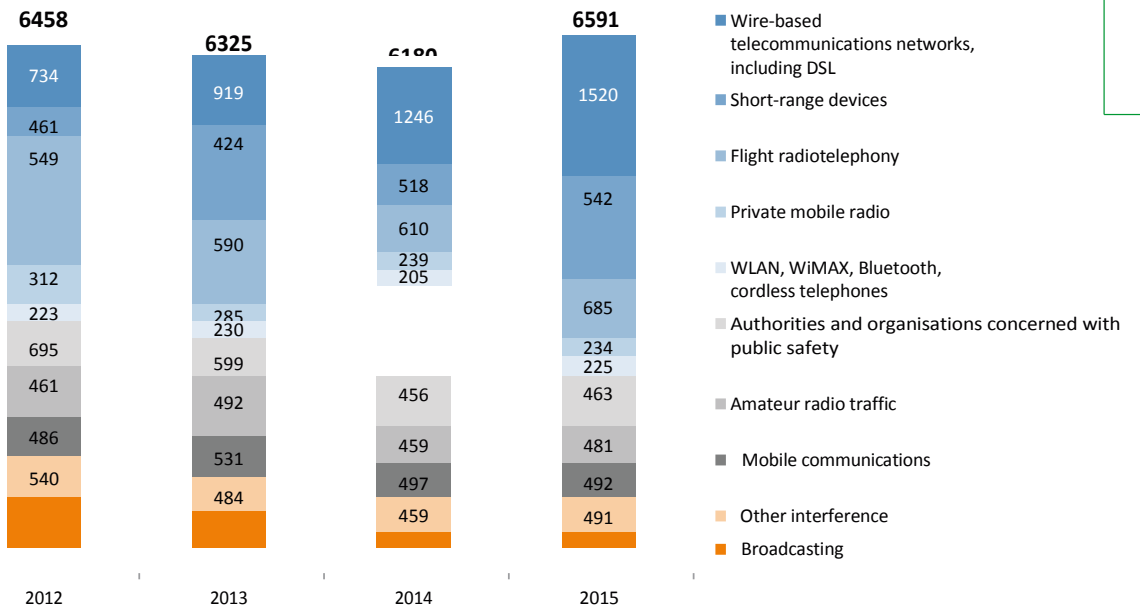
Development of interference volumes by topic cluster from 2012 to 2015



Dispute resolution

The Bundesnetzagentur's dispute resolution panel acts as an intermediary within the scope of the TKG in disputes between customers and telecommunications providers. It aims to find a solution that is acceptable to both parties and thus avoid a legal dispute. Dispute resolution provides a fast, unbureaucratic and cost-effective alternative to civil proceedings.

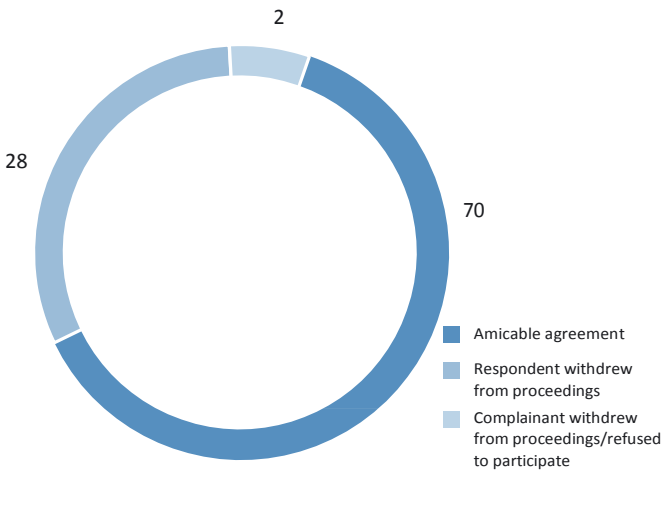
The Bundesnetzagentur received a total of 1,104 requests for dispute resolution in 2015. There were also 300 other enquiries and requests for assistance. This represents another year-on-year increase. This very intensive use of the dispute resolution panel is due to the 2012 amendment of the TKG, which expanded the panel's powers, particularly in contract law disputes pertaining to consumer protection rights laid down in the TKG. This made it possible to reduce the burden on ordinary courts in many contractual disputes between companies and end customers and reach an out-of-court settlement.

In 2015 the dispute resolution panel actively supported the legislative procedure for the implementation of the European Directive on Alternative Dispute Resolution. This draft legislation provides for, among other things, amendments to the TKG and a new consumer dispute resolution act. The practices of all dispute resolution panels in Germany are to be standardised and the Bundesnetzagentur's dispute resolution services are to be provided free of charge in future. The legislation is scheduled to come into effect in spring 2016.

In 2015 1,100 proceedings were concluded by the dispute resolution panel. In 11% of cases, the application was withdrawn by the complainant before the dispute resolution process began due to, for example, the matter already having been resolved. In 32% of cases, the application for dispute resolution had to be rejected because the prerequisites for carrying out dispute resolution proceedings had not been met (no breach of consumer protection rights according to the TKG).

Of the remaining 618 dispute resolution proceedings, the parties reached an agreement in 70% of cases. In the majority of cases, the parties reached a settlement amongst themselves prior to the issue of a dispute resolution proposal or the matter was resolved before formal proceedings began. The percentage of proceedings in which the respondent chose not to take part in the dispute resolution proceedings, without offering a solution to the issue at hand, was 30%.

Dispute resolution cases in 2015



The percentage of eligible dispute resolution cases pertaining to contractual matters in 2015 (58%) remained virtually unchanged year on year. Most contentious matters related to the provision of contractually agreed performance levels, for instance, data transmission rates or lengthy periods of connection downtime. The number of billing complaints rose slightly to 16%. The percentage of dispute resolution cases relating to problems switching providers, relocation issues or number porting fell once again, ultimately accounting for just 17%.

Switching providers

When a switch of providers occurs, telecommunications providers and network operators have a legal obligation to ensure that there is no disruption to the service provided to customers by the company they are leaving before the contractual and technical requirements for the switch have been met. The service of the subscriber must not be interrupted for more than one calendar day. If the switch to the new provider is unsuccessful, the donor provider is obligated to resume service provision. To ensure that the process of switching providers runs smoothly, consumers are advised to task the new provider with terminating the contract with the old provider rather than attempting to do so themselves.

To this end, the new provider sends the consumer a number porting form which covers both the termination of the contract and the application for number porting.

If anything goes wrong during the switching process, the consumer should initially contact the companies involved. If this does not yield the desired results, the parties can contact the Bundesnetzagentur.

The Bundesnetzagentur has determined that 229 providers are now obligated to engage in immediate and non-discriminatory cooperation within the framework of the escalation procedure. The Bundesnetzagentur forwards consumer complaints directly to the relevant companies in each case if, in contravention of the statutory regulations, service is interrupted for more than one calendar day when switching providers. The companies are asked to present their stance on the matter in hand and quickly propose targeted solutions. The aim is to promptly clarify what has to be done by each party to bring the change of providers to a successful conclusion and ensure that consumers once again have access to telecommunications services. The primary aim of the escalation procedure is to reinstate consumers' telecommunications services as quickly as possible.

Experience shows that an increasing number of consumers are making use of the support offered by the Bundesnetzagentur. In 2015 the Bundesnetzagentur represented consumer interests in around 30,000 cases pertaining to switching providers (including repeat enquiries). The number of escalation cases initiated remained constant year on year at around 5,300.

Ultimately it is within the scope of influence and in the interests of companies in the market to themselves reduce the error rate for switching providers and thus strengthen consumer confidence in a well-functioning process by quickly and comprehensively establishing automated processes. The reduction in the number of complaints received from the second half of 2015 suggests that there has been a general improvement

in the process of switching providers for the first time since the process was changed. The Bundesnetzagentur will closely monitor further developments.

It continues to firmly support initiatives launched by providers and professional associations to this end, particularly the automated coordination process and exchange of porting data.

Despite efforts within the industry to reduce the error rate when switching providers, the Bundesnetzagentur continues to channel all available legal resources into ensuring that the regulations on switching providers are implemented in accordance with the law. Based on the findings obtained from the escalation procedure, it assesses whether companies are in breach of their obligations as recipient or providers. Following the initiation of fine proceedings against three major companies accused of failing to meet their obligations with regard to switching providers in 2014, further fine proceedings were completed in February 2015. The Bundesnetzagentur fined the companies in question a total of €300,000. All four providers account for around 70% of complaints received about switching providers. The appeals lodged by two of the companies are being heard by Bonn Local Court.

Transparency measures – draft Transparency Ordinance

The Bundesnetzagentur has drafted a Transparency Ordinance to provide consumers with additional information about telephone and internet services. The starting point was an analysis of the information behaviour of providers of fixed and mobile broadband connections. The Bundesnetzagentur's market study revealed that – across all technologies, products and providers – there is a major discrepancy between the contractually agreed maximum data transmission rate and the actual data transmission rate. It also became apparent that no information, or no robust information, on realisable data transmission rates was being provided in contracts despite the fact that transparency of service provision has a major impact on customer satisfaction. With this in mind, the Bundesnetzagentur initiated a dialogue process with industry. The outcome is a binding regulatory concept which improves transparency for consumers. Despite making numerous valuable contributions, the ideas proposed by industry were too vague for a self-regulatory approach. There were also serious doubts as to whether the proposals would be implemented voluntarily by all providers. The draft ordinance underwent a public consultation process in February 2014. The draft was revised on the basis of the comments received and submitted to the responsible ministries in September 2014 with a view to reaching the necessary consensus.

The draft ordinance covers the following key aspects:

The product information sheet

As provided for in the coalition agreement, providers must, prior to concluding a contract, offer consumers a product information sheet covering the key components of the contract, including the contract duration, minimum and maximum data transmission rates, conditions which lead to a reduction in the data transmission rate, and the beginning and end of the contract. The layout and content of product information sheets will be specified by the Bundesnetzagentur. This information should be highlighted in the contract.

Checking data transmission rates after activation of a connection

After activation of a connection, consumers have a legal right to be informed of the current data transmission rate of the mobile or fixed-network connection. Consumers are therefore able to check compliance with contractually promised speeds and document these to facilitate the process of contesting possible performance deficiencies. Providers can fulfil this obligation by offering customers their own measuring tool. Alternatively, they can refer consumers to the Bundesnetzagentur's measuring service (www.breitbandmessung.de), which was launched on 18 September 2015. This service compares contractually agreed data transmission rates with actual data transmission rates.

Presenting and storing measurement results

Providers are obligated to show consumers "at a glance" the contractually agreed minimum and maximum data transmission rates and the data transmission rate actually measured. The measurement results must be storable and documented in the online customer centre.

Private users can easily carry out several measurements and raise complaints about any discrepancies between actual and contractually agreed data transmission rates with their provider.

Contract duration and cost control

Many consumers find it difficult to keep track of when their contract expires. The Bundesnetzagentur therefore intends to make it legally binding for providers to specify on monthly bills the date upon which the contract began and the end of the minimum contractual period. This creates transparency for consumers. The rules on cost control are also to be optimised. In certain cases, warnings are to be introduced for mobile tariffs in the event of data traffic exceeding the agreed volume. This will protect consumers from unexpectedly high bills.
The Transparency Ordinance has yet to enter into force, despite there being political will to make this happen. The Federal Ministry of Justice and Consumer Protection, for example, has expressly welcomed the regulations of the Transparency Ordinance. However, to ensure a solid legal basis for the ordinance, it was necessary to first make some amendments to the draft Consumer Dispute Resolution Act. The draft Transparency Ordinance will not be presented to the Bundestag for deliberation until coordination of the draft Consumer Dispute Resolution Act is complete. The Bundesnetzagentur intends to use its political scope to ensure that the ordinance comes into effect as quickly as possible. The regulatory framework for telecommunications is currently subject to revision at the European level. The Bundesnetzagentur's draft ordinance can be adapted to take account of this.

IP migration of Telekom Deutschland GmbH

DTAG wants to make its existing landlines throughout Europe suitable for internet communication by 2018 and migrate its network to IP-based telephony. Voice communication will thus be transmitted in packet-switched mode. To achieve this, around 70,000 DTAG customers in Germany are being migrated to the new system every week. Other telecommunications companies in Germany are also focusing on IP technology and offering digital telephony. For many DTAG customers, the IP migration constitutes a radical change – not only due to the contractual implications. Contracts which, in some cases, have been in place for decades are being terminated by the company. It is also necessary to determine on a timely basis whether existing terminal equipment and special safety-related services (medical alarms, security alarms, fire alarms) function in the IP world. Moreover, there have been instances where the IP technology – and therefore the telephone service – has failed during the changeover phase.

It should be noted that the introduction of IP-based technology by DTAG is subject to very little regulatory control. Companies in the market are free to decide what products they offer. No legal obligation exists to offer one or more specific types of connection, nor are companies obligated to seek approval from the Bundesnetzagentur for certain connection types. However, the Bundesnetzagentur must ensure that there is no breach of TKG consumer protection provisions (sections 43a ff TKG) and that the universal service, ie the provision of basic telecommunication services (sections 78 ff TKG), is provided.

Due to the high number of complaints initially received in connection with the IP migration, the Bundesnetzagentur has entered into a structured dialogue with DTAG with the aim of making the migration process as consumer friendly as possible. The German federal states' working group for telecommunications, information technology and post and the Federation of German Consumer Organisations (VZBV) are also involved in this process. Thanks to the great dedication of all involved, individual improvements have been made for the benefit of private households, particularly the establishment of a test centre for special services. Here, tests can be conducted to determine, among other things, which medical alarm systems are compatible with IP technology. This provides consumers with the protection they need in the event of an emergency. The Bundesnetzagentur has also succeeded in ensuring that DTAG takes a more transparent approach to communicating the contract termination process. These, and further results of the dialogue round, have increased acceptance of the IP migration process. This is reflected in the steady reduction in the number of complaints received since August 2015. The Bundesnetzagentur will continue to monitor the migration process very carefully.

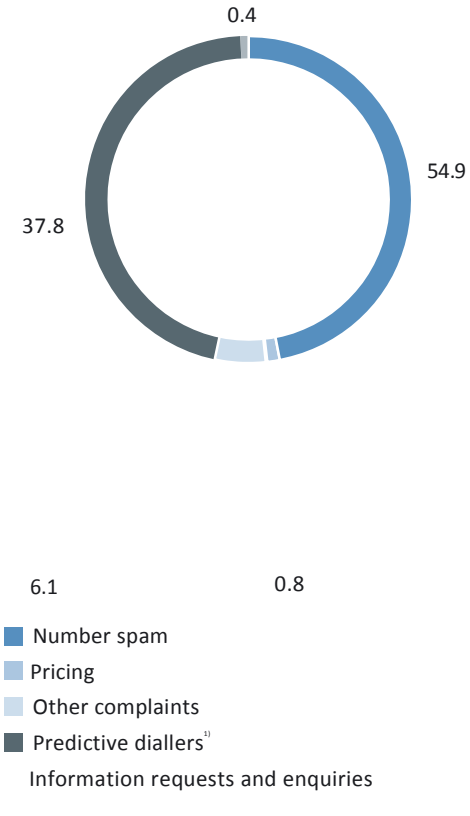
DTAG is also introducing POTS (Plain Old Telephone System) cards, which translate analogue or ISDN telephone signals into IP signals, thus offering customers who only have a voice connection a complete substitute for their existing services.

Combating number misuse

The TKG places responsibility on the Bundesnetzagentur for combating number misuse. This could involve the Bundesnetzagentur imposing fines for breaches of TKG consumer protection provisions, such as breaches of the rules on call price indication and pricing messages, or breaches of prohibitions on circumvention. However, breaches of competition rules, such as spam faxes and texts, also fall under the Bundesnetzagentur's remit. Consumers are to be protected against disturbance and financial loss caused by number misuse and other market participants are to be protected against distortion of competition caused by breaches of law

In 2015 the Bundesnetzagentur received a total of 77,772 written complaints and queries about telephone number misuse, which shows a slight rise from 65,127 complaints in 2014.

Main subjects of written complaints and enquiries in 2015
%



The number of telephone complaints received by the Bundesnetzagentur has also risen from 20,327 complaints about number misuse and unsolicited marketing calls in 2014 to 22,085 in 2015.

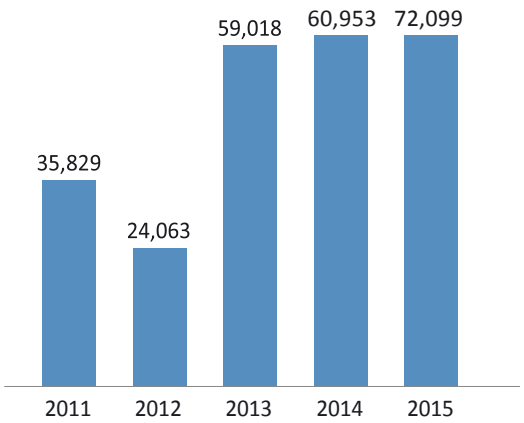
The Bundesnetzagentur opened 1,983 administrative proceedings last year, the majority of which involved extensive investigation. In 170 cases the Bundesnetzagentur ordered the disconnection of 3,913 phone numbers. Billing and collection bans were also issued for 47 telephone numbers. A ban on billing means that the sums involved may no longer be charged. If consumers have already received an invoice but not yet paid it, the ban on collection applies. The Bundesnetzagentur also banned anti-competitive business models in two cases and issued warnings in a number of cases.

Spam

As part of its work combating number misuse, the Bundesnetzagentur is responsible for combating spam, whether telephone, fax or e-mail. The Bundesnetzagentur can only take action, however, if the spam can be related to a telephone number. Hence the criterion for intervention, even for email spam, is that a telephone number is given, perhaps as a contact number. Telephone spam covers spam texts, telephone prize scams, "missed call" scams and unreasonable telephone behaviour by call centres (predictive diallers).

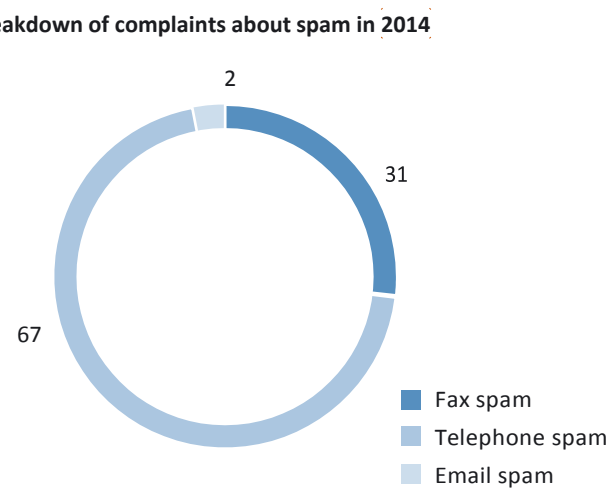
The number of complaints relating solely to telephone number spam reached 72,099 in 2015. This represents an increase compared with the previous year (60,953 complaints).

Written complaints about spam



Most complaints about call number spam received by the Bundesnetzagentur related to telephone spam (67%), followed by complaints about fax spam (31%) and email spam with a related telephone number (2%).

Breakdown of complaints about spam in 2014



Combating text spam

The Bundesnetzagentur continued to consistently take action against unsolicited promotional text messages in 2015 following 13,485 consumer complaints about this type of nuisance advertising. A considerable proportion of complaints related to text messages in which short URLs were advertised under various pretexts. When recipients opened the links, they were automatically redirected to websites most commonly running promotional competitions. To take part, consumers had to provide personal data. In other cases, short URLs were used to advertise lending services and premium rate chat and adult entertainment services. The Bundesnetzagentur ordered the disconnection of more than 2,700 mobile numbers which were used to send illegal promotional text messages.

Call centre phone practices

During the year under review the Bundesnetzagentur was faced with a considerable number of complaints – 29,387 in total – about call centres' nuisance telephone behaviour resulting from the use of predictive diallers. Predictive diallers are programmes which dial several numbers at the same time. The number and circumstances of the attempted calls, however, can become an unreasonable nuisance for those receiving the calls. In such cases the Bundesnetzagentur has recourse to various measures within the scope of number administration. On 1 January 2015 self-imposed industry codes were adopted and published by several associations. These codes contain specific frameworks for call behaviour as well as industry rules for call times and the number of attempted calls.

Directory enquiry services/circumvention models

The Bundesnetzagentur ordered the disconnection of the directory enquiry service numbers 11865 and 11878, and also imposed a ban on billing and collection. Local numbers, freephone numbers starting with 0800 and medium rate service numbers were being used to make consumers call the directory enquiry service numbers 11865 and 11878, thus intentionally concealing high tariffs and circumventing the statutory regulations on price transparency. Following the disconnection of these two numbers, several measures were imposed on 0180 and 0900 numbers which were being used to continue this business model.

Combating nuisance marketing calls

In 2015 the Bundesnetzagentur received 24,455 written complaints about unsolicited marketing calls. The number of complaints therefore remained high, but was lower than in the previous year thus continuing the positive trend of previous years. The Bundesnetzagentur also dealt with 22,085 telephone enquiries and complaints about number misuse and unsolicited marketing calls last year.

The Bundesnetzagentur continued to conduct fine proceedings in 2015. Fines totalling roughly €467,350.00 were imposed due to unsolicited marketing calls and callers hiding their identity.
Warnings were also issued to enterprises and individuals from various branches of industry. Those most frequently involved were enterprises advertising energy supply services via the telephone. The other main sectors involved were telecommunications, insurance and finance, the same as in the previous year.

Measuring broadband speeds

Zafaco GmbH was commissioned by the Bundesnetzagentur in 2015 to develop a broadband test. This test enables broadband users to quickly and easily measure the speed of their internet connection, regardless of provider or technology, and thus determine the performance of their fixed or mobile broadband connection. The test was launched on 25 September 2015 on the website www.breitbandmessung.de.

The Bundesnetzagentur had already carried out nationwide measurements in 2012 and 2013, when internet users were able to measure the data transmission rate of their internet access service. The results of these measurements were incorporated into two studies on the service quality of broadband internet access. These studies are available on the Bundesnetzagentur's website at www.bundesnetzagentur.de/qualitaetsstudie. The results of both Bundesnetzagentur measurement studies and industry dialogue on this issue were taken into account when developing the test. The intensive dialogue with industry was continued in various workshops during the development of the broadband speed test.

The basis for measuring broadband speeds is provided for by the transparency requirements of the Telecommunications Act (sections 43a, 45n TKG). End customers should be able to easily compare the level and quality of telecommunications services. Under the statutory regulations, the Bundesnetzagentur can therefore carry out its own measurements or develop tools which allow customers to carry out their own measurements. The test enables a comparison of the actual data transmission rate of a broadband connection with the contractually agreed data transmission rate. Customers can carry out the test themselves and the results can be stored electronically.

Customers can measure the speed of fixed broadband internet access services via a browser-based measurement client, which runs using a Java plug-in. Via another measurement client, customers can measure mobile broadband internet access services from smartphones or tablets using an app which supports both Android and iOS. From a technical perspective, the actual measurement process is identical in both cases.

The customer's specific contractually agreed tariff information is requested during the measurement process. To avoid consumers having to enter data manually, providers' tariff data is stored in a database which is regularly updated. The customer can then select the provider/tariff from a dialogue box. This greatly facilitates the assignment of individual contract data.

In conjunction with industry, the Bundesnetzagentur has developed a template for data delivery. In addition to the data supplied by large telecommunications providers, the Bundesnetzagentur wrote to more than 300 companies in 2015 requesting tariff information. It has consequently received tariff data from various providers which, together, represent more than 90% of the fixed network market volume. The list of tariff information stored in the measurement database is updated and supplemented on an ongoing basis.

Where possible, the Bundesnetzagentur also aims to record and take account of all environmental factors which could affect customers' measurement results. Such factors include the type of connection (WLAN) or whether or not additional terminal devices are using the internet during the measurement process. With certain routers, which account for a large share of the market, additional parameters can already be obtained, including the transmitted data volume sent and received. It is also possible to obtain additional values for both the iOS and Android mobile operating systems. The Bundesnetzagentur's long-term objective is to collect additional parameters for as many router types as possible.

Over 400,000 measurements were carried out in 2015, more than half of these via the app.

Universal service

Last year around 4,350 consumers contacted the Bundesnetzagentur for support in matters concerning the provision of basic telecommunication services. The universal service comprises a minimum set of publicly available services of a specific standard to which all end users, irrespective of their place of residence or work, shall have access at an affordable price.

Telekom Deutschland GmbH provides the basic service in Germany on a voluntary basis. Connection at a fixed location to a public telecommunications network and access to publicly available telephone services continued to be the main focus of activities in universal service in 2015. The number of complaints received by the Bundesnetzagentur in this connection rose by 36% compared with the previous year. For consumers, these were largely prompted by delays in the provision of a telephone line. Thanks to a separate work process agreed by the Bundesnetzagentur and DTAG, the Bundesnetzagentur is able to ensure a speedy and, in most cases, satisfactory solution for consumers.

The nationwide provision of public payphones and cardphones is likewise part of the universal service. In November 2014 an inventory of payphones and cardphones listed around 29,000 phones. At the same time, mobile communications have continued their extensive spread, now having reached more than 113.40 million SIM cards. The market developments in mobile telecommunications and the full coverage nationwide that has been attained with landlines have led to a complete change in users' telecommunications behaviour and subsequently an extremely low level of demand for public telephones. Despite the measures adopted in the past, such as acknowledging the "basic telephone" as being a public pay telephone or cardphone, the number of extremely uneconomic locations of public telephones increased further in the period from January to November 2015.

Text and video relay service

The TKG sets out that providers of publicly available telephone services have to set up a text and video relay service for deaf and hearing-impaired people. The aim is to enable such individuals to have access to customary "voice" telephony, thus ensuring telephone contact with family members, friends, doctors, local authorities, etc. Via a PC, the deaf person can set up a video or data link to the text and video relay service's sign language interpreter, who then translates the message into spoken language for the recipient. He/she then translates the recipient's message back into sign language or written language.

Through the text and video relay service, deaf people are able to make and receive calls to and from anybody participating in the service. The Bundesnetzagentur has been following this service since 2005 and since 2009 has put the regular operation of this service out to tender.

All providers of publicly available telephone services are obligated to provide their own text and video relay service for deaf or hearing-impaired people, or to commission a third party to do so. Because the market has been unable to agree on an industry-wide solution thus far, the Bundesnetzagentur regularly puts this service out to tender – most recently in 2014. The tender was awarded to Tess – Sign & Script – Relay Dienste für hörgeschädigte Menschen GmbH, which

will provide the service from 2015 until the end of 2018.

Furthermore, the Bundesnetzagentur once again took appropriate measures in 2015 to ensure that the text and video relay service would also be financed by the telecommunications operating companies. An increase in salaries for sign language interpreters and speech-to-text interpreters has meant that the costs for the interpreters employed at Tess GmbH have also risen since 2015. Linked to this increased cost is an increase in the contributions of telecommunications companies and in the call tariffs for users of the text and video relay service. As in previous years, any surplus of Tess GmbH will be distributed in full to the telecommunications companies that were called upon to make payment.

Investigating interference – the radio monitoring and inspection service

The Bundesnetzagentur's radio monitoring and inspection service makes an important contribution to consumer protection. An average of more than 6,000 cases of radio interference are dealt with and eliminated by employees of the radio monitoring and inspection service each year. These include radio interference to the aeronautical service, interference to DSL connections and interference on vehicle radio keys caused by radiation. The radio monitoring and inspection service is available 24 hours a day, seven days a week, to ensure that important radio services, such as aeronautical radio and applications used by authorities and organisations concerned with public safety, can be used without interference around the clock. The radio monitoring and inspection service is represented in 19 locations throughout

Germany and is equipped with the most up-to-date mobile and stationary measuring technology which enables it to investigate and remedy the causes of interference without delay.

A slight downward trend in the number of interference cases reported to the radio monitoring and inspection service has been observed in recent years. Bucking this trend, the number of incidents of interference increased significantly by around 7% in 2015 compared with 2014. This trend reversal is due to the considerable rise in interference to wire-based telecommunications networks including DSL. With a total number of 1,520 cases, interference to wire-based networks made up the largest statistic in 2015 across all categories.

Due to the ongoing nationwide broadband rollout and the associated sharp rise in wire-based broadband connections, a further rise in this type of interference complaint can be expected.

Calculating safety distances according to the Ordinance concerning the Controls for the Limitation of Electromagnetic Fields (BEMFV)

Fixed radio installations with an equivalent isotropic radiated power of 10 watts or more can only be brought into service if the Bundesnetzagentur has issued a corresponding site certificate. To issue this site certificate, the Bundesnetzagentur calculates the site-related safety distance required to comply with limits for personal protection in Germany.

In urban areas, in particular, it is becoming increasingly necessary to evaluate the location of radio installations on the basis of technical measurements. This is due to the increasing density of multiple-use radio installations and their locations. To minimise outlay and costs, the Bundesnetzagentur plans to expand the calculation process to include a near-field analysis with a view to dispensing with cost-intensive field strength measurements wherever possible in future.

The Bundesnetzagentur has commissioned a study for this purpose and is carrying out systematic measurements at selected radio installation sites. The aim is to provide an additional near-field evaluation module by the end of 2016.

Rulings, activities and proceedings

In view of the fast growth in mobile data communications, the Bundesnetzagentur auctioned off spectrum in the 700 MHz, 900 MHz, 1,500 MHz and 1,800 MHz frequency bands. The Bundesnetzagentur conducted proceedings on the introduction of vectoring technology with the aim of enabling the ongoing broadband expansion and promoting competition.

Spectrum management

Mobile broadband – Project 2016 – Spectrum auction in 2015

Powerful broadband networks that allow the rapid exchange of information and knowledge provide commercial and social infrastructure that is of equal importance to well-developed road and rail networks. They also form the backbone for business decisions on location and increase the appeal of residential areas. Mobile broadband plays a role in speeding up nationwide expansion. The Bundesnetzagentur had already laid the foundations for the rollout of fast LTE networks in 2010 by auctioning off spectrum and the early move by the Bundesnetzagentur to award spectrum in the 800 MHz frequency band (known as Digital Dividend I) ensured that its high potential could be deployed, especially in rural areas. This spectrum was key to the fast, economic expansion of broadband networks.

Mobile technologies continue to play a major role in working towards future-proof broadband networks, in particular in rural areas. In view of the fast growth in mobile data communications driven by broadband services, the Bundesnetzagentur provided additional spectrum in the 700 MHz, 900 MHz, 1,500 MHz and 1,800 MHz frequency bands.

On 28 January 2015 it announced a decision on the rules for awarding and auctioning this spectrum. Since a shortage of capacity had been established, the spectrum was awarded by way of an auction. Applications for admission to the auction could be submitted up until 6 March 2015.

Five companies applied for admission. Two applicants did not meet the entry requirements and their applications were rejected. Three applicants qualified for the auction:

- Telefónica Deutschland GmbH & Co. OHG
- Telekom Deutschland GmbH
- Vodafone GmbH

The auction proceedings were held in Mainz, Germany from 27 May to 19 June 2015.

A spectrum bundle comprising 270 MHz in total was auctioned off. The spectrum was made available on a technologically neutral and service-neutral basis and can now be deployed for all current and future technologies, such as the fifth-generation mobile communication standard, 5G.

The auction format was largely the same as in 2010. With respect to the 900 MHz band, each bidder was able to purchase a maximum of 2 x 15 MHz (paired). This preserved the existing infrastructure whilst ensuring fair access for potential new entrants to this spectrum, which is particularly important for the basic provision of voice telephony.

The award of spectrum was bound to a coverage obligation. The federal states have already submitted the associated framework conditions regarding broadband policy, which were taken into account in the decision. Each assignee must provide blanket broadband coverage to at least 97% of households in each federal state and 98% of households nationwide, whilst achieving minimum transmission rates of 50 Mbit/s per sector

Users must be offered average transmission rates of at least 10 Mbit/s. Full coverage is to be guaranteed along national motorways and high-speed railway lines where legally possible and practicable. The entire spectrum held by an assignee may be deployed in order to meet this target

As part of its decision, the Bundesnetzagentur also developed a concept designed to take the interests of other user groups – especially radio microphones and broadcasting – into consideration and demonstrate how the needs of these user groups can be met.

After 181 rounds held over 16 auction days, the auction ended on 19 June 2015. All companies admitted to the auction successfully purchased frequency blocks:

Telefónica Deutschland GmbH & Co. OHG

Frequency band	Frequency block	Spectrum package	Award type	Highest bid
700 MHz (paired)	700 A	2 x 5 MHz	specific	€166,397,000
	700 C	2 x 5 MHz	abstract	€166,847,000
900 MHz (paired)	900 A	2 x 5 MHz	specific	€195,520,000
	900 G	2 x 5 MHz	abstract	€189,958,000
1.8 GHz (paired)	1800 G	2 x 5 MHz	abstract	€239,228,000
	1800 I	2 x 5 MHz	abstract	€240,288,000
Total of the highest bids payable				**€1,198,238,000**

Telekom Deutschland GmbH

Frequency band	Frequency block	Spectrum package	Award type	Highest bid
700 MHz (paired)	700 D	2 x 5 MHz	abstract	€166,567,000
	700 E	2 x 5 MHz	abstract	€171,649,000
900 MHz (paired)	900 D	2 x 5 MHz	abstract	€183,671,000
	900 E	2 x 5 MHz	abstract	€180,968,000
	900 F	2 x 5 MHz	abstract	€180,465,000
1.5 GHz (unpaired)	1500 D	2 x 5 MHz	abstract	€42,964,000
	1500 F	2 x 5 MHz	abstract	€39,011,000
	1500 G	2 x 5 MHz	abstract	€40,961,000
	1500 H	2 x 5 MHz	abstract	€40,961,000
1.8 GHz (paired)	1800 B	2 x 5 MHz	abstract	€248,054,000
	1800 E	2 x 5 MHz	abstract	€248,101,000
	1800 H	2 x 5 MHz	abstract	€248,784,000
Total of the highest bids payable				**€1,792,156,000**

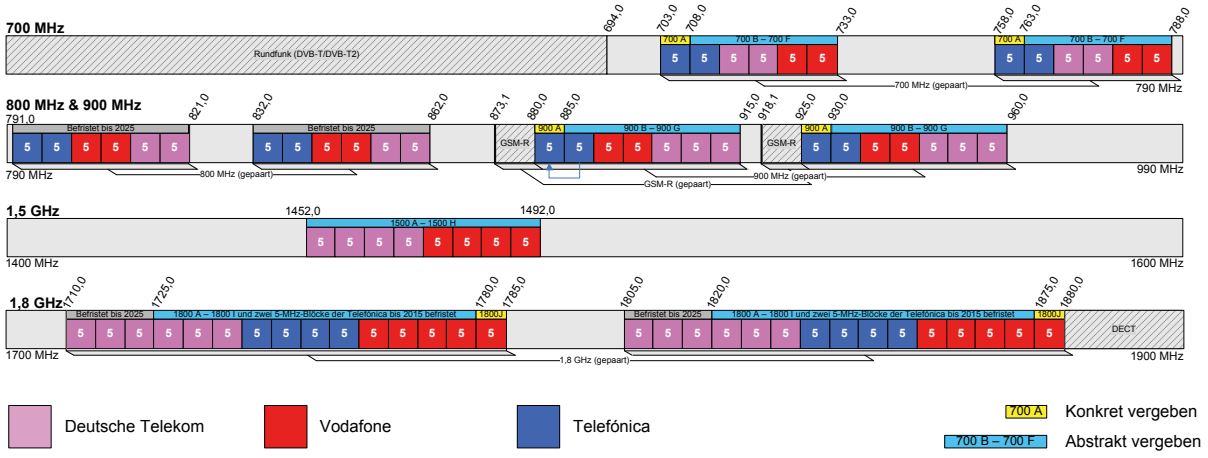
Vodafone GmbH

Frequency band	Frequency block	Spectrum package	Award type	Highest bid
700 MHz (paired)	700 B	2 x 5 MHz	abstract	€165,509,000
	700 F	2 x 5 MHz	abstract	€163,476,000
900 MHz (paired)	900 B	2 x 5 MHz	abstract	€211,807,000
	900 C	2 x 5 MHz	abstract	€203,298,000
1.5 GHz (unpaired)	1500 A	1 x 5 MHz	abstract	€40,939,000
	1500 B	1 x 5 MHz	abstract	€40,939,000
	1500 C	1 x 5 MHz	abstract	€40,919,000
	1500 E	1 x 5 MHz	abstract	€42,961,000
1.8 GHz (paired)	1800 A	2 x 5 MHz	abstract	€237,494,000
	1800 C	2 x 5 MHz	abstract	€258,247,000
	1800 D	2 x 5 MHz	abstract	€249,133,000
	1800 F	2 x 5 MHz	abstract	€255,967,000
	1800 J	2 x 5 MHz	specific	€180,153,000
Total of the highest bids payable				**€2,090,842,000**

Following the auction, the abstract frequency blocks purchased were allotted to the highest bidders in a separate process. The mobile spectrum purchased was therefore allotted to the successful bidders Telefónica Deutschland GmbH & Co. OHG, Telekom Deutschland GmbH and Vodafone GmbH as follows:

After being allotted to the bidders, spectrum was initially assigned in accordance with the applications. The spectrum assignments expire on 31 December 2033.

Mobile spectrum in the 700 MHz to 1.8 GHz band following the 2015 auction and the allotment of abstract frequency blocks purchased.



Frequency regulation aspects of the merger between Telefónica and E-Plus

Planned mergers or company acquisitions must be examined by the Bundesnetzagentur through the prism of telecommunications law to ensure that a distortion of competition in the relevant product and geographical market is not to be feared as a result of the companies' volume of spectrum and that efficient use of spectrum can continue into the future.

In 2014 the European Commission confirmed that the merger between the mobile network operators Telefónica Deutschland and E-Plus was in compliance with anti-trust law and approved the move. On 4 July 2014 the President's Chamber reached a decision on the frequency regulation aspects. The President's Chamber of the Bundesnetzagentur also examined the spectrum holdings by reference to the regulatory objectives and principles contained in the German Telecommunications Act. Particular attention was paid to securing fair competition, promoting markets with sustainable competition, safeguarding user interests – especially those of the consumer – and ensuring efficient, interference-free spectrum usage. The Bundesnetzagentur's decision stipulates the early return of spectrum in the 900 MHz and 1,800 MHz bands by Telefónica/E-Plus by 31 December 2015, closely timed to the re-award of the "GSM spectrum" (2015 auction), and requires that a subsequent investigation is carried out into spectrum holdings with respect to the allocation of frequencies following the merger (in particular the re-award of spectrum in the 900 MHz and 1,800 MHz bands) once all the facts are known.

The post-merger company has since submitted an application for the joint use of the Telefónica and E-Plus spectrum. Telefónica and E-Plus were granted the requisite approval in a ruling dated 25 September 2015. The company also undertook to return usage rights on spectrum of 2 x 24.8 MHz (paired) in the 1,800 MHz band earlier than first planned – effective on a regional basis as of 31 December 2015 and on a national basis as of 30 June 2016.
These spectrum usage rights were originally due to expire on 31 December 2016 and were not re-purchased by Telefónica at this year's auction.

Telefónica reports to the Bundesnetzagentur on a monthly basis regarding the status of the measures for vacating its frequencies. It has already freed up the above-mentioned frequencies on a regional basis in compliance with the 31 December 2015 deadline.

Market regulation

Conditions for access to the local loop

In the reporting period, the topic of vectoring once again dominated debate on the regulation of the "last mile", or local loop.

In February 2015, as part of the periodic review process concerning the regulatory obligations imposed on Telekom Deutschland GmbH on the local loop access market, Telekom Deutschland GmbH submitted an application for the wider deployment of vectoring technology. In its application, Telekom Deutschland GmbH is seeking exclusive rights to deploy vectoring technology, including near a main distribution frame. This concerns some 40,000 street cabinets within a radius of 550m of all of its main distribution frames, of which there are almost 8,000. The rules governing the deployment of VDSL vectoring outside of this radius were determined in 2013 and 2014 on the basis of earlier decisions.

Following extensive preliminary investigations, on 23 November 2015 the Bundesnetzagentur published a draft decision on the conditions that will allow other providers access to Telekom's local loop in the coming years. Although the topic of vectoring in the vicinity of a main distribution frame is just one of a raft of aspects covered by this comprehensive draft decision, at the same time it is the part of the regulatory process that has garnered the most public attention.

The primary objective of the draft decision is to drive forward the build-out of broadband connectivity and prevent the use of vectoring technology from leading to the emergence of new monopolies. For the benefit of consumers, the principle of fair competition must continue to be safeguarded into the future. It is essential that companies all find fair, dependable framework conditions in place when investing in modern broadband networks. What this means is that no regulatory restrictions will be placed on companies rolling out optical fibre to the building.

In addition, Telekom is to remain under a general obligation to grant other providers access to the unbundled local loop, or "bare copper wire". However, it could refuse to provide access to the local loop in the direct vicinity of its main distribution cabinet, ie within a radius of 550m, if its lines there use VDSL2 vectoring technology. In such cases, however, other providers could deploy VDSL2 vectoring themselves within this radius and access the unbundled local loop as necessary, but only if their DSL coverage in a

particular area is greater than Telekom's. In this case, the respective company would have to submit a binding rollout plan by the end of May 2016.

Telekom is to be required to offer other providers a virtual unbundled local access product that closely replicates the characteristics of the unbundled local loop in place of the access to unbundled local loops that will no longer be available everywhere in future. A wholesale virtual unbundled local access product such as this would give other providers a launch pad for rolling out their own broadband network. Like Telekom, they, too, would be able to expand their networks into the vicinity of the main distribution frames with optical fibre to end customers.

The draft decision also sets out differentiated rules regarding the financial compensation that Telekom must pay to other providers if they can no longer gain access to unbundled local loops because vectoring has been rolled out to the vicinity of a main distribution frame. Under the new provisions, Telekom must obtain approval of the charges it levies for access to the copper local loop and the associated virtual unbundled local access product in line with the benchmark for costs for efficient service provision. The charges for the optical fibre local loop are to continue to be based on ex post price regulation in accordance with the standards for anti-competitive conduct.

Review of the reference offer for access to the local loop
The Bundesnetzagentur is currently reviewing the draft revised reference offer submitted by Telekom Deutschland GmbH with respect to access to the local loop.

Particular attention is being paid to various separate points including the contract terms and conditions as well as the planning, ordering and provisioning process for local loop access. The focus is also on fault clearance rules, the specific structure of an effective incentive system for contract-compliant local loop provisioning and fault clearance using service level agreements (SLA) and key performance indicators (KPI), rules on contractual penalties and lump-sum damages, available access to (planning) information for the purpose of accessing local loops, and questions regarding physical access, or "collocation".

Conditions for bitstream access
On 28 October 2015, prompted by an upcoming periodic review, the Bundesnetzagentur announced the revised regulatory order for bitstream access.

Under the new order, Telekom Deutschland GmbH must continue to ensure non-discriminatory bitstream access for other providers and keep standard agreements, or reference offers, on file for this purpose. This obligation to grant access extends to both the layer 2 and layer 3 bit streams.

The prohibition of discrimination has been extended to include the monitoring of key performance indicators, in particular those relating to provisioning and fault clearance, in order to ensure equality with respect to bitstream access and transparency for third parties.

The rates will be uniformly regulated in accordance with the provisions on anti-competitive conduct (section 28 of the Telecommunications Act), with rates for layer 2 bitstream access additionally subject to the ex ante authorisation requirement due to the important role this wholesale product will play in the future. In contrast, the rates for layer 3 bitstream access are subject to ex post price regulation. This differentiated approach ensures that there is or remains room for manoeuvre in terms of price-setting for innovative risk-sharing models whilst delivering sufficient planning certainty for all market participants regarding important layer 2 rates. As a result, the price-setting for bitstream access will be consistent with the overall wholesale pricing structure.

Furthermore, the decision picks up on the fact that Telekom was exempted from the regulation on layer 3 bitstream access in several towns and cities. The requirement to provide access to this wholesale product in these towns and cities does not apply wherever a layer 2 bitstream product is available.

Review of the reference offer for layer 2 bitstream access
Telekom Deutschland GmbH submitted a draft reference offer in connection with the layer 2 bit stream on 5 February 2015. This contractual offer did not meet the legal requirement for equal opportunity, timeliness and equity. As a result, following in-depth discussions with the market participants, the Ruling Chamber issued an initial partial decision dated 17 August 2015 containing extensive remedial requirements.

These related primarily to the start and scope of service, the ordering and provisioning process for DSL lines, the quality of transport and additional provisions regarding handover accesses and transport.

In response, on 28 September 2015 Telekom Deutschland GmbH submitted a revised version of the draft reference offer, which Ruling Chamber 3 is currently examining to determine the extent to which Telekom has implemented the remedial requirements from the initial partial decision and whether it has done so adequately. If it has failed to do so, the Ruling Chamber will implement the necessary changes itself and furnish the updated reference offer with a minimum term during which Telekom is bound by the contractual offer.

Final approvals for fixed-line interconnection and mobile termination

On 1 April 2015, the Bundesnetzagentur definitively approved the new fixed-line interconnection rates for Telekom Deutschland GmbH, as well as the fixed-line termination rates for 55 other access network operators backdated to 1 December 2014 following resolutions dated 17/19 August 2015. Mobile call termination rates were also applied retroactively as of 1 December 2014 on the basis of decisions dated 24 April 2015.

The respective rates had initially only been provisionally approved because of serious concerns in all cases on the part of the European Commission regarding the rates proposed by the Bundesnetzagentur. This was due to the lack of implementation of "pure LRIC cost modelling" proposed in the recommendation on termination, as a result of which the Commission had initiated an in-depth examination process.

Upon conclusion of this process, the European Commission asked the Bundesnetzagentur to amend or retract its decisions and further reduce the fixed-line and mobile call termination rates.

However, in order to maintain consistency with its previous decisions, the Bundesnetzagentur stood by its proven method of calculating fixed-line and mobile call termination rates on the basis of the costs of efficient service provision.

Reference offers for PSTN and IP fixed-line interconnection

In the second partial decision dated 17 December 2015, once the consolidation process was implemented and the European Commission had issued no comments with respect to the draft decision discussed, Ruling Chamber 3 concluded its review of Telekom Deutschland GmbH's reference offers for fixed-line PSTN and IP interconnection. In this review, it made various additional changes to the revised agreements submitted by Telekom on the basis of the initial partial decision from December 2014, so as to ensure that the reference offers complied with the legal requirement for equal opportunity, equity and timeliness of service provision. Major aspects included assuring complete control by access seekers over their own networks and service offerings, and minimising the burden on smaller carriers in connection with the migration to IP interconnection.

The Bundesnetzagentur is one of the first European regulatory authorities to set out the specific conditions applicable to IP interconnection in a published interconnection reference offer.

Conditions for VHF transmission

On 17 August 2015, Ruling Chamber 3 approved and prescribed various rates to be levied by Media Broadcast GmbH for VHF end-user and wholesale services. This laid the rates-based groundwork for opening up access to the VHF transmission market to alternative network providers.

The regulated rates aim to stimulate competition on the market for VHF transmission services from early 2016. Media Broadcast has considerable market power on the respective markets. In view of this, since the end of 2014 the company has been obliged to grant other companies – ie those who wish to offer VHF transmission services to radio broadcasters in future –access to the VHF antenna systems at regulated rates and to have these rates approved beforehand in line with the benchmark for costs for efficient service provision.

Ruling Chamber 3 has reviewed the revised draft reference offer submitted by Media Broadcast for the joint use of analogue VHF antenna systems.

Prior to this, the Bundesnetzagentur had also issued a partial decision on 25 June 2015 requiring extensive changes to the draft agreement initially submitted by Media Broadcast.

These changes included the introduction of a verification process in connection with various disputes between the contract parties, the incorporation of a commitment to ensuring continued operation to the benefit of radio broadcasters in the event of provisioning delays, the deletion of a clause on automatic contract termination in the event of the abandonment of ownership and functional ownership of the VHF antenna system, and the revision of the preliminary application, planning and ordering process.

Approval of new local loop, interconnection and mobile termination rates

In the reporting period, the Ruling Chamber approved new monthly local loop charges for specific periods of time between 8 February 1999 and 31 March 2009 in each case based on the relationship between Telekom and various requesting parties.

The latter had successfully appealed against numerous rates originally approved for these time frames. In addition, new interconnection call charges for the period from 1 December 2008 to 30 June 2011 and mobile termination rates for the period from 1 December 2007 to 31 March 2009 were approved in specific individual circumstances.

These decisions closed gaps in rates approvals that had arisen between Telekom and other providers, in some cases following lengthy legal battles as a result of court rulings lifting the approvals of local loop, interconnection and mobile termination rates made at the time. In consideration of settlement arrangements that have been implemented between the companies, the original rate approvals were re-submitted by the relevant parties for new approval. The Ruling Chamber accommodated these requests.

Furthermore, the Ruling Chamber determined that certain settlement sums, in connection with which the companies concerned had agreed to suspend their claims for payment in return for a declaration to forego or abandon action, were not subject to approval. Since the decisions entered into force, the companies have withdrawn all pending appeals against decisions on local loop, interconnection and mobile termination rates and put an end to many years of legal wrangling over the "right amount" of key rates for wholesale services.

Carrier leased line rate approval

Telekom Deutschland GmbH is obliged on the basis of a regulatory order to grant access to the terminating segments of leased lines with bandwidths of 2 MBit/s to 155 MBit/s (carrier leased lines) including necessary collocation and auxiliary services. The access rates it levies are subject to approval.

Leased lines can be realised using different technologies (synchronous digital hierarchy or Ethernet). Various provisioning and monthly charges are in place for leased lines, graded according to bandwidths.

In preliminary resolutions dated 30 June 2015 and 22 July 2015, the respective rates were given preliminary approval as of 1 July 2015. Final approval will be issued once the community-scale consolidation process has been implemented.

Reference offer for leased lines

Telekom Deutschland GmbH was directed to publish a reference offer for access to the terminating segments of leased lines.

Telekom Deutschland GmbH complied with the deadline by submitting and publishing a reference offer containing explanations regarding the implementation of the decision.

The major areas of dispute related to the length of provisioning deadlines, the quality of leased lines with respect to propagation delays, and the issue of whether it is permissible to make lump-sum fees for damages dependent on planning arrangements.

The reference offer was reviewed by the Ruling Chamber and furnished with a minimum term expiring on 31 December 2016.

Provision of subscriber data

Ruling Chamber 2 reviewed several, largely identical, complaints from publishers claiming that their partner company Deutsche Telekom Medien GmbH (DeTeMedien) was billing them inflated costs for subscriber data in connection with joint publications of subscriber directories.

Following an in-depth examination by the Ruling Chamber, no formal proceedings were opened, on the grounds that matters relating to the amount of remuneration paid within the joint publishing company fall under civil law, for which the regulatory authority is not responsible.

Dispute resolution and anti-competitive conduct
On the basis of a request filed by 1&1 Telecom GmbH (1&1), Ruling Chamber 2 reviewed the "MagentaZuhause Hybrid" lines sold by Telekom Deutschland GmbH on a regional basis and, since March 2015, on a national basis. These lines offer bundled fixed-line and mobile technology via a single router.

1&1 asserted that the service provider obligation under mobile licensing law required Telekom to provide a wholesale product that allowed its hybrid products to be replicated. Furthermore, 1&1 maintained that Telekom's conduct was an abusive exploitation of its market power, because, without a hybrid-capable wholesale product, 1&1 could not compete with Telekom due to significant bandwidth disadvantages.

The investigations established that there are at present no grounds for intervention on the basis of anti-competitive conduct as defined in the Telecommunications Act. In a ruling dated 30 October 2015, the Ruling Chamber also dismissed the requests for dispute resolution as unfounded at the very least, because the service provider obligation under licensing law relates solely to mobile communications and not to fixed-line products.

Ex post price regulation
In a set of preliminary investigations, Ruling Chamber 2 examined a raft of regional promotional offers from Telekom Deutschland GmbH in connection with its "MagentaZuhause" broadband line products. The limited-time-only offers included a price reduction of €5 in certain towns and cities compared with the standard tariff. The preliminary investigations were carried out at the request of various other providers.

The investigations established that these offers did not significantly impair competitive conditions for rival companies.

Creation of the Digitisation and Interconnectivity, Internet Platforms Task Force

Digitisation and interconnectivity continue to impact all areas of modern society with unrelenting dynamism. They touch on all areas of life, from communication with family and friends, to managing building technology and the smart home, private consumption (online platforms), and the learning and working environment (local learning and working). Social and political exchanges are held directly using digital means of communication, and often do not involve classic media forms.

What is more, the digital transformation of the economy means that national and international businesses are faced with making significant structural changes. Established value chains are becoming more flexible and, in many cases, accessible to new participants as a result of the collection, storage and processing of data, interconnection processes, and the increasing automation of production processes.
The most essential prerequisite for digitisation in Germany is powerful information and communication infrastructure nationwide that meets the qualitative demands of industry and thus allows industrial production and services to be digitised and interconnected efficiently. The aim is to support the German government's Smart Networks initiative and identify measures that can promote the digitisation process in the various sectors. The Smart Networks initiative encompasses areas including energy (smart metering, smart grids), transport (public rail transport and connected/self-driving cars in the private transport sector) and health care.

The Task Force is also working on a method of monitoring internet platforms with the aim of obtaining an overview of applications used by over-the-top (OTT) providers in Germany and their impact on the economy. It is currently gathering information on sources, analysing and initiating suitable studies, and generating other information that might be necessary.

In addition, the Task Force reviews aspects affecting competition between internet platforms in order to identify potential factors that may distort competition. It also considers new business models that emerge from the collection, linking, analysis and use of non-standardised big data volumes. In this context, the objective is to analyse the implications for the economy and for competition policy of business models that are based on data collections of this nature. Particular attention is paid to data protection and data security

with respect to internet-specific dangers and IT security in complex environments.

Infrastructure atlas

The infrastructure atlas has been maintained and updated by the Bundesnetzagentur since 2009. It contains data on infrastructure that can be used for broadband activities, such as empty cable ducts, optical fibre cable, distribution boxes and masts. This data has been accessible via a web GIS application since 2012. Authorised users are shown a map containing infrastructure data and contact details of the owner.

Anyone who can furnish evidence of involvement in a specific broadband expansion project can use the infrastructure atlas. In the interests of using existing infrastructure more efficiently and accelerating the broadband build-out, this service adds much-needed transparency in order to avoid duplicate investments.

The number of requests for infrastructure atlas information again increased slightly in 2015 to a total of 1,657 requests compared with 1,607 in 2014. 51% of requests were filed by companies, followed by planning offices at 21% and the federal states at 20%. The remainder related to requests from local and regional authorities.

With a view to improving the infrastructure atlas database even further, in 2015 the Bundesnetzagentur approached specific additional companies, in particular regional energy providers and telecommunication network operators. Some 500 companies were reviewed periodically. Looking ahead, steps to improve the quality of the data in cooperation with the infrastructure owners involved will take on increasing significance. Intensifying the involvement of various industries so as to offer a relevant – ie as extensive and reliable as possible – database continues to be a challenge. Against this backdrop, the number of companies contributing data increased substantially year on year from around 170 to 991 as of 31 December 2015.

Thanks to feedback from users, the technology behind the infrastructure atlas was also improved in 2015 and, to give one example, now uses more recent, up-to-date background maps.

In 2016 the EU Broadband Cost Reduction Directive is due to be transposed into national law. The EU directive considers the infrastructure atlas to be integral to a single central information point on the build-out of digital networks and a key condition for establishing more transparency in connection with the broadband rollout.

With respect to transparency requirements, including at European level, the Bundesnetzagentur's infrastructure atlas sets the bar high for national standards and has become an established tool for promoting the broadband rollout.

Numbering issues in M2M communication

Machine-to-machine (M2M) communication refers to the mainly automated exchange of information between technical equipment and may be wireless or non-wireless. It is used primarily to automate industrial processes but is also found in the automotive industry, consumer goods/households, public infrastructures and transport and logistics.

Many M2M applications use mobile communication networks, which means they need mobile call numbers and IMSI (International Mobile Subscriber Identity), the latter being necessary to assign technical addresses to mobile devices. The Bundesnetzagentur provides these numbers. Some countries have introduced special number ranges for M2M communication. So far this has not been necessary in Germany as sufficient mobile numbers are available. However, a dedicated new number range can be created if required.

Most IMSI numbers are allocated to mobile network operators in accordance with the existing allocation rules. So far about one quarter of the one hundred IMSI blocks available have been assigned. Various market players, however, are demanding that the assignment entitlement be extended, which could lead to a shortage given the small amount of number blocks.

On the basis of a market survey carried out in 2014, the Bundesnetzagentur drew up a draft numbering plan and supporting documentation. The draft numbering plan allows mobile virtual network operators (MVNO) to also request assignment of an IMSI block. An extension of the eligibility to apply so as to include M2M users (such as automotive manufacturers, energy providers) does not appear necessary at present.

One further issue in connection with M2M communication is the international use of the mobile and IMSI numbers deployed in M2M. Products with integrated M2M technology (including a SIM card or a SIM module) are often produced for the global market. With the exception of international roaming, so far it has generally not been permitted to use German numbers

outside the German territory or to use foreign numbers in Germany. The new draft support documentation now contains explicit provisions for allowing the general international use of IMSIs in M2M communication. After assessing the comments received in response to the drafts, the numbering plan and the supporting documents – including changes where necessary – are to enter into force. Following this, the Bundesnetzagentur plans to pass similar regulation on the international use of mobile numbers.

Broadband expansion aid

While in the past the expansion plan has concentrated on rolling out a basic level of broadband coverage across Germany, in future the focus will be on providing high-speed broadband lines. The federal government's broadband target is to achieve nationwide coverage with broadband connections of at least 50 Mbit/s by 2018.

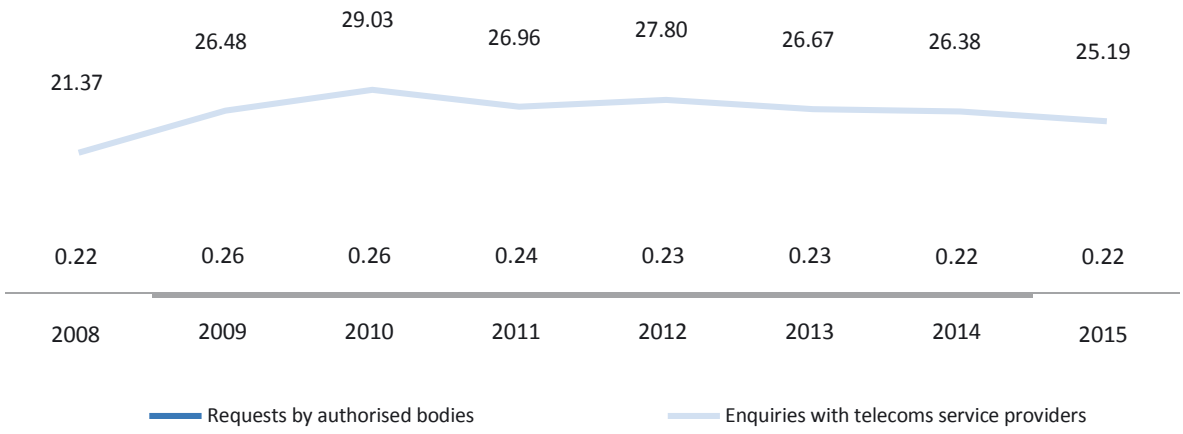
Important factors in market-driven investment choices in high-speed networks comprise the technology deployed and the population density of the regions involved, as well as customer demand and willingness to pay. State aid can facilitate expansion of the high-speed networks even in those regions whose potential development cannot be brought about solely by industry-led investments.

Importantly, care must be taken that aid schemes do not produce ineffective network structures and that any distortion of competition is avoided. To this end, any networks with state funding must be organised in such a way that they are future-proof and open to competition so that private investment is not prevented or hindered by state aid. This means that third parties must also be granted access to the part-state funded infrastructure so that consumers in those regions have a choice of suppliers.

In addition to forming the basis of the European Commission's aid guidelines, these principles are also an integral part of the relevant national regulatory frameworks of the German government and the federal states. The Bundesnetzagentur gives its opinion as part of an evaluation of the access terms and conditions, including the prices, in the agreements between the public office granting the aid and the network operator receiving the aid. This is intended to secure effective, open network access for third-party suppliers in the regions involved. Overall in 2015, the Bundesnetzagentur evaluated almost 250 agreements through the prism of various legal provisions on the granting of aid.

At the beginning of 2015, the Bundesnetzagentur published comments that had been discussed regarding the screening framework and criteria in connection with the processes in the General Block Exemption Regulation (AGVO). In July 2015, broadband aid regulations were modified at federal level as a result of the publication of the regulatory framework for next-generation access networks (NGA), following its approval by the European Commission. The NGA regulatory framework supersedes the federal guidelines on ducts (BRLR). In December 2015 the Bundesnetzagentur discussed comments on the screening framework and criteria used in the processes in the NGA framework regulation.

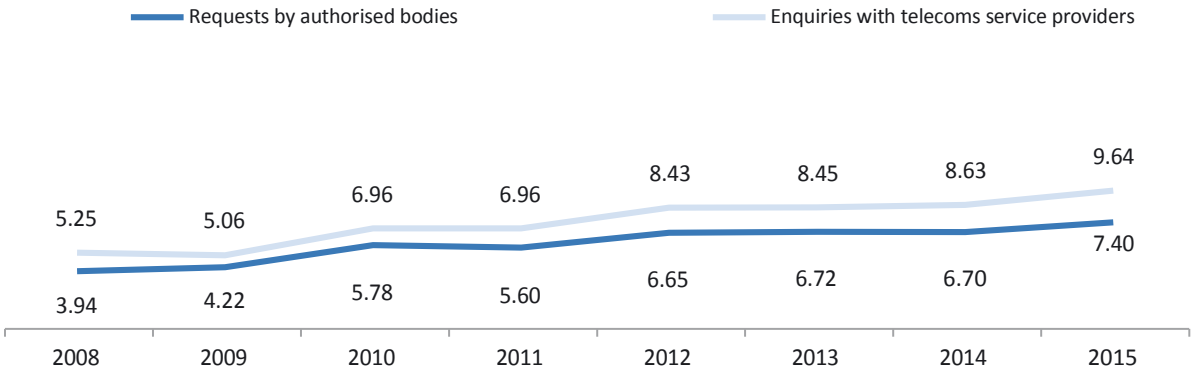
Name-based requests made by authorised bodies and resulting enquiries made with telecommunications service providers
million



Public safety

Automated information procedure as per section 112 of the Telecommunications Act
The information procedure as provided for by section 112 of the Telecommunications Act makes a significant contribution to ensuring public safety in Germany. Legally authorised bodies, mostly public safety and criminal prosecution authorities, may request specific subscriber data such as their name, address and telephone number from the Bundesnetzagentur if the data is necessary for them to perform their statutory tasks. The Bundesnetzagentur has an automated process for forwarding any queries to the telecommunications service providers and collects their responses. There are currently 107 authorities registered as authorised bodies and 116 telecommunications undertakings contribute information.

Number-based requests made by authorised bodies and resulting enquiries made with telecommunications service providers
million



In 2015, the Bundesnetzagentur received a total of 7.62 million requests for information. This resulted in 34.83 million enquiries overall with telecommunications undertakings in the same period.

The Bundesnetzagentur answers a customer name request by providing to the authorised bodies the call number(s) or the information that no call number is associated with the relevant name at the residence provided. Customer name requests are passed to all telecommunications service providers participating in the process because it is not known which provider a customer has received a number from or even how many numbers. Consequently, even a low number of requests for customer names (0.22 million) generate a disproportionately large number of queries that have to be forwarded to telecommunications undertakings (25.19 million).

The Bundesnetzagentur forwards a call number request to the authorised bodies and includes the subscriber name, address and network operator/service provider associated with the call number required. Call number requests must be passed on to significantly fewer telecommunications undertakings, therefore the number of queries corresponds by and large to the number of incoming requests. The use of filter mechanisms meant that only 9.64 million queries were forwarded to telecommunications undertakings in 2015 from the total 7.4 million call number requests received by security authorities.

Technical safeguards as per section 109 of the Telecommunications Act

The key objectives of section 109 of the Telecommunications Act are to protect the privacy of telecommunications and personal data, protect systems against faults, and manage the risks to the security of telecommunications networks and services.

In 2015, the Bundesnetzagentur examined 56 new and 119 revised security concepts from operators of public telecommunications networks and services for compliance with the provisions of section 109 of the Telecommunications Act. Its activities included performing 95 spot checks on the parties subject to this obligation.

The national procedure for notifying security violations in accordance with section 109(5) of the Telecommunications Act is set out in the implementation concept developed by the Bundesnetzagentur. In 2015 the Bundesnetzagentur was made aware of 19 security incidents, 12 of which were classed as security violations.

New technologies for lawful interception and information provision

The Bundesnetzagentur's activities in connection with the technical implementation of lawful interception measures make an important contribution to maintaining public safety.

Following a transition period, the requirement for a secure electronic interface pursuant to section 113 of the Telecommunications Act was made mandatory for some 30 companies with effect from 1 July 2014. The Bundesnetzagentur is supervising the implementation of the requirements, which were determined both on the basis of ETSI Specification TS 102 657 and, in conjunction with companies, authorised bodies and manufacturers, in the Technical Directive setting forth the requirements of the Ordinance concerning the Technical and Organisational Implementation of Measures for the Interception of Telecommunications (TR TKÜV).

The WLAN-based internet service (eg Hotspot service) was included in the lawful interception obligation at the start of 2015. This obligation affects companies that are connected with more than ten thousand subscribers or other parties enjoying the right of use as set out in section 3 of the Telecommunications Interception Ordinance (TKÜV). It is the task of the Bundesnetzagentur to monitor the technical systems and organisational measures implemented by the parties covered by the obligation. Ideally, interception in this telecommunications sector will be possible by the authorised bodies from 2016 onwards.

Storage requirements and maximum retention periods for traffic data (data retention)

With the introduction of a mandatory data retention law in Germany, the Bundesnetzagentur is responsible for developing the requirements catalogue as per section 113f of the Telecommunications Act in consultation with the Federal Office for Information Security and the Federal Commissioner for Data Protection and Freedom of Information. The catalogue sets out the requirements applicable to technical precautions intended to uphold the high standards of data security and data quality. In addition to developing the catalogue, the Bundesnetzagentur is also responsible for monitoring the requirements set forth therein on an ongoing basis and for updating the catalogue without delay as and when required.

Secure electronic transactions for consumers, business and authorities

The Bundesnetzagentur is the authority responsible for implementing the successor to the Electronic Signatures Act, the EU Regulation on electronic identification and trust services for electronic transactions in the internal market (eIDAS), on a national basis. The eIDAS Regulation was adopted in all 28 EU member states at the end of 2014 and will apply from mid-2016 onwards with the repeal of the Electronic Signatures Act.

It is a milestone on the European Union's Digital Agenda, which aims to create a digital single market for secure, cross-border information and telecommunication technologies and for electronic transactions. The Digital Agenda delivers the legal framework required to safeguard the security and interoperability of the necessary mechanisms and services.

In addition to qualified electronic signatures and electronic time stamps, the eIDAS Regulation expands the existing range of trust services to include the following: an electronic seal for use by legal persons such as companies and authorities in place of a signature, electronic registered delivery services to ensure secure communication, electronic storage services, and website authentication services that provide reliable information about the author of a website. The aim is to allow authorities and businesses to introduce faster, paper-free processes and save costs. In particular, an electronic seal represents a significant leap forward in this respect.

The market for qualified electronic signatures is also changing as a result of the eIDAS Regulation and will see server-based signature and verification services become permissible. The intention is to allow users to sign electronically or have a provider verify that an electronic signature is correct without the need for special equipment (such as a card reader, smart card or special software).

The Bundesnetzagentur has prepared for the evolution taking place in this area by playing an active role in shaping the legal framework of the eIDAS Regulation and making preparations for its national rollout.

Technical regulation

Technical Telecommunications Regulation Committee
The Technical Telecommunications Regulation Committee (ATRT) is an independent advisory committee to the Bundesnetzagentur. It comprises representatives of network operators, service providers, professional bodies and user associations, as well as consumers themselves.

The Committee's activities in 2015 primarily focussed on the migration of analogue and ISDN lines to IP lines. The aim is to make this transition transparent and, as far as possible, free from technical hitches for end customers, private and commercial users alike.

Mobile network standardisation into the 5th generation (IMT-2020)
The standardisation of 5G is being handled at national level by the German Institute for Standardisation (DIN) and the German Commission for Electrical, Electronic and Information Technologies of DIN and VDE (DKE), and at European level by the European Telecommunications Standards Institute (ETSI) and the European Conference of Postal and Telecommunications Administrations (CEPT). Globally, 5G standardisation activities are primarily being dealt with by the International Telecommunication Union (ITU) and by the 3rd Generation Partnership Project (3GPP).

The key aspects of the development of the fifth-generation mobile standard were set out by the ITU Radiocommunication Sector between 2012 and 2015 with the Bundesnetzagentur's involvement. These included a "vision" of 5G by 2030, the specification of technical performance standards, and the adoption of a time line and plan of work up to 2020. The Bundesnetzagentur's role in the international groups (ITU-R, ETSI, 3GPP) is to provide the necessary regulatory frameworks.

Industry 4.0

The Internet of Things refers to the digitisation of all areas of life. This development is being driven by the industry 4.0 platform under the auspices of the Federal Ministry for Economic Affairs and Energy and the Federal Ministry of Education and Research. Together with research institutes and the German manufacturing sector, the Bundesnetzagentur has helped to forge the platform and assisted with updating the industry 4.0 roadmap. In addition, in close cooperation with the Federal Ministry for Economic Affairs and Energy, along with other partners, the Bundesnetzagentur supports standardisation activities with the intention of incorporating relevant core elements into international standards.

The Bundesnetzagentur also contributed to the work of the committees of national (DIN/DKE) and European (CENELEC and ETSI) standardisation organisations. Its activities included drawing up application scenarios for the communication of industrial applications and specifying security requirements in respect of communication solutions in industrial value chains.

Auction of spectrum for wireless internet nationwide

High-speed wireless internet even in rural areas was one of the goals of the spectrum auction for mobile broadband access in June 2015. The auction generated proceeds of €5 billion, a substantial portion of which is to be invested in the network expansion.

In June 2015, the Bundesnetzagentur for the fourth time auctioned off mobile broadband spectrum. Without the new frequencies that were made available via the auction, it will be extremely difficult to handle rapidly growing data volumes. Wireless data connectivity is taking on increasing significance as it will allow smaller towns and rural areas to be supplied with high-speed internet, making them more attractive as a base for companies.

After 16 days of auction in Mainz, the three participating network operators Vodafone, Telekom and Telefónica successfully purchased frequencies amounting to 270 MHz. The spectrum in the 700 MHz, 900 MHz, 1,500 MHz and 1,800 MHz frequency bands was auctioned for some €5bn.

Demand was particularly high for spectrum in the 900 and 1,800 MHz bands, which are already used for conventional mobile communications and for which the licences expire at the end of 2016. The 700 MHz band that became available for mobile communications as part of the migration of terrestrial digital broadcasting from DVB-T (Digital Video Broadcasting – Terrestrial) to DVB-T2 was also auctioned off.

The exploitation rights are normally granted for a period of around 15 years. The planning certainty this provides is designed to encourage companies to invest swiftly in rolling out the network across Germany. Telefónica pays €1.2bn for its exploitation rights, Deutsche Telekom pays €1.8bn, and Vodafone €2.1bn. A signification portion of the proceeds are to be distributed at federal and state level to be used to ensure blanket broadband coverage.

International cooperation

The need for an overhaul of the legal framework for the telecommunications sector in the European Union that was already becoming apparent in 2014 picked up pace in 2015 and increasingly became the main focus of international committee work.

Committee work

Internationally, the main focus of committee work was provided by the Body of European Regulators for Electronic Communications (BEREC), on which the Bundesnetzagentur and the relevant regulatory authorities from other member states are represented. Pursuant to the directives on the European telecommunications market, BEREC's input is required in various measures, such as advising the European Commission or checking that planned decisions by national regulators in connection with the national markets comply with EU directives and do not hamper the creation of a European single market.

In 2015, the outcome of the BEREC strategy for the years 2015 to 2017 was implemented. A decision was made to concentrate on nine working groups in order to further enhance BEREC's efficiency. The Bundesnetzagentur provided a co-chair for each of the two working groups for Next Generation Networks and Regulatory Accounting and was additionally represented by experts on all nine working groups to provide content-related support and contribute their extensive experience.

In addition to BEREC, which was established on the basis of an EU regulation, the European regulatory authorities formed the Independent Regulators Group (IRG) back in 1997, which, as an organisation under Belgian law, has had legal personality since 2008 and maintains its own office and conference facilities available in Brussels. The IRG enables a closer working relationship between the regulatory authorities and gives them a discussion platform for those issues that fall outside of BEREC's area of responsibility.

Lastly, the Bundesnetzagentur is also a member of the Network of Economic Regulators established by the Organisation for Economic Co-operation and Development (OECD). This committee is an opportunity for the regulatory authorities from a range of sectors, including telecommunications, to discuss regulatory topics that extend beyond their respective industries. This includes, for example, a comparison of regulatory systems at international level.

BEREC Vice Chair in 2015/BEREC Chair in 2016/IRG Chair in 2016

BEREC is represented externally by a Chair, who is elected for one year at a time by the members, and four Vice Chairs. The Vice President of the Bundesnetzagentur, Dr Wilhelm Eschweiler, was the BEREC Vice Chair for 2015. In 2016, Dr Eschweiler executes the duties of Chair of BEREC. In parallel, the representatives of the IRG member states elected Dr Eschweiler as Chair of the IRG in 2016.

As BEREC Vice Chair, Dr Eschweiler's duties in 2015 included staffing decisions concerning the BEREC office. The office supports BEREC and the working groups with their tasks and currently comprises 21 employees and four national experts who are seconded to BEREC by their respective national regulatory authorities for a limited period of time.

Dr Eschweiler's responsibilities in this role also included creating the BEREC work programme for 2016. A draft version was presented to the public in October 2015 and approved by the BEREC Plenary Meeting in December 2015.

The focus of the 2016 work programme is on the upcoming review of the existing European regulatory

framework (telecoms review) for electronic communication. BEREC will actively include the expertise and experience of European regulators in the upcoming legislative process in connection with various regulatory issues. These include access to next-generation networks (NGN/NGA), the role of new market participants (known as over-the-top providers), consumer protection and universal service.

As BEREC's Chair, in 2016 Dr Eschweiler will focus on setting the fundamental course for structuring the future digital single market. During his period of office, Dr Eschweiler will also be responsible for following up on the implementation of the Telecoms Single Market Regulation with the areas of network neutrality and international roaming.

Article 7/7a procedure

In accordance with Articles 7 and 7a of Framework Directive 2002/21/EC, regulatory authorities in the telecommunications sector must notify the European Commission and other national regulatory authorities of proposed regulatory measures. These bodies then have the opportunity to comment on whether the planned measures comply with European law. In particular, the European Commission may raise serious doubts as to their compatibility with law and open a Phase II investigation. During a Phase II investigation the regulatory authorities involved are prohibited from adopting the draft decisions submitted.

Instead, BEREC convenes an ad-hoc working group of experts from other regulatory authorities to draft a detailed opinion and statement on the criticised measures. The European Commission is obliged to consider BEREC's position to the fullest extent possible when passing final comment on the regulatory measures concerned.

If the Phase II procedure relates to a proposal for remedies (procedure pursuant to Article 7a of the Framework Directive), the European Commission can pass a recommendation asking the regulatory authority concerned to either withdraw or adjust their measure. Alternatively, the European Commission can withdraw its opinion of serious doubts. However, European Commission recommendations of this nature are not binding on the national regulatory authorities.

In 2015, the European Commission launched a Phase II investigation in four cases; in each case BEREC drew up its opinions within the tightly prescribed time period. For the most part it supported the European Commission's position; however, in one case BEREC did not share the Commission's serious doubts and asked the Commission to withdraw its reservations.

Three of the opinions issued by BEREC in 2015 in connection with Phase II investigations related to draft decisions notified by the Bundesnetzagentur. In all three cases the European Commission raised serious doubts (pursuant to Art. 7a of Directive 2002/21/EC) about the cost accounting approach (cost of efficient service provision) applied to the calculation of mobile termination rates (DE/2014/1666-1667) and fixed termination rates (DE/2014/1685, DE/2015/1718). However, the regulatory authorities still have room for manoeuvre when choosing a suitable cost accounting methodology.

Connected Continent

In 2013 the European Commission initiated a legislative package with the aim of creating a digital single market for telecommunications ("connected continent"). The package contains regulation on network neutrality and international roaming and was adopted by the European Parliament on 27 October 2015. The regulation includes measures intended to safeguard the open internet from 30 April 2016 and requirements on the phasing out of roaming fees charged on top of domestic mobile tariffs from mid-2017.

The network neutrality rules require all traffic associated with the provision of internet access services to be treated equally and without discrimination. The regulation also provides for contractual freedom for internet access providers and end users alike.

Specialised services are only permitted in very specific circumstances. This will ensure that network capacities are sufficient to allow them to be provided and offered in the first place and alongside existing internet access services. Moreover, the intention is to prevent specialised services from being used or offered as a substitute for internet access services. Nor may they impede the availability or general quality of internet access services. Providers of internet access services may implement traffic management measures under certain conditions. In particular, appropriate traffic management measures must be transparent, commensurate and non-discriminatory.

Furthermore, a minimum degree of transparency is required with respect to contracts for internet access. Contracts must contain details such as information on the effects of significant deviations from the speed advertised. BEREC is required to publish guidelines on

network neutrality by 30 August 2016. These guidelines are intended to ensure the consistent implementation of the provisions by national regulatory authorities. The regulation assigns responsibility to the Bundesnetzagentur for monitoring and ensuring compliance with the rules on open internet access, enforcing the transparency measures, and requiring the continuous availability of internet access services at a quality level that reflects advances in technology. It is also required to publish annual reports on its monitoring activities and findings and submit these reports to the European Commission and BEREC.

A central element of the new roaming rules is the phase-out of roaming surcharges from 15 June 2017. From 30 April 2016, operators have a transition period during which they may levy end customers a fixed surcharge for roaming services on top of their domestic tariffs. In addition, the operators can opt to apply a fair use policy that prevents users from incurring excessive roaming charges. Roaming providers who cannot offer their regulated roaming services on a profitable basis and would thus undermine their national pricing model can apply to the national regulatory authority for approval to receive a top-up. In Germany, the Bundesnetzagentur is responsible for granting such approvals.

Digital Single Market/telecoms review

Digital Single Market strategy

On 6 May 2015 the European Commission published its Digital Single Market strategy, which addresses not only the "classic" telecommunications market but also numerous other areas such as e commerce, platform regulation, audio-visual (media) services, copyright, consumer law, data protection and data security rules, as well as standardisation. The section on needs-based telecommunications regulation summarises core elements which include a review of the European regulatory framework for electronic communications, the performance of an in-depth examination of the role of "over-the-top" services, and the revision of the legal framework for audio-visual media.

Telecoms review

A central component of the European Commission's Digital Single Market strategy planning comprises the overhaul of the existing legal framework for electronic communications (telecoms review). In this context, the European Commission has positioned a number of issues with BEREC to be addressed. These concern an evaluation of the existing legal framework on the basis of practical experience, as well as considerations on how it could be updated. BEREC issued an extensive response on 10 December 2015. The Bundesnetzagentur will closely supervise the next stages of the review process as part of its BEREC chairmanship in 2016.

International spectrum management

Committee work in the European Conference of Postal and Telecommunications Administrations (CEPT)

The Bundesnetzagentur, together with the Federal Ministry of Transport and Digital Infrastructure, represents national interests in connection with telecommunications matters on the Electronic Communications Committee (ECC) of the European Conference of Postal and Telecommunications Administrations (CEPT). In 2015 this related in part to the harmonisation and implementation of broadband communication between aircraft and ground stations. The primary aim is to offer passengers in-flight internet access. In addition, a decision was reached on the harmonised use of mobile earth stations on land and water operating with non-geostationary satellites based on the cross-border and liberal use of these earth stations. Moreover, following detailed studies, spectrum regulation for intelligent transportation systems was revised and re-published.

Outcome of the World Radiocommunication Conference (WRC 15)

The World Radiocommunication Conference (WRC) adopts resolutions on amendments to the Radio Regulations necessary to reflect technical and political development and hence makes significant decisions on future international frequency management.

Preparatory work on the German stance is transparent and non-discriminatory and takes place under the stewardship of the Federal Ministry of Transport and Digital Infrastructure. The Bundesnetzagentur was mandated with convening working parties for the various standpoints. Participation in these working parties was open to all stakeholders.

From a German perspective, the outcome of the WRC 15 on the following points was of particular interest:

- Extension of the frequency band allocated to the Earth exploration-satellite service to allow use by high-resolution satellite systems
- Allocation of additional frequencies to the non-navigational radiolocation service, including for use by automotive radar systems
- Worldwide harmonisation of existing frequency bands (in particular 700 MHz and 1.5 GHz) for public radio applications

- Recommendation on tuning ranges for the radio services of authorities and organisations concerned with public safety
- Creation of an option for uninterruptible global flight tracking following the disappearance of Malaysian Airlines flight MH370

As a whole, Germany and Europe were able to assert their positions successfully. The outcome garnered was thus a major success and speaks for the continued use of the established preparatory process.

The WRC-15 also approved the agenda for the WRC 19 and a review was opened in connection with a total of 30 GHz spectrum above the 24 GHz band for additional use by 5G applications. Furthermore, numerous topics were examined with the aim of allocating additional frequencies or making existing rules more flexible, for example for transport telematics systems, machine-to-machine communication and potential WLAN expansion areas.

Committee work in the European Union in the Radio Spectrum Policy Group (RSPG) and the Radio Spectrum Committee (RSC)

Another field of activity in European Union bodies is work in the Radio Spectrum Policy Group (RSPG) and the Radio Spectrum Committee (RSC), where the Bundesnetzagentur and the Federal Ministry of Transport and Digital Infrastructure address aspects of European spectrum harmonisation. The RSPG drafted recommendations on the future use of the UHF radio band (470 to 790 MHz).

The RSC approved a decision to implement harmonised technical conditions for mobile/fixed communications networks within the 1,452 to 1,492 MHz frequency band. In addition, draft implementation decisions were drawn up in particular with respect to the harmonisation of the 700 MHz band.

Committee work in the International Telecommunication Union (ITU)

As part of its work with the International Telecommunication Union, the Bundesnetzagentur represents Germany's interests in the working groups and conferences. In the radiocommunication sector (ITU-R), technical developments relating to radio technology are discussed, reports drawn up and recommendations made to the administrations.

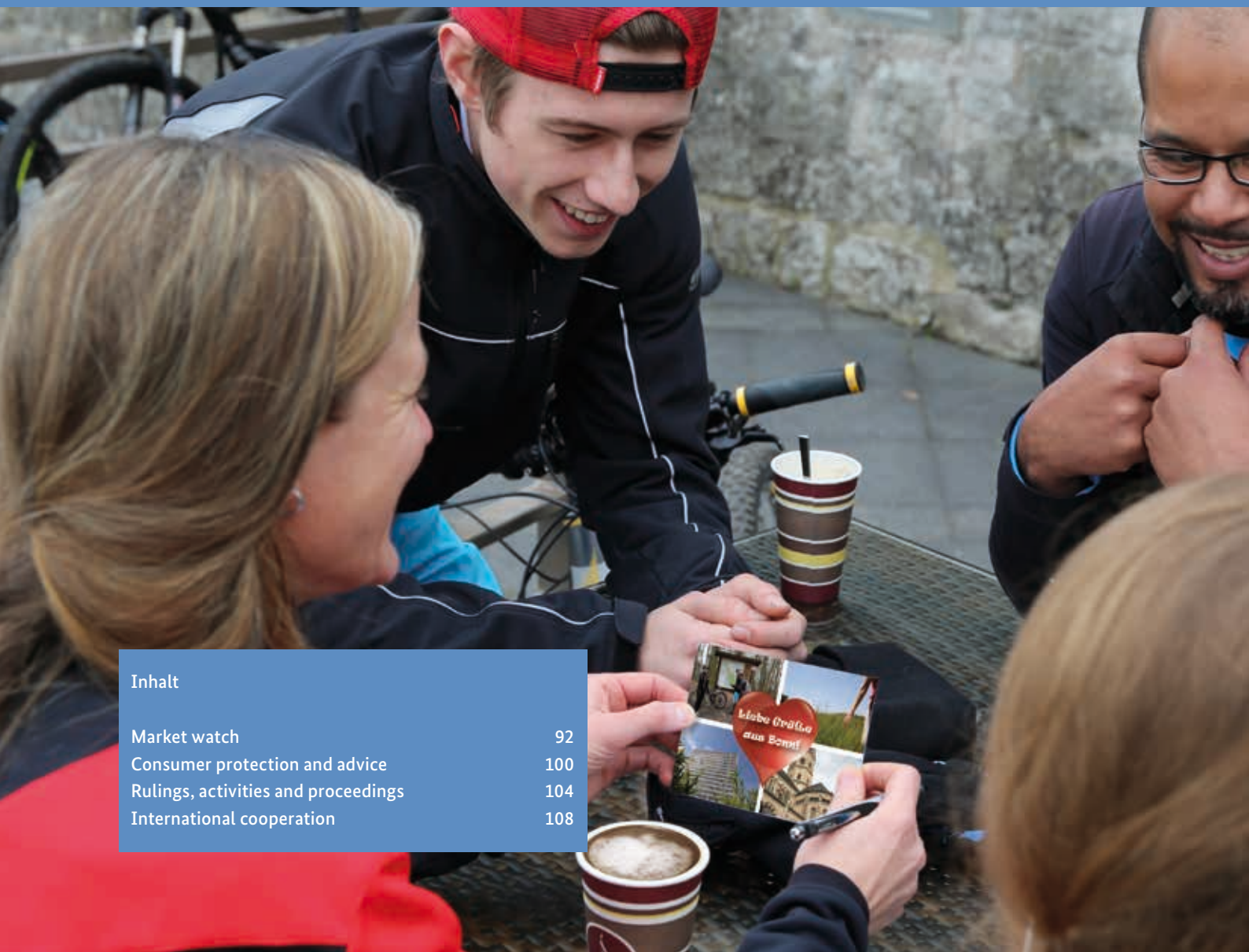
With the Bundesnetzagentur's involvement, a new report was completed on broadband radio applications for radio services of authorities and organisations concerned with public safety, as well as on intelligent transportation systems. Furthermore, a recommendation was drawn up regarding the demands on the technical capabilities of the next-generation mobile standard (IMT-2020/5G) compared with IMT-Advanced (4G).

Lastly, stances were reviewed and/or established on the co-existence of power-line telecommunications with wired services and aeronautical radio services as well as threshold values for smart grid applications and technologies including global or regional frequency bands used for the wireless charging of (mobile/portable) devices and electric vehicles.

POST

Markets shaped by e-commerce

Increasing digitisation characterised the postal market. Positive changes including an increase in the range of services offered were seen in particular in the parcels market. The parcel operators responded to the dynamic growth in e commerce with guaranteed delivery periods, pre-arranged delivery times, nationwide services, standardisation and automation.



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In 2015 the Bundesnetzagentur focused on the changing conditions in the postal market. The letters market still faced the challenge of e substitution, with electronic forms of communication increasingly replacing letter mail. The parcels market by contrast enjoyed significant growth through the boom in e commerce, with parcel services progressively taking over the lead role in the postal sector.

Process innovations led to an acceleration in companies' transport chains, and it was possible to realise significant savings potential. Changes in consumers' buying habits and the rapid development of online retail platforms resulted in the expansion of e commerce. The Bundesnetzagentur reacted to these developments and made them a focus of its activities and market monitoring.

The Bundesnetzagentur ensures the existence of fair competitive conditions and an efficient infrastructure across the country. In times of changing communication habits postal services remain a key component of our infrastructure – especially in the context of a well-functioning community. Large volumes of messages are still being sent in written form. And the boom in parcel logistics shows just how much society and the economy based on a division of labour depend on the availability of high-quality postal services.

Market watch

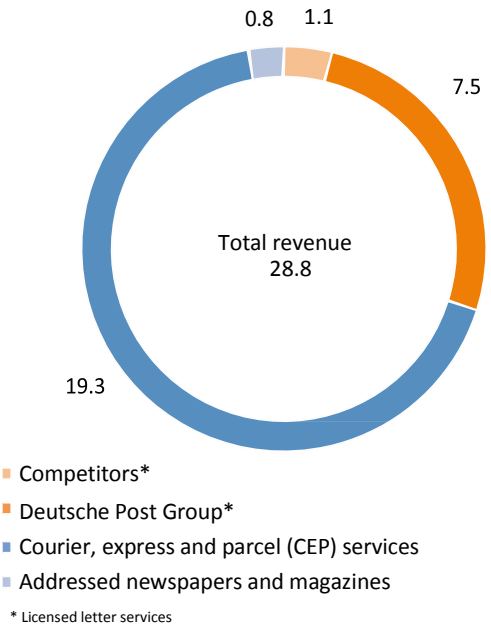
Competition and continuing digitisation paved the way for new services and optimised delivery in the parcels market. The letters market was marked by overall stability.

Postal market

The overall positive development in the postal sector continued in the year under review. In 2014 revenues in the postal markets totalled €28.8bn, representing a year on year increase of 2.5%.

Of this, around €8.6bn were accounted for by licensed letter services (letters up to 1,000g). Courier, express and parcel (CEP) services reported a significant increase, with revenues of approximately €19.3bn.

Revenues in the postal markets: 2014
€bn



The postal markets were driven by the marked increases in revenue and volume recorded in the parcel sector. There was a slight decrease in 2014 in the volumes reported for licensed letter services and addressed newspaper and magazine delivery (part of the postal market), while revenues remained stable. Overall, though, further growth is anticipated in 2015 thanks to the expected increase in online retail sales.

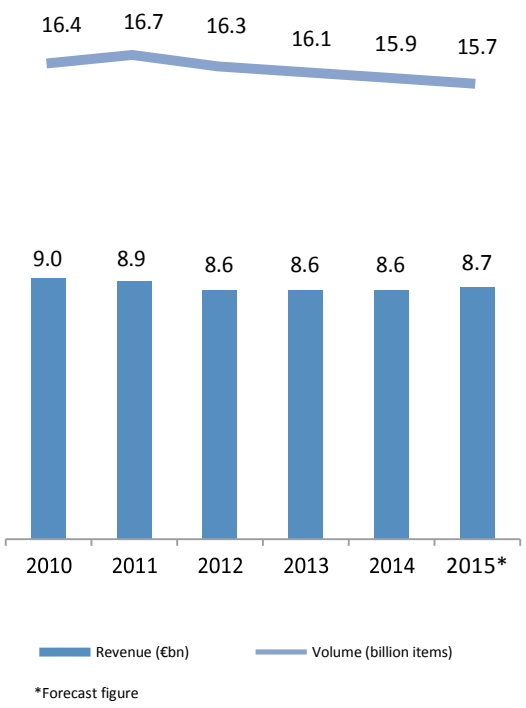
Licensed letter services

Revenues and volumes

The letters market saw no significant changes in 2014 compared to the previous year. Licensed letter mail revenues totalled €8.6bn, a level that is not anticipated to change in 2015.

In 2014 letter volumes totalled 15.9bn items. The volume is expected to fall in 2015 to approximately 15.7bn, continuing the moderate decline in letter volumes seen in previous years.

Volumes and revenue
Billion items/€bn



*Forecast figure

Revenues generated by competitors to Deutsche Post Group totalled €1.05bn in 2014 and are expected to be around €1.1bn in 2015. Revenues remained stable year on year, while mail volumes fell slightly. This is due to a small increase in the stamp prices charged by both Deutsche Post Group and its competitors. Prices have therefore risen slightly across the market.

Network access
In the licensed letter services sector, the dominant operator is required to provide access to its incidental services. The majority of letter mail is handled under such access arrangements. Access mail revenues increased slightly from €4.7bn in 2013 to €4.8bn in 2014.

Revenues are expected to remain stable in 2015 at €4.8bn. Access mail revenues generated by the competitors remained unchanged at €0.1bn or around 2%, and similar revenues are anticipated for 2015.

Access mail volumes in 2014 totalled approximately 10.5bn items. These included approximately 2.6bn items delivered by the competitors to Deutsche Post AG. The remaining items comprise mail delivered directly by bulk mailers to Deutsche Post AG and letter mail handled by a combination of Deutsche Post Group companies.

End-to-end competition
The second pillar in the letters sector alongside access competition is end-to-end competition, where an operator undertakes the entire process from collecting to delivering mail. Provided they have the required delivery network structure, operators can handle the whole postal chain from collection to delivery to the recipient without having to access Deutsche Post's network.

In 2014 Deutsche Post Group handled 3.4bn items end to end, generating €2.9bn in revenue. A volume of around 3.3bn items and similar revenue are expected in 2015. In 2014 the competitors' end-to-end volumes totalled 2.0bn items, with end-to-end revenues of around €0.9bn. The competitors anticipate a volume of approximately 2.1bn items in 2015, with a slight increase in revenues to around €1.0bn. All in all, the competitors expect to see a modest increase in both volume and revenues, while Deutsche Post Group anticipates another slight decline in volume and a small increase in revenue in 2015.

Market shares in the letters market
Deutsche Post Group's dominant position in the licensed letter services sector remained unchanged in 2014. The Group consolidated its position with a slight year-on-year increase in its market share by revenue to 87.8%. The other operators together held a market share of 12.2%, showing a slight upward trend. Deutsche Post Group's market share is forecast to fall to 87.3% in 2015.
In terms of volume the competitors achieved a small increase in their share, as in previous years. Their share in 2014 at 12.5% is expected to increase further in 2015..

Market shares in the licensed letter services sector by revenue and volume
Market shares (%)

Year	2010	2011	2012	2013	2014*	2015 [1)]
Revenues						
Deutsche Post Group	89.6	90	88.5	87.7	87.8	87.3
Competitors	10.4	10	11.5	12.3	12.2	12.7
Volumes** Deutsche Post Group	89.8	89.4	88.6	87.7	87.6	86.8
Competitors	10.2	10.6	11.4	12.3	12.5	13.2

* Rounding differences

** Deutsch Post Group volumes include all access mail items

1) Forecast figures

Competitors' market structure

In 2014 around 570 operators other than Deutsche Post AG provided their own licensed letter services. Of particular note again is the continued high proportion of small companies with an annual revenue of less than €100,000. There are 325 such companies, more than half of the total number of companies operating in the market. By contrast, there are 120 larger companies with a revenue of more than €1.0m per annum.

In 2015 a number of companies again withdrew from the market owing to insolvency or having merged with other licensees. The number of licensed operators with an annual revenue of over €10.0m was more or less the same in 2014 as in the previous year. These companies, having operated in the market for some considerable time, have been able to establish viable business models.

In 2014 the ten largest competitors to Deutsche Post Group generated around €0.5bn in revenues and handled 1.1bn items. This is approximately 50% of the total revenues generated and around 54% of the total volume of items handled by all of Deutsche Post Group's competitors. The ten largest competitors recorded a year-on-year increase in revenues of €70m, with a similarly positive development in volumes.

Deutsche Post Group's ten largest competitors anticipate further increases in revenues (+6.2%) and volumes (+7.3%) in 2015. This group is the main driver behind growth in competition, with competitors focusing mainly on the business customer segment.

Stamp prices

Deutsche Post AG's stamp price for standard letters has risen several times since 2013. As from January 2016, sending a standard letter costs €0.70.

Overall, however, Deutsche Post AG's prices for individual letter items (eg postcards, standard letters, compact letters) remained relatively stable in the period from when the letters market was liberalised to 2015.

Licensed letter service operators by revenue*
(without Deutsche Post Group)

Revenue	Up to €100,000	>€100,000 to €500,000	>€500,000 to €1m	>€1m to €10m	>€10m	Total numb
2010	~ 330	108	44	93	20	595
2011	~ 330	117	42	90	22	601
2012	~ 350	113	36	103	28	630
2013	~ 350	94	42	94	26	606
2014	~ 325	97	28	92	27	569

* The number of companies in the breakdown is lower than the total number of licensed operators since in several cases the parent company or group provided data for all affiliated licensed companies.

**Stamp prices for letters (in EUR)*:
2010 to 2016**

Year	2010-	2013	2014	2015	2016
Standard letter (up to 20g)	0.55	0.58	0.60	0.62	0.70
Compact letter (up to 50g)	0.90	0.90	0.90	0.85	0.85
Large letter (up to 500g)	1.45	1.45	1.45	1.45	1.45
Maxi letter (up to 1,000g)	2.40	2.40	2.40	2.40	2.60
Postcard	0.45	0.45	0.45	0.45	0.45

* Prices as at 1 January of each year

Taking into account price increases up to 2015, stamp prices for letters have decreased by 0.6% in real terms (ie adjusted for inflation) since 2010.

This is lower than the increase in the general cost of living index in the same period.

Workforce development

The licensed letter service operators (excluding subcontractors) had a total average number of employees in 2014 of 167,306, around 89% of whom were employed by Deutsche Post Group and about 11% by the other market players. These figures comprise staff employed on a full-time, part-time and mini-job basis.

There was a year-on-year decrease in the number of staff employed in the licensed letter services segment at both Deutsche Post Group and its competitors. Given the overall decline in mail volumes, it can be assumed that the number of employees will continue to fall slightly. Structural changes in the market resulted in a further increase in the number of employees switching between licensed and non-licensed services, since many companies operate both types of service.

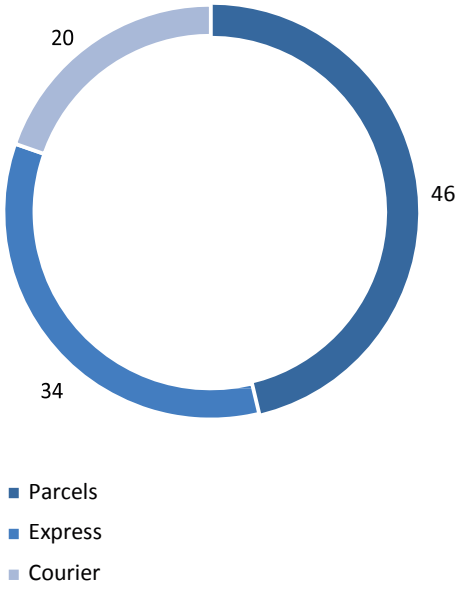
Courier, express and parcel (CEP) services

Revenues and volumes

The positive developments seen in the CEP services market between 2010 and 2013 continued. In 2014 revenues in the CEP market totalled €19.3bn. This represents a year-on-year increase of 4.0%, which is higher than the overall economic growth rate of 1.6% for 2014.

Parcel services accounted for the largest share of the revenues in 2014, with 46% or €9.0bn.
This compares to express services' 34% (€6.6bn) and courier services' 20% (€3.8bn) share.

CEP revenue shares: 2014
(%)



Source: MRU GmbH

Growth in the three segments varied in 2014: parcel services had the largest increase in revenue at 6.7%, while express services had a 2.2% increase and courier services 1.0%. Parcel services have long been the main driver behind growth in the CEP market.

Following the trend of recent years, total volumes in the CEP market also continued to increase in 2014, up by 4.9% on 2013 to 2.7bn items. Based on the information provided for this report, total revenue increased in 2015 by approximately 3.5% and volume by around 4.0%.

The increase in internet bandwidth and mobile internet availability are key drivers behind growth in e commerce, with changes in consumer habits also boosting online retail sales. In the parcels segment, in particular, all the signs are pointing to a further increase in volumes and revenues.

Access services, PO box facilities and change-of-address information

Access services

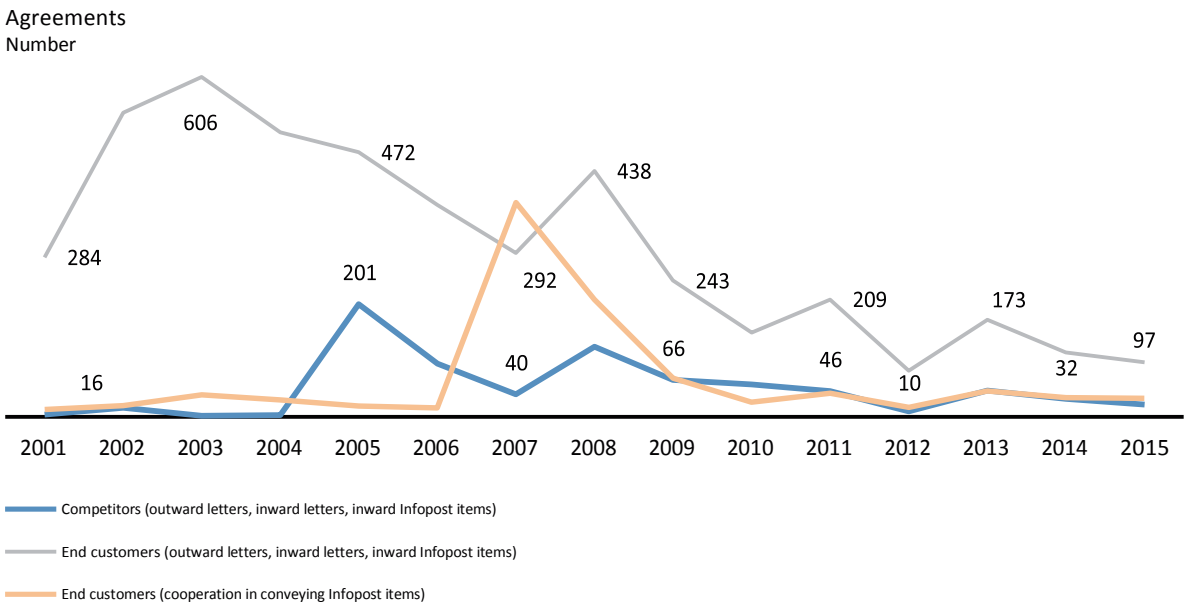
Deutsche Post Group, as the dominant operator in the market for licensed letter services, is required to offer parts of these services separately. Access to Deutsche Post Group's network is open on the same terms to both competing operators and end customers.

This enables regional operators, for example, to offer national delivery services to their customers.

To enable the Bundesnetzagentur to follow market developments, Deutsche Post Group must submit all access contracts to the Bundesnetzagentur within one month of conclusion. A distinction is made between contracts with operators primarily providing transport, pre-sorting or franking services.

In 2015 Deutsche Post Group concluded 16,782 new access contracts, including 22 with competitors for access services (outward letters, inward letters, inward Infopost items), 97 with end customers for access services (outward letters, inward letters, inward Infopost items) and 33 with end customers for cooperation in conveying Infopost items.

Deutsche Post also concluded 16,380 new access contracts for franking end customers' and competitors' items and 232 contracts for electronic franking (letters)/franking items using data processing equipment and mailing systems.



In some cases, companies have the option of a supplementary agreement allowing items from affiliated companies to be handled as well. Companies then mailing larger volumes together would qualify for better discounts on postage. The full scope of options has yet to be exhausted. Supplementary agreements are generally available to both end customers and competing operators. In 2015 18 such agreements were signed.

Changes of address, PO box facilities
Deutsche Post Group, as the dominant operator, is required to offer competitors access to change-of-address information in return for a fee. In 2015 five new agreements were concluded for access to such information.

The Bundesnetzagentur carried out a market survey in 2015 to look more closely at this access product. The survey revealed that in most cases information about individual addresses was requested.

The dominant operator is also required to allow competitors to deliver PO box addressed mail to its PO box facilities, again in return for a fee. In 2015 one new agreement was concluded for PO box access.

The Bundesnetzagentur also looked more closely in 2015 at this access product. One of its findings was that only one in four active postal operators uses this option. One of the reasons is that many letter service operators focus mainly on collecting mail, which is then delivered to the recipients by other operators, in particular Deutsche Post AG.

Market access

Licensing
Between 1998 and 2015 the Bundesnetzagentur issued licences for the conveyance of letters up to 1,000g to a total of 2,952 companies and individuals. In 2015 53 new licences were issued. In the same year 13 licensed operators withdrew from the market, for instance because they had ceased business or changed business activities or had their licence revoked by the Bundesnetzagentur. The Bundesnetzagentur has no reason to believe that the introduction of the minimum wage has had a negative effect on licensed operators' activities.

Should companies or individuals operate services without the required licence, the Bundesnetzagentur may prohibit their activities and initiate administrative offence proceedings. The companies and individuals concerned are first contacted for comment and may then be ordered to cease their activities and face coercive or administrative fines. In 2015 the Bundesnetzagentur searched the premises of several postal operators in North Rhine-Westphalia and Saxony-Anhalt following reports from other companies and the police of serious infringements in operating their letter services. In one instance letters had been opened illegally, and in another letters had been disposed of illegally. The Bundesnetzagentur's checks revealed that the companies concerned had been operating letter services without the required licence. The Bundesnetzagentur therefore opened prohibition and administrative fines proceedings against the companies. Where the activities constituted criminal offences, investigations were launched by the police and public prosecutors.

Subcontractor survey
The results of the survey conducted in 2014 on working conditions at licensed operators' subcontractors were evaluated and the project was completed in 2015. The survey questioned transport companies and post office agents separately, covering a total of about 2,600 transport companies and 1,200 agencies. The survey showed that in 2013 the national average gross hourly rate for workers at the transport companies (drivers and delivery staff) was €8.31, which is below the current minimum wage. It also revealed that in economic terms letter services were only of minor importance to the subcontractors participating in the survey.

Notification obligation
Operators of licence-exempt postal services are required to notify the Bundesnetzagentur in writing and within one month when they commence, change or cease operations. The postal services that are notifiable include:

- conveying letters with an individual weight of more than 1,000g;
- conveying addressed parcels weighing up to 20kg;
- courier services; conveying books, catalogues, newspapers or magazines by companies also operating letter or parcel services; and
- conveying letters with an individual weight of up to 1,000g as a subcontractor of another licensed operator.

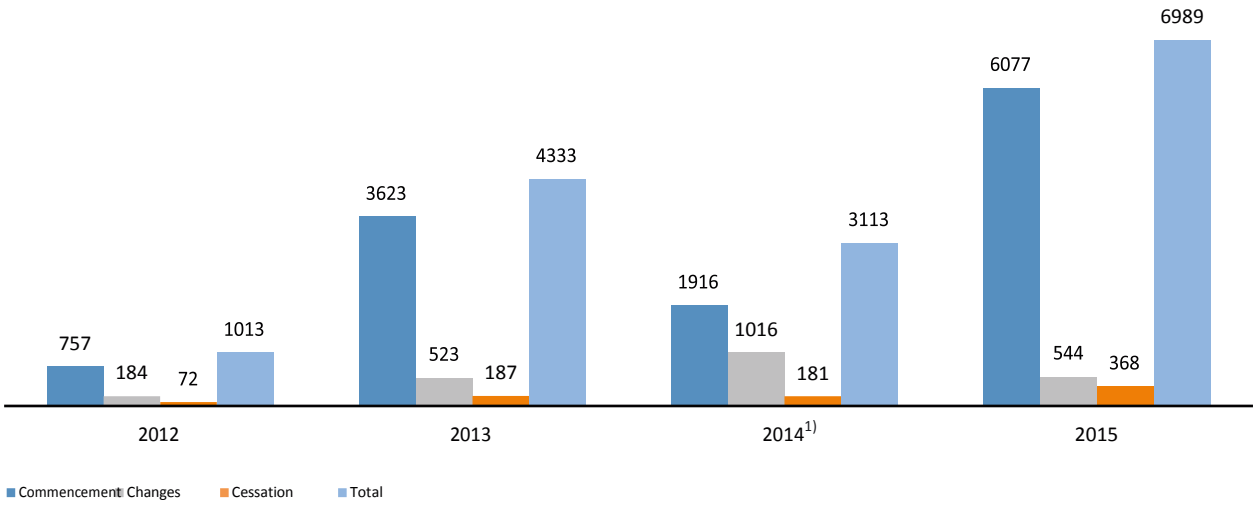
In 2015 the Bundesnetzagentur identified a number of breaches of the notification obligation. In most cases the operators had been unaware of their obligations under the German Postal Act. This prompted the Bundesnetzagentur to intensify its information services and contact a large number of sole traders primarily providing postal services but also in particular parcel shops affiliated with the major parcel carriers and providing postal services as a by-product only. In 2015 the Bundesnetzagentur confirmed 6,077 new notifications.

Electronic forms

In 2015 the Bundesnetzagentur, in cooperation with the Centre for Data Processing and Information Technology (ZIVIT), designed a series of electronic forms. During the course of 2016 it will be possible for operators to submit and amend their section 36 notifications electronically. Licence applications can be submitted and processed online. Complaint and dispute resolution forms will be available on the Bundesnetzagentur's website for different customer groups, making it simpler and quicker for consumers to contact the Bundesnetzagentur.

The new electronic procedures will make communication between the public and industry on the one hand and the Bundesnetzagentur on the other hand considerably easier.

Notifications received: 2012-2015



1) Updated figures

Postal market checks/data protection

As one of its ongoing tasks the Bundesnetzagentur carried out checks at a number of postal operators' premises in 2015 to verify compliance with the statutory provisions for postal secrecy and data protection and the notification obligations. A total of 580 checks were carried out, 502 of which were routine and 78 prompted by specific circumstances. Postal secrecy and data protection was an issue of key interest to the operators as well. The Bundesnetzagentur was able to answer their questions in particular about the requirements for business operations and premises. It often emerged that companies not operating as part of a network were unaware of their obligation to notify the Bundesnetzagentur of their licence-exempt services.

The checks revealed neither such external warehouses nor breaches of the postal secrecy and data protection provisions.

One of the issues covered in 2015 by the activities in the field of postal data protection in cooperation with the Federal Commissioner for Data Protection and Freedom of Information was e retail. In respect of personal data required for proper postal service provision, the authorities ruled that it was permissible to have the customer's telephone number as well as their name and address on the outside of a parcel. This could help speed up the delivery process and make it more customer-friendly.

Further development of the postal universal service

Digitisation has brought about significant changes in the use of postal services over the past few years. This also raises questions about the effects on the universal service, which ensures the availability of basic postal services for all.

The legal framework for this basic service provision – the German Postal Universal Service Ordinance (PUDLV) and the European regulations in the Postal Services Directive – was developed in the 1990s and thus at a time when electronic communications had yet to be taken up by the masses.

The Bundesnetzagentur therefore triggered discussions about the postal universal service with its "food for thought" paper published at the end of 2014. Even though the market players do not see an acute need for changes to the universal service requirements at the moment, the present framework needs to be reviewed in light of the advance of digitisation. Given the dynamism of market developments, viable concepts for the future design of the postal universal service should be developed. The responses to the consultation on the "food for thought" paper which are reflected in the Bundesnetzagentur's recommendations on the postal universal service can therefore mark only the beginning of the discussion process. Due account must also be taken of the need for effective consumer protection.

The increase in the number of complaints shows that consumer interests are not always adequately protected. Thought should be given here to strengthening consumer rights in the postal sector.

Consumer protection and advice

Complaints about letter or parcel delivery services have increased significantly. The Bundesnetzagentur offers advice and active support. It monitors the availability of basic postal services.

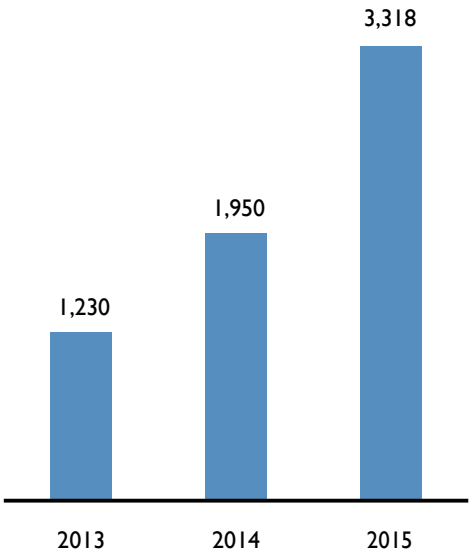
Consumer advice

The Bundesnetzagentur has established itself as a port of call and provider of advice for consumers with complaints about letter or parcel delivery services. For the Bundesnetzagentur's postal consumer advice team, complaints are a valuable indicator of potential irregularities in the nationwide provision of basic postal services (the universal service). The Bundesnetzagentur investigates the complaints and asks the operators for feedback after looking into the matter, with the aim of finding the most customer-friendly solutions possible. Consumers who turn to the Bundesnetzagentur for help have a much higher prospect of satisfactory answers and proposals from their postal operators.

Complaints

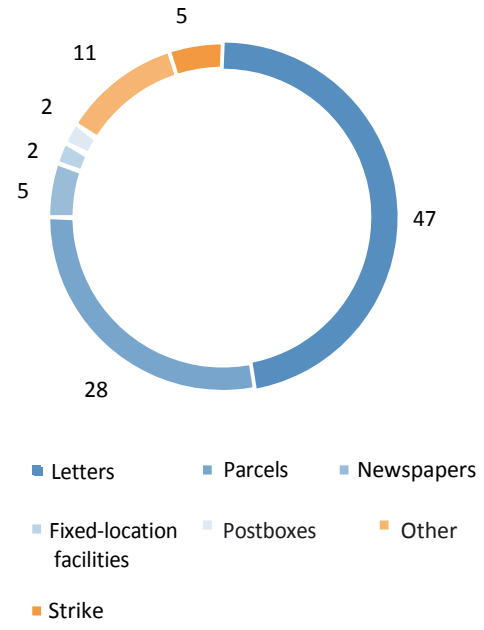
The number of complaints about letter and parcel delivery services increased significantly in 2015. The Bundesnetzagentur received a total of 3,318 written complaints (emails and letters), up 70% on 2014 (1,950 complaints). In 2015 the Bundesnetzagentur also dealt with around 1,800 calls from postal consumers.

Written complaints



Some complaints related to several issues. 47% of the complaints received were about letter services and 28% about parcel services. The remainder was broken down as follows: newspaper delivery (5%), postboxes (2%), fixed-location facilities such as post office branches and agencies (2%), and other matters, including postal operators' complaint handling (11%).

Complaints by reason: 2015
(%)



One difference compared to the previous year was the strike at Deutsche Post DHL accounting for 5% of the complaints. Complaints were made about the disruption to letter and parcel services caused by the strike, about the problem frequently experienced by customers of not being able to collect post themselves from a post office branch or sorting office, and about the lack of proper information and the long delays in dealing with the backlog of post after the strike.

In 2015 the majority of complaints came from customers in North Rhine-Westphalia (451), followed by Berlin (351), Hamburg (317) and Lower Saxony (315). As in 2014 the smallest number of complaints came from Saarland (15).

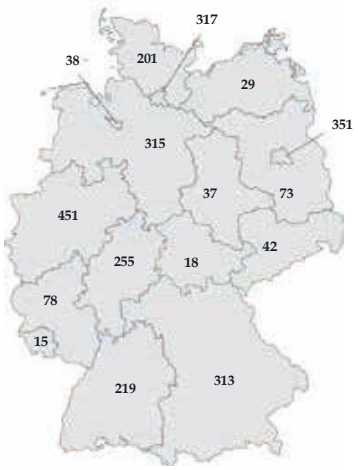
Letter services

The majority of complaints about letter services concerned delivery. Customers complained about the lack of delivery on certain days of the week or over a longer period of time, letters being delivered to alternative or wrong addresses, and letters being returned without any obvious reason. This was followed by frequent complaints about "lost" letters, transit times, stamp prices, redirection services, registered post and damaged letters.

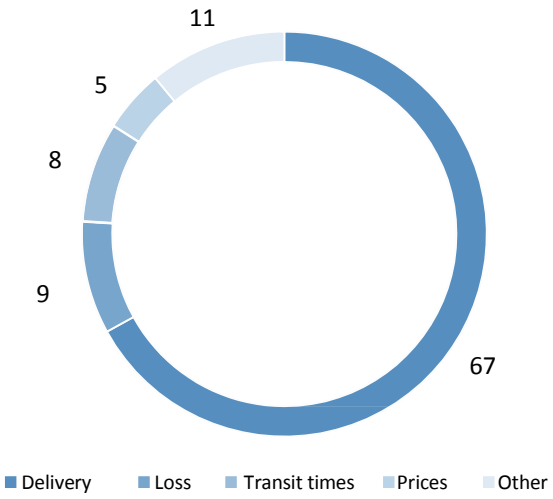
The strike and its impact was also reflected in the complaints about delivery and transit times. The slow rate of improvement at Deutsche Post DHL after the strike angered many customers, as did the move to combine delivery areas during the summer holidays, which Deutsche Post AG was slow to communicate and which prompted a large number of complaints.

At one point in 2015 there was a noticeable peak in the complaints received by the Bundesnetzagentur from some parts of Germany, including Berlin and Hamburg, where there were considerable problems in letter deliveries. In some cases there were no deliveries for a number of days at a time. Deutsche Post AG said when contacted by the Bundesnetzagentur that the lack of deliveries had been due to an unexpectedly high number of staff off sick, changes in delivery areas and more staff on holiday. The Bundesnetzagentur then requested detailed information on staffing, interruptions in delivery, and delivery rounds. The Bundesnetzagentur was in continuous contact with the company about the shortcomings in its letter services and called for long-term improvement in the situation. Up to the end of the period under review, however, problems in certain areas were still being reported.

Complaints by federal state: 2015



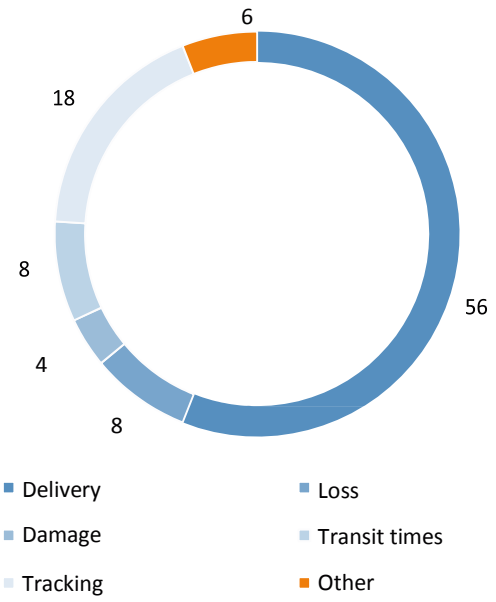
Reasons for complaints – letter deliveries: 2015
(%)



Parcel services

The majority of the complaints about parcel services concerned delivery. Many consumers complained about finding a missed delivery card in their letter box although they could prove they had been at home and their doorbell was working properly. They also pointed out that neighbours had been at home who could have taken their parcel instead. Other subjects of complaint were parcels being returned to the sender for no proper reason and lost or damaged parcels. Dissatisfaction with parcel tracking systems, which did not always run smoothly, also played a large part. The postal strike and the very slow improvement in services at Deutsche Post DHL after the strike were also reflected in the complaints about parcel delivery.

Reasons for complaints – parcel deliveries: 2015
(%)



Universal service provision

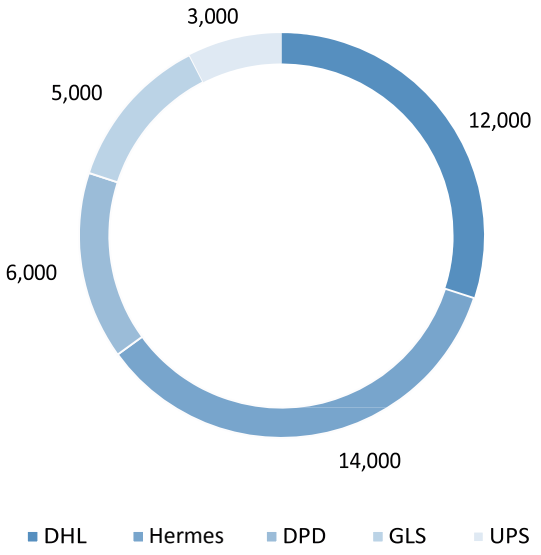
The Bundesnetzagentur monitors the provision of sufficient and affordable postal services across the country. The Postal Universal Service Ordinance specifies the content and scope of this basic service provision (universal service). The Ordinance designates specific postal services as universal services and defines certain quality standards for letter and parcel services.

One of these is the requirement that there must be at least one letter and parcel delivery per working day in Germany. This statutory requirement was met in 2015, even though indications of possible deficits increased. There was a noticeable increase in the number of complaints received by the Bundesnetzagentur about – sometimes persistent – shortcomings in delivery. One of the contributing factors was most certainly the strike at Deutsche Post DHL and in particular the slow improvement in delivery after the strike.

Another requirement is that there must be at least 12,000 fixed-location facilities in Germany where customers can conclude contracts for the conveyance of letters and parcels. In 2015 Deutsche Post AG alone operated a total of 13,160 branches or agencies for letter and parcel services. Last year customers in many towns and districts could also use fixed-location facilities operated by Deutsche Post AG's competitors to send letters.

In 2015 the Bundesnetzagentur once again identified progress in enhancing the infrastructure for collecting and transporting parcels. The upward trend from previous years continued – with Deutsche Post DHL as well as with other major parcel operators such as DPD, GLS Germany, Hermes Logistik Gruppe and UPS. These five companies together put the number of parcel shops operated in Germany in 2015 at around 40,000.

Parcel shops: 2015



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 2015 Deutsche Post AG had 111,269 postboxes across the country. In addition, private customers in several towns and districts had access to postboxes provided by competing operators.

The Ordinance requires that at least 80% of national letters be delivered on the working day after collection and 95% within two working days. Deutsche Post AG commissions an external quality and market research institute to measure its actual delivery times. The measurements are certified by TÜV Rheinland and the results presented on a quarterly basis to the Bundesnetzagentur. The results show that in the period under review Deutsche Post AG met the delivery targets. However, the impact of the strike and the sluggish rate of improvement after the strike were clearly reflected in the statistics.

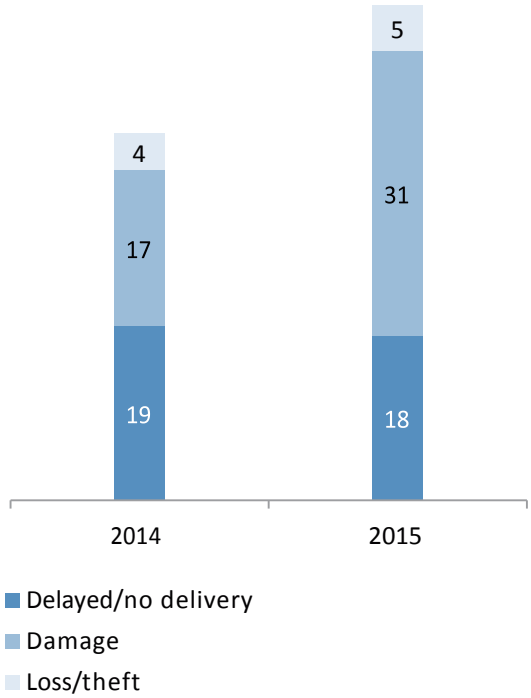
Dispute resolution

A request for dispute resolution can be made by customers in particular when postal items have been lost, stolen, damaged or delayed.

One condition is that they must have first tried – and failed – to settle the issue with their postal operator. Another is that their operator must be willing to cooperate in the proceedings.
Where possible, the Bundesnetzagentur's dispute resolution panel suggests ways for the two parties to settle the dispute amicably. The parties are not obliged to follow the Bundesnetzagentur's suggestions and are free to end the voluntary process at any time.

In 2015 the Bundesnetzagentur received 62 requests for dispute resolution, up around 10% on the previous year's figure of 56. The Bundesnetzagentur rejected eight requests that did not meet the preconditions for resolution proceedings. The remaining 54 cases went before the panel for amicable settlement. The majority of the cases initiated and concluded during the year under review resulted in successful mediation by the Bundesnetzagentur and agreement between the parties, with providers reimbursing their customers with on average around 68% of the amount under dispute.

Reasons for dispute resolution requests



Rulings, activities and proceedings

Changes in the legal basis for regulating prices required the Bundesnetzagentur to develop a new price cap framework. Higher stamp prices were approved.

Price cap benchmarking

In its 2013 price cap benchmarking decision the Bundesnetzagentur defined Deutsche Post AG's scope for pricing letters up to 1,000g for the period from 2014 to 2018. The legal basis for this decision was, however, modified through the amendment of the German Postal Rates Regulation Ordinance (PEntgV) on 29 May 2015 and, more specifically, through the revision of section 3(2) of the Ordinance. This subsection defines the components of the costs of efficient service provision – a core benchmark in rates regulation.

The revised Ordinance specifies that for the purpose of comparison in particular the profit margins of companies operating in other European countries in markets comparable with the licensed sector should be used instead of the business risk when determining the appropriate profit mark-up, one of the components of efficient service provision. In addition, the pricing intervals within the price cap procedure should be combined into a price approval period, taking into account the expected rate of price increases in the economy overall for the period. This means that there will be no individual price cap intervals within the benchmarking period.

The legislator's aim was to enable the regulated company to increase returns in order to reshape the postal networks and be able to respond appropriately to the economic challenges posed by competition from digital services such as email. The associated utilisation risks of the very staff-intensive letter service processes were to be adequately reflected in pricing.

Deutsche Post AG, referring to the amendment of the Ordinance, requested that the benchmarking process that had been effectively concluded in 2013 be resumed. The competent ruling chamber granted the request in its notice issued on 15 June 2015. The Bundesnetzagentur then set new benchmarks in its decision published on 23 November 2015.

The Bundesnetzagentur defined a new rate of growth in productivity, or "X factor", of 5.8% for the subsequent three years. This factor takes account of the relation between the initial rate level and the applicable costs according to the revised Ordinance.

Together with the expected rate of inflation of 1.7%, this enables Deutsche Post AG to make price adjustments of up to 7.5% in the period from 2016 to the end of 2018.

The 2015 benchmarking involved both a re-examination of the costs and a reassessment of the structure and forecast of mail volumes. It was otherwise based on more or less the same assumptions as those taken in the benchmarking conducted in 2011 and 2013.

Approval of letter prices for 2016 to 2018

Following the benchmarking decision Deutsche Post AG submitted its proposed price changes for the period from 2016 to 2018. The decision on letter prices in the three-year period was published on 4 December 2015 and was based on the new benchmarks. The decision relates to the products for personal customers that are subject to price cap regulation, including national and international standard, compact, large and maxi letters, postcards, and special services such as confirmed delivery. One product included for the first time in the price cap was national secured delivery for cash or valuables.

The most significant change was the increase in the rate for a standard letter from €0.62 to €0.70. The stamp price for a maxi letter rose from €2.40 to €2.60. Charges for special services (confirmed delivery) and some rates for international letters were also raised. Deutsche Post AG's proposed increases were near the maximum allowed under the regulatory framework.

Following several successive increases, the decision will ensure that letter prices remain stable in the period from 2016 to 2018. New benchmarks will not be set until 2018, with any consequent changes to the pricing framework becoming effective from 2019.

The Bundesnetzagentur's approval of the new letter prices is now under judicial review.

Approval of rates for *E Postbrief mit klassischer Zustellung*

On 18 December 2015 the competent ruling chamber approved the follow-up application submitted by Deutsche Post E POST Solutions GmbH for its E Postbrief mit klassischer Zustellung with effect from 1 January 2016.

E Postbrief items are posted electronically by the senders and delivered either electronically (to registered addresses) or physically. Items that are delivered physically are sent as electronic messages by the sender and printed, folded, inserted in an envelope and franked with the postage payable for the comparable Deutsche Post AG product – for instance €0.70 for a standard letter – by Deutsche Post E POST Solutions GmbH or one of its subcontractors. The letters are then passed on to Deutsche Post InHaus Services GmbH – a mail consolidator which hands them over to Deutsche Post AG – for delivery to the recipient.

Each of the rates put forward for approval by Deutsche Post E POST Solutions GmbH is the charge payable for physically transporting the letters, just part of the service provided by the company. In other words, the rates do not correspond to the full charge payable by a customer. Senders also have to pay for electronic posting, for producing the letter, and the applicable VAT. A private customer would for instance need to pay €0.70 for a Standard-E Postbrief and not the approved rate of €0.42. The rates approved are valid until 31 December 2016.

The ruling chamber found that the prices proposed for two of the products – compact letters and maxi letters – were below cost. The chamber determined that the volumes and hence discounts assumed by the company when calculating its costs were too high, and ruled that the rates be increased so as not to disadvantage competitors.

The ruling is currently being reviewed by Cologne Administrative Court. The main point of appeal is that the prices are based on a business model of consolidation applied by a Deutsche Post AG subsidiary.

Review of rates for business parcels

Competitors had raised complaints about Deutsche Post DHL's rates for parcels sent by mail order companies being too low. The rates were – in the competitors' view – below cost, or at least the internal transfer prices paid by DHL Vertriebs GmbH for its parent company's services were too low. Business customers' parcels were said to be cross-subsidised by the prices paid in particular over the counter by personal customers, which were above cost.

The preliminary investigations showed that Deutsche Post DHL is the dominant operator in the relevant postal market for business parcels and is therefore subject to regulation by the Bundesnetzagentur. The relevant product market includes standard business parcels up to 31.5kg (B2X) and hence in particular parcels from mail order companies. The ruling chamber defines the market as a single national market for business parcels comprising both the B2B and the B2C segments. Deutsche Post DHL is the dominant operator in this market and is thus subject to regulation under postal law. Yet the investigations ultimately did not find anything to suggest that the prices are in breach of the Postal Act, even when taking a consolidated look at the costs and revenues for DHL Vertriebs GmbH and for Deutsche Post AG's business parcels area. However, the chamber's findings showed that the transfer prices would need to be increased if Deutsche Post AG's specific cost situation and cost increases were to be reflected in the transfer pricing system.

Deutsche Post AG will therefore modify its transfer pricing as from 2015 in line with the chamber's findings, without calling into question the market and transfer pricing system agreed with the European Commission. There will be progressive, moderate increases in the transfer prices for business parcels. This will ensure that Deutsche Post DHL's prices for business parcels remain consistent with postal legislation within and beyond the current assessment period.

Proceedings concluded against the Bundesnetzagentur's rulings

Federal Administrative Court on rates approvals for 2003 to 2005

Following a complaint from a postal customer, the Federal Administrative Court partially annulled the approvals granted in price cap proceedings by the Bundesnetzagentur for Deutsche Post AG's rates from 2003 to 2005.

The court's decision is based on the following reasons: A postal customer is entitled to appeal against a rates approval granted under postal legislation in so far as violation of the customer's rights appears possible. On account of its effects on private law the contested rates approval can violate the customer's personal autonomy in so far as the customer has actually used the service for which the rates have been approved.

The guarantee of legal redress requires that the examination of the material requirements for approval in the two-stage price cap procedure should cover both the benchmarking decision in the first stage and the rates approval in the second. The court found the benchmarking decision of 26 July 2002 – underlying the rates approvals for 2003 to 2005 – to be unlawful. A legal error had been made in determining the rate of growth in productivity. In its first price cap procedure the ruling chamber – with a view to not imposing too much price pressure on actual and potential competitors – had enabled Deutsche Post AG to charge higher rates. This action – justified by the regulatory aims of the Postal Act – conflicted with the statutory requirements. Although the ruling chamber had scope for determining the expected rate of growth in productivity, its scope was limited by law. The benchmark of the extended costs of efficient service provision, which at the same time formed the content of the prohibition of surcharges, had binding character and served not only as a point of reference for the subsequent examination. The annulment of the rates approvals for 2003 to 2005 granted on the basis of the unlawful price cap decision is, however, restricted by the Federal Administrative Court to the legal relationship between the plaintiff customer and Deutsche Post AG.

The assumption that rates approvals can be subjectively divided corresponds to judicial decisions on rates approvals granted under telecommunications law.

The Federal Administrative Court's decision made it clear that the postal customer can obtain legal redress against all decisions taken in connection with price cap rates regulation under postal law.

Submission of Deutsche Post InHaus Services GmbH's access contracts

In its judgment of 1 December 2015 Cologne Administrative Court confirmed that the requirement to submit access contracts as laid down in section 30(1) of the Postal Act applied not only to Deutsche Post AG as a dominant parent company but also to its subsidiaries. Deutsche Post InHaus Services GmbH, as Deutsche Post AG's "in-house" consolidator, provides services to its customers that are relevant in terms of access, or partial, services. By consolidating postal items from various senders Deutsche Post InHaus Services GmbH achieves larger mail volumes which it then delivers directly to Deutsche Post AG's mail centres under the terms of an access contract. These higher volumes qualify Deutsche Post InHaus Services GmbH for larger discounts from Deutsche Post AG than the individual senders delivering their mail to Deutsche Post AG themselves. Deutsche Post InHaus Services GmbH passes on these discounts – minus a charge for processing and transporting the mail – to its customers. In 2012 the Bundesnetzagentur requested Deutsche Post InHaus Services GmbH to present its access contracts with its customers as required by section 30(1) of the Postal Act to enable a review of the market conditions in this segment. Deutsche Post InHaus Services GmbH did not meet this request. In the administrative court proceedings following Deutsche Post InHaus Services GmbH's objection to the request for information, the company stated that it had an access service relationship with Deutsche Post AG but not with its customers.

Cologne Administrative Court made it clear that Deutsche Post InHaus Services GmbH was required to submit the contracts with its customers in accordance with section 30(1) of the Postal Act. According to section 36(2) of the German Competition Act (GWB), Deutsche Post InHaus Services GmbH – as an affiliated company of the dominant company Deutsche Post AG – was also to be regarded as dominant. In addition, it could be assumed that Deutsche Post InHaus Services GmbH – as part of the Deutsche Post AG group – provided access services to its customers, hence the contractual relations constituted access contracts that were required to be submitted.

This was clear from the fact that the company's general terms and conditions required customers to pre-sort their mail themselves – which itself constituted a partial service – before handing it over to Deutsche Post InHaus Services GmbH. The court also made it clear that the relation between Deutsche Post AG and Deutsche Post InHaus Services GmbH did not constitute an access service relationship within the meaning of section 28 of the Postal Act but rather a licence-exempt service provided internally within the company group. The judgment is final.

International cooperation

In 2015 the Bundesnetzagentur supported digitisation in the postal and logistics markets. At European level it promoted the development of open standards.

European and international standardisation

The European Commission supports the development of open standards in the postal sector through its mandates to the European Committee for Standardization (CEN). Postal standardisation is focused on harmonising technical methods at EU level for the external measurement of quality of service performance within the universal service and on improving interoperability between postal industry stakeholders. A dedicated CEN Technical Committee (TC 331) is working on these aims by defining European standards and technical specifications for postal services.

CEN's working groups comprise representatives of post and logistics companies, courier, express and parcel operators, online retailers and industry, as well as regulatory authorities, professional associations and consumer organisations, all of whom are also members of the national standardisation body DIN. At national level the relevant DIN committee was chaired in 2015 by the Bundesnetzagentur.

The Bundesnetzagentur's tasks include combating barriers to market entry for competitors resulting from non-open standards and promoting transparency in standardisation and the provision of clear information for all competitors in the market. With a view to this second task, the Bundesnetzagentur has supplemented its website with key information on current standardisation activities and an up-to-date list of published standards.

In 2015 the European Commission and CEN/TC 331 began intensive talks about a further mandate from the Commission to CEN. The main issues of discussion were e commerce, developing interfaces between post, logistics and retail operations, digitisation and automation, and transport security. Since 2015 the players have been taking a closer look at the interfaces between post and logistics. At the centre of digital developments in the retail sector, online retailers operate primarily with GS1 standards – part of a globally recognised merchandise information system – using standardised parcel labels for cross-border e commerce.

In 2015 a new working party was created within the national body DIN with the objective of standardising the technologies used by delivery staff and addressees to access parcel boxes. The aim is for all authorised courier, express and parcel operators to be able to deposit items in the same parcel boxes for retrieval by the recipients, with optional procedures for processing returns between addressees and parcel service providers.

ERGP

The Bundesnetzagentur is a member of the European Regulators Group for Postal Services (ERGP). The ERGP facilitates the dialogue between regulatory authorities and the development of common positions in joint reports and position papers. One of its main tasks is to advise and assist the European Commission in consolidating the internal market for postal services. In this context, the ERGP is particularly concerned with the consistent application of the regulatory framework for postal services across all Member States. The Group is composed of the regulatory authorities of the EU Member States, the European Economic Area and EU candidate countries, with the European Commission participating as an observer and providing secretarial services. Only the representatives of the EU Member States' national regulatory authorities are entitled to vote, with each authority having one vote.

In 2015, Lithuania's regulatory authority RRT chaired the ERGP. The 2015 plenary meetings of the Group, during which fundamental decisions – for instance reports and position papers developed by the various working groups – are adopted, took place in Vilnius in early July and in Brussels in early December. An internal workshop to draw up the work programme for 2016 was also held the day before the plenary meeting in Vilnius.

In 2015, the ERGP's work programme was managed by four sub-groups dealing with the following issues: (1) accounting and price regulation, (2) universal service costs/effects of VAT exemption, (3) consumer issues, and (4) cross-border e commerce parcels delivery. The Bundesnetzagentur and the French regulatory authority ARCEP jointly chaired the sub-group for cross-border parcels delivery. The ERGP Task Force set up at the end of 2014 to deal with current issues was primarily concerned in 2015 with analysing the possible impact of the judgment of the European Court of Justice (ECJ) concerning the interpretation of Article 12 of the EU Postal Directive (case C 340/13 (bpost)).

The reports and common position papers produced by the sub-groups in 2015 included reports on the development of the universal service obligation, quality of service, consumer protection and complaint handling in 2014, and core indicators for monitoring the market. The ERGP also published a report looking at the legal regimes applicable to domestic and cross-border e commerce parcels delivery and the extent to which these regimes may coincide or conflict with each other. The ERGP Task Force presented a report on the possible impact of the ECJ's judgment in case C 340/13 (bpost).

In addition, in the second half of 2015 the ERGP and the Body of European Regulators for Electronic Communications (BEREC) produced a joint opinion on price transparency and regulatory oversight of cross-border parcels delivery. The Bundesnetzagentur acted as the ERGP Chair of the joint expert working group. The joint opinion was delivered following two working group meetings and a joint internal workshop aimed at facilitating dialogue between the telecommunications and postal regulation sectors in the context of the digital internal market.

Further information on the ERGP's reports and consultations is available at
http://ec.europa.eu/growth/sectors/postal-services/ergp/ index_en.htm.

Universal Postal Union

In 2015, under the leadership of the Federal Ministry for Economic Affairs and Energy, the Bundesnetzagentur contributed to the work of the Universal Postal Union (UPU), a UN specialised agency with 192 member countries that serves as a forum for cooperation between postal sector players worldwide. In 2015, preparations were made for the Universal Postal Congress to be held in 2016.

The Postal Operations Council (POC) strives to enable players to react more quickly to the challenges and developments in the market. In this context the POC promotes a seamless and comprehensive postal network that – by integrating networks, products and services – will enable players to accommodate the changes triggered by digitisation and e commerce better than before. Here, the POC assumes that while letter volumes in almost all the member countries are declining, parcel volumes are increasing. Its efforts are therefore directed at speeding up customs procedures and enhancing a parcels delivery network adapted to increased security requirements.

The UPU believes that the growth in e commerce may lead to changes in what is required of the universal service, which in turn may necessitate changes to the international regulatory framework.

In the context of the universal service, quality and costs are set against each other. One question to be considered here is whether all parcels need fast delivery or whether slower and cheaper but still reliable delivery would also be an option.

In 2015 proposals were discussed with a view to reshaping the UPU in terms of accelerating voting procedures, defining responsibilities more clearly, and streamlining structures by reducing the number of working groups. This means the UPU will be facing significant challenges in the coming year. Decisions on the proposed reforms are expected at the Universal Postal Congress in 2016.

RAIL

Rail and Competition

In the course of numerous individual proceedings, the Bundesnetzagentur has specified and improved the framework for competition in the railway sector. It has objected to a number of rules and arrangements for the use of the DB Netz AG rail network – and has ordered adjustments in the track access charging system with a view to the future calculation of the costs.

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The Bundesnetzagentur works to increase competition in the railway sector. To accomplish this, it monitors the railway sector to ensure that competitors are able to use the railway system on fair terms and at reasonable prices.

The share held by competitors in the rail freight transport segment continued to grow in 2015 and is likely to have since reached 36%. The share of the short-distance passenger transport sector held by competitors has also developed positively. Deutsche Bahn AG (DB AG) undertakings accounted for approximately 84% of traffic volume in 2010. This figure fell to only 79% in 2015. At more than 99%, Deutsche Bahn AG undertakings continue to handle most of the traffic in the long-distance transport segment. However, several enterprises have announced that they will be entering the market in the long-distance segment in 2016.

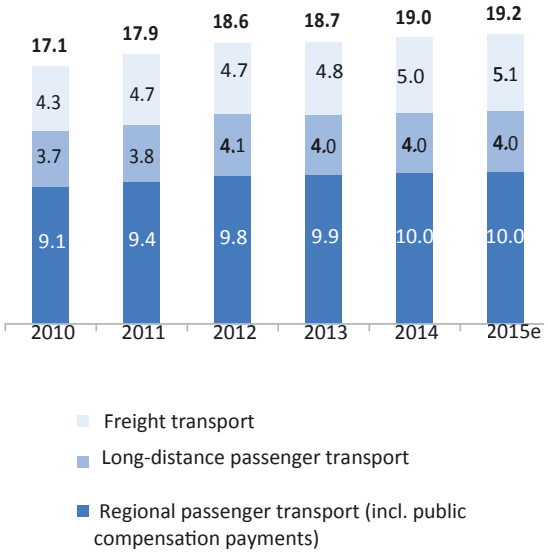
Market watch

Bundesnetzagentur surveys of market players show that the situation in the railway market has improved slightly. This is particularly the case in segments that are regulated by the Bundesnetzagentur.

Key trends

As in 2014, revenue from long-distance passenger transport is expected to stagnate again in 2015. Revenue from regional passenger transport, including public compensation payments, is expected to have increased slightly in 2015, continuing the trend seen in 2014. It is assumed that revenue in the rail freight transport segment also increased in 2014 and 2015. It can generally be said that all segments have seen virtually continual growth over a period of five years.

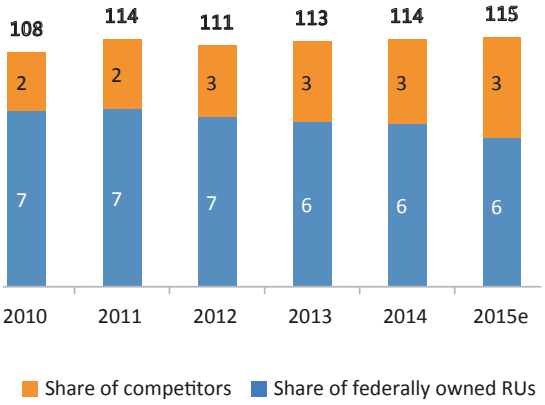
Revenue development in the railway market
By type of transport
€bn



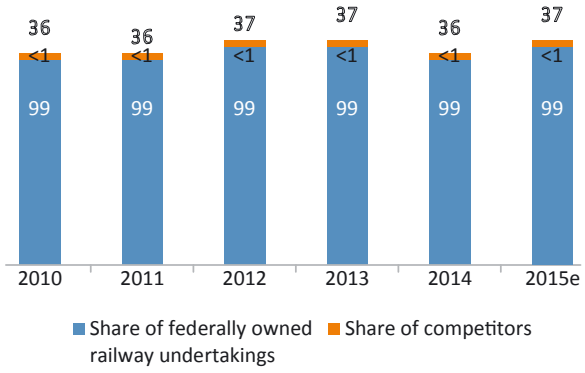
[1]Annual figures marked with an "e" are estimated values. It is not possible to determine the actual values at the present time.

At 115bn tonne kilometres (tkm), traffic volume in the rail freight segment in 2015 is expected to have increased slightly over 2014, extending the positive trend observed in this segment in recent years. The traffic volume attributable to Deutsche Bahn AG's competitors rose to 38% of the rail freight market in 2015.

Competition in the rail freight segment
By traffic volume, percentage shares



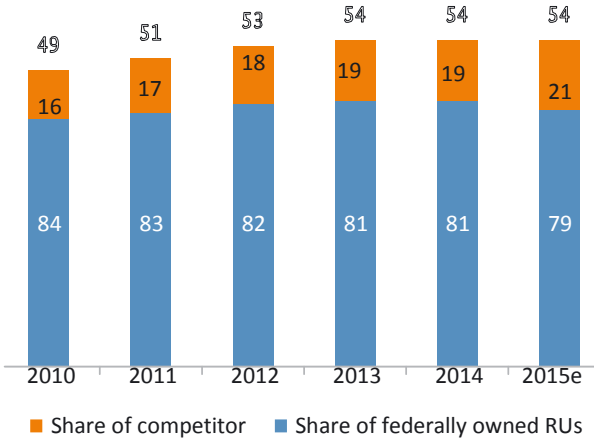
Competition in the long-distance passenger transport segment
By traffic volume, percentage shares



At 37bn passenger kilometres (pkm) the transport volume in the long-distance passenger transport segment in 2015 increased slightly over the previous year. Once again, the vast majority of the transport services – more than 99% – was provided by Deutsche Bahn (DB AG) undertakings. DB AG's competitors accounted for less than 1% of the total. Looking at the domestic traffic market, none of Deutsche Bahn AG's competitors provide a greater number of train movements every day of the year on a profit-making basis. The enterprises derschnellzug.de GmbH and Locomore GmbH & Co KG have announced that they will be entering the market next year, starting March 2016 and September 2016 respectively. In addition, RDC

Deutschland GmbH (Railroad Development Corporation Deutschland GmbH) plans to offer car train service to and from the island of Sylt.

Competition in the regional passenger transport segment
By traffic volume, percentage shares



At 54bn passenger kilometres, traffic volume in the regional passenger transport segment in 2015 remained constant, as it did in the previous year. Traffic volume in this segment has however increased by more than 30% over a ten-year period. The share of this market held by competitors has also developed in a positive direction in 2015.

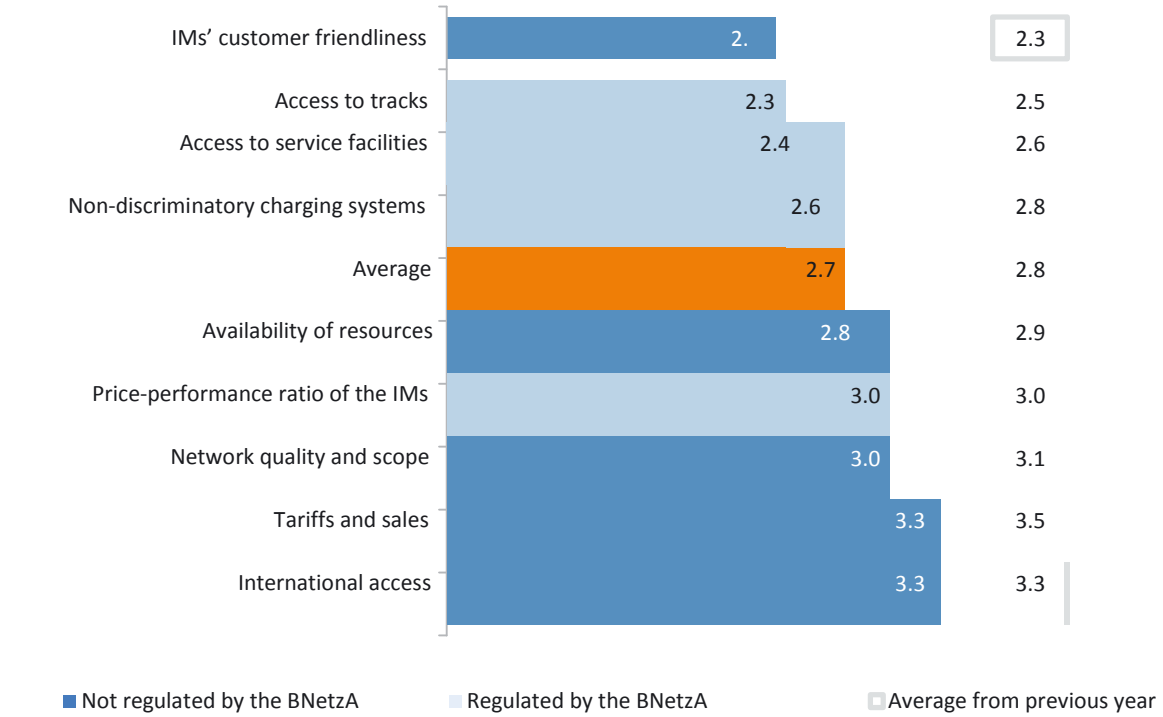
DB AG undertakings accounted for some 84% of the relevant traffic in 2010, but by 2015 they were contributing only about 79%. One reason for the competitors' increasing share of transport volume was the launches of the enterprises Vlexx, a subsidiary of Regentalbahn, the NEB Betriebsgesellschaft and the Hessische Landesbahn, which took over DB AG transport services.

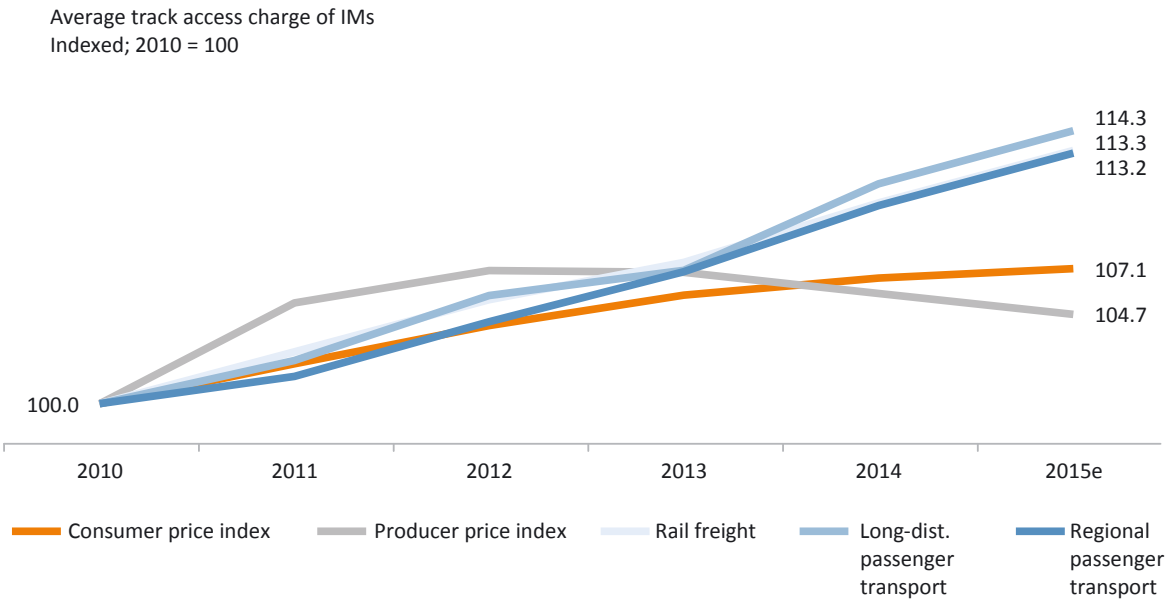
Market assessment

In the annual survey of the factors influencing the railway market, railway undertakings (RUs) were invited to assess the categories listed in the chart by giving a rating between 1 and 5. 1 stands for "excellent" and 5 means "inadequate"

According to the RUs, the situation in the railway market has improved slightly. The average rating improved, from 2.8 to 2.7. One reason for this is the improved ratings in the categories "tariffs and sales", "access to service facilities" and "access to tracks". The ratings for network quality and scope and for the customer friendliness of infrastructure managers (IMs) improved again over the previous year.

Factors influencing the railway market
Based on averaged ratings of 1 (excellent) to 5 (very poor)

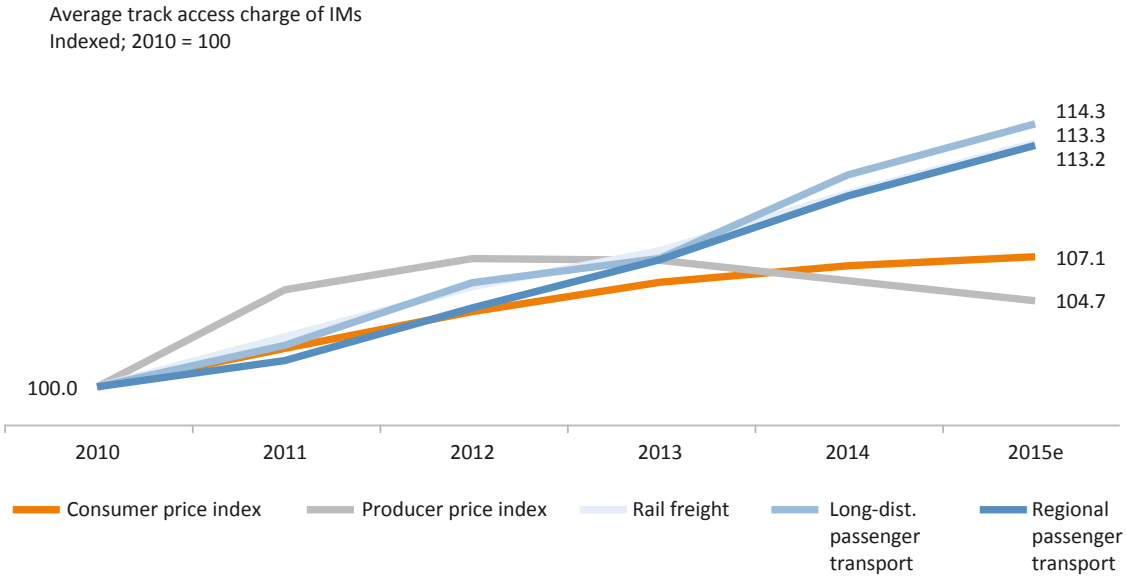




Infrastructure access charges

Between 2010 and 2015, the consumer price index and the producer price index for industrial products rose by 4% and 7% respectively, while track access charges increased by some 13% in the freight transport and regional passenger transport segments and by more than 14% in the long-distance passenger transport segment.

Since 2010 the average station usage charge (railway undertakings pay station usage charges to infrastructure managers for the use of their train platforms and stopping points) increased by more than 12%. This rate of increase is also significantly higher than the increases seen in the consumer price index and the producer price index for industrial products.



Operating results of the railway undertakings

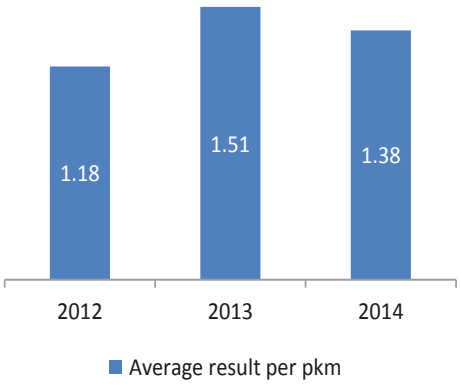
Compared to 2013, the railway undertakings saw their revenues fall off in all transport service segments.

Measured in terms of passenger kilometres, the long-distance passenger transport segment reported an average operating result of 0.50 cent per passenger kilometre in 2014, a slightly lower operating result than in 2013. In the regional passenger transport segment, the average operating result was 1.38 cents per passenger kilometre travelled, also less than in 2013 when the operating result was 1.51 cents per pkm. The railway undertakings reported an average loss of 0.07 cent per tonne-km in the rail freight transport segment. In 2013 the average result per tonne-km was 0.11 cent.

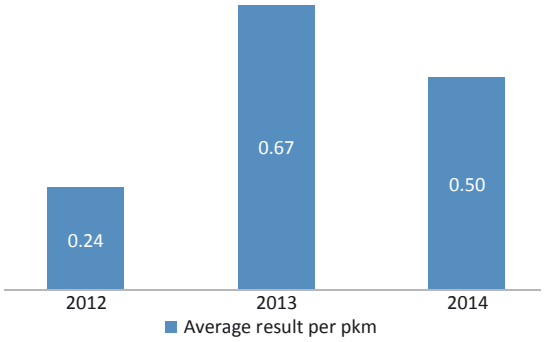
Traction current

Energy suppliers other than DB Energie GmbH provided traction power for railway undertakings with the help of the network access model for the first time during the second half of 2014. Numerous railway undertakings switched energy suppliers in 2014 and 2015 (see chart). Measured in terms of the total expected demand for electricity of all non-federally owned railway undertakings, approximately 63% came from sources other than DB Energie GmbH. This corresponds to some 1.2 terawatt hours. Based on this, the share accounted for by other energy suppliers is about 11% of the entire traction current market.

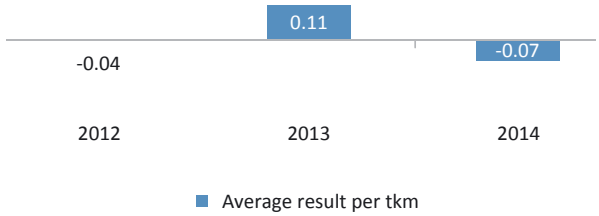
Specific results of RUs in the regional passenger segment
Cents per pkm



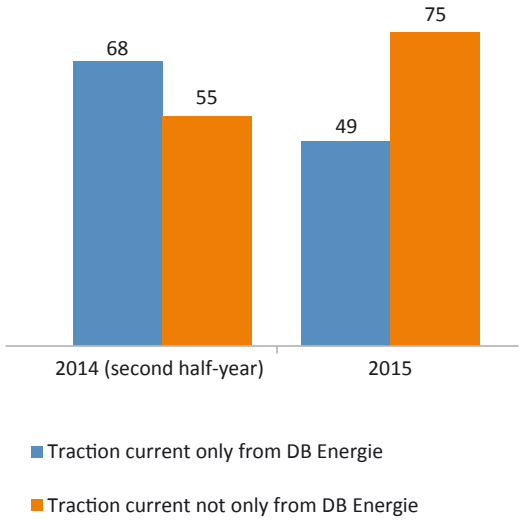
Specific results of RUs in the long-distance passenger segment
Cents per pkm



Specific results of RUs in the freight transport segment
Cents per tkm



Number of RUs that draw their traction current only / not only from DB Energie GmbH



Rulings, activities and proceedings

In the course of numerous individual proceedings, the Bundesnetzagentur has specified and improved the framework for competition in the railway sector. This applies not only to access to tracks and to service facilities but also to infrastructure access charges.

Track access

Network Statement 2017

The Bundesnetzagentur objected to several of the proposed amendments to DB Netz AG's network statement for 2017 (SNB 2017) on 16 November 2015. This objection particularly concerned the planned deletion of provisions governing trial operations. Test runs, for example, are necessary for testing new, yet unauthorised rolling stock under real operating conditions on the railway network operator's infrastructure. DB Netz AG plans to publish these provisions only on the internet in future. Since this information is mandatory and must be included in all network statements, the Bundesnetzagentur objected to the planned deletion. Should the provisions be published only on the internet in future, equal treatment of the parties with access entitlements would no longer be ensured. Further, the provisions could be amended at any time and at short notice. DB Netz AG has filed an appeal against the notice issued by the Bundesnetzagentur.

Operations and Engineering Works working party

In recent months the Bundesnetzagentur has received several complaints from parties with access entitlements regarding construction works. These parties reported on various problems regarding how DB Netz AG has organised and carried out construction works to date. The Bundesnetzagentur set up a working party with interested railway undertakings, regional transport authorities and representatives of DB Netz AG with the aim of optimising the flow of the construction work. One reason for many impediments is that the process workflows at DB Netz AG have to be further optimised in order for, for example, construction projects to be coordinated better and at an earlier point in time. This also includes a better and more detailed presentation of planned construction measures and their impact on the railway undertakings' individual trains. DB Netz AG plans to completely restructure its IT systems by 2020. This should solve many of the identified problems. In the meantime, smaller enhancements are being implementing in the IT systems on an ongoing basis and will bring about some improvement. The working party's findings and the individual steps for optimising the processes will be published.

Results of the Dispatching Rules working party
In response to complaints, the Bundesnetzagentur discussed DB Netz AG's dispatching rules in a working party with the DB Netz AG and parties with access entitlement. Dispatching organises the order of train movements when it is necessary to deviate from the regular timetable due to delays or breakdowns. The focus here was on the rule that provides for faster trains taking precedence over slower trains. Some undertakings criticised that as a result of this, delayed long-distance trains are frequently given priority over regional trains which had been punctual prior to this time. This can lead to missed connections and penalty payments to the regional transport authorities.

The working party agreed that this was necessary for operational reasons but noted that the application of this rule could be improved in individual cases. In future DB Netz AG schedulers are to consider allowing exceptions to the rule more often, particularly when exceptions would lead to greater overall train punctuality within the network. DB Netz AG has subsequently revised its dispatching rules.

Train service to Sylt
The Bundesnetzagentur was involved in the allocation of railway infrastructure capacity for train service to and from Sylt in 2015. This first involved framework agreements for the framework timetable period from 2016 to 2020, then the train paths scheduled for the 2016 annual timetable and finally the train paths in the non-scheduled train services segment. Questions and legal disputes concerning the allocation of limited railway capacity had to be clarified, particularly in light of the market entry being planned by a second provider of car train service between Niebüll and Westerland (Sylt). Due to the single-track sections of this line it was not possible to implement all framework agreement requests or train path requests for the 2016 working timetable and outside the timetabling process.

In this connection, the Bundesnetzagentur decided that framework agreements could be concluded for a maximum of two time windows per hour and per direction to and from Westerland, Sylt. A total of 39 periodic and four non-periodic framework agreement time windows were agreed for each direction for this train service which would primarily serve regional passenger rail transport purposes. In addition, framework agreements for DB AG long-distance trains to Sylt and, for the first time, framework agreements for a competitor (RDC Deutschland GmbH) in the car train service segment were concluded.

The Bundesnetzagentur additionally raised objections to a total of 19 planned train path rejections and turned down the objections that a party with access entitlement filed against the allocation process. As things presently stand, the Sylt train service will be on the Bundesnetzagentur's work agenda beyond the year 2015 and will pose new regulatory challenges for the Bundesnetzagentur particularly as a result of the new competition in the car train service segment.

Congestion proceedings
Traffic density in Germany's railway network is very high in some areas; this has led to numerous declarations of congestion. Congestion affects ever greater portions of the DB Netz AG track network. In 2015, the planned congestion proceedings focused particularly on the lines Cologne-Mülheim – Dortmund and Mannheim-Waldhof – Frankfurt – Zeppelinheim ("Riedbahn"). Both lines are amongst the most important rail links in the German railway network.

The proceedings for the Rhine-Ruhr line were completed with the drafting of a plan to increase rail infrastructure capacity. Although the level of congestion is currently quite high and leads to significant delays every day, the infrastructure measures proposed by DB Netz AG are rather small in scope. DB Netz AG cites plans to expand the line for the Rhine-Ruhr-Express (RRX) in the medium to long term as the reason for this. It would however be possible to carry out short-term measures such as the construction of a crossover in Mülheim-Heißen. But since realisation of this latter project depends on the commissioning of the Electronic Railway Control Centre in Duisburg, it cannot be undertaken until the year 2020. Although electronic railway control centre technology theoretically makes it possible to improve network performance, the strict IT specifications and high costs also ensure that work to expand and upgrade the network proceeds very slowly and at considerable expense, even when it involves what are essentially less extensive individual measures (such as, in this case, the installation of two switches).

The parallel line that runs to the north through the Ruhr area from Oberhausen to Gelsenkirchen and Herne also does little to reduce congestion.
The congestion on the Riedbahn line between Mannheim and Frankfurt is even more problematic than on the Rhine-Ruhr line. The Riedbahn line has also reached the limits of its capacity and allows only a few additional train paths every day for non-scheduled rail services. In addition to possibilities for smaller-scale operational improvements, signal blocks could be set more closely to one another to increase capacity and

improve the quality of operations. A significant long-term reduction in congestion will come only with the construction of the planned high-speed route between Mannheim and Frankfurt.

Access to service facilities

Conflicts over access to service facilities

Infrastructure managers are required to make corresponding proposals – when possible – for all requests to use service facilities that parties with access entitlement submit. Some infrastructure managers, such as DB Netz AG, use a formal procedure with a set deadline to process requests for the next working timetable period. When infrastructure managers determine in the course of processing requests that requested uses overlap they negotiate with the parties concerned to find a solution. When a conflict cannot be resolved in this way, the infrastructure managers then apply the priority rules in accordance with their respective network statement for service facilities.

The Bundesnetzagentur has the right to review and, if need be, object to rejections planned by the infrastructure managers. This is also the case when rejections are to be issued even when there is no conflict at hand.

In the case of the 2016 working timetable, DB Netz AG and DB Fernverkehr AG have notified the Bundesnetzagentur that they plan to reject a total of 54 requests for using infrastructure during the 2016 working timetable. In nine out of a total of 11 conflicts reported by DB Netz AG the highest bid decided which request was to be given priority. The other intended rejections were based on other priority rules in DB Netz AG's network statement. The Bundesnetzagentur did not object to DB Netz AG's planned rejections in any of these cases.

The facilities operated by DB Fernverkehr AG in Niebüll and Westerland include Sylt Shuttle ramps that are needed to load vehicles onto railway cars. Conflicts in this connection arose for the first time. In 24 cases, the party with access entitlement had not previously signed an agreement concerning a corresponding train movement. The Bundesnetzagentur did not object to the rejections that were based on this. In the remaining 19 cases, however, the Bundesnetzagentur rejected the planned decision to refuse use solely on the grounds of the applicant's failure to submit a safety certificate.

Ruling on the question of whether trimodal terminals are subject to mandatory regulation

In 2013 the Bundesnetzagentur obligated Duisburg Intermodal Terminal GmbH (DIT) to draft a network statement for the service facilities it operates for the transhipment of containers.
The Cologne Administrative Court dismissed a complaint filed by DIT in this regard because services related to railway operations are offered in the terminal. According to the court, the fact that infrastructure also serves other modes of transport does not restrict the definition of a service facility. Parts of a complex can also be subject to rail regulation.

An appeal has been filed against the ruling. Other litigation is also ongoing with operators of trimodal freight terminals which will be taken up again in the wake of the ruling that is expected in 2016.

Use of the service facilities for loading cars for the Sylt Shuttle

According to rulings of the Federal Administrative Court, DB Fernverkehr AG must grant non-discriminatory access to the loading ramp of the Sylt Shuttle. The question remains unanswered whether this also applies to the asphalted areas in front of the loading ramps. DB Fernverkehr AG argues against this, whereas the Bundesnetzagentur views these areas as a necessary part of the entire loading facility. In order to achieve a timely solution, DB Fernverkehr AG and the Bundesnetzagentur signed a contract under public law. This contract is valid for one year.

During this time, the contract will ensure that driving on and driving off is unhindered and establish legal security for competitors in this respect.

Decision regarding the shippers' right of access

Deutsche Umschlaggesellschaft Schiene-Straße mbH (DUSS) wanted to exclude all companies wanting to have freight shipped by railway undertakings (shippers) from the right to conclude contracts concerning freight handling in railway terminals and to grant this right exclusively to railway undertakings.

The Federal Administrative Court confirmed the Bundesnetzagentur's ruling that shippers are entitled to conclude this type of contract themselves. The Federal Administrative Court handed down a parallel decision regarding railway infrastructure. According to this decision, shippers are entitled to conclude contracts with DB Netz AG regarding track usage themselves.

The question of who concludes the contracts for the use of freight terminals is important for the functioning of logistics chains. Freight forwarders and operators have overall responsibility vis-à-vis their customers for ensuring that freight is delivered reliably and on time. This key role is better served when the shipper is the party that has a contract with the terminal operator.

Reviews of network statements for service facilities in 2015

In 2015 the Bundesnetzagentur reviewed planned changes in DB Netz AG's network statement for service facilities. It objected to the planned deletion of procedural requirements and other requirements for trial runs from the network statement.

Trial runs are necessary for testing new, yet unauthorised rolling stock under real operating conditions. They are important for stimulating competition and making it easier for new railway undertakings to enter the market. This provision must continue to be a mandatory part of the network statement for service facilities in future in order to ensure transparent and non-discriminatory processes. The proceedings will be conducted parallel to the respective objection in connection with the review of the network statement.

In addition, the planned changes to DB Station&Service AG's network statement for passenger stations were also reviewed. DB Station&Service AG has set up an internet portal for requesting station stops and concluding contracts. Communication via e mail, fax or letter is to be possible only to a limited degree in future. The Bundesnetzagentur's objection targets this arrangement. The Bundesnetzagentur considers it necessary to have a broad fall-back level in case of technical problems.

The Bundesnetzagentur reviewed the first draft of BLG Autoterminal Bremerhaven GmbH & Co.'s network statement for service facilities and the changes in Bremische Hafeneisenbahn's (BHE) network statement as well. It coordinated both network statements in consultation with the two undertakings to ensure that due account was taken of the reciprocal deadlines for the allocation of capacity and the development of the working timetable, thus ensuring that traffic between the port railway and terminal is as smooth as possible.

Infrastructure access charges

Review of DB Netz AG's track access charging system for 2011

The Bundesnetzagentur concluded its review of the level of charges in DB Netz AG's 2011 track access charging system with the determination that the level of its charges were in line with railway law. The Bundesnetzagentur additionally conducted an extensive review of the costs that DB Netz AG incurs for the operation of the railway network plus a normal market return. In this connection, the Bundesnetzagentur issued a notice requiring DB Netz AG to make its calculations and presentation of the costs more transparent. It was found that the allocation of costs and revenues and the allocation of assets and financial resources are not completely transparent. Differences were also apparent in how DB Netz AG and the Bundesnetzagentur assessed some of the individual cost positions and balance sheet items. For this reason, the Bundesnetzagentur ordered adjustments in the calculation of the costs in order to avoid possible future violations of railway law. DB Netz AG has filed an objection to these orders. As a result the notice that was issued is not yet final. Regardless of this, DB Netz AG and the Bundesnetzagentur began holding working-level meetings toward the end of the year in order to coordinate in detail appropriate, practicable options for implementing the orders.

Obligation to give notice of the lists of charges imposed by infrastructure managers

In 2014, the Bundesnetzagentur exempted 30% of the railway line infrastructure operators for the 2015/2016 working timetable year from the statutory requirement to submit to the Bundesnetzagentur lists of their planned charges in advance.
Since it is unlikely in the case of these undertakings that this would lead to a distortion of competition, such a waiver represents a tried and tested means of regulation in moderation. At the same time, vigorous efforts were made to ensure that the infrastructure operators who were not exempted would notify the Bundesnetzagentur of all the charges they were planning for the next working timetable period and outline how these charges are in compliance with railway law.

As a result it has been possible to increase the total number of notifications and the concomitant preliminary reviews of the charges and, by doing so, help ensure a significantly higher level of legal certainty. At the same time, the Bundesnetzagentur exempted another 20% of the infrastructure operators from the obligation to submit a list of their charges to the Bundesnetzagentur; the exemptions in these cases are not expected to lead to any distortion of competition.

Notice regarding the charge component

"Loading point district transfer trips" of the HPA
Based on complaints lodged by parties with access entitlements, the Bundesnetzagentur declared the "loading point district transfer trips" component in the Hamburg Port Authority's pricing system to be invalid on 30 April 2015. This component makes it possible to charge multiple times for vehicle movements between loading point districts in the Hamburg port railway when the transported wagons can be assigned to various inbound and/or outbound trains. As a result the shunting facilities used are not priced in line with the services provided. There is only indirect pricing via the loading point district transfer trips. The Hamburg Port Authority has applied to the courts for an interim injunction and the Cologne Administrative Court has indicated the need for further investigations. Consequently the Bundesnetzagentur has suspended enforcement of the notice. This pricing component will therefore remain effective for the time being. The Bundesnetzagentur however is continuing its investigations in the administrative appeal proceedings.

Extension of DB Station&Service AG's transport service factor

On 27 August 2015 the Bundesnetzagentur concluded an agreement with DB Station&Service AG supplementing an existing public-law agreement with the company. In the year 2012 both parties agreed to remove the train length factor from the station price system and replace it with a simplified transport service factor. The train length factor is problematic under regulatory law. Using the transport service factor, the station price is 2.4 times higher for stops in the long-distance traffic segment than for stops in the regional traffic segment.

This transport service factor was originally intended to be applicable for two years, and then be replaced by a factor based on costs and/or bearability by the market. In order to accommodate changes in the legal framework arising from a new railway regulation law, a supplementary agreement was concluded during the year under review. In this agreement DB Station&Service AG committed itself to introducing a new transport service factor within 12 months following the date on which the Railway Regulation Act goes into force. This deadline can be extended only when the new act establishes an entirely new yardstick for pricing.

Development of DB Netz AG's new track access charging system

In 2015 the Bundesnetzagentur continued to provide intensive support for the development of a new track access charging system which DB Netz AG had begun in 2014. The Bundesnetzagentur participated in the extensive market consultation process conducted in spring 2015, during which the market participants were informed in detail about the continued development of the track access charging system. In addition to providing expertise, the Bundesnetzagentur had the task of being available with an "open ear" for market participants during the consultations and ensuring an effective exchange of opinions and information between the market and DB Netz AG.

DB Netz AG subsequently initiated comments proceedings in which market participants had the opportunity to raise questions and express opinions regarding the new track access charging system. DB Netz AG and the Bundesnetzagentur regularly discussed the opinions expressed during this process.

As a result, a number of points in the new track access charging system were honed and sensible changes were made in order to bring the new, demand-oriented system more into line with actual market needs.

In addition, the Bundesnetzagentur supported and monitored from an early point in time the implementation of the new track access charging system in DB Netz AG's network statement. This process was largely completed during the reporting year. It is no longer possible to introduce the new track access charging system in December 2016 when the new working timetable goes into effect because there is not enough time to conduct the normal process prescribed by railway law due to the significant amount of development work and the market's broad participation. In addition, the date on which DB Netz AG's new track access charging system goes into effect is linked to the passage of the draft railway regulation act which is still in the legislative process.

Sylt-Shuttle

Most visitors reach Sylt by train via the Hindenburgdamm which connects the island with the mainland. Travellers who come by car have to use the car train that departs from Niebüll. One of Deutsche Bahn AG's competitors, RDC Deutschland GmbH, now plans to offer car train service to and from the island of Sylt.

Anyone wanting to compete with DB Fernverkehr AG on the Niebüll - Westerland line needs railway capacity. However railway capacity is in short supply and DB Netz AG allocates it using a process that is regulated in detail by law. In cases where a conflict arises between railway undertakings that want to use this route, the Bundesnetzagentur acts as an arbitrator in keeping with the provisions of the law. The Bundesnetzagentur is intensively engaged in strengthening competition in the railway sector.

In the course of numerous network access proceedings, the Bundesnetzagentur was involved in the allocation of railway infrastructure capacity for train service between Niebüll and Westerland in 2015. The first step here involved ensuring long-term rights of use from 2016 to 2020 in framework agreements, followed by specific rail links in the 2016 annual timetable and then train paths in non-scheduled rail services. Since some sections of the line between Niebüll and Westerland have only a single track not all requests for the use of this line could be approved.

Similar conflicts had to be settled with regard to the use of the ramps which are used to load cars onto the Sylt Shuttle. The results of the network access proceedings for RDC: RDC will be able to use the line and can offer car train service to Sylt several times a day.

Issues regarding service to and from Sylt will remain on the Bundesnetzagentur's agenda beyond the year 2015 as well. The following however is certain: Trains will run - and competition usually leads to improved quality and better service for rail passengers.

International cooperation

International cooperation is taking on increasing importance in the area of rail regulation. Important parts of this work are carried out by the Independent Regulators' Group (IRG-RAIL) and the European Network Rail Regulatory Bodies (ENRRB) which is headed by the European Commission.

Working groups at IRG Rail and in the ENRRB

In response to the growing importance of international cooperation in the area of railway regulation, two bodies have been firmly established that are consulted on relevant issues at EU level and contribute joint positions: the Independent Regulators' Group (IRG-Rail)[1] which has grown in size to 26 members and the European Network of Rail Regulatory Bodies (ENRRB) which is headed by the European Commission. At the same time, these bodies provide a platform for an exchange on regulatory practices between participating regulators. The Bundesnetzagentur is a member of both bodies.

IRG-Rail has four working groups and two sub-groups that deal with legislative proposals at European level, the regulation of charges, the regulation of access, and market monitoring. In 2015, the Bundesnetzagentur chaired the working groups "Emerging Legislative Proposals" and "Access" and the sub-group "Charges for Service Facilities".

The ENRRB meetings in 2015 gave priority to sharing experience with and information on partner regulatory bodies' decision-making practice, particularly with regard to the implementation of the Recast - the Fourth Railway Package - and the different legal instruments for its enforcement. Cross-border freight transport was another important issue on the agenda of these meetings. The European Commission additionally established another forum: the European Commission-ENRRB-PRIME (Platform of Rail Infrastructure Managers in Europe).

The European Commission's Recast

One of the central projects of the IRG-Rail working group "Emerging Legislative Proposals in the Railway Sector" in 2015 was the exchange on the implementation of the Recast, in other words, the First Railway Package of the European Commission of the European Union[2], which will be completed in Germany when the new Railway Regulation Act is passed in 2016.

Fourth Railway Package

The European Commission published its Fourth Railway Package with various projects and proposed laws in January 2013.[3] Key aspects of the Fourth Railway Package include the improvement of railway competitiveness, the facilitation of market access through non-discriminatory terms and conditions for access, the reduction of barriers to access, the opening of the national passenger transport markets and

[1] http://www.irg-rail.eu/
[2] http://ec.europa.eu/transport/modes/rail/packages/2008_en.htm
[3] http://www.irg-rail.eu/public-documents/2013/ - IRG-Rail (13) 5_rev2 - Fourth Package position paper

competitive tendering in the rail passenger transport service segment. It can be assumed that agreement will be reached during the Dutch presidency in 2016. The responsible IRG-Rail working group, which is jointly chaired by the Bundesnetzagentur and the British regulatory authority ORR, has developed and submitted position papers on relevant areas under discussion. The deliberations and considerations revolved around the role, powers and responsibilities of the regulatory authorities.

Implementing acts of the European Commission pursuant to Directive 2012/34/EU

Directive 2012/34/EU provides for the introduction of "implementing acts" by the European Commission to spell out in more concrete terms the individual sections of the Directive. The European Commission has commenced work on corresponding legislative texts on access to service facilities and on framework agreements. Implementing acts on rail market monitoring at European level (Rail Market Monitoring Scheme - RMMS), on criteria for parties with access entitlement and on the calculation of the direct costs of a train movement - which is of major importance for the regulation of charges - were adopted in 2015. The work of the IRG-Rail working group on Charges in 2016 will focus on the implementation of the latter act.

Access issues, corridors and service facilities

The work done by the working group on Access in 2015 focused on international freight traffic, particularly with a view to "Regulation No 913/2010 concerning a European rail network for competitive freight". Rail freight corridors are designated railway lines between two or more Member States of the European Union that link terminals along a principal route. Nine European rail freight corridors (initially six, and three more have been added since November 2015) were established to create a European rail network for competitive freight traffic. This includes offering pre-arranged paths. Each corridor has a Corridor One-Stop-Shop (C-OSS) that is responsible for the allocation of the train paths. The aforementioned EU Regulation requires infrastructure managers to work more closely with one another than in the past, to offer continuous cross-border train paths, and to streamline the process for requesting sections of train path. Initial practical experience has raised a number of questions that have to be addressed and resolved in the course of new initiatives. IRG-Rail adopted a document in this connection; this document will be refined and further developed in 2016. In view of the enormous importance that non-discriminatory access to service facilities has for the internal railway market, the European Commission plans to adopt an implementing act for this in 2016.

International market monitoring

One important task that is part of this international cooperation is the participation in the IRG-Rail Market Monitoring working group and the RMMS (Rail Market Monitoring Scheme, in other words: market monitoring at European level) sub-group meetings. The focus of these activities in 2015 was on developing indicators for establishing ever-greater comparability of national monitoring activities in the railway sector and fostering an exchange between regulatory authorities with the aim of increasing transparency in the European railway market. An annual market monitoring report provides qualitative and quantitative data analyses on numerous key issues in the railway market.

The Bundesnetzagentur's core tasks and organisation

The Bundesnetzagentur is primarily responsible for promoting competition in the regulated areas and ensuring non discriminatory access to networks. In doing so it profits from a task oriented organisational structure, which meets the many and varied requirements and at the same time allows the Bundesnetzagentur to accommodate new tasks in an open and flexible manner.

Functions 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. On being assigned responsibilities under the Energy Act and the General Railway Act, the Regulatory Authority for Telecommunications and Post was renamed the Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen in 2005.

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 the expansion of electricity transmission lines crossing national or state borders in the context of the Energiewende. 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 diversified. They range from cases addressed in quasi-judicial proceedings in regulation areas, to reporting requirements and planning authority responsibilities, consumer protection and information activities in the regulated sectors, right down to the nationwide presence for investigating and processing 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 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. This is how decisions on specific details of obligations are reached, for example in the field of 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 Energy Act gives the ruling chambers decision-making powers on general and individual issues regarding access to electricity and gas networks and network tariffs.

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 from the gas and electricity 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 relevant rail regulation tasks are performed by the rail department, as the General Railway Act does not yet provide for a ruling chamber.

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, innovations and competition for the benefit of all citizens.
Consumer protection remains another key focus area in the telecommunications sector. For this purpose, emphasis is placed on investigating problems that hinder a smooth change of supplier. In addition, the Bundesnetz-agentur continues to vigorously combat misuse as regards 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, in particular 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 under section 47a of the Telecommunications Act and section 10 of the Postal Services Ordinance (PDLV), and general consumer services. Under Part Seven of the Telecommunications Act, the Bundesnetzagentur plays an important 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. These include, for instance, monitoring the electricity and gas wholesale markets, supervising the redistribution mechanism under the Renewable Energy Sources Act (EEG), registering photovoltaic systems to determine the progressive reduction in the EEG-regulated feed-in tariff and any interventions necessary to safeguard security of supply, for example if system-relevant power plants are to be decommissioned. The latter task is statutorily limited in duration to 2017. 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 Energiewende 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 a part of network development planning, key decision-making information was prepared and presented to the legislator as a basis for determining the priority needs of network expansion set by the energy sector. Following the adoption of the Federal

Requirements Plan in 2013, planning procedures for extra-high voltage lines crossing federal state and national borders take place as part of the federal sectoral planning process and the subsequent approval procedure. 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 amount 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 well. To ensure consistency the Bundesnetzagentur's regional offices, the contact point with consumers and the industry, are managed and coordinated centrally by a single department.

The regional offices are mainly responsible for technical matters. They provide information, for instance, on compliance with the Telecommunications Act, electromagnetic environmental compatibility provisions and the Electromagnetic Compatibility of Equipment Act. 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 orders under the Telecommunications Act and the Electromagnetic Compatibility of Equipment Act.

Additional executive tasks are carried out by specific regional offices. In particular this involves activities in number administration, number misuse and cold calls, consumer protection and information, the registration of photovoltaic systems and the registration of railway infrastructure. Moreover, they also carry out some personnel 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 and 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 not only excellent specialist knowledge, but also 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 2,900 specialists, including legal experts, economists, engineers and scientists from various fields, to ensure the efficient, proper performance of tasks in all areas.

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. Vocational training is available for office communication trainees, electronic equipment and systems trainees, and for IT trainees in system integration and applications development. Since 2011 the Bundesnetzagentur has also offered a practice-oriented study programme to qualify students (Bachelor of Engineering/Electrical Engineering and Bachelor of Science) to work as technicians for electronic equipment and systems at the Bundesnetzagentur.

Moreover, since 2012 two civil servants preparing for the rank of Regierungsinspektor are selected annually 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.

In 2015, a total of 172 young people were trained at the Bundesnetzagentur in various occupations. Of the 28 trainees who successfully completed their training in 2015, 18 decided to stay with the Bundesnetzagentur. Additionally, in 2015, for the first time, two students graduated from the Bundesnetzagentur's practice-oriented study programme. A graduate in IT in public administration and an electrical engineering graduate took posts at the Bundesnetzagentur at higher intermediate level.

Budget

The Bundesnetzagentur's income and expenditure is budgeted for in the federal budget in the departmental budget of the Federal Ministry for Economic Affairs and Energy.

The table below shows the income for 2015 (target and performance) and 2016 (target).

Type of income	Target 2015 (€000)	Performance 2015 (€000)	Target 2016 (€000)
Telecoms fees, contributions and other charges	3,796,438	3,793,987	62,787
Fees and other charges in the postal sector	58	35	6
Fees and other charges in the rail sector	100	68	62
Fees and other charges in the energy sector (electricity and gas)	6,341	2,199	4,760
Fees and other charges under the Grid Expansion Acceleration Act (NABEG)	15,000	7,400	16,303
Other administrative income, eg fines, rents and disposals	1,043	3,917	984
Administrative income	**3,818,980**	**3,807,606**	**84,902**

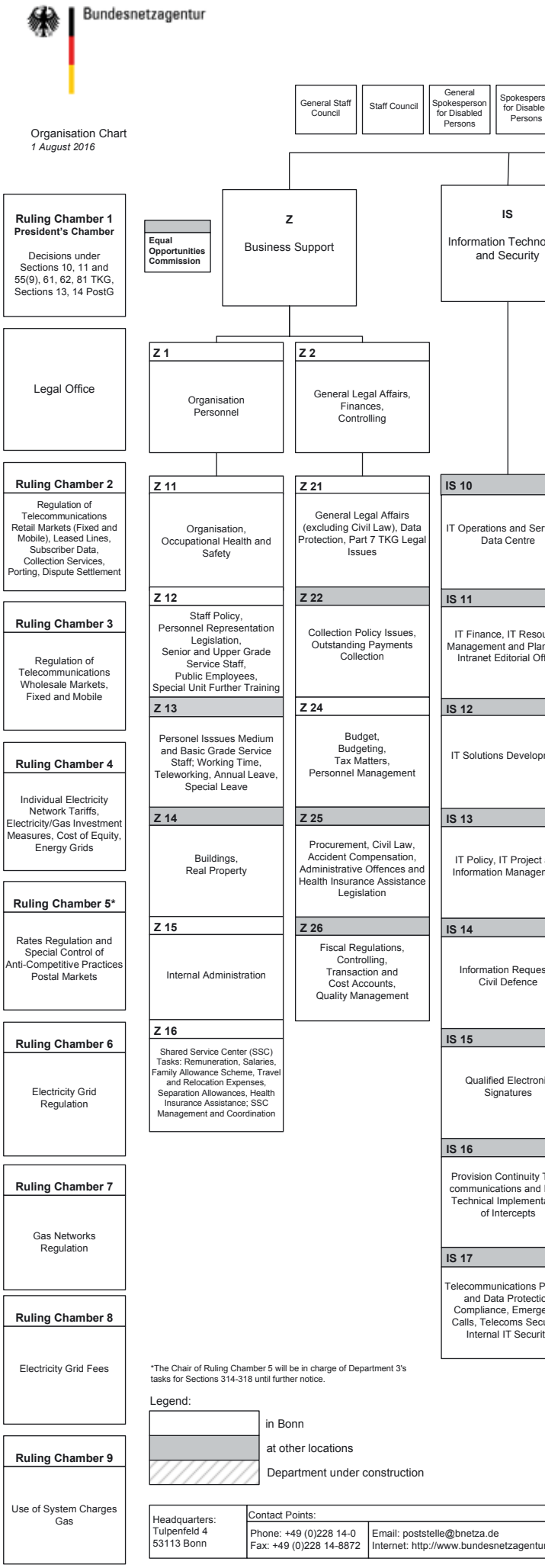
On 19 June 2015 the Bundesnetzagentur's spectrum auction for mobile broadband ended after 16 auction days. In total 270 MHz of spectrum from the 700 MHz, 900 MHz, 1500 MHz and 1800 MHz bands were auctioned, generating a total revenue of €5.08bn. Revenues from auctioning the 700 and the 1500 MHz spectrum totalling €1.33bn are earmarked for broadband expansion, whereas revenues generated from auctioning the 900 and 1800 MHz spectrum totalling €3.75bn go to the federal budget.

In connection with network expansion, the 2015 budget estimated income of some €15m, but the actual income only amounted to €7.4bn in 2015. This is partially owing to the continued long delays in application submissions for federal sectoral planning. At the present time, however, there are also delays in projects already submitted, as transmission system operators need to make changes and revise their applications to ensure statutory priority for underground cables. The additional expected income will be delayed until subsequent financial years.

The chart below shows the expenditure for 2015 (target and performance) and 2016 (target).

Type of expenditure	2015 (€000)	2015 (€000)	2016 (€000)
Personnel costs	135,738	129,942	138,694
General administrative expenditure, appropriations	56,484	49,968	57,580
Investment	14,909	9,221	17,416
Total expenditure	**207,131**	**189,149**	**213,690**

The ceiling was increased to accommodate personnel joining the Bundesnetzagentur from other government bodies and institutions.


Bundesnetzagentur
Organisation Chart
1 August 2016
General Staff Council
Staff Council
General Spokesperson for Disabled Persons
Spokespers for Disable Persons
Ruling Chamber 1
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Business Support
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Information Techno and Security
Legal Office
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Organisation Personnel
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Use of System Charges Gas
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Vice President

Vice President

Security Officer

Data Protection Commissioner

Office-Berlin „Energy of the Future" Administrative Unit

Press

Press, Public Relations

Management Office

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- 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

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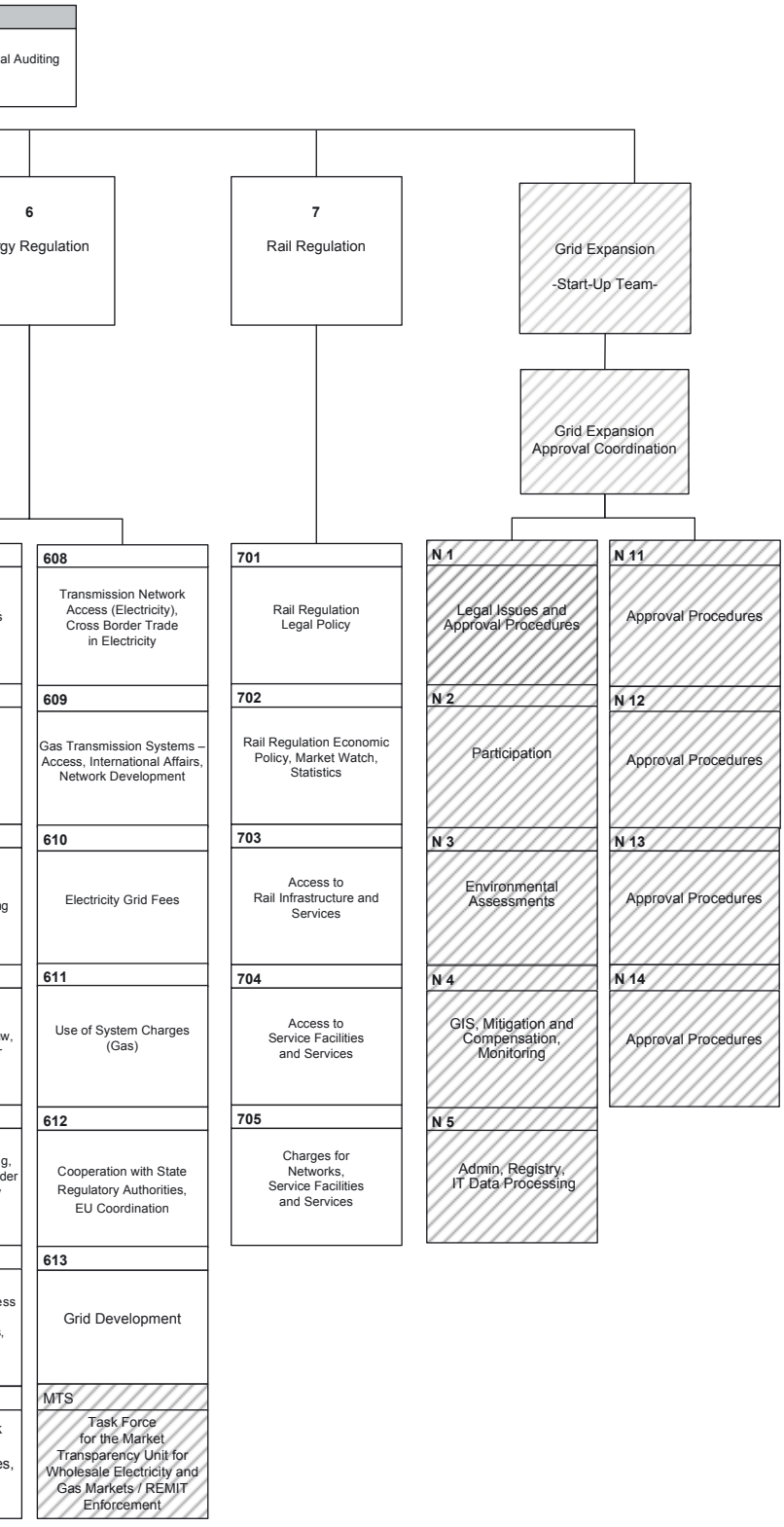
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GIS, Mitigation and Compensation, Monitoring
N 5
Admin, Registry, IT Data Processing
N 11
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N 12
Approval Procedures
N 13
Approval Procedures
N 14
Approval Procedures

List of abbreviations

A

AbLaV Interruptible Loads Ordinance

ACER Agency for the Cooperation of Energy Regulators

AEG General Railway Act

AGVO General Block Exemption Regulation

ARCEP Autorité de régulation des communications électroniques et des postes

ARegV Incentive Regulation Ordinance (Anreizregulierungsverordnung)

Art. Article

ATRT Technical Telecommunications Regulation Committee

AusglMechAV Ordinance implementing the Equalisation Scheme Ordinance

B

B2B Business-to-Business

B2C Business-to-Consumer

B2X Business-to-Business and Business-to-Consumer

BEMFV Ordinance concerning the Controls for the Limitation of Electromagnetic Fields

BEREC Body of European Regulators for Electronic Communications

BHE Bremische Hafeneisenbahn

BMBF Federal Ministry of Education and Research

BMWi Federal Ministry for Economic Affairs and Energy

BNetzA Bundesnetzagentur

BRLR Federal guidelines on ducts

BVerwG Federal Administrative Court

C

CA UPU Council of Administration

CAM Capacity allocation mechanism

CEE Commission on the Rules for the Approval of the Electrical Equipment

CEER Council of European Energy Regulators

CEN European Committee for Standardization

CEN TC 331 Technical Committee of the European Committee for Standardization

CEP Courier, express and parcels

CEREMP Centralised European Register for Market Participants

CERP European Committee for Postal Regulation

CFV-SDH Carrier leased lines - Synchronous digital hierarchy

C-OSS Corridor One-Stop-Shop

ct/kWh Cent per kilowatt hour

CWE Central West Europe

D

DB AG Deutsche Bahn AG

DB Netz AG Deutsche Bahn Netz AG

DB Station & Service AG Deutsche Bahn Station & Service AG

DIN German Institute for Standardisation

DIT Duisburg Intermodal Terminal GmbH

DKE German Commission for Electrical, Electronic and Information Technologies

DSL Digital Subscriber Line

DSO Distribution network operator

DUSS Deutsche Umschlaggesellschaft Schiene Straße mbH (German Road-Rail Transshipment Company)

DVB-T Digital Video Broadcasting-Terrestrial

E

ECC Electronic Communications Committee

ECJ European Court of Justice

EEG Renewable Energy Sources Act

EIBV **Rail Infrastructure Usage Regulations**

eIDAS-Regulation Regulation (EU) on electronic identification and trust services for electronic transactions in the internal market

EMVG Electromagnetic Compatibility of Equipment Act

ENRRB European Network of Rail Regulatory Bodies

ENRRB-PRIME Platform of Rail Infrastructure Managers in Europe

ENTSOG European Network of Transmission System Operators for Gas

EnWG Energy Act

ERGP European Regulators Group for Postal Services

ERP Enterprise-Resource-Planning

F

FNB Gas transmission system operator

FSR Florence School of Regulation

FTTB Fibre-to-the-building

FTTH Fibre-to-the-home

G

GasNEV Gas Network Charges Ordinance

GasNZV **G**as Network Access Ordinance

GWB Restraints of Competition Act

H

HFC network Hybrid fibre coaxial network

HVDC High voltage direct current

I

IM Infrastructure manager

IMSI International Mobile Subscriber Identity

IMT International Mobile Telecommunication

IRG Independent Regulators Group

IRG-Rail Independent Regulators' Group – Rail

ISMS Information security management system

IT Information technology

ITU International Telecommunication Union

K

KEP Courier, express and parcel services

km Kilometre

KPI Key Performance Indicators

kV Kilovolt

L

LTE Long term evolution

LRIC Long-Run Incremental Costs

M

M2M Machine-to-Machine

MVNO Mobile virtual network operator

MW Megawatt

N

NABEG The Grid Expansion Acceleration Act

NBS Network statement for service facilities

NC CAM Network Code on Capacity Allocation Mechanism

NDP Network development plan

NEMO Nominated electricity market operator

NGA Next Generation Access

O

O-NDP Offshore network development plan

ORR Office of Rail Regulation

OTT Over-The-Top

P

PCI Projects of Common Interest

PEntgV Ordinance concerning Rates Regulation in the Postal Sector

pkm Passenger kilometre

POC Postal Operations Council

PostG Postal Act

POTS Plain Old Telephone System

PUDLV Postal Universal Service Ordinance

R

RDC Railroad Development Corporation

RDCD Railroad Development Corporation Deutschland GmbH

REMIT Regulation on Wholesale Energy Market Integrity and Transparency

RMMS (European) Rail Market Monitoring Scheme

RRT Communications Regulatory Authority of the Republic of Lithuania

RRX Rhein-Ruhr-Express

RSC Radio Spectrum Committee

RSPG Radio Spectrum Policy Group

RU Railway undertaking

S

SIM Subscriber Identity Module

SLA Service Level Agreement

SNB Network Statement

StromNEV Electricity Network Charges Ordinance

T

TAR NC Network code on harmonised transmission tariff structures for gas

TEN-E Regulation Regulation (EU) of the European Parliament and of the Council on guidelines for trans-European energy infrastructure

TC Technical Committee

TK Telecommunications

TKG Telecommunications Act

tkm Tonne-kilometre

TKÜV Telecommunications Interception Ordinance

TSO Transmission system operator

U

UPU Universal Postal Union

V

VDE German Association for Electrical, Electronic & Information Technologies

VULA Virtual unbundled local access

VZBV Federation of German Consumer Organisations

W

WRC World Radiocommunication Conferences

Z

ZIVIT Centre for Data Processing and Information Technology

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