Communication No 169/2013

Draft document for consultation on the order for and choice of proceedings for the award of spectrum in the bands 700 MHz, 900 MHz, 1800 MHz and 1452 – 1492 MHz for wireless access

BK1-11/003

The President's Chamber of the Bundesnetzagentur is inviting responses to its draft document on the award of spectrum in the bands 900 MHz, 1800 MHz, 700 MHz and 1452 – 1492 MHz (1.5 GHz) for wireless access (mobile broadband).

The following document makes provision for auctioning usage rights for spectrum at 900 MHz, 1800 MHz, 700 MHz and 1.5 GHz on account of the scarcity of the spectrum and for making a "frequency reserve" in the band 900 MHz available at the same time on a non-discriminatory basis.

The combination of an auction with a "frequency reserve" of 2 x 5 MHz (paired) in the 900 MHz band in the consumer interest for each of the four national mobile operators E-Plus Mobilfunk GmbH & Co. KG, Telefónica Germany GmbH & Co. OHG, Telekom Deutschland GmbH and Vodafone GmbH will help to accelerate the rollout of high speed wireless networks for the benefit of the consumer and, in parallel, to maintain the almost full mobile communications coverage – most notably with voice communication – for the consumer. The aim is also to consolidate the well-functioning competition in the mobile sector on an enduring basis and to enable new competitors to enter the market on a non-discriminatory basis.

The Chamber believes that part of the spectrum currently used for GSM (Global System for Mobile Communications) in the bands 900 MHz and 1800 MHz should continue to be used for GSM services for a certain period after the usage rights have expired. It anticipates, however, that this spectrum will increasingly be used for mobile broadband and can therefore make an important contribution to nationwide coverage for the consumer as envisaged in the Federal Government's broadband strategy. To secure continued coverage, the Chamber began proceedings in 2011 in order to take appropriate decisions well in advance of expiry of the usage rights in the bands 900 MHz and 1800 MHz on the provision of this spectrum in the future.

It was decided at the World Radiocommunication Conference 2012 to allocate the band from approximately 694 to 790 MHz to the mobile service on a co-primary basis with the broadcasting service and to identify it for IMT-2000 (International Mobile Telecommunications-2000) applications.

To make the spectrum resources available in an efficient and timely manner and in line with demand, the Federal Ministry of Economics and Technology (BMWi) has initiated a process of discussion on the provision of further spectrum to meet the broadband strategy targets (cf *Mobile Informationsgesellschaft der Zukunft, Diskussionspapier* – "Mobile Media 2020"). The paper states the following in this regard (page 10):

> ***"The Federal Government's broadband targets to 2018 and beyond can be met only by a combination of highly efficient wired and wireless technologies. Wireless technologies can make a significant contribution to meeting these targets if a l l the spectrum resources available are used.***
> *The coalition's political objective is for 75% of households to have a minimum broadband speed of 50 MBit/s by 2014 and for this to be available everywhere in the country by 2018.*
> *With a view to the provision in the future of high speed broadband access to rural communities, in particular, today's wireless technologies (LTE), in conjunction with the spectrum already made available, can make a complemen-*

tary contribution to meeting the Federal Government's long term goals. To meet these long term goals it must be an aim of spectrum policy to make further radio spectrum available efficiently and as requested."

The Bundesnetzagentur's proposal has an enabling function in this. Thus the Bundesnetzagentur, in conjunction with the Federal Ministry of Economics and Technology, is looking at all possible ways of accelerating proceedings to improve broadband coverage and eliminate the digital divide so as to make the 700 MHz spectrum that is well suited for rolling out high speed telecommunications networks across the country available at an early stage.

Its proposal to include in the proceedings further spectrum in the 700 MHz band, in particular, is designed as an added incentive to invest efficiently in order to speed up roll-out. This spectrum has good propagation conditions for the cost-efficient coverage of rural communities and hence can contribute significantly to achieving the target of 50 megabits per second (Mbit/s) Internet access by 2018 for consumers in sparsely populated areas as well.

The discussion paper says the following on this (page 12):

"Nationwide broadband coverage, the political goal of the Federal Government, could be facilitated by the provision of additional resources below 1 GHz. Such spectrum could already be available as from 2017/18 additionally to spectrum above 1 GHz, effectively a decision for the World Radio Conference 2015 (WRC-15)".

The Chamber is thus looking to open proceedings in 2014 in light of the many separate stages so as to ensure that consumers can use the spectrum in 2017/2018.

In making the 800 MHz spectrum available early on the Bundesnetzagentur ensured that its great potential – most notably for covering rural areas – was used in Germany for the consumer's benefit at the earliest possible opportunity. The Digital Dividend spectrum was a major factor in rolling out broadband networks quickly and economically in rural areas too, giving Germany a pioneering role in Europe.

To implement the broadband strategy the Bundesnetzagentur, parallel to the frequency planning procedures of the Federal Government and the Länder, began in 2009 to assign the frequencies of the Digital Dividend, auctioning the spectrum the very next year, in 2010, so that it could be used to provide consumers with broadband mobile services at an early stage. Expectations of the award of the 800 MHz spectrum were exceeded by far as a result of all the parties acting in concert at every level of political, regulatory and entrepreneurial decision-making.

Just one year after the auction, wireless technologies have made the biggest contribution to eliminating the white spaces. Reference is made to this in the Second Monitoring Report on implementing the Federal Government's Broadband Strategy (www.bmwi.de):

"Auctioning the Digital Dividend spectrum and the rapid deployment of broadband in the priority areas (availability of 1 Mbit/s minimum broadband connections for less than 95 percent of households) that followed the auction is one of the main successes in implementing the Federal Government's broadband strategy."

This was confirmation of the important role radio could play here. Germany is the first country in Europe to have used the opportunities and the benefits of the Digital Dividend. It is hoped that the award of the 700 MHz spectrum, in particular, will build on this success. Recommendation 10 of the Third Monitoring Report (www.bmwi.de) has the following to say (page 60):

"It is necessary that the legal and regulatory framework conditions for the possible uses of further spectrum for mobile communications (Digital Dividend II)

be clarified before the next World Radio Conference (WRC) in 2015. The interests of all the stakeholders (most notably the Länder, broadcasters, cable operators, wireless microphone businesses, the German Federal Armed Forces) must all be taken into account to the best possible extent and a solution sought early on that reconciles the different interests.

This will consolidate Germany's pioneering role in Europe in the best possible use of the terrestrial radio spectrum."

With a view to this the Bundesnetzagentur is publishing, besides its draft, a paper setting out its ideas on the short, medium and long term availability of spectrum resources for broadband rollout in Germany. Following the Federal Government's broadband strategy and the "Mobile Media 2020" discussion paper the Bundesnetzagentur's principal aim is planning and investment certainty for the provision of spectrum resources for broadband rollout in Germany, but also for the user groups and usages concerned (including broadcasting, wireless microphones, public safety agencies, the *German Federal Armed Forces*) and their requirements. Mobile Media 2020 (page 2) has the following to say on this:

"The discussion paper should help to reconcile, in a fair and appropriate manner, the legitimate interests of all current and potential users in frequency bands for which there is particularly high demand, in order to achieve optimum use of resources. The guiding principle is to secure efficient, interference-free use of the radio spectrum, a public resource rendered scarce by demand, for the provision of nationwide appropriate and adequate services.

The Federal Ministry of Economics and Technology is launching the necessary open and transparent process with this discussion paper."

The "Strategic Aspects" paper of the Bundesnetzagentur supports this initiative of the Federal Ministry of Economics and Technology ("Strategic Aspects of the Availability of Spectrum for Broadband Rollout in Germany", cf Communication No 170/2013 in the same Official Gazette).

This paper is not intended to take the place of the public consultations provided for by the Telecommunications Act. Rather, the aim is to provide the wider, general picture prior to the official consultations. Changes set out in the paper will be made in line with procedural law via frequency plan amendment procedures with the proper non-discriminatory and transparent participation proceedings which will be opened in due course by the Bundesnetzagentur for the particular band.

The Federal Government is seeking, in line with the aims of the Digital Agenda of the European Commission (Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 19 May 2010, COM(2010)245 final), to provide broadband access for the population as a whole. The Federal Government's broadband strategy aims to provide 75 percent of households with connection speeds of 50 Mbit/s minimum by 2014 and the whole of the country with these speeds by 2018.

Essential preconditions are competition, and technology and provider diversity. Wireless technologies play an important part alongside wired technologies. The use of mobile technologies for broadband offers for both private and business users makes good economic sense for geographically large and relatively sparsely populated areas. In this connection the Federal Government's Third Monitoring Report has the following to say (page 60):

"The possibility of high speed mobile Internet use will provide a vital stimulus to the digital economy and is therefore just as important a factor in Germany's competitiveness as the cable infrastructures."

The experience with the rollout of LTE (Long Term Evolution) also shows that wireless high speed networks are essential if there is to be nationwide access to innovative broadband services and content such as mobile Internet or the so-called infotainment (information and entertainment – for instance, videostreaming, Internet radio or Internet TV, etc). Wireless high speed networks are also a precondition for social innovations through providing access to offers in a number of areas, for instance e-learning, e-government, e-health and e-work. Hence the aim must be to enable these broadband services everywhere in the country as soon as possible, for rural communities in particular, through mobile networks. The spectrum below 1 GHz is particularly valuable in this connection.

Telecommunications networks, having intelligent platforms and covering as they do large parts of the population, are essential to a modern information society. Wireless networks such as the GSM networks that use the 900 MHz and 1800 MHz spectrum reach virtually 100 percent of the population in Germany and also provide service to subscribers along infrastructures such as motorways and railway tracks. They are also used for data services that support the use and operation of other network infrastructures and supply networks (eg machine-to-machine (M2M), e-calls, toll systems, smart metering and smart grids for gas, water, electricity and heating, etc). In future, broadband wireless communications infrastructures and services will make a valuable contribution to refining supply networks in the energy industry and thus ultimately to the *Energiewende* in Germany.

It is precisely the mobile communications infrastructures that can be a significant factor in achieving the Federal Government's aim of nationwide coverage with high broadband speeds of 50 Mbit/s and thus to the economic development of rural areas. There is much to indicate that a number of measures and investments will be needed if the data speeds offered are to be increased across the country. No single measure is likely to be enough, given the data volumes anticipated for the future. This is why great importance is attached to the technical further development of, for instance, LTE to LTE-Advanced and especially the provision of additional spectrum most notably in the 700 MHz band, besides making the mobile networks more extensive and more dense. This was pointed out by the industry during the National IT Summit 2012 (cf documentation of the results of the AG2 broadband sub-working group at the National IT Summit (*AG2 Unterarbeitsgruppe Breitband zum Nationalen IT Gipfel*) on 13 November 2012 in Essen; BITKOM position paper of 25 May 2012):

> *"If an operator has twice as much UHF bandwidth as today, the target data speed of 50 Mbps can be reached on average. Data speeds for subscribers farther away from the base stations would require special antenna solutions on the subscriber side for the target to be reached.*
>
> *Shared use of the entire spectrum available at 700 und 800 MHz would make it possible to offer contracts of "up to 50 Mbps" and provide the majority of subscribers in rural communities too with this speed, without special antenna solutions. Dedicated antenna solutions such as external and roof-top antennas with antenna gain can be used to improve the situation in places where the reception conditions are poor.*
>
> *With LTE-Advanced the technical core elements of a solution such as Carrier Aggregation or MIMO for a larger number of antennas are standardised in 3GPP and can already be seen in prototypes based on commercially available base station technology. The band combinations for 700 and 800 MHz must still be standardised and implemented. The necessary development investment requires* ***clear, timely framework conditions*** *in respect of the availability of the 700 MHz band so as to be able to provide and implement the solutions in the field by 2018."* (Author's emphasis).

The Bundesnetzagentur is increasingly being contacted by consumers stating that the speeds and data volumes of the services currently on offer do not always match their needs. The provision of further spectrum for rural areas would be one very good way of achieving the Federal Government's aims.

With a view to additional spectrum for further broadband rollout in Germany becoming available within the foreseeable future, the Bundesnetzagentur recommends that everything possible be done to speed up this process and that the 700 MHz spectrum that is suitable for rolling out high speed telecommunications networks be made available for the offer of mobile broadband services, in rural areas as well, at the earliest possible opportunity.

The Chamber expects this band to have great social and economic potential for broadband rollout in Germany. The 700 MHz band is already harmonised globally to the greatest possible extent, providing economies of scale in respect of the cost-efficient provision of technical systems and handsets. In Asia, South America and Africa this spectrum will either be made available shortly or has already been allocated to broadband. The 700 MHz band can be expected to become a valuable resource internationally for broadband services in the coming years. The Chamber is hence working on the assumption that in Germany too, favourably priced technical systems and handsets will be available at an early stage and hence stimulate cost-efficient, nationwide coverage of consumers with mobile broadband services as envisaged in the broadband strategy. Further, maximum global harmonisation gives consumers the best possible deal as regards international roaming.

In assessing the great social and economic potential of the 700 MHz band for broadband rollout in Germany the Chamber is also mindful of the social and cultural importance of broadcasting und PMSE users, as well as public safety, and will seek to reconcile all the different interests (cf Strategic Aspects, loc cit).

Reconciling the different interests, which allows the 700 MHz spectrum to be included in the current proceedings, presupposes however that as many activities as possible take place in parallel and that stakeholders work together closely, quickly and actively at the political, regulatory and entrepreneurial levels. If all the stakeholders join forces to follow a common aim, the proposed inclusion and the accelerated proceedings will be possible. This in turn calls for a national consensus between the Federal Government and the Länder, along with the participation of all the groups affected (including, but not limited to, mobile communications, broadcasting, wireless microphones and public safety agencies) (cf Strategic Aspects, loc cit). The Federal Government, with a view to provision of the 700 MHz spectrum, had the following declaration included in the minutes of the Bundesrat meeting in February 2012 (cf BR minutes of plenary proceedings 892, page 4ff):

> *"The Federal Government undertakes, in awarding the spectrum hitherto allocated to the broadcasting service – in particular in an auction – to reach agreement, by consensus with the Länder, on distribution of the proceeds between the Federal Government and the Länder before the Frequency Ordinance, which requires the consent of the Bundesrat, is transmitted to the Bundesrat. The Federal Government is aware that the Länder are anticipating half of the proceeds after deduction of the migration costs."*

The following draft for consultation is to encourage discussion of the use of the 900 and 1800 MHz spectrum after 2016 and further spectrum so as to meet the targets of the Federal Government's broadband strategy.

To structure proceedings in timely manner and to ensure transparency the President's Chamber is opening a consultation on the following draft on the order for and choice of proceedings for the award of spectrum in the bands 700 MHz, 900 MHz, 1800 MHz and further spectrum in the band 1.5 GHz.

Interested parties are **invited to respond to the President's Chamber draft** on the order for and choice of proceedings for the award of spectrum in the bands 700 MHz, 900 MHz, 1800 MHz and further spectrum in the band 1452 – 1492 MHz for wireless access for the offer of telecommunications services. Responses should be submitted in German

by **4 October 2013**,

in writing to the following address

Bundesnetzagentur
Referat 212
Tulpenfeld 4
53113 Bonn

and

electronically in Word (or Word-compatible) or PDF format (copying and printing must be possible) to the following email address: referat212@bnetza.de

We intend to publish the responses on our website in the original. For this reason we would ask you to declare your consent to publication when you submit your response. If your response is confidential, we would ask you to submit a non-confidential version **in addition**.

Draft for consultation

of the President's Chamber of the *Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen* of [date] on the order for and choice of proceedings for the award of spectrum in the bands 700 MHz, 900 MHz, 1800 MHz and further spectrum in the band 1452 – 1492 MHz for wireless access for the offer of telecommunications services
Decision as provided for by section 55 subsections (4), (5) and (10), section 61 subsections (1), (2) and (3) and section 132 subsections (1) and (3) of the TKG

BK1-11/003

The *Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen* has taken the following decision under section 55 subsections (4), (5) and (10), section 61 subsections (1), (2) and (3) and section 132 subsections (1) and (3) of the Telecommunications Act (TKG) through its Ruling Chamber 1 (President's Chamber) on the award of spectrum for wireless access for the offer of telecommunications services in the bands 700 MHz, 900 MHz, 1800 MHz and further spectrum in the band 1452 – 1492 MHz.

1 Order for award proceedings

It is hereby ordered under section 55(10) TKG that assignment of the frequencies for wireless access for the offer of telecommunications services in the bands 700 MHz, 900 MHz, 1800 MHz and further spectrum in the band 1452 – 1492 MHz,

in conjunction with

assignment, upon application, of 2 x 5 MHz (paired) in the band 900 MHz to each of the companies E-Plus Mobilfunk GmbH & Co. KG, Telefónica Germany GmbH & Co. OHG, Telekom Deutschland GmbH and Vodafone GmbH,

be preceded by award proceedings as provided for by section 61 TKG.

The President's Chamber w i s h e s t o p o i n t o u t

that the purpose of assigning, upon application, 2 x 5 MHz (paired) in the band 900 MHz to each of the four mobile operators is to maintain coverage of the consumer with mobile communications services. A coverage obligation of 99 percent of the population from 1 January 2017 will be imposed in connection with these assignments. The assignments for all the frequencies in these proceedings, with a term of approx 15 years, will have the same expiry date.

2 Choice of award proceedings

The proceedings referred to in section 61(1) TKG will be conducted as an auction in accordance with section 61(2) TKG.

Rationale

1 The following considerations and rationale have prompted the Chamber to order and choose proceedings for the award of spectrum in the bands 700 MHz, 900 MHz, 1800 MHz and 1452 – 1492 MHz (1.5 GHz).

I. Considerations

2 Provision of this spectrum is based on the following considerations:

The spectrum available in the bands 900 MHz and 1800 MHz as from 1 January 2017 is to be provided for wireless access for the offer of telecommunications services on a technology-neutral basis. Additionally, it is already highly probable that further spectrum at 700 MHz will become available shortly and that this can be provided for wireless access along with the spectrum in the bands 900 MHz, 1800 MHz and 1.5 GHz, in line with the regulatory aims.

3 The spectrum is being provided in consideration of the regulatory aims set out in section 2(2) TKG. In following these the Bundesnetzagentur is guided by the principles laid down in section 2(3) TKG of safeguarding competition in the telecommunications sector for the benefit of the consumer and promoting infrastructure competition. It is taking particular account of the conditions in the different geographic areas of the Federal Republic of Germany by providing frequencies with different physical propagation conditions (frequencies above and below 1 GHz). Provision of this spectrum in open, transparent and objective proceedings will ensure that the operators of existing mobile networks and new entrants are given non-discriminatory access to the spectrum above and below 1 GHz. These proceedings will also encourage efficient investment and innovation in new and improved infrastructures.

4 Optimum use has been made of the potential of the 900 MHz and 1800 MHz spectrum, notably for mobile voice communications, through GSM (GSM: Global System for Mobile Communications) licensing in Germany and the introduction of GSM service offers across Europe. Economically, GSM has been a resounding success for the German

mobile market with great importance for the economy as a whole. Offering consumers nationwide mobile communication for the very first time, its social benefit has been huge. Due to its introduction across Europe the GSM success story can also be viewed in terms of economic and social integration in the European Union.

5 Meanwhile, consumers want more than just mobile voice communications and text messaging. Demand is soaring for high speed wireless access for innovative mobile data services (mobile Internet), driven especially by the following:

- new multimedia devices,eg smartphones and tablets,
- mobile broadband Internet usages,
- cloud computing,
- videostreaming,
- mobile software applications (apps),
- increase in machine-to-machine, or M2M information exchange,
- multimedia social networks,
- high definition voice.

6 By lifting the restrictions on the GSM usage rights the Bundesnetzagentur has paved the way for use of the frequencies for broadband systems such as UMTS (Universal Mobile Telecommunications System), LTE (Long Term Evolution) and LTE-Advanced. In principle, the spectrum can already be used for broadband mobile data services. The physical propagation conditions of the two bands make them well suited to satisfy the growing demand for new, innovative data services, both in rural areas and in centres of population, hence allowing optimum use of the potential of the 900 MHz and 1800 MHz bands to continue into the future through the offer of mobile voice communications and high speed mobile data services in particular.

7 The Federal Government's broadband strategy of 2009 set ambitious goals for deploying broadband:

> *"A total of 75 percent of households should have high speed broadband access with transmission rates of at least 50 MB/sec by 2014. The government's goal is to deliver nationwide access with this high-speed broadband as soon as possible."* (Federal Government's broadband strategy, page 5, downloadable from www.bmwi.de).

8 To continue to make spectrum resources available in an efficient and timely manner and in line with demand, the Federal Ministry of Economics and Technology (BMWi) has initiated a process of discussion on the provision of further spectrum to meet the broadband strategy targets ((cf *Mobile Informationsgesellschaft der Zukunft, Diskussionspapier* – "Mobile Media 2020"). The paper states the following in this regard (page 10):

> ***"The Federal Government's broadband targets to 2018 and beyond can be met only by a combination of highly efficient wired and wireless technologies. Wireless technologies can make a significant contribution to meeting these targets if a l l the spectrum resources available are used.*** *The coalition's political objective is for 75% of households to have a minimum broadband speed of 50 Mbit/s by 2014 and for this to be available everywhere in the country by 2018.*
> *With a view to the provision in the future of high speed broadband access to rural communities, in particular, today's wireless technologies (LTE), in conjunction with the spectrum already made available, can make a complementary contribution to meeting the Federal Government's long term goals. To meet these long term goals it must be an aim of spectrum policy to make further radio spectrum available efficiently and as requested."*

9 The Bundesnetzagentur's proposal to include in the proceedings further spectrum in the 700 MHz band in particular is designed as an added incentive to invest efficiently

in order to speed up the rollout of broadband wireless networks. This spectrum has good propagation conditions for the cost-efficient coverage of rural communities and hence can contribute significantly to achieving the target of 50 megabits per second (Mbit/s) Internet access by 2018 for consumers in sparsely populated areas as well. The discussion paper says the following on this (page 12):

> *"Nationwide broadband coverage, the political goal of the Federal Government, could be facilitated by the provision of additional resources below 1 GHz. Such spectrum could already be available as from 2017/18 additionally to spectrum above 1 GHz, effectively a decision for the World Radio Conference 2015 (WRC-15)".*

10 The Chamber is thus looking to open proceedings for award of the 700 MHz spectrum and spectrum in the bands 900 MHz, 1800 MHz and 1.5 GHz in 2014 already, in light of the many separate stages, so as to ensure use of the spectrum for consumers in timely manner in 2017/2018.

11 In awarding the spectrum it is also important to set investment incentives and to encourage innovation and sustainable competition for the benefit of the consumer as effective support for the Federal Government's goals.

12 At European Union (EU) level, too, mobile broadband is an important spectrum management topic. The first European programme (RSPP – Radio Spectrum Policy Program; Decision No 243/2012/EU of the European Parliament and of the Council of 14 March 2012) lays down in Article 3 that the Member States cooperate to support and achieve the following policy objectives:

> Art 3 letter b) *"seek to allocate sufficient and appropriate spectrum in a timely manner to support Union policy objectives and to best meet the increasing demand for wireless data traffic, thereby allowing the development of commercial and public services, while taking into account important general interest objectives such as cultural diversity and media pluralism; to that end, every effort should be made to identify, based on the inventory established pursuant to Article 9, at least 1200 MHz of suitable spectrum by 2015. That figure includes spectrum already in use;"*
>
> Art 3 letter c) *"bridge the digital divide and contribute to the objectives of the Digital Agenda for Europe, fostering access to broadband at a speed of not less than 30 Mbps by 2020 for all Union citizens and making it possible for the Union to have the highest possible broadband speed and capacity;"*

13 At EU level 1025 MHz of spectrum has been harmonised for wireless access (cf Radio Spectrum Policy Group, RSPG – 12-408, Annex 1).

14 Awarding spectrum in the bands 800 MHz, 1.8 GHz, 2 GHz and 2.6 GHz in 2010 on the basis of the President's Chamber Decision of 12 October 2009 (BK1a-09/002), the Bundesnetzagentur has paved the way for overcoming the digital divide and hence for rapid rollout to provide the population, rural communities in particular, with mobile Internet access. This marked a first contributory step to achieving the aims of the European Commission and the Federal Government's broadband strategy to provide the population with high speed broadband connections.

15 Provision of this spectrum has enabled broadband networks to be rolled out using the new LTE technology. The coverage obligations imposed with assignment of the 800 MHz spectrum have been met but there are still gaps in coverage, particularly in rural areas, in which there is neither wired nor wireless broadband access. Mindful of the aims of the broadband strategy, that is to say high speed connections for consumers everywhere in the country, the provision of further spectrum below 1 GHz for wireless access will give fresh momentum to filling these gaps,too.

16 Requests to this effect were made at political level in 2012 already. To create powerful, future-proof Internet infrastructures in rural areas as well the German Bundestag (BT printed paper 17/9159 of 27 March 2012) requested the Federal Government, amongst other things, to

> *"[…] continue its broadband strategy as the basis for high speed networks, taking it forward in line with demand and as far as the legal and budgetary scope allows. This should be done keeping an eye all the while on those rural areas that are still underserved."*

17 The broadband concept of the SPD parliamentary party, "Securing nationwide broadband coverage and accelerating dynamic development" of 10 September 2012 set out the following aims:

> *"[…] rollout of high speed networks delivering significantly higher speeds of 50 Mbit/s and more and also capable of meeting the demands placed on a modern broadband infrastructure. The real challenge in this is to create, or improve, the conditions for less densely populated areas so that they can be connected to a top-grade broadband infrastructure despite the high costs involved."*

18 The coalition's working group "A future for rural areas – Securing and extending regional diversity" requested the following in the Bundestag on 27 November 2012 (BT printed paper 17/11654 of 27 November 2012, page 2):

> *"1. Modern transport, communications and energy infrastructure network*
>
> *a) Telecommunications*
>
> *The main challenge is to improve the local conditions of rural areas through enabling equal participation, everywhere in the country, with urban areas in the high speed Internet and preventing a digital divide in Germany. Priority should be given to the following in order to achieve the Federal Government's rollout targets:*
>
> *[…]*
>
> *– Provision of further spectrum (eg 700 MHz band) for mobile broadband use […];"*

19 The Federal Government, with a view to provision of the 700 MHz spectrum, had the following declaration included in the minutes of the Bundesrat meeting in February 2012 (cf BR minutes of plenary proceedings 892, page 4ff):

> *"The Federal Government undertakes, in awarding the spectrum hitherto allocated to the broadcasting service – in particular in an auction – to reach agreement, by consensus with the Länder, on distribution of the proceeds between the Federal Government and the Länder before the Frequency Ordinance, which requires the consent of the Bundesrat, is transmitted to the Bundesrat. The Federal Government is aware that the Länder are anticipating half of the proceeds after deduction of the migration costs."*

20 In its Special Report 61 issued in 2011 the Monopolies Commission pronounced itself in favour of a "Digital Dividend II" (page 17, para 23):

> *In the long term it would seem necessary, given the anticipated growth in the volume of mobile data, to provide further spectrum for mobile communications below 1 GHz by 2018/2020 at the latest. The Monopolies Commission pronounces itself in favour of harvesting this spectrum from a Digital Dividend II by making further spectrum below 790 MHz, previously used for terrestrial broadcasting, available for mobile communications. The Monopolies Commission does not deny that the further spectrum requirements of terrestrial broadcasting cannot be accurately predicted today. Yet in view of the growing share*

of broadcasting via satellite, cable and IPTV the importance of terrestrial transmission is likely to decrease, rather than increase."

21 With reference to this Special Report the Bundesrat provided the following clarification in respect of the divergent interests (BR printed paper 531/12 of 2 November 2012):

"The Bundesrat wishes to clarify that the UHF spectrum from 470 MHz to 790 MHz that remains after release of the Digital Dividend will continue to be required for broadcasting. It must likewise be possible for production broadcasts, outside broadcasts and events technology – namely for more demanding microphone systems (theatre, opera) – to continue to use the spectrum from 470 MHz to 790 MHz on account of the necessary stability and the low costs."

22 The Chamber shares the view that social and cultural aspects such as the requirements cited by the Bundesrat should also be taken into consideration in providing the spectrum. This is particularly true in light of the social importance of broadcasting and PMSE (Programme Making and Special Events). The Chamber is looking at all the different interests relative to the spectrum requirements of broadcasting, mobile communications and wireless microphones that have to be balanced. The Bundesnetzagentur has drawn up a concept on this, setting out its ideas on the short, medium and long term availability of spectrum resources for broadband rollout in Germany ("Strategic Aspects of the Availability of Spectrum for Broadband Rollout in Germany", cf Communication No 170/2013 in the same Official Gazette). In its considerations on reconciling the different interests the Bundesnetzagentur is not assuming a priori that spectrum requirements are falling off.

23 The Second Monitoring Report on the broadband strategy has the following to say on the spectrum requirements for further broadband rollout (downloadable from www.bmwi.de, page 25):

"The potential of the use of further spectrum from the Digital Dividend is not yet sufficiently anchored in the industry players' perception, as the auction was held only recently and use of the first frequencies from the Digital Dividend (790 bis 862 MHz) has only just begun."

24 With a view to improving broadband coverage and eliminating the digital divide the Bundesnetzagentur is looking at all possible ways of accelerating proceedings so as to make the 700 MHz spectrum that is well suited for rolling out high speed telecommunications networks across the country available at an early stage, after this spectrum was already identified internationally at WRC 12 (World Radio Conference 2012) for the mobile service.

25 The Chamber expects this band to have great social and economic potential for broadband rollout in Germany. The 700 MHz band is already harmonised globally to the greatest possible extent, providing economies of scale in respect of the cost-efficient provision of technical systems and handsets. In Asia, South America and Africa this spectrum will either be made available shortly or is already being used for broadband. Thus the 700 MHz band can be expected to become a valuable resource for broadband services internationally. The Chamber is hence working on the assumption that in Germany, too, favourably priced technical systems and handsets will be available at an early stage and hence stimulate cost-efficient, nationwide coverage of consumers with mobile broadband services as envisaged in the broadband strategy. Further, maximum global harmonisation gives consumers the best possible deal as regards international roaming.

26 The provision by the Bundesnetzagentur at the earliest possible opportunity of spectrum in the bands 700 MHz, 900 MHz, 1800 MHz and 1.5 GHz for wireless access can inject new impetus into the process of achieving the aims of the broadband strategy to provide the population with high speed connections of at least 50 Mbit/s in a further

step after the award of spectrum in 2010. Even though LTE rollout has begun, the Bundesnetzagentur is increasingly being contacted by consumers regretting that the speeds and data volumes of the services currently offered in the market do not always match their needs. In assigning further spectrum for wireless access the Chamber must take proper account of the diverse conditions in connection with competition and the consumer that prevail in the different geographical areas of Germany. Doing so will contribute to ensuring the availability of adequate and appropriate telecommunications services throughout the federal territory, as envisaged in Article 87f of the Basic Law, or constitution, and to securing coverage of those regions in which levels are still below average.

27 The frequencies will be assigned for a particular purpose in accordance with the Frequency Plan and in non-discriminatory manner, on the basis of clear and objective procedures. If frequencies are not available for assignment in sufficient numbers, the law makes provision in section 55(10) TKG for an auction to be held. A departure from this method of proceeding is possible only in exceptional cases in consideration of the regulatory aims of section 2(2) TKG.

28 Provision of the 900 MHz, 1800 MHz and further spectrum in Germany is to encourage efficient investment and innovation in new, improved infrastructures while safeguarding competition in the market and upholding the principle of non-discrimination. Accordingly, to be encouraged are frequency usages that heighten the intensity of competition, especially through the deployment of new technologies that can enhance product quality and diversity in terms of both offer and price for the consumer. This does not rule out the continued use of existing infrastructures, however. Yet if existing infrastructures continue to be used entirely unchanged – as for instance in the case of extending all the current frequency assignments in the case of spectrum shortage – competition and market structures will basically remain unchanged as well and there will be no incentive to innovate or to heighten the intensity of competition. This cannot be the measure for a regulatory decision oriented by the promotion of new, improved infrastructures, efficient investment and non-discriminatory access to spectrum in the event of scarce resources. This is why usage rights are typically granted for a limited period only. Consequently, as a general rule there can be no such thing as a legitimate interest in the continued existence of these rights. Such an interest can exist only exceptionally if this is necessary in light of the regulatory aims of section 2(2) TKG. Otherwise, non-discriminatory access to the spectrum would be virtually impossible, particularly for new entrants.

29 Account must be taken on the other hand of the interest of the consumers in continuing to enjoy the benefits in terms of choice, price and quality of the mobile services that the services and infrastructure competition of the four current mobile operators have delivered. Currently available to consumers are four mobile infrastructures, each with an almost 100 percent degree of coverage. Each of these infrastructures serves at least 19 million mobile subscribers. Thus continued coverage of the consumer on the basis of these four infrastructures is of particular importance. In light of this it is necessary to secure the continued existence of the current, virtually nationwide, mobile communications infrastructures in principle if the infrastructure requirement of Art 87f of the Basic Law, or constitution, is to be met and the regulatory aims of section 2(2) TKG ensured.

30 The continued existence of the four current mobile communications infrastructures with a degree of coverage of almost 100 percent cannot automatically be secured in award proceedings – an auction or a beauty competition – giving equal access to the spectrum resources. In such proceedings a right to frequency assignment changes into a right to take part.

31 By contrast, combining spectrum award proceedings with the pledge of an adequate "frequency reserve" can provide a stimulus, for the benefit of the consumer, for accelerating the rollout of wireless high speed networks and in parallel, maintain the almost

one hundred percent coverage of the consumer with mobile services. This also takes account of consumer interest in rolling out future-proof telecommunications networks as part of the obligation to safeguard the infrastructure. It will also facilitate non-discriminatory market entry for newcomers.

32 The Bundesnetzagentur, in making spectrum in the bands 700 MHz, 900 MHz, 1800 MHz and further spectrum available, aims to secure fair competition and to promote telecommunications markets with sustainable competition in services and networks and in associated facilities and services, in rural areas as well.

33 Fair competition can be secured in particular by taking account, in equal measure, of the opportunities of all parties requesting assignment. Making available the spectrum required for the business models of each interested party in objective, transparent and non-discriminatory proceedings will be a way of doing so.

34 The Bundesnetzagentur is providing all the spectrum available in a foreseeable period in one set of proceedings. In taking this approach it is following the principle of avoiding regulation-induced scarcity. Providing all available spectrum in one set of proceedings will make it possible for interested companies to factor in value and usage interdependencies between the frequencies to the greatest possible extent and to choose accordingly. The volume of spectrum provided, the award of spectrum above and below 1 GHz and the attendant possible choices may affect the price level in award proceedings. Provision of the maximum volume of spectrum can make it possible for all the interested parties to obtain a sufficient spectrum package for their particular business model to be in a position to compete, creating maximum planning and investment certainty for them. This was last confirmed in the auction in 2010 in which every participant, taking into account the value and usage interdependencies between the frequency bands, was able to obtain sufficient spectrum for their business model as a result of the diverse choices resulting from the provision of spectrum above and below 1 GHz and the large volume of spectrum.

35 The joint award of spectrum from the bands 900 MHz, 1800 MHz, 700 MHz and 1.5 GHz is based on the principle of simple, appropriate and prompt administrative proceedings. This approach avoids having to carry out a number of time-consuming award proceedings, each requiring many separate steps from opening proceedings right up to assignments for the individual frequency bands.

36 To use every possible way of streamlining and accelerating proceedings the Bundesnetzagentur is adopting a parallel approach in providing the 700 MHz and 1.5 GHz spectrum, aiming to carry out the legal steps concurrently with the necessary changes to the planning regulations. This presupposes that the Federal Government and the Länder are of one mind in drawing up the Frequency Ordinance and the Frequency Plan. Only early initiation of the steps needed to provide this spectrum will ensure that the Federal Government's declared aim of nationwide coverage of at least 50 Mbit/s for the population as a whole by 2018 at the latest is achieved, and is indeed a prerequisite for this.

37 The spectrum will be provided in line with the Frequency Ordinance and the Frequency Plan on a technology and service-neutral basis. This means that it can be used for all the applications consumers want. Under international harmonisation and technological neutrality requirements provision of the spectrum for broadband systems will need channel bandwidths of 5 MHz or a multiple of this. Provision and assignment will be in contiguous blocks, as far as possible, to facilitate the efficient use of broadband wireless systems.

38 In providing spectrum in the bands 700 MHz, 900 MHz, 1800 MHz and further spectrum the Bundesnetzagentur is also promoting high speed next generation public telecommunications networks. Consumers' strongly growing demand for high speed data services calls for the provision of suitable bands that can be used flexibly. At the same time, flexible use will provide scope for technology change by allowing the current

technologies to continue in use as required while having spectrum available for the successive use of new technologies as required by the network operators' business models and demand in the market, in pursuance of the aim of efficient spectrum use.

II. Explanatory statement

A Starting point

39 Spectrum in the bands 900 MHz and 1800 MHz will be available from 1 January 2017 for nationwide use for wireless access for the offer of telecommunications services.

40 With regard to the 900 MHz and 1800 MHz spectrum the frequencies in the bands from 880.1 – 914.9 MHz (lower band) and from 925.1 – 959.9 MHz (upper band) and from 1725.0 – 1730.0 MHz, 1735.1 – 1752.5 MHz, 1752.7 – 1758.1 MHz, 1763.1 – 1780.5 MHz (lower band) and from 1820.0 - 1825 MHz, 1830.1 – 1847.5 MHz, 1847.7 – 1853.1 MHz, 1858.1 – 1875.5 MHz (upper band) have been assigned for a limited period expiring on 31 December 2016 for the GSM licences of the network operators E-Plus Mobilfunk GmbH & Co. KG (E1 licence), Telefónica Germany GmbH & Co. OHG (E2 licence), Telekom Deutschland GmbH (D1 licence) und Vodafone GmbH (D2 licence) (published in the Official Gazette of the Federal Ministry of Post and Telecommunications 23/1994, Order No 259, 1994, page 866). Accordingly, these bands, providing in total some 160 MHz, will be available for frequency assignment again as from 1 January 2017.

41 The GSM licences were awarded in Germany in the 1990s. The 900 MHz and 1800 MHz bands provided for this licensing were reserved for Europe-wide mobile communications services operating to the GSM standard as a result of European harmonisation. A unique opportunity was therefore provided to introduce mobile communications across Europe. GSM licensing in Germany and the Europe-wide introduction of GSM mobile services enabled optimum use of the potential of the 900 MHz and 1800 MHz bands to be made for both services and infrastructure competition. Economically, GSM proved a huge success for the German mobile market with great importance for the economy as a whole. It also delivered great social benefit for consumers who, for the very first time, were offered nationwide mobile communications by the four operators in the market. Due to its introduction across Europe the GSM success story can also be viewed in terms of economic and social integration in the European Union.

42 The historically different terms of the GSM licences have now been aligned to the same expiry date – 31 December 2016 – (cf "*GSM-Konzept*" 2005, Order No 88/2005, RegTP Official Gazette 23/2005, page 1852ff, Communication No 951/2007, Bundesnetzagentur Official Gazette 23/2007, page 4673ff and Communication No 168/2012, Bundesnetzagentur Official Gazette 3/2012, page 361ff). This alignment was necessary in order that the regulatory framework conditions were the same for all the operators, as the licences would have ended at different times as a result of licence grant in stages. The different terms of the GSM licences would have made reallocation processes or spectrum re-award more difficult if, successively, only parts of all the GSM bands had been available.

43 This has created a regulatory environment allowing decisions on use of all the spectrum after 2016 to be taken at the same time, suitably ahead of expiry of the time limit.

44 The technical restrictions on the GSM system have now been lifted in the wake of the flexibilisation process. The 900 MHz and 1800 MHz bands are no longer tied to a particular technology and can thus be used for broadband systems such as UMTS and LTE or LTE Advanced.

45 To guarantee objective, transparent and non-discriminatory proceedings the Chamber in December 2011 opened formal demand identification proceedings for the bands at

900 MHz and 1800 MHz in order to take decisions in timely manner before the frequency assignments expired (cf President's Chamber Decision BK1a-09/001).

46 Up to 2 x 40 MHz (paired) will be available in the band at 700 MHz for future frequency assignments for wireless access for the offer of telecommunications services. In the international discussions on harmonised provision of this spectrum a volume ranging from 2 x 30 MHz (paired) to 2 x 40 MHz (paired), depending on the band plan, is looking increasingly likely.

47 The band 470 – 790 MHz is currently allocated in Germany to the broadcasting service on a primary basis and designated to television broadcasting within the meaning of telecommunications law.

48 It was decided at WRC-12 to allocate the band 694 – 790 MHz to the mobile service on a co-primary basis with the broadcasting service and to identify it for IMT-2000 (International Mobile Telecommunications-2000) applications. WRC-12, in RESOLUTION 232 (WRC-12; Use of the frequency band 694 - 790 MHz by the mobile, except aeronautical mobile, service in Region 1 and related studies) laid down the following key elements:

> *"resolves*
>
> *1 to allocate the frequency band 694-790 MHz in Region 1 to the mobile, except aeronautical mobile, service on a co-primary basis with other services to which this band is allocated on a primary basis and to identify it for IMT;*
>
> *2 that the allocation in resolves 1 is effective immediately after WRC-15 […].*
>
> *4 that the lower edge of the allocation is subject to refinement at WRC-15, taking into account the ITU-R studies referred to in invites ITU-R below and the needs of countries in Region 1, in particular developing countries;".*

49 Accordingly, allocation will become effective in the Radio Regulations directly after WRC-15. In the meantime the main technical parameters of use (band plan, etc) will be drawn up, due account being taken of the interests of broadcasting, but also of PMR (eg wireless microphones), public safety agencies (BOS) and the German Federal Armed Forces (cf Strategic Aspects, loc cit). This approach is consistent with Recommendation 10 of the Federal Government's Third Monitoring Report (page 60, www.bmwi.de):

> *"It is necessary that the legal and regulatory framework conditions for the possible uses of further spectrum for mobile communications (Digital Dividend II) be clarified before the next World Radio Conference (WRC) in 2015. The interests of all the stakeholders (most notably the Länder, broadcasters, cable operators, wireless microphone businesses, the German Federal Armed Forces) must all be taken into account to the best possible extent and a solution sought early on that reconciles the different interests."*

50 The Frequency Ordinance is therefore expected, in consideration of the interests of other stakeholders in Germany, to allocate spectrum in the 700 MHz band to the mobile service. The Bundesnetzagentur will amend the Frequency Plan on the basis of the Frequency Ordinance such that the frequencies required for broadband rollout can be assigned in line with demand.

51 This calls for a national consensus between the Federal Government and the Länder, along with the participation of all the groups affected (including mobile communications, broadcasting, wireless microphones and public safety agencies) (cf Strategic Aspects, loc cit). The Federal Government, with a view to provision of the 700 MHz spectrum, had the following declaration included in the minutes of the Bundesrat meeting in February 2012 (cf BR minutes of plenary proceedings 892, page 4ff):

"The Federal Government undertakes, in awarding the spectrum hitherto allocated to the broadcasting service – in particular in an auction – to reach agreement, by consensus with the Länder, on distribution of the proceeds between the Federal Government and the Länder before the Frequency Ordinance, which requires the consent of the Bundesrat, is transmitted to the Bundesrat. The Federal Government is aware that the Länder are anticipating half of the proceeds after deduction of the migration costs."

52 Frequencies have been assigned regionally for DVB-T (Digital Video Broadcasting – Terrestrial) for public and private broadcasting in the whole of the band 470 – 790 MHz. Most of the assignments run until 2025. The Bundesnetzagentur is drawing up a concept to make the 700 MHz spectrum available for wireless access at an early point in time not just regionally but nationwide and to properly consider the interests of other stakeholders (cf Strategic Aspects, loc cit, 4.1.1).

53 Available in the band 1452 – 1492 MHz is 1 x 40 MHz (unpaired). This band is allocated wholly or in part to the fixed service, the mobile service, the broadcasting service and the broadcasting-satellite service. There is currently a national allocation for the broadcasting-satellite service until the end of 2018. As the entire band is not being used the aim is to have it designated for wireless access (cf Strategic Aspects, loc cit, 4.2).

B Steps

54 To ensure objective, transparent and non-discriminatory proceedings the Bundesnetzagentur on 6 July 2011 published in a first step a key elements paper to identify demand for 900 MHz and 1800 MHz spectrum after 1 January 2017 in its Official Gazette (Bundesnetzagentur Official Gazette No 13/2011, Communication No 365, page 3446ff) and on its website and invited responses to this paper. By publishing these key elements for demand identification proceedings the Bundesnetzagentur provided an overview of the procedural steps and the framework conditions for any later decisions required by law. At the same time all interested parties were given the opportunity to prepare for participation at an early stage.

55 Most of those responding to the key elements paper welcomed the planned early identification of future requirements in the bands 900 MHz and 1800 MHz in open, transparent proceedings with input from parties concerned. This would help to create planning and investment certainty, they said. Most of the respondents also wanted qualified notified requirements to be a precondition for consideration in the proceedings, as companies must not be able to claim requirements while in reality following different interests (cf on the individual responses: Order No 79/2011, Bundesnetzagentur Official Gazette No 23/2011, page 4138ff).

56 The next step was the opening on 21 November 2011 by the Chamber of formal demand identification proceedings for the bands 900 MHz and 1800 MHz in order to identify requirements ex officio for spectrum for wireless access for the offer of telecommunications services from 1 January 2017 (Order No 79/2011, Bundesnetzagentur Official Gazette No 23/2011, page 4138ff).

57 This was the stage at which interested parties were called upon to set out their anticipated requirements for spectrum as from 2017. Six companies did so.

58 In a further step the interested public were asked their views on foreseeable market, technological and international developments and suitable spectrum package factors (Analysis Paper, Bundesnetzagentur Official Gazette 08/2012 of 2 May 2012, Communication No 275/2012, page 1150ff).

59 The inclusion of further market developments and demand for broadband wireless applications in the investigation of requirements for spectrum in the bands 900 MHz and 1800 MHz for wireless access as from 2017 was welcomed by the majority of those

responding to the Analysis Paper. It was necessary, they believed, to look at the bigger picture, encompassing the different bands and all the available and suitable frequencies in the bands 450 MHz to 3.8 GHz. Nor was a number of award / assignment proceedings in quick succession in light of the successive expiry dates of the frequency assignments (2016 (GSM), 2020 (UMTS), 2021 (BWA), 2025 (the 2010 auction)) and further spectrum available in the future appropriate. The exponential growth of mobile data as a result of the increasing use of mobile broadband services required spectrum policy that was drawn up for the long term, they said. In the short term, however, market players in particular wanted an extension and flexibilisation of the 900 MHz and 1800 MHz spectrum as soon as possible for an appropriate period, irrespective of the scarcity issue.

60 Working on the basis of telecommunications law requirements and declared interest the Bundesnetzagentur has drawn up various scenarios for provision of the 900 MHz and 1800 MHz spectrum, to which it has invited responses (Scenarios Paper, Bundesnetzagentur Official Gazette 22/2012 of 21.11.2012, Communication No 958/2012, page 3960ff). On this it said the following:

> *"With a view most notably to safeguarding consumer interest the scenarios must be looked at in terms of consumer interest in nationwide mobile coverage (voice telephony in particular) and the growing demand for mobile broadband services. The aim of accelerating the rollout of high speed telecommunications networks, the declared aim of the Federal Government's broadband strategy too, calls for proactive spectrum management. Hence the resources must be made available in open, transparent and non-discriminatory proceedings and efficient spectrum usage ensured, not just to promote competition. Due account must also be taken of broadcasting interests but also those of PMR (eg wireless microphones) and public safety agencies (BOS) with a view to further spectrum.*
>
> *In the interest of predictable regulation it is necessary to provide suitable proceedings for assigning the frequencies, reconciling the interests in delivering planning certainty as soon as possible regarding assignment of the frequencies expiring shortly in the band 900/1800 MHz and the call to look at the different bands as a whole and/or include all the spectrum that is available and suitable for broadband wireless access to cover rural areas and expand capacity."*

61 Scenario 1 (extension) addresses an extension of the current assignments at 900 MHz and 1800 MHz.

62 Scenario 2 (award proceedings for 900/1800 MHz) describes proceedings solely for the expiring assignments at 900 MHz and 1800 MHz.

63 Scenario 3 (award proceedings for 900/1800 MHz plus) includes further available spectrum in the proceedings. It sets out the possibility of the 900 MHz and 1800 MHz spectrum being provided together with the 2 GHz and 3.5 GHz spectrum and with new bands such as 700 MHz and 1.5 GHz, too.

64 Scenario 4 (total award in 2025) sets out an approach in which the assignments expiring in 2016 are included in total award proceedings. Accordingly, all the spectrum for wireless access could, in essence, be provided at the same time in one set of proceedings.

65 A public information event was held on 9 November 2012 to provide the background to frequency requirements and the regulatory options resulting from them (cf Bundesnetzagentur Official Gazette of 05.09.2012, Communication No 614/2012). The Scenarios Paper was published in Bundesnetzagentur Official Gazette 22/2012 of 21.11.2012, Communication No 958/2012, page 3960ff and responses invited.

66 A total of 23 responses to the consultation were received, most notably from network operators, equipment and systems manufacturers, industry associations and broadcasters.

67 Basically, the following was said:

Some of the respondents were in favour of early extension of the 900/1800 MHz spectrum usage rights, pointing to a lack of scarcity, as extension would quickly provide planning and legal certainty for the mobile operators. Some wanted at least a short term extension (approx 4 years), while others favoured a longer period. Extension should, they believed, retain at least some of the current conditions (eg fragmentation, coverage obligation, service provider obligation). It was also claimed that a newcomer would find it difficult in Germany to enter the market on account of the existing competition situation. If the current usage rights were not extended, consolidation would be a more likely outcome.

68 Some of the respondents were in favour of extending the spectrum usage rights and lifting the restriction to GSM. Yet GSM was not likely to be phased out before 2020/2025, given the heavy demand in the market. By contrast, other respondents declared that an extension of GSM had to be ruled out because the availability of standards such as UMTS, HSPA (High Speed Packet Access), LTE and LTE-Advanced meant that the spectrum could be used more efficiently; hence extension was not reconcilable with the requirement of efficient spectrum use.

69 With a view to the regulatory aims, extension was necessary in the respondents' view, so that even if scarcity was assumed the current usage rights should be extended by four years to the end of 2020. Extension of the 900/1800 MHz spectrum keeping the existing rights and obligations was appropriate; possible interest on the part of new entrants would have to take second place to nationwide coverage. Continuance of coverage across Germany with voice and narrowband data services via GSM served consumer interest to a great extent and delivered considerable added value for the economy as a whole. In rural areas in particular, the GSM network was sometimes still the only form of mobile service, and would be under threat if there was no extension. The federal infrastructure obligation, too, called for provision of the spectrum for these services after 2016, and could not be interpreted solely in terms of broadband coverage. At the same time it followed from the federal infrastructure obligation, specifically from the Federal Government's broadband strategy, that award proceedings should not, through the conduct of an auction, unnecessarily deprive the market of financial resources that could otherwise be invested in broadband rollout.

70 On the other hand, attention was drawn to the unlawfulness of extension, scarcity having already been established with regard to the 900/1800 MHz spectrum. The preconditions for extension which regulatory aims could call for in a particular, exceptional, case were not given. In other respects, extension in the case of scarcity was only possible, according to a ruling of the Federal Administrative Court of 26.01.2011, 6 C 2.10, if comparable spectrum was made available to the competitors.

71 Many of the respondents were against a separate auction for the 900/1800 MHz spectrum usage rights, pointing out the threat of distortions of competition from, amongst other things, regulatory-induced scarcity; nor was there any serious market entrant in sight. This also held good in light of the incumbents' interest in the continued existence of the GSM usage rights. For the rest, a number of award proceedings in rapid succession should be avoided, they said.

72 One respondent noted that only Scenario 2 offered the necessary planning and investment certainty and complied with the legal requirements where demand was found to exceed supply. For new entrants in particular, access to this rural area spectrum was important in order to provide basic service.

73 It was pointed out that the Monopolies Commission believed spectrum should be auctioned only when demand exceeded supply and at least one serious potential new entrant had submitted proper notification of requirements. However, there was no sign of a serious new entrant looking to enter the German market. One respondent feared that the Bundesnetzagentur was under political pressure to conduct an auction.

74 Scenario 3 was welcomed by a large number of respondents, the majority of whom favoured a combination with an interim extension as per Scenario 1. The Bundesnetzagentur should implement Scenario 1 first, however, they believed. With a view to avoiding multiple proceedings in quick succession Scenario 3, awarding spectrum from different bands, was generally endorsed.

75 Some respondents welcomed the inclusion of the 2 GHz and 3.5 GHz spectrum in award proceedings for the 900/1800 MHz spectrum, as it made it possible for common value interdependencies with the 2 GHz and 3.5 GHz spectrum to be taken into account. Two respondents, however, were not in favour of this inclusion. It was not possible, they said, to value the spectrum in a way that would make efficient distribution in the auction possible if proceedings took place more than three years before the spectrum became available.

76 Some of the respondents, while basically in favour of including the 700 MHz band and the 1.5 GHz band, were not in favour of doing so at the present time. The inclusion of further spectrum must not be allowed to delay the decision on the award of spectrum actually available, they said. Mixing the 2012 notified requirements for the 900/1800 MHz spectrum with forecasts of future requirements for frequency bands that were not yet available was not permitted. It was pointed out that the spectrum was required for broadcasting at least until 2022. It was proposed that the 2 GHz and 3.5 GHz spectrum be extended until 2025 and awarded together with the spectrum auctioned in 2010 for use from 2026. Further, with a view to a possible interim extension, the inclusion of the 2 GHz and 3.5 GHz spectrum at a later date was taken into consideration by some.

77 It was said that new demand identification proceedings would be necessary if the 900/1800 MHz spectrum were to be provided together with further bands. Without formally identifying demand it would not be possible, respondents believed, to establish surplus demand for the frequencies for allocation under Scenarios 3 and 4. The surplus demand established within the meaning of section 55(10) first sentence, first alternative of the TKG related to a particular frequency band. If this point of reference were to be changed in Scenarios 3 and 4 it would be necessary to carry out new demand identification proceedings.

78 If further spectrum was included, the interests of all the different users of the UHF band would have to be taken suitably into account, it was said. Another respondent called for cable to be taken into consideration from the outset in preparing for future award proceedings.

79 While some of the respondents were in favour of total award 2025 (Scenario 4) particularly for economic reasons, this scenario was rejected by a larger number of respondents who favoured providing spectrum at appropriate intervals. The reason for this was the enormous financial requirements for obtaining the total package an operator would need. New spectrum coming onto the market would possibly lie idle in the run-up to total award or would be awarded for very short periods only. Attention was also drawn to the need for interim solutions, not yet defined, to align the current assignment terms.

80 Further, some of the respondents to the consultation on the Scenarios Paper declared, with reference to the demand identification proceedings, that there was no scarcity. In light of this, a right to extension (from short term up to 15 – 20 years) by way of individual assignment existed. Inadmissible or ineligible notified requirements must not be included in the proceedings. Nor should submissions from parties not admitted to earlier

proceedings or notified requirements not included in the designation of the frequencies be considered, just as little as mere declarations of intent. The eligible notifications would represent the requirements ceiling in the scarcity test as it was not clear in particular why companies should notify lower requirements than they needed on the basis of their business model. Moreover, in addition to demand exceeding supply, there had to be at least one qualified notification from a serious potential new entrant, they declared.

1 Order for award proceedings

81 The order for award proceedings is made under sections 55(10), 61 TKG, section 55(4) and (5) TKG and Article 87f of the Basic Law or constitution (GG), section 2(2) and (3) TKG in such a way that the assignment of frequencies for wireless access in the 700 MHz, 900 MHz, 1800 MHz bands and other frequencies in the bands from 1452 – 1492 MHz must precede award proceedings in connection with the assignment of 2 x 5 MHz (paired) in the 900 MHz band on the petition of the four mobile operators E-Plus Mobilfunk GmbH & Co. KG, Telefónica Germany GmbH & Co. OHG, Telekom Deutschland GmbH and Vodafone GmbH.

82 Under section 55(10) sentence 1 TKG it may be ordered, without prejudice to section 55(5) TKG, that the assignment of frequencies be preceded by award proceedings based on conditions provided for in section 61 TKG as determined by the Bundesnetzagentur. Award proceedings can be ordered if insufficient frequencies are available or if several applications are made for specific frequencies. This order as per section 55(10) TKG is made at the discretion of the Bundesnetzagentur.

83 The amount of available frequencies for wireless access in the 700 MHz, 900 MHz and 1800 MHz bands as well as the 1.5 GHz band is insufficient (cf 1.3).

1.1 Timing of the order

84 The Chamber considers it appropriate to order award proceedings for the frequencies in the 700 MHz, 900 MHz and 1800 MHz bands as well as in the 1.5 GHz band at an early stage.

85 In its earlier decision BK1a-09/001 of 12 October 2009 (Flexibilisation Decision, Official Gazette of the Bundesnetzagentur 20/2009 of 21 October 2009, Order no 58, page 3575 ff.) the Chamber announced that the decision concerning provision of the expiring GSM assignments will be made in good time, ie around three years before they expire in order to provide market participants the planning and investment certainty they require.

86 In order to ensure that spectrum is provided in good time, the Chamber takes the view that formal award proceedings should be opened now in order to allow network operators already active in the market as well as new entrants access to the available frequencies and to bring the assignment proceedings for these frequencies to a close at an appropriate time.

87 In this context the Chamber is including all the frequencies in the award proceedings which, like the 900 MHz and 1800 MHz bands, the Chamber considers will be available in the foreseeable future for wireless access in order to enable the parties requesting assignment to acquire appropriately competitive spectrum packages. This concerns frequencies which it is foreseeable will be available for later assignment for wireless access, even if rights to use these frequencies are already assigned at the time award proceedings are ordered. This not only applies to frequencies which will become available again as a result of expiring time limits on rights of use, but also for those which - owing to quite other circumstances, such as anticipated relocations of rights to use spectrum - are very likely to become available to be awarded anew. If the Chamber were only to open award proceedings for such frequencies when these fre-

quencies were available for assignment within the meaning of section 55(5) para 2 TKG, this would contravene the principle of efficient use of these frequencies owing to the circumstance that, under section 61 TKG, a considerable amount of time is needed for the award proceedings themselves and it would therefore be inevitable that such frequencies might very well remain unused during this time.

88 The following frequencies are in principle available for wireless access:

Spectrum	**Frequency band**	**Availability**
450 MHz	451.075 - 455.575 MHz / 461.075 – 465.575 MHz	01.01.2021
800 MHz	791 - 821 MHz / 832 – 862 MHz	01.01.2026
900 MHz	880 - 915 MHz / 925 – 960 MHz	01.01.2017
1800 MHz	1710.0 - 1725.0 MHz / 1805.0 - 1820.0 MHz	01.01.2026
	1725.0 - 1730.0 MHz / 1820.0 - 1825.0 MHz	01.01.2017
	1730.1 - 1735.1 MHz / 1825.1 - 1830.1 MHz	01.01.2026
	1735.1 - 1758.1 MHz / 1830.1 - 1853.1 MHz	01.01.2017
	1758.1 - 1763.1 MHz / 1853.1 - 1858.1 MHz	01.01.2026
	1763.1 - 1780.5 MHz / 1858.1 - 1875.5 MHz	01.01.2017
2 GHz	1900.1 - 1905.1 MHz	01.01.2026
	1905.1 - 1920.1 MHz	01.01.2021
	2010.5 - 2024.7 MHz	01.01.2026
	1920.3 - 1930.2 MHz and 2110.3 - 2120.2 MHz	01.01.2021
	1930.2 - 1940.1 MHz and 2120.2 - 2130.1 MHz	01.01.2026
	1940.1 - 1950.0 MHz and 2130.1 - 2140.0 MHz	01.01.2021
	1950.0 - 1959.9 MHz and 2140.0 - 2149.9 MHz	01.01.2026
	1959.9 - 1979.7 MHz and 2149.9 - 2169.7 MHz	01.01.2021
2.6 GHz	2500 - 2690 MHz	01.01.2026
3.5 GHz	3410 - 3473 MHz and 3510 - 3573 MHz	01.01.2022
	3473 - 3494 MHz and 3573 - 3594 MHz, smaller frequency blocks assigned regionally or locally	01.01.2023
3.7 GHz	3600 - 3800 MHz; smaller frequency blocks assigned regionally or locally	01.01.2023

Table 1

89 Other frequency bands available for wireless access:

Spectrum	**Frequency band**	**Availability**
700 MHz	Approx. 694 - 790 MHz (max. 2 x 40 MHz)	After WRC 2015
1.5 GHz	1452 - 1492 MHz	Anticipated for 2015

Table 2

90 In the short term frequencies will be available in the bands at 900 MHz and 1800 MHz as of 1 January 2017. It is already highly probably at the present time that further

spectrum in the 700 MHz and 1.5 GHz bands will be available which can be used for wireless access together with frequencies in the 900 MHz and 1800 MHz bands.

91 The Chamber's objective in including further spectrum in the frequency bands at 700 MHz and 1.5 GHz is to utilize all the potential for speeding up the process to ensure that these frequencies are available as envisaged in the broadband strategy in good time before 2018 for the broadband rollout in Germany. It is not necessary for the purpose of including such frequencies that all the measures for changing the conditions required under planning law for a later assignment are already in place at the time the decision is made to award these frequencies. They need only be definitely foreseeable and the conditions must be transparent for the parties requesting assignment. The Chamber expects the conditions required under planning law for the assignment of frequencies to be met in good time; section 55(5) sentence 1 para 1 TKG. For this reason it is necessary to begin with to ensure that a firm decision has been made on the allocation and dedication of frequencies at the time of the award proceedings (at the outset of the auction). This is only possible if a political consensus exists between the Federal Government and the Länder. Frequencies can only be assigned if the allocation and dedication of frequencies for wireless services have been allocated and dedicated in the frequency ordinance and frequency plan.

92 The Chamber also takes the view that it is necessary but also sufficient that, prior to the award proceedings, international harmonisation has progressed to such an extent that the essential technical conditions – including but not limited to the channel plan – are sufficiently stable and that the spectrum to be offered can be determined with sufficient certainty.

93 The Chamber is thus pursuing a parallel approach by taking steps to award contracts at the same time as making required changes in planning law. The Chamber's regulatory concepts to date also envisaged that frequencies which it was foreseeable will become available must be made available to the market early on. Most recently, for example, frequencies were included in the award proceedings for the 2010 auction even though not all the conditions required under planning law and/or frequency usage conditions were met.

94 In this connection the Chamber points out that the order of award proceedings at this point does not mean that it will be possible to start such proceedings in the near future. This is because the legislation requires further Chamber decisions (on the conditions and rules for award under section 61(4) TKG) to have been taken before award proceedings - for which consultation with the Advisory Council is also needed - can be conducted. In addition, the assignment procedure and the use of the frequency spectrum linked with it only take place after the award. In this context frequencies can be included in award proceedings even though not all the conditions required under planning law (frequency ordinance and frequency plan) and/or frequency usage conditions are met. The procedural purpose of the order and choice of award proceedings under the Telecommunications Act is to tackle scarcity.

95 Ultimately the Chamber takes the view that it is possible to include 700 MHz in the proceedings for the award of the 900 MHz and 1800 MHz bands and other frequencies at this point in time, even if neither the conditions required under planning law nor all the technical frequency-related parameters required for subsequent use have as yet been met . The Chamber believes it is necessary but also sufficient that the value of the spectrum to be offered can be assessed with sufficient accuracy before the award proceedings. The spectrum to be offered will be clarified in this way in a further Ruling by the President's Chamber on the conditions of award and use of frequencies under section 61(3) sentence 2 paras 1 to 4 TKG (Ruling by the President's Chamber on the determination of and rules for award proceedings). Depending on progress made in international studies provisional terms of use or channel plans may be necessary, as was the case in previous proceedings.

96 At the same time this approach will also enable proceedings to be organised as efficiently as possible. The joint award of foreseeable available frequencies along with the award of 900 MHz and 1800 MHz frequencies in one set of proceedings makes it unnecessary to carry out a number of different costly award proceedings, each of which would require a number of individual procedural steps from the initiation of the proceedings through to assignment for each frequency band.

97 For this reason the frequencies which will become available in the 1.5 GHz band will also be included in the proceedings. The frequencies should also be dedicated for wireless access. As international harmonisation currently stands, it is apparent that the frequencies are suitable for use in the framework of existing mobile networks.

98 The "Frequency management" (WG FM) working group is currently working on an ECC (Electronic Communications Committee) harmonisation decision for "supplementary downlink" (SDL) wireless access, including the necessary technical user parameters in the form of a block edge mask (BEM). This should be adopted by the end of the 2013.

99 Joint award of the entire spectrum available, including the 1.5 GHz frequencies, reflects the President's Chamber's practice of providing all the available frequencies in one set of proceedings (consistency requirement). The potential of 1.5 GHz frequencies should also be exploited as rapidly as possible in order to promote broadband rollout in Germany as intended in the broadband strategy.

100 Inclusion of these frequencies is also a suitable means of promoting the regulatory aims of the TKG. In addition to the paired frequency bands provided in these proceedings these frequencies are also a suitable means of promoting mobile broadband rollout in urban and rural regions in the interest of consumers within the meaning of section 2(2) para 1 TKG. By including these frequencies in the proceedings, the Chamber is making all the available frequencies available for wireless access to the parties requesting assignment. These parties will then be in a position to provide the higher capacities in the downlink which are required for most high performance mobile data networks within the meaning of section 2(2) para 5 TKG. Provision of these frequencies, which can be used together with paired spectrum, also ensures efficient use of these frequencies within the meaning of section 2(2) para 7 TKG. The parties requesting assignment will be in a position, depending on their business models and on the acquisition of paired spectrum, to obtain and make efficient use of an optimum spectrum package. Potential value and use interdependencies between the different frequency bands can only be taken into account by making provision in a procedure on the largest possible scale.

101 The need to avoid a large number of award proceedings over a short period of time has also been emphasised by the respondents.

102 The procedure which these respondents call for - that frequencies in the 700 MHz band should be awarded in later proceedings - would not ensure that those frequencies which are particularly suitable for the nationwide rollout of wireless services could be put to efficient use at the earliest possible time in rolling out broadband in Germany and, in this respect, the Federal Government's schedule for ensuring coverage over large areas could not be met. This could set back the dynamic development of the broadband market in Germany by years and would also fail to satisfy consumers' growing high demand for nationwide mobile broadband services.

103 As far as respondents' call for the timing of awards, particularly for the 700 MHz band, to be synchronised with the availability of technology devices, the following remarks must be made: There is a risk that synchronising the timing of award proceedings for frequencies with the actual availability of mobile systems would contravene the regulatory aim of ensuring efficient use of frequencies under section 2(2) para 7 TKG as the duration of proceedings could easily delay use of frequencies. Early introduction of the proceedings does not mean frequencies would actually be assigned immediately af-

terwards. At the time at which award proceedings are ordered a decision must first be made concerning the frequency bands which are to be awarded as well as on which award proceedings to select; section 55(10) and section 61(1) TKG (part decisions I and II). The frequency usage conditions and other rules for award will be stipulated in a further decision, section 61(3) sentence 2 TKG (part decision III). The next procedural step will be the award proceedings themselves. Depending on progress made in international studies, provisional terms of use or channel plans may be necessary, as was the case in previous proceedings. Only then will specific frequencies be assigned for use.

104 What is more, the early development of suitable mobile services is related to the time at which a new frequency band will be available. Launching proceedings at an early stage could inject further impetus into speeding up the drafting of harmonised frequency usage conditions and stable framework conditions for the development of mobile systems. Ongoing technological developments will also be accelerated early on by specific demand coming from network operators and final customers.

105 In this connection the Chamber points out that at the time of provision of newly identified frequency bands – as was the case previously with the UMTS core band or most recently the 800 MHz band – corresponding technologies and devices have not yet been finally developed.

106 However, the Chamber only includes those frequency bands in its decisions which have already been identified internationally and for which harmonisation measures have already been initiated.

107 With the inclusion of frequencies which will be become foreseeably available in the bands at 700 MHz and 1.5 GHz the Chamber is adhering to the principle of avoiding regulation-induced scarcity. The inclusion of 700 MHz frequencies, in particular, could more or less "double" the spectrum below 1 GHz in these proceedings. This would make an important contribution to overcoming the "digital divide" as the objective of the broadband strategy for the rollout of broadband networks in rural regions. Spectrum in the bands at 900 MHz and 700 MHz up to 2 x 75 MHz (paired) in particular is especially suitable for rollout to rural communities as well as for the availability of high bit-rate mobile broadband services up to 50 Mbit/s throughout the country, and, as such, also generally for improved provision at every location in a cell.

108 This was pointed out by the industry at the National IT Summit 2012 (cf the documentation of the outcomes of the AG2 broadband sub-working group at the National IT Summit on 13 November 2012 in Essen; BITKOM Technical Potentials Statement LTE: Mobile communications and VDSL vectoring of 25 May 2012):

> *"(…) there are limits to the extent to which technological development can contribute to higher spectral efficiency on the margins of the service area given that very tight physical limits are set by thermal noise and very low receiving levels. Improvements could in particular be achieved by subscribers using antennae technology, although these would have to be mounted on the outside of buildings or on roofs with directivity.*
>
> *On the other hand, additionally provided spectrum could also bring about a more or less linear improvement in the performance of mobile communications system, in particular by providing further frequencies in the UHF band with comparable range as in 800 MHz. In this context, the World Radiocommunication Conference WRC-2012 resolved, with immediate effect following the next WRC-2015 conference, to allocate the so-called 700 MHz band (694–790 MHz) in the ITU Region 1 on a co-primary basis for IMT mobile communications. The time between the conferences will be used for the required coexistence analyses, including clarifying the lower band edge. If an FDD band plan with 2 x 30 MHz in the 700 MHz band is accepted, this would double the amount of spectrum available for rural mobile broadband services. The ex-*

pansion of today's 10 MHz downlink broadband to 20 MHz across both bands with one or several network operators would enable them to use LTE Advanced Carrier Aggregation and to achieve at least a doubling in the volume of data they could offer up to the edge of a cell. (…)

This illustrates the importance of further UHF spectrum in achieving the broadband objectives with the aid of LTE Advanced:

an operator which can use twice as much UHF bandwidth as today can, on average, provide subscribers the target data rate of 50 Mbps (…)

Manufacturers are firmly of the view that LTE Advanced can provide a timely and substantial contribution to achieving broadband objectives of enabling superfast connections of at least 50 Mbps to be offered to every household in Germany by 2018.

The key reasons for this are

- *the allocation of additional radio frequency spectrum in the 700 MHz band for mobile communications by confirming the WRC-2012 resolution at the WRC-2015;*
- *prompt national implementation and the allocation of band prior to 2018; as well as*
- *clearly defined framework conditions for implementation."*

109 In this context the Chamber has taken into account that the provision of higher data rates to meet demand can also be achieved by optimising existing network infrastructures, including in particular by making networks more dense using smaller cell structures as well as by deploying more powerful technologies, such as LTE Advanced. There are limits, however, to the extent to which capacities in a mobile network can be increased, or at least in an economically feasible manner, if the objective of providing cost effective broadband coverage over large areas is to be met. Micro-cell base stations have already been developed which are both compact and simple to install and which can consequently be deployed cost effectively. Even if these enable substantial increases in local capacities, measures of this kind are generally not an economic way of meeting demand for broadband data services in rural communities. Extensive coverage using micro-cells of this kind would not be feasible owing to the costs involved – particularly for connecting to the core network.

110 There are also likely to be considerable bottlenecks at the locations which would be required for the purpose of increasing capacities. In particular, resistance in the population to additional antennae locations and ever more stringent building and environmental regulations would very likely make it considerably more difficult to acquire new locations.

111 Demand-oriented provision of higher data rates can also be supported by using more frequencies assigned for public use ("offloading"). However, these frequencies have been assigned for use by the general public and cannot therefore be used exclusively by mobile operators. What is more, this would only help to achieve local increases in capacity and would not help in finding solutions for meeting demand over large areas.

112 Nonetheless, the Chamber takes the view that more appropriate frequency resources are also needed in addition to these measures. The provision of further frequencies below 1 GHz enables capacities to be increased over large areas at reasonable economic cost. Existing mobile operators in particular will be able to make cost-effective use of frequencies in the 700 MHz band in their existing network infrastructures and achieve a substantial increase in network capacities over large areas as a result. New entrants would also be able to establish a mobile network rapidly and cost efficiently with these frequencies.

113 This was pointed out by the representatives of network operators and the industry in the VATM-Tele-Kompass Berlin-Mitte (page 8):

> *"Developments such as LTE Advanced, which from 2015 will enable 10 times higher data rates than today's LTE allows require additional spectrum for mobile communications. The low frequency range below 1 GHz will be especially important – and particularly the 700 MHz band (Digital Dividend II) which has already been allocated as of 2015 on a co-primary basis by the World Radio Conference (WRC-12) to mobile communications.*
>
> *The deployment of this frequency band would not only make broadband coverage in rural areas affordable, it would also ensure that the cost of chipsets and thus also of terminal devices would fall. 700 MHz frequencies are also needed in order to make the most of the benefits offered by LTE Advanced. Germany has played a pioneering role in Europe in this respect by making awards and establishing rollout rules for 800 MHz frequencies at an early stage. The aim now must be to maintain and build on this position in the 700 -MHz frequencies band."*

114 Inclusion of the 700 MHz band would also allow the parties requesting assignment to take maximum account of the value and use interdependencies between the available frequencies – particularly below 1 GHz – and to apply these in their selection criteria. This will provide the maximum possible planning and investment security which mobile operators need for the rollout of broadband. This was confirmed most recently in the framework of the 2010 auction in which the numerous options arising from provision of spectrum below and above 1 GHz and the amount of spectrum enabled all participants to acquire sufficient frequencies for their business models taking account of the value and use interdependencies between the frequency bands.

115 In the medium term further frequencies will be available for wireless access from 2021 onwards.

116 The frequencies which will be available from the year 2021 in the 2 GHz band (known as UMTS frequencies) and the frequencies which will become available from 2022 onward in the 3.5 GHz band (known as BWA frequencies) will not be included in these award proceedings but will be made available for renewed use in good time before frequency usage rights expire.

117 While inclusion of these frequency bands could provide considerably more spectrum (totalling around 500 MHz, Scenario 3, scenario paper of 9 November 2012, loc cit.) in the course of proceedings, the Chamber nonetheless recognises that the market and technical developments in the dynamically moving broadband market do not lie so far in the future as to make it impossible to produce reliable forecasts of business models and corresponding frequency requirements for the frequency usage rights which will only become available again from 2021. Respondents have noted this explicitly and stated that, at this stage, any forecasts are subject to huge uncertainties.

118 As far as the frequencies which will also become available for wireless access in the 450 – 470 MHz band in the medium term and which are currently assigned regionally until 31 December 2021 the Chamber points out the following: Divergent interests have been brought forward for this band, which include public as well as non-public applications, in some cases with public safety responsibilities (cf strategic aspects, loc cit. 3.1). Wide consideration will need to be given to this area and the diverging interests of the various actors and their requirements must also be reconciled.

119 In the long term the frequencies awarded in the 2010 auction in the bands at 800 MHz, 1800 MHz, 2 GHz and 2.6 GHz will become available again from the year 2026. It is also envisaged that these bands, with a total frequency of around 360 MHz, will be made available to the market together in good time. On the other hand, a joint award (cf Scenario 4, scenario paper of 9 November 2012, loc cit.) of frequencies which will

become available in the short, medium and long term would not provide companies with sufficient planning and investment security for the frequency usage rights assigned prior to 2026. These would have to be time limited until 31 December 2025, which would result in short payback periods.

120 As far as the frequencies which become available for wireless access in the short term are concerned, steps must first be taken to ensure that they can be provided promptly in open, transparent and non-discriminatory proceedings which also provide for an appropriate payback period for the investments made by mobile operators, including new entrants. On the other hand, it is not possible to ensure appropriate, non-discriminatory payback periods for frequencies which become available in the medium term. As far as the Federal Government's broadband strategy of promoting a nationwide mobile broadband rollout is concerned the frequencies which are appropriate for this purpose should be made available to the market as soon as possible, while ensuring as much planning and investment security as possible; the current proceedings should not therefore be geared to a "Joint award in 2025" scenario (cf scenario paper, loc cit.).

1.2 Availability

121 Frequencies in the bands at 900 MHz and 1800 MHz will be available for assignment for wireless access from 1 January 2017. Further frequencies in the bands at 700 MHz and 1.5 GHz will also become available during the same period of time.

122 Specifically:

Spectrum	**Spectrum in MHz**	
900 MHz	880 - 915 / 925 - 960	2 x 35
1800 MHz	1725.0 - 1730.1 / 1820.0 - 1825.1 1735.1 - 1758.1 / 1830.1 - 1853.1 1763.1 - 1780.5 / 1858.1 - 1875.5	2 x 45.5
700 MHz	694 – 790 (lower band edge under discussion)	max. 2 x 40
1.5 GHz	1452 - 1492	1 x 40

Table 3

123 Frequencies are available if they are not already being used for other purposes and if the additional assignment criteria stipulated in section 55(5) TKG are met.

124 The rights of use for frequencies in the 900 MHz and 1800 MHz bands will expire on 31 December 2016 and these frequencies will therefore in principle become available from 1 January 2017.

125 It is envisaged that, upon application, the four mobile operators will each be assigned 2 x 5 MHz as "frequency reserve" in the 900 MHz frequency band in the framework of these proceedings. This means that these frequencies will not be available for assignment to other requesting parties (cf 1.4).

126 As part of its demand identification proceedings concerning the availability of the 1800 MHz band (guard channel upper band edge) the Chamber referred to the following (Order no 79/2011, Bundesnetzagentur Official Gazette 23/2011, page 4138 ff. Rationale, Re 2):

> *"The harmonisation of the technical conditions for the availability and efficient use of the 900 MHz and 1800 MHz bands for terrestrial systems capable of providing electronic communications services was effected through Commis-*

sion Decision of 16 October 2009 on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community (2009/766/EC). With regard to the technical conditions for the availability of the above-mentioned frequency bands, the Member States are required under Article 5(2) of the Decision to ensure that the other systems referred to in Article 3, 4(2) and paragraph 1 of this Article give appropriate protection to systems in adjacent bands (GSM-R below 880 MHz and DECT above 1880 MHz). It will only be possible at a later date to stipulate guardbands or coordination measures that may be necessary because these will depend on what technologies are ultimately employed."

127 The free area between frequencies in the 1800 MHz band which has been used to date has been referred to in the demand identification proceedings for the sake of completeness. The current findings of international compatibility tests show that if immediately adjacent channels are used, compatibility with DECT is only achieved if DECT recognises the interference and can switch to other channels. This would lead to a restriction in the capacities available for DECT. The Chamber is not, therefore, including this frequency band in the award proceedings.

128 Currently frequencies are assigned in the frequency bands 700 MHz and 1.5 GHz:

In the 700 MHz band frequencies have been assigned for mobile services for a limited period to the end of 2025. These concern approximately 140 frequency assignments for terrestrial DVB-T service (DVB-T) (cf specifically: Strategic Aspects, loc cit., 4.1). It is possible to migrate existing radio broadcasting to the 470 MHz to approximately 694 MHz frequency band in good time (depending on the band edge which has not yet been defined) in order to make the 700 MHz band available for mobile broadband nationwide. The Bundesnetzagentur can take the necessary measures in consultation with the assignees to ensure that coverage requirements continue to be met in accordance with the legal broadcasting provisions of the Länder. These measures must be agreed with the relevant Land authorities.

129 Measures will also be taken for the secondary use currently being made of the 700 MHz band which will enable these to be used according to demand (cf specifically: Strategic Aspects, loc cit., 4.1).

130 Currently the 1479.5 – 1492 MHz sub-band has been assigned nationally for satellite radio until the end of 2018. However, a survey undertaken at the CEPT level revealed that the entire 1452 – 1492 MHz band is unused. It is therefore envisaged that the entire 1452 – 1492 MHz band should be made available for the efficient use of wireless access in order to provide telecommunications services (cf specifically: Strategic Aspects, loc cit., 4.2).

131 Under section 55(5) sentence 1 para 1 TKG frequencies can only be assigned if they are designated for the proposed use in the frequency plan. The 900 MHz and 1800 MHz bands are allocated on a primary basis to mobile services and dedicated to wireless access for the provision of telecommunications services. The 1.5 GHz frequency band has already been allocated for mobile service at the frequency ordinance level. It is not necessary for a corresponding dedication to wireless access for the provision of telecommunications services to be made in the frequency plan. Both the frequency ordinance and the frequency plan must be amended for the 700 MHz band. The assignment of frequencies in the 700 MHz band depends on allocation for mobile service and dedication for wireless access.

132 The Chamber assumes that sufficiently robust decisions have been made to enable the allocation and dedication of the 700 MHz frequencies to coincide in good time with the award proceedings (at the start of the auction). In addition, the Chamber takes the view that it is necessary but also sufficient that, prior to the award proceedings, if international harmonisation has progressed to such an extent that the essential technical

conditions – including but not limited to the channel plan – are sufficiently stable and that the spectrum to be offered can be determined with sufficient certainty.

133 Under section 53(1) TKG the Federal Government is responsible for stipulating the national assignment of spectrum and other stipulations This is where the authority rests for the allocation of frequency, for the implementation of the relevant findings of the WRC in a legal instrument and then for adding to these as required as well as for the implementation of European and national frameworks. Under section 53(1) sentence 2 TKG the frequency ordinance requires the approval of the Bundesrat. Under section 53(1) sentence 3 TKG the parties affected must be involved in the preparation of frequency allocations.

134 The key elements of the allocation of the 700 MHz frequency band for mobile services on a co-primary basis have already been defined at the WRC-12 in Resolution 232 (WRC-12). Accordingly, allocation will take effect in the Radio Regulations immediately after the WRC-15; the key technical user parameters will be developed in the meantime.

135 Bearing in mind the robust decisions reached at the international level, the Chamber believes it will be possible for the national planning regulations required for the implementation of the Federal Government's broadband strategy to be prepared in parallel to international decisions and that it will accordingly be possible to provide the frequencies for broadband communication at the earliest possible stage.

> *"If all parties involved take joint decisive action, it may even be possible to combine low and high frequency ranges during the next frequency allocation. This improves the prospects of the resources with the best propagation properties from the Digital Dividend actually being used to close gaps in coverage."* (The Federal Government's broadband strategy, page 15)

136 This depends on a national consensus being reached among the parties affected (mobile communications, radio, wireless microphones and authorities and organisations concerned with pubic safety) by these proceedings (cf Strategic Aspects, loc cit.). As far as the provision of the 700 MHz frequencies is concerned, the Federal Government issued the following statement for the record at a session of the Bundesrat in February 2012 (cf BR minutes of plenary proceedings 892, page 4 ff):

> *"With regard to the award - and particularly the auctioning - of frequencies which in the past were allocated to the broadcasting service, the Federal Government herewith undertakes to regulate, together with the Länder, the distribution of proceeds between itself and the Länder on the basis of mutual agreement before the frequency ordinance is passed to the Bundesrat for its approval. The Federal Government is aware that the Länder assume the proceeds will be divided fifty-fifty after deduction of the costs caused by changes."*

137 Bearing in mind consumer interests, in particular, these frequencies must be provided in a way which satisfies consumers' interest in the provision of mobile communications over large areas as well as growing demand for broadband mobile services. The objective, which is also being pursued as part of the broadband strategy, of accelerating the rollout of high-speed telecommunications networks calls for a proactive approach.

138 It will only be possible to award the frequencies as quickly as is envisaged if work is undertaken in parallel to create the conditions required under planning law, in particular work on reaching mutual agreement on changes to the frequency ordinance and plan. As far as the 700 MHz and 1.5 GHz frequency bands are concerned, appropriate account must also be taken of the interests of radio as well as non-public radio applications (such as wireless microphones) and of public authorities and organisations concerned with public safety as well as the German Federal Armed Forces (cf Strategic Aspects, loc cit.). This is particularly the case bearing in mind that authorities and

organisations concerned with public safety have already asserted their requirements in the 700 MHz band.

1.3 Scarcity

139 Based on the substantiated notified requirements of 31 January 2012 (cf here the demand identification proceedings of 21 November 2011, Order no 79/2011, Bundesnetzagentur Official Gazette 23/2011 page 4138 ff.) and taking account of the submissions made by interested parties and other parties affected on 24 April 2012 (cf specifically: Com no 275/2012 , Bundesnetzagentur Official Gazette 8/2012, page 1150 ff.) and 9 November 2012 (cf specifically: Com no 958/2012, Bundesnetzagentur Official Gazette 22/2012, page 3960 ff.) the Chamber is convinced that demand for frequencies in 700 MHz, 900 MHz and 1800 MHz bands referred to above, as well as in the 1.5 GHz band, exceeds the available spectrum and that frequencies are therefore scarce resources within the meaning of section 55(10) sentence 1, 1st alternative TKG. Frequencies will continue to be scarce despite the inclusion of frequencies in the bands at 700 MHz and 1.5 GHz following the launch of the demand identification proceedings.

140 Under section 55(9) sentence 1 TKG it may be ordered, without prejudice to section 55(5) TKG, that the assignment of frequencies be preceded by award proceedings based on conditions according to section 61 TKG as determined by the Chamber, when spectrum is scarce. The scarcity assumed in the two alternatives in section 55(10) sentence 1 TKG can result from either the established fact of a surplus of applications (section 55(10) sentence 1, 2nd alternative) or the forecast of an insufficient number of frequencies being available (section 55(10) sentence 1, 1st alternative.).

141 In consideration of the wording of the law and of the connection between the two possible cases referred to in section 55(10) sentence 1 TKG, the forecast mentioned in the 1st alternative refers to demand exceeding supply at the time of assignment, that is, to a greater number of applications being made than frequencies are available. This forecast is based on the excess demand identified by the Chamber.

142 The procedure that is used to determine demand for spectrum is multi-stage, informative and tried and tested. It takes the form of demand identification proceedings in which the Chamber, paving the way for a decision on issuing an order for award, makes a public call for requirements for particular frequencies to be notified within a suitable period.

143 Official demand identification proceedings are not explicitly prescribed in section 55(10) TKG. However, if they are not carried out prior to an order for award being issued, the Chamber will have to draw on information that offers a comparable guarantee for the accurate recording of current frequency requirements and which is hence not less suitable as a basis for a forecast of – possibly – insufficient spectrum (cf also Federal Admin Court 6 C 3.10, No. 25). Contrary to the views of some respondents, the fact of scarcity is not exclusively determined by the requirements notified.

144 In its decision of 21 2011 the Chamber held that it is appropriate and efficient to initiate demand identification proceedings to determine the frequency required in the 900 MHz and 1800-MHz bands as the first procedural step in order to ensure that frequencies are assigned in open, objective, transparent and non-discriminatory proceedings (cf specifically the decision of 21 November 2011).

145 Total substantiated demand for spectrum exceeds the volume of available frequencies in the 900 MHz and 1800-MHz bands. Six undertakings have given notice of or announced their requirements in demand identification proceedings. Bearing this in mind the Chamber has taken account of requirements for which the interested undertakings have been able to demonstrate the plausibility of their need for spectrum in line with

substantiated demand identification proceedings. The Chamber has therefore determined potential scarcity of spectrum by including frequencies for which interested undertakings have notified requirements and which such undertakings can clearly and conclusively guarantee they can put to efficient and interference-free use within the meaning of section 55(5) sentence 1 para 4 TKG at the time of assignment. This clear and conclusive account must cover not only the subjective requirements of reliability, efficiency and specialist knowledge but also present a convincing concept for intended use of the frequencies for assignment. Respondents' demands have been met in as much that a mere declaration of interest or the announcement of requirements are not sufficient criteria for inclusion when demand is identified.

146 The Chamber consequently applies stringent criteria before notified requirements can be included in demand identification proceedings with the aim of ensuring that notification of demand is plausible. In principle, requirements notified in demand identification proceedings must be put forward in much the same way as in a qualification procedure for an auction within the meaning of sections 55(4) and 5, 61(4) sentence 3 TKG, without the need, however, to present applicable documentary evidence. The decision of 21 November 2011 on demand identification proceedings puts this as follows:

> *"Re 5. Putting forward spectrum requirements*
>
> *Participation in proceedings to identify demand is not restricted. All interested undertakings are invited to put forward their spectrum requirements in the 900 MHz and 1800 MHz bands as from 1 January 2017. Some respondents called for participation in the proceedings to be restricted to the undertakings which currently operate mobile services. This will not be done, as there is no apparent legal or objective reason for such restriction.*
>
> *In order to ensure that the notification of demand is plausible and seriously meant, the notifications have been made subject to specific requirements. In requiring this, the Chamber has aligned itself with the majority of respondents, who called for the proceedings to require notifications to be properly substantiated. In line with the purpose of identifying demand - to establish whether demand is likely to exceed supply as the basis for forecasting whether the number of applications is expected to exceed the frequencies available (section 55(9) sentence 1 1st alternative TKG) - demand notifications that also take account of the objective and subjective criteria for future frequency assignment (section 55 subsections (3), (4) and (5) TKG) when interest in a particular usage is set out, are particularly convincing.*
>
> *Preconditions for assigning frequencies are that "their efficient and interference-free use by the applicant is secured" and "their compatibility with other frequency usages is given" (see section 55(5) sentence 1 subparas 3 and 4 TKG). Interested undertakings are thus called on to set out clearly and conclusively that efficient and interference-free use by them within the meaning of section 55(5) sentence 1 subpara 4 TKG will be securely established at the time of assignment. This clear and conclusive account must cover not only the subjective requirements of reliability, efficiency and specialist knowledge but also present a convincing concept for intended use of the frequencies for assignment.*
>
> *For efficient use of this spectrum, an aim to which the TKG is committed, it is recommended that applicants provide such accounts with reference to their particular business model. This is especially relevant if they already hold suitable spectrum with which to implement their business model, as was also requested by respondents. In this context the Chamber has thus decided not to adopt the proposal of a respondent who called for the proceedings to take due account of the fulfilment of assignment conditions at a past time.*

147 For further details on requirements concerning the plausibility of demand for spectrum subject to the criteria of reliability, efficiency and specialist knowledge as well as the frequency usage concept for the technical implementation of the planned service concept the Chamber makes reference to its statements in the decision of 21 November 2011 (loc cit., page 19 ff.). At this stage of the proceedings it would place an unreasonable burden on parties requesting assignment to expect them to provide evidence (such as financing commitments) in addition to plausible frequency requirements – not least owing to the cost of providing such evidence. The Chamber cannot therefore accept the call, made by some respondents in their responses to the scenario paper, that account should not be taken when identifying demand for frequency of the requirements notified by applicants who have not demonstrated fulfilment of assignment conditions in the past. The Chamber wishes to point out that:

148 Evidence cannot be demanded in the framework of demand identification proceedings: this means that notified requirements do not have to meet the same criteria as is expected for an application for assignment/approval application. It is necessary but also sufficient that the subjective assignment requirements as well as a frequency usage concept are presented clearly and conclusively during the demand identification proceedings. This corresponds with the principle of proportionality. The information which needs to be presented in the course of demand identification proceedings must not be such as to impose an unreasonable burden on undertakings and its scope must be appropriate and limited to information which is relevant for the purpose of the demand identification proceedings. Evidence that these requirements are met can therefore only be asked for in the course of the application and qualification process.

149 In this connection the Chamber points out that the purpose of the notified requirements is to identify potential excess demand and the legally envisaged procedures which consequently arise for frequency assignments. Demand is identified as provided in section 55 TKG as well as on the basis of clear, objective and non-discriminatory proceedings. It is essential that the Chamber can act on the basis of frequency requirements that are rooted in objective fact and reflect the actual requirements of interested undertakings. The exercise of strategic influence on this objective procedure and the actual demand situation in the market is therefore incompatible with the purpose of the demand identification proceedings.

150 The frequencies will only be assigned by the Bundesnetzagentur upon written application and only after participation in award proceedings. The Bundesnetzagentur will issue a call to apply for usage rights shortly before conducting particular proceedings for assigning the spectrum, section 61(4) sentence 3 TKG. Applicants which have already declared their substantiated interest in specific frequency usage in the bands at 900 MHz and 1800 MHz in the demand identification proceedings are also required, under section 55(4) and (5) TKG, to provide more detailed accounts and evidence of compliance with the legal requirements for assignment under section 61(4) sentence 5 TKG.

151 The Chamber considers all substantiated notified requirements to be sufficiently informative for the purpose of forecasting that the number of applications may be expected to exceed the available frequencies in the 900 MHz and 1800 MHz band (cf section 55(10) sentence 1 1st alternative TKG).

152 The Chamber still considers all the notified requirements dating from the year 2012 to be stable. In accordance with the decision of 21 November 2011 the undertakings have presented clear and conclusive concepts for a planning period of five years and longer. The results of the demand identification proceedings were presented to the public at an information event held on 9 November 2012. The interested undertakings thereby confirmed and upheld their notified requirements.

153 After evaluating the notified requirements the Chamber concludes that total notified requirements exceed the spectrum available in the bands at 900 MHz and 1800 MHz.

154 Based on the actual spectrum available for the award proceedings in the 900 MHz and 1800 MHz bands the Chamber has identified excess demand of 2 x 55 MHz (paired). The spectrum available for these proceedings is shown again in the following table:

Spectrum	**Spectrum in MHz**	
900 MHz	880 - 915 / 925 - 960	2 x 35
1800 MHz	1725.0 - 1730.1 / 1820.0 - 1825.1 1735.1 - 1758.1 / 1830.1 - 1853.1 1763.1 - 1780.5 / 1858.1 - 1875.5	2 x 45.5

Table 4

155 Bearing in mind the envisaged channel arrangement of 5 MHz this means that 2 x 35 MHz in the 900 MHz band and 2 x 45 MHz in the 1800 MHz band can be provided. As a result, only 2 x 45 MHz (paired) is actually available in the 1800 MHz band instead of the 2 x 50 MHz (paired) identified in the demand identification proceedings. The free area between frequencies in the 1800 MHz band which has been used to date has been referred to in the demand identification proceedings for the sake of completeness. The current findings of international compatibility tests show that if immediately adjacent channels are used compatibility with DECT is only achieved if DECT recognises the interference and can switch to other channels. This would lead to a restriction in the capacities available for DECT. The Chamber does not, therefore, include this frequency band in the award proceedings.

156 Based on the originally identified availability the Chamber published the findings of the demand identification proceedings in Communication 958/2012 of 21 November 2012 (Official Gazette 22/2012) on excess demand in the Official Gazette of the Bundesnetzagentur:

> *"The frequencies available in the bands from 880 – 915 MHz and from 925 – 960 MHz as well as from 1725 – 1785 MHz and from 1820 – 1880 MHz are to be made available for wireless access after 1 January 2017:*
>
> | *Spectrum* | *Frequency band* | *Volume* |
> |---|---|---|
> | *900 MHz* | *880 - 915 MHz and 925 - 960 MHz* | *2 x 35 MHz* |
> | *1800 MHz* | *1725 - 1730.1 MHz and 1820 - 1825.1 MHz*
1735.1 - 1758.1 MHz and 1830.1 - 1853.1 MHz
1763.1 - 1785 MHz and 1858.1 - 1880 MHz | *2 x 5.1 MHz*
2 x 23 MHz
2 x 21.9 MHz |
>
> *Table 1*
>
> *This means that total spectrum of 170 MHz will be available in the future in both frequency bands for assignments.*
>
> *Six undertakings have given notice of or announced their requirements in demand identification proceedings. The following table summarises the notified requirements for both frequency bands; the calculated total thereby exceeds the available spectrum:*
>
> | *Spectrum* | *Amount of spectrum available* | *Total notified requirements* |
> |---|---|---|
> | *900 MHz* | *2 x 35 MHz* | *Approximately 2 x* |

Spectrum	*Amount of spectrum available*	*Total notified requirements*
		55 MHz
1800 MHz	*2 x 50 MHz*	*Approximately 2 x 80 MHz*

Table 2

Total notified requirements for the 900 MHz band exceed the available spectrum by 40 MHz. Total requirements notified for the 1800 MHz band exceed the available spectrum by 60 MHz.

As far as the interest shown is concerned it must be concluded that the GSM network operators, who have been assigned frequencies to date have notified their demand for spectrum. Interest has primarily been expressed in obtaining planning and investment security as soon as possible by prolonging frequency usage rights and making assignments more flexible. Most network operators anticipate consistently high demand for GSM mobile services in the medium term. In addition to continued operation of the GSM network in the medium term, demand for spectrum is also anticipated in the short, medium or long term - depending on frequency band - for the operation of LTE systems.

Other undertakings have also expressed their interest in using frequency in the bands at 900/1800 MHz in the future."

157 In contrast to the scenario paper referred to above, total excess demand actually amounts to 2 x 55 MHz (paired). The requirements notified for the 900 MHz band exceed the available spectrum by 2 x 20 MHz (paired). The requirements notified for the actually available 1800 MHz spectrum exceed the available spectrum by 2 x 35 MHz (paired).

158 What is more, bearing in mind the notified requirements referred to above and the submissions made by interested parties and other parties affected on market, technical and international developments on 24 April 2012 (cf specifically Order no 275/2012, Bundesnetzagentur Official Gazette 8/2012 of 2 May 2012) the Chamber is convinced that demand for frequencies in the 900 MHz and 1800 MHz bands will exceed the available spectrum, even if the 700 MHz band is included, and that frequencies are therefore scarce within the meaning of section 55(10) sentence 1, 1st alternative TKG.

159 In this context the Chamber initially draws on the fact that with the 700 MHz band – contingent on international harmonisation and definition of the lower band edge and a channel plan (cf specifically: Strategic Aspects, loc cit., 4.1) – between 2 x 30 MHz (paired) and a maximum of 2 x 40 MHz (paired) will be available for wireless access. This means that, with the 700 MHz, 900 MHz and 1800 MHz bands, a total of up to 2 x 120 MHz paired spectrum will be made available.

160 Bearing in mind total identified excess demand of 2 x 55 MHz for paired radio frequencies in the 900 MHz and 1800 MHz bands, the calculated inclusion of the 700 MHz band results in a continuing scarcity of spectrum of at least 2 x 15 MHz – dependent on actually available spectrum in the 700 MHz band.

161 In its considerations the Chamber realises that including the 700 MHz band would extend the scope of demand identification. However, the Chamber believes it is legitimate to include further interchangeable frequencies in order to avoid regulation-induced scarcity. The outcome of the auction of the 800 MHz spectrum in 2010, for example, illustrated the fundamentally high level of demand for frequencies below 1 GHz. This is not invalidated by the fact that no explicit demand was notified for 700 MHz frequencies as the Telecommunications Act does not create any right to assignment of specific frequencies.

162 The Chamber is convinced that the substantiated requirements notified by interested undertakings provides insights which offer a comparable guarantee for the accurate recording of current demand and is hence not less suitable as a basis for a forecast of insufficient spectrum than a formal demand identification survey which includes the 700 MHz band.

163 This procedure conforms with the Telecommunications Act, section 55(10) TKG which does not explicitly call for formal demand identification proceedings. In this respect the Chamber has thus decided not to adopt the proposal of respondents who are calling for a further hearing and separate demand identification proceedings in this case. As far as 700 MHz frequencies are concerned, the costly procedures which have been proposed would not be appropriate given that the frequencies are intended to be included in the proceedings at the earliest possible time in order to make an important contribution to providing high-speed broadband coverage to the population over large areas; this would also be incompatible with the principle of carrying out simple, prompt and purposeful proceedings as required by section 10 of the Administrative Procedures Act (VwVfG).

164 In identifying frequency requirements for the purpose of determining excess demand the Chamber included available spectrum in the 700 MHz, 900 MHz and 1800 MHz bands which are suitable for the purpose of implementing the business models of the parties which have notified their requirements. During the demand identification proceedings the parties requesting assignment submitted concepts for the intended use of certain frequencies in the bands at 900/1800 MHz which are based on their own business models. In doing so the relevant undertakings provided consistent planning information on the use of the frequency bands below and above 1 GHz for nationwide network infrastructures.

165 The Chamber takes the view that frequencies in the 700 MHz band, which are interchangeable with the 900 MHz as well as 1800 MHz frequencies, can also be considered.

166 The Bundesnetzagentur proposes dedicating frequencies in the 700 MHz band in Germany for wireless access for telecommunications services. This would mean that these frequencies, and those in the bands at 900 MHz and 1800 MHz, would be available on a technology and services-neutral basis for wireless access and frequency bands could be used to meet demand - according to undertakings' specific business models - from consumers for mobile telephone services.

167 The physical and technical propagation properties of 700 MHz frequencies are comparable with those of 900 MHz frequencies. Frequencies in the 700 MHz band have the same cell range as frequencies in bands at 900 MHz and 800 MHz. Existing network structures (locations and cell sizes) can therefore be used almost unchanged by existing network operators. 700 MHz frequencies are also interchangeable with 900 MHz frequencies for new entrants, given that existing plans for the expansion of networks based on 900 MHz can also be achieved with 700 MHz.

168 The 700 MHz spectrum and 1800 MHz spectrum are also to some extent interchangeable. The 1800 MHz spectrum is particularly suitable for increasing capacities as well as, in principle, for serving wide sweeps of land. It is also possible, however, to increase capacity with spectrum below 1 GHz. The existing 1800 MHz infrastructures could be used with spectrum below 1 GHz. 700 MHz frequencies are also interchangeable with 1800 MHz frequencies for new entrants, given that existing plans for the expansion of networks based on 1800 MHz can also be achieved with 700 MHz

169 Bearing in mind the identical potential uses arising from identical dedication and technical interchangeability of spectrum in the bands at 700 MHz, 900 MHz and 1800 MHz, it is possible to include 700 MHz when forecasting scarcity, even if the frequencies in the 700 MHz band have not been included from the very start.

170 Because of the interchangeability which is possible both below and above 1 GHz it is not possible to assess the scarcity of this spectrum in isolation. On the contrary, inclusion of further spectrum of 2 x 30 MHz through to 2 x 40 MHz can lead to a reduction in existing excess demand. By including as much spectrum as possible in the proceedings the Chamber is adhering to the principle of avoiding regulation-induced scarcity.

171 Ultimately the figures show, therefore, that frequency continues to be scarce even if the 700 MHz band is included.

172 At the same time, the Chamber recognises that the parties requesting assignment have primarily expressed their preferences regarding the continuation of existing business models in the framework of the notified requirements.

173 Current mobile operators have given notice of their requirements for 900 MHz and 1800 MHz band in order to continue offering their current GSM mobile services using the existing infrastructure. In this context, attention has been drawn to the fact that almost 100 percent of the population is currently provided with GSM mobile services – including in particular voice communication – with the current spectrum at 900/1800 MHz. In addition, however, these frequencies should also be used for innovative broadband mobile services in the future. In this context the undertakings emphasise that GSM will be "phased out" as of the year 2020. At this time at the latest it is envisaged that these frequencies should be used for mobile broadband services and for continued voice communication.

174 The Chamber recognises that, in the forthcoming proceedings, mobile telecommunications companies have a preference for frequencies in the 900 MHz and 1800 MHz bands as these frequencies can be used to build network infrastructures with which voice communication and data services can be provided over large areas. The Chamber is convinced that there will continue to be demand for these GSM services for a certain period of time to come. At the same time, demand for broadband services will continue to rise (cf specifically: Com no 275/2012, Bundesnetzagentur Official Gazette 8/2012, S. 1150 ff.) and that suitable spectrum should therefore be provided to meet this demand.

175 The Chamber takes the view that the preference expressed by mobile telecommunications companies should be recognised for a period of time. This does not, however, mean that the frequencies need continue to be assigned on the same scale and with the same channel arrangement.

176 As far as the preference for 900/1800 MHz expressed by the parties requesting assignment is concerned, the Chamber must take into account that existing network operators expressed their preference against the backdrop of the continued operation of GSM. Even there continues to be demand for GSM for a certain period of time to come and if a "phase out" is expected in 2020, the Chamber nonetheless takes the view that a preference for frequencies in the sense of continued use of the entire spectrum cannot militate against inclusion of the 700 MHz band when forecasting scarcity. The continued use of existing infrastructures in their current form would basically mean retaining existing competition and market structures, but would not create any incentives for innovation or more intensive competition. This cannot be considered to provide the basis for a regulatory decision the purpose of which is to promote new and better infrastructures as well as efficient investments and non-discriminatory access to spectrum where resources are scarce. This is why frequency usage rights are usually granted for a limited period of time. This means that there can be no legitimate interest in the continuing and comprehensive existence of these rights. This may be the case in exceptional circumstances if required by the regulatory aims of section 2(2) TKG.

177 Under section 55(6) TKG there can be no claim either to any particular frequency. This means that preferences for certain frequencies may be expressed, but that at the same time they cannot acquire any binding effect for an assignment. In the interest of meeting the statutory duties under section 52 TKG necessary flexibilisation is created

to ensure that, particularly in the case of scarce frequencies, it is possible to make reference to equivalent frequencies (cf reasoning in section 53(5) E-TKG, Bundesrat printed paper 755/03). If the parties requesting assignment can point to equivalent spectrum at 700 MHz, this spectrum can also be included when forecasting scarcity, even if this spectrum was not included in the corresponding notified requirements.

178 The preference expressed in the statements made by mobile operators concerning assignment/extension of current frequency assignments would entail maintaining the fragmentation of the 900 MHz band. However, the fragmentation of band contradicts the principles of technology and service neutrality stipulated in section 1 TKG and the efficient use of spectrum under section 2(2) para 7 TKG which, therefore, also provide grounds for not complying with preference of this kind (section 55(5) sentence 2 TKG). When providing the available spectrum account must rather be taken of the circumstance that a technology change will take place in the foreseeable future after which preference will be given to technical systems which use a channel bandwidth of 5 MHz and a multiple of this. Providing frequencies in 5 MHz blocks would enable use of technologies which are available for broadband high-speed networks as well as the continuation of previous business models which are based on existing GSM infrastructures.

179 What is more, some mobile operators have themselves identified spectrum at 700 MHz as suitable for broadband rollout, although this should only take place after the WRC-15 given that the framework conditions for the use of the band have not as yet been firmly defined. The 700 MHz spectrum will be provided at a later point in time, where applicable with other spectrum which is available at that time.

180 The Chamber is also convinced that there will continue to be excess demand even after inclusion of the 1.5-GHz band and that frequencies will continue to be scarce within the meaning of section 55(10) sentence 1, 1st alternative TKG.

181 It is envisaged that frequencies in the 1.5 GHz band – as well as frequencies in the 700 MHz band – will be dedicated for wireless access. At the international level use of the 1.5 GHz band as a "supplementary downlink" is favoured.

182 Unpaired frequencies at 1x 40 MHz are available in this spectrum. As international harmonisation currently stands, it is apparent that the frequencies are suitable for use in the framework of existing mobile networks and the frequencies will be included in the proceedings for this reason.

183 The Chamber takes the view that frequencies will remain scarce even if unpaired spectrum is included in the 1452 – 1492 MHz band. Unpaired frequencies are not interchangeable with paired frequencies. In contrast to paired frequencies, unpaired frequencies are not suitable for the use of technical systems based on the frequency division duplex (FDD) method. What is more, mobile networks across large areas of Europe are mainly based on the use of paired spectrum.

184 Despite the anticipated technology and services-neutral dedication of the 1.5 GHz band for wireless access, it is not possible simply to assume, on the basis of frequency usage concepts and the business models of interested undertakings which are based exclusively on the use of frequency in symmetrically paired frequency bands – primarily by continuing to use existing GSM networks with frequency division duplex systems or (future) use for broadband networks – that, in comparison with the 700 MHz, 900 MHz and 1800 MHz band, interested undertakings would assign substitutive but complementary properties to the 1.5 GHz band and inclusion of these frequencies would not therefore solve existing excess demand.

185 Joint award of all the spectrum available, including the 1.5 GHz frequencies, reflects the President's Chamber's practice of providing all the available frequencies in one set of proceedings (consistency requirement). The potential of 1.5 GHz frequencies

should also be exploited as rapidly as possible in order to promote broadband rollout in Germany within the meaning of the broadband strategy.

186 Inclusion of these frequencies is also a suitable means of promoting the regulatory aims of the TKG. In addition to the paired frequency bands provided in these proceedings these frequencies are also a suitable means of promoting mobile broadband rollout in urban and rural regions in the interest of consumers within the meaning of section 2(2) para 1 TKG. By including these frequencies in the proceedings, the Chamber is making all the available frequencies available for wireless access to the parties requesting assignment. These will then be in a position to provide the higher capacities in the downlink which are required by most high performance mobile data networks within the meaning of section 2(2) para 5 TKG. Provision of these frequencies, which can be used together with paired spectrum, also ensures efficient use of these frequencies within the meaning of section 2(2) para 7 TKG. Depending on their business models and their acquisition of paired frequencies, the parties requesting assignment will then able to obtain and make efficient use of an optimum spectrum package. Potential value and use interdependencies between the different frequency bands can only be taken into account by making provision in a procedure on the largest possible scale.

187 These notified requirements and the excess demand arising from them therefore form the factual basis for Chamber's forecast decision. The Chamber accordingly assumes that there will not be sufficient suitable spectrum available. The forecast decision reached by the Chamber under section 55(10) sentence 2, 1st alternative TKG is based on a comprehensive consideration of all the relevant facts which are relevant in clarifying the availability of sufficient spectrum at the time of award.

188 Bearing in mind the requirements that have been notified to date and the inclusion of internal and international forecasts on market, technological and international developments, the Chamber takes the view that at the time of the award the number of applications exceeds the number of frequencies available.

189 After taking into account all the circumstances, and the relevant objective facts in particular, the President's Chamber forecast must be reached on the basis of objective, transparent and non-discriminatory proceedings. At the same time account must also be taken of future developments on the market and, in addition to the use which is currently being made of spectrum and existing technologies and service offers, of foreseeable technical developments and innovative services.

190 Bearing in mind the complexity of measures to regulate frequencies on the one hand and the dynamic development of markets and ever shorter development cycles for innovative technologies on the other, a forecast cannot simply reflect the existing status quo but must, wherever possible, also include foreseeable future developments to ensure that frequency regulation takes account of the dynamic conditions which prevail in the market. For this reason, when reaching a decision relevant to scarcity, the Chamber regards one of its main tasks to be not only evaluating requirements which have already been notified but also assessing future market and technology developments in order to provide frequencies in a competitive environment in a way which satisfies demand and requirements.

191 The Chamber has come to the conclusion that parts of the spectrum which have been used for GSM to date will continue to be used for GSM services for a certain period of time to come. In addition to the incremental changeover from GSM to broadband technology, it is also necessary that additional spectrum is provided for mobile broadband at the earliest possible date. From the point of view of the Chamber the demand referred to in the notified requirements is adequate if a somewhat short-term view is taken of the need for spectrum, particularly for current mobile telephone offers. In terms of an assignment period of around 10 to 15 years in the field of mobile communications the Chamber also takes account of medium-term developments in mobile

communications and is providing further frequencies for broadband rollout in the 700 MHz band.

192 Against the backdrop of the successes achieved to date in the mobile communications market in Germany the Chamber regards the enormous dynamism of technical developments, the development of service offers, an appropriate price structure as well as the permanently growing number of users who are making increasing use of mobile broadband services as indicators that there will continue to be growing demand for suitable spectrum resources for the continuing rollout of the broadband network. The statements made by respondents to the analysis paper also provide fundamental confirmation of the assessments made by the Chamber.

193 Bearing in mind the rapidly growing number of customers who are making use of mobile data services as well as dynamic technological developments in the field of terminal devices (eg smartphones), rapidly growing demand for mobile broadband services (the key term here is "mobile Internet") will inject further impetus into the further rollout of high-speed broadband networks. The number of smartphones and tablets sold in Germany, for example, has risen substantially. In the year 2013 four out of five mobile phones sold are expected to be smartphones (cf BITKOM press release of 13 February 2013 and 19 April 2013). More smartphones were sold on the German market than conventional mobile phones for the first time in 2012 (cf Comscore study on "Digitales Deutschland", 2013).

194 In terms of the objectives of its broadband strategy the Federal Government's aim is to provide the population across large areas with 50 Mbit/s by the year 2018. In order to achieve these objectives coverage will need to be extended to poorly served areas in good time and the available data rates increased. It will only be possible to meet rising demand for high bit rate data services, however, if bandwidths of 10 MHz and more are used. The continuing technical development of LTE into LTE Advanced will be standardised with a bandwidth of up to 100 MHz.

195 The key objective of the broadband strategy is that broadband rollout will primarily be undertaken competitively by telecommunications companies subject to market forces. In order to provide stimulus for broadband rollout, including in rural communities, further suitable spectrum resources will need to be provided for this purpose. The more sufficient and suitable spectrum is made available to undertakings for broadband rollout over large areas, the more the pace of development will be stepped up in the context of competition for infrastructure.

196 Wireless high-speed networks are an essential precondition for the provision of access to innovative mobile broadband services, whereby existing and still growing high demand for services such as voice and SMS will continue to use up corresponding network capacities. Correspondingly high network capacities will be required for this purpose. Increases in network capacities are influenced by technological developments in network elements and terminal devices, as well as the optimisation of network architectures which contribute to an efficient use of existing spectrum resources. Nonetheless, these measures will need to be accompanied by the early provision of additional suitable spectrum resources.

197 Foreseeable growth in demand for mobile broadband services means that the broadband objectives of providing at least 50 Mbit/s over large areas can only be met if corresponding transmission capacities can be provided cost efficiently. The Chamber does not believe that other measures – such as making networks more dense – would be as cost efficient a way of providing services to rural areas outside metropolitan areas. On the contrary, provision of services across large areas to increase capacity – particularly in rural areas - with twice as much available spectrum can be achieved far more cost efficiently than by making networks more dense which would involve a substantial increase in the number of locations. Acquiring new locations is a time consuming and costly undertaking. Rapid and cost efficient rollout to rural communities using

the 800 MHz frequencies awarded in 2010 was primarily intended to ensure that existing locations could be used. This demonstrates that incentives for the continued rollout of high-speed wireless broadband networks in rural communities and achievement of the objectives of the broadband strategy depend on sufficient spectrum being provided below 1 GHz. The digital divide between urban and rural areas would then grow even wider.

198 International studies on future market developments are also based on the assumption of an enormous increase in data volumes and corresponding frequency requirements. The ITU (International Telecommunication Union) forecasts demand for mobile broadband up to the year 2020 in its report ITU-R M.2243 (Assessment of the global mobile broadband deployments and forecasts for International Mobile Telecommunications, http://www.itu.int/pub/R-REP-M.2243-2011). The huge success of new technologies and devices, such as smartphones or tablet PCs, innovative applications as well as new business models and the resulting change in behaviour of cell phone customers have already led to a far greater volume of data than predicted in the ITU's Report ITU-R M.2072 for period 2007 to 2011. In 2011 the ITU consequently adjusted its projections for volumes of data traffic up to 2015. A recent Cisco forecast from the year 2013 (Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2012–2017) suggests that even these adjusted figures will be exceeded.

199 The Chamber forecasts that, bearing in mind notified requirements as well as market and technological developments, more applications will be made for award of frequencies in the bands at 700 MHz, 900 MHz, 1800 MHz and 1.5 GHz than frequencies are available.

1.4 Order of award proceedings

200 The order for award proceedings is made under sections 55(10) and 61 TKG and Article 87f GG, section 2(2) and (3) and section 55(4) and (5) TKG in such a way that the assignment of frequencies for wireless access for provision of telecommunications services in the 700 MHz, 900 MHz, 1800 MHz bands and other frequencies in the 1.5 MHz band must precede award proceedings in connection with the assignment of 2 x 5 MHz (paired) in the 900 MHz band on the application of the four mobile operators.

201 Under section 55(10) TKG the Bundesnetzagentur "can" order - without prejudice to subsection 5 - that frequencies are assigned before award proceedings are ordered under section 61 TKG. If frequencies are scarce, the law is such that award proceedings must be ordered. Under current conditions of scarcity, it is only possible to renew frequency assignments in exceptional cases if this is necessary in order to meet regulatory aims, pursuant to section 2(2) TKG. Renewal would be required if award proceedings were unsuitable for the purpose of achieving the regulatory aims. In this context the Federal Administrative Court has ruled that:

> *"In the event of scarcity section 55(9) sentence 1 TKG in principle excludes individual assignment of the relevant frequencies. Owing to the binding nature of the basic rights in Article 12(1) and Article 3(1) of the Basic Law (GG) and the prohibition of discrimination under European law (Article 5(2) para. 2, Article 7(3) of the Authorisation Directive, GRL), the law requires that Bundesnetzagentur's discretionary decision ("can") in situations such as these should in principle take the form of an order for award. Only in exceptional cases is it possible, taking account of the regulatory aims, to waive the order of award proceedings despite scarcity of frequency (ruling of 26 January 2011 loc cit. No 25 with further citations). In this respect explicit discretionary consideration need not be given as a rule, but only in exceptional cases."* (cf Federal Administrative Court, ruling of 23 March 2011, 6 C 6/10, No 23)

202 There are insufficient frequencies available in the 700 MHz, 900 MHz and 1800 MHz bands for frequency assignments (cf 1.3). Under section 55(10) TKG the law envisages award proceedings owing to the scarcity of these frequencies.

203 Award proceedings and the assignment of 2 x 5 MHz (paired) in the 900 MHz band upon application by the four mobile operators are an appropriate means of ensuring that the Bundesnetzagentur fulfils its statutory task and, in contrast to the views expressed by respondents, there is no requirement to renew the GSM frequency usage rights.

204 The Chamber does, however, take the view that the mandate to ensure the availability of telecommunications infrastructure under Article 87 f GG and the regulatory aims of section 2(2) TKG would support the assignment, in the frequency band 900 MHz, of a total of 2 x 20 MHz (paired) frequency blocks of 2 x 5 MHz (paired) on a non-discriminatory basis to each of the four mobile operators for wireless access in the framework of the award proceedings as individual assignments upon application.

205 The proposal made by the Chamber is based on the following considerations:

In order to fulfil the infrastructure mandate stipulated by Article 87f GG and to safeguard the regulatory aims of section 2 TKG it is also necessary, in the event of scarcity, in exceptional cases to provide part of the available spectrum in the 900 MHz band for the existing assignees in the form of individual assignments. Award proceedings should not, therefore, be held for this part of the 900 MHz spectrum which totals 2 x 20 MHz (paired). Conducting award proceedings for these frequencies would not be appropriate in the same way for the purpose of safeguarding both the mandate to ensure the availability of telecommunications infrastructure and the regulatory aims of the Telecommunications Act.

206 Under Article 87f (1) GG the Federal Government must guarantee the provision of adequate and sufficient nationwide telecommunication services. Under Article 87 f (2) GG, services are provided on a private enterprise basis by undertakings which have emerged from the special asset (Sondervermögen) Deutsche Bundespost and by other private providers. Adequate and sufficient nationwide services within the meaning of Article 87f GG can only be provided if an efficient telecommunications infrastructure is in place in which investments would be made by an efficient company which is subject to competition.

207 At present there are four practically nationwide mobile networks which are optimally placed to provide mobile voice communication, primarily on the basis of existing GSM infrastructures. Demand from consumers for mobile voice communication continues to be high and is continuing to grow at a high level. The Bundesnetzagentur's 2012 annual report shows that voice telephony will continue to increase in the mobile communications sector.

208 The Chamber takes the view that the infrastructure mandate requires that existing infrastructures are maintained in order to provide adequate and sufficient services to the population. In this context it is in the interest of consumers to provide new broadband services at affordable prices in addition to existing GSM mobile telephone services. In this respect the aim must be for existing infrastructures to be operated with efficient technologies and not just with current GSM systems. It is therefore envisaged that frequencies which it is planned will also be assigned individually in order to maintain existing infrastructures should be made available on a technology neutral basis for wireless access.

209 This procedure would also contribute to the implementation of the objectives of the broadband strategy which envisages wireless infrastructures as the second pillar of broadband coverage. The broadband strategy (page 13) describes this as follows:

"Our frequency policies aim to make optimum use of radio frequencies. These are a limited resource. The Federal Government supports the approach taken by the Bundesnetzagentur, which seeks to involve all affected sectors and the technical community in maximising the flexibility of frequency use and removing its dependence on particular technologies. For example, the Bundesnetzagentur is currently collecting views on the future possible use and distribution of the existing GSM spectrum to cater for next-generation mobile technologies. Today's broadband mobile networks mainly serve densely populated areas. This coverage will be improved. In future, the frequency bands around 900 MHz, which are currently used by GSM networks, are to be freed up to all forms of wireless network access, regardless of the technology employed."

210 Sufficient suitable spectrum below 1 GHz (known as rural area spectrum) is necessary to safeguard the infrastructure mandate. 2 x 5 MHz (paired) in the 900 MHz band are necessary but also sufficient owing to the foreseeable changeover to new technologies with typical block sizes of 5 MHz. This would enable a nationwide infrastructure to be maintained or realised on a technology neutral basis. Owing to their physical wave propagation capabilities frequencies in the 900 MHz band are suitable for the cost efficient expansion of the network, particularly in rural regions. In addition, existing network operators can also use spectrum in other frequency bands to supply rural communities and to provide capacity for mobile services. The broadband strategy also underlines the special importance for nationwide broadband coverage of frequencies in the 900 MHz band compared with frequencies over 1 GHz (page 14):

"However, most of this spectrum is found within the frequency range above 1,000 MHz (1.8 GHz, 2 GHz, 2.6 GHz). Developing mobile networks within this range would therefore be a very costly exercise – the expectation is that only a small proportion of the spectrum would be used to supply less densely populated areas."

211 Provision of the entire available spectrum in award proceedings is not an equally suitable way of ensuring fulfilment of the mandate to ensure the availability of telecommunications infrastructure under Article 87 f GG. In the framework of award proceedings entitlement to the assignment of frequency is transformed into the entitlement to take part in an objective, comprehensible and non-discriminatory procedure. This goes hand in hand with the opportunity for access to spectrum, although it is not possible to ensure that all existing network infrastructures in the frequency 900 MHz band can be maintained to provide consumers with mobile services over a large area. The maintenance of sufficient infrastructures in this band can be ensured by making assignments of 2 x 5 MHz (paired) for uninterrupted supply to consumers. This is consequently the lightest form of regulation compared to the renewal of all frequency assignments which has been requested by some respondents.

212 The award proceedings in combination with the assignment of 2 x 5 MHz (paired) in the 900 MHz band on application from the four mobile operators is an appropriate way of ensuring the regulatory aims of section 2(2) TKG are met.

213 The performance of award proceedings fundamentally meets the regulatory aims of safeguarding consumer interests required by section 2(2) para 1 TKG, ie of obtaining the greatest possible benefits for consumers with regard to choice, quality and price. A technology and service-neutral assignment of available frequencies makes it possible, regardless of the business models used by mobile operators and demand from consumers, to continue supplying large areas with voice communication and to rollout the broadband infrastructure. The form which the award proceedings take creates incentives for frequencies to be used as quickly and efficiently as possible to enable innovative services to be provided to consumers at affordable prices.

214 Nonetheless, the Chamber takes the view that, in order to safeguard consumer interests as required by section 2(2) para 1 TKG, 2 x 5 MHz (paired) must be assigned in-

dividually to each of the four mobile operators. More than 100 million SIM cards are currently being used in the four mobile networks (cf Bundesnetzagentur's 2012 annual report). These cards are distributed among approximately 20 – 37 million subscribers per mobile network operator (cf www.bundesnetzagentur.de). The 900 MHz and 1800 MHz frequencies in particular are used to provide almost 100 percent of the population with mobile services. Consumers' interest in nationwide use of mobile services – and voice communication in particular – will remain unchanged in the future. At the same time there is also growing consumer demand for nationwide mobile broadband services. In order to ensure that consumers can continue to use mobile services and to ensure the greatest possible benefits for consumers in terms of choice and quality of mobile services nationwide – particularly in rural regions – as well as in terms of appropriate prices, it is necessary but also sufficient for 2 x 5 MHz (paired) to be made available to ensure the continuing cost-efficient existence of the four GSM infrastructures. Bearing in mind physicalwave propagation capabilities and existing network structures, the 900 MHz frequencies are needed to ensure continuing, nationwide and cost efficient coverage for consumers. Provision of 2 x 5 MHz (paired) in the 900 MHz band is sufficiently capable of meeting both consumers' interest in the continuation of existing GSM services, such as voice communication in particular, as well as growing consumer demand for competitive nationwide broadband services. In this context the Chamber has taken account of the fact that other frequency bands can also be used by mobile operators to provide consumers with mobile services.

215 In contrast, award proceedings for these frequencies as well would, in particular, not ensure that competitive services are available everywhere in the country using the existing four infrastructures. Award proceedings for the entire spectrum cannot ensure with sufficient certainty that frequencies will continue to be provided for the continued operation of the four mobile networks in the interests of consumers. The Chamber believes that other measures, such as imposing spectrum caps, would not be as appropriate for the purpose of securing the four nationwide infrastructures. The award proceedings grant existing network operators the right to participate in award proceedings, but do not provide a sufficiently reliable basis for the acquisition of the spectrum which would be needed to continue ensuring coverage is provided everywhere in the country in the interests of consumers.

216 Award proceedings are one way of achieving a key regulatory aim: securing equitable competition and promoting sustainable competitive markets (section 2(2) para 2 TKG). Award proceedings are an objective, open, transparent and non-discriminatory method which provide for equitable access to frequency resources for the business models of the four mobile operators and of market entrants. Equitable competition for market participants and new entrants can, most notably, be secured by means of award proceedings based on suitable procedural rules.

217 Sustainably competitive markets can only be promoted - including when frequencies are made available for competitors - if the framework and procedural conditions are determined in such a way that competition continues to function and can be stepped up in as many areas as possible. Award proceedings are an appropriate way of eliminating potentially negative competitive impact in terms of spectrum package.

218 The objective of maintaining the four existing GSM infrastructures in the future cannot be achieved by procedural rules, such as a spectrum cap, alone. In fact what is required is the individual assignment of 2 x 5 MHz (paired) in the 900 MHz band for the four mobile operators to safeguard equitable nationwide competition as well as promotion of sustainably competitive markets. Provision of 2 x 5 MHz (paired) for each of the four mobile operators can ensure that each of the mobile operators have a sufficient amount of spectrum to enable consumers to continue benefitting from the advantages of four competing nationwide mobile networks. All four mobile operators have more spectrum in other frequency bands, enabling them to offer GSM services and broadband services.

219 In order to guarantee that consumers can continue to be supplied with mobile services everywhere in the country each of the four mobile operators need to be provided with 2 x 5 MHz (paired) spectrum in the 900 MHz band to enable them to expand or maintain the existing infrastructure. This will ensure that an auction and its unforeseeable outcome does not lead to one of the current mobile operators withdrawing from the market with unpredictable consequences for the service provided to the affected consumers. The Monopoly Commission pointed this out in 2011 (cf Monopoly Commission Special Report 61 "Strengthening investment incentives, securing competition" page 15):

> *"The Monopoly Commission concludes that in this overall situation the competition intensity of the German mobile communications market is critically dependent on maintaining its existing market structure with four independent network operators. Both theoretical and empirical considerations suggest that the intensity of competition would decline in a market with just three network operators equipped with similar resources which apply similar corporate strategies and have practically identical market shares."*

220 At the same time, provision of just 2 x 5 MHz (paired) as part of an individual assignment would enable new entrants to obtain a sufficiently large amount of spectrum of under 1 GHz in open, transparent and non-discriminatory award proceedings. In order to guarantee equitable access, most notably for a new entrant, the Chamber will formulate appropriate specific stipulations and rules for award proceedings.

221 Award proceedings can meet the regulatory aim of accelerating the rollout of high-speed next-generation public telecommunications networks (section 2(2) para 5 TKG). The technology neutral provision of frequencies in award proceedings creates incentives for using frequencies as soon and as efficiently as possible for high-speed mobile broadband networks.

222 The technology neutral individual assignment of 2 x 5 MHz (paired) for the four existing network operators will speed up the rollout of high-speed next-generation public telecommunications networks within the meaning of section 2(2) para 5 TKG. The provision of 2 x 5 MHz (paired) in the 900 MHz band enables existing mobile operators to maintain or expand existing nationwide infrastructures and to convert them cost efficiently into nationwide high-speed next-generation broadband networks to meet demand, eg for use in UMTS/HSPA or LTE or LTE advanced systems. Existing mobile operators have locations for base stations everywhere in the country as well as further infrastructure for connecting up to the core network to provide nationwide services to consumers. By maintaining these infrastructures it will be possible to rollout competitive high-speed telecommunications networks at the earliest possible time.

223 Award proceedings are a suitable way of ensuring efficient use of frequencies within the meaning of section 2(2) para 7 TKG. Award proceedings can be used to determine which of the parties requesting assignment are best suited to making efficient use of the frequencies available for award. A successful bid typically demonstrates the willingness and ability to make optimum use of the particular frequency in the market and the intention to use it economically.

224 The individual assignment of 2 x 5 MHz (paired) to the four network operators also ensures that frequencies are used efficiently within the meaning of section 2(2) para 5 TKG. Mobile operators are currently using 900/1800 MHz frequencies to provide mobile services to almost the entire population. The Chamber is convinced that if 2 x 5 MHz (paired) is assigned individually in the 900 MHz band, existing mobile operators will continue to make efficient use of frequencies. Mobile operators have already presented detailed frequency usage concepts in the framework of demand identification proceedings which show how they will make efficient use of frequencies in the future.

225 The President's Chamber points out that the purpose of assigning 2 x 5 MHz (paired) spectrum in the 900 MHz band on the application of the four mobile operators is to ensure continuing coverage for consumers. It is envisaged that these assignments will meet 99 percent of coverage obligations for the population as of 1 January 2017.

226 Assignments of 2 x 5 MHz (paired) in the 900 MHz band to the four mobile operators are intended, in accordance with sections 55(5), 60 and section 61 TKG, to secure the mandate to ensure the availability of telecommunications infrastructure (Article 87 f GG) as well as the regulatory aims of section 2(2) TKG of providing 99 percent of the population services as of January 2017 (cf Annex). The decision to impose coverage obligations for the use of frequencies in the 900 MHz band is based on the following considerations:

227 In the view of the Chamber, at least 99 per cent of the population must be served to ensure that regulatory aims of assigning 2 x 5 MHz (paired) in the 900 MHz band are in fact achieved. In particular, the four network infrastructures must be able to provide the population with almost 100 percent coverage, most notably with mobile voice communication services but also, with a view to the broadband strategy, to continue rolling out the network throughout the entire assignment area.

228 The aim is to serve the interests of consumers nationwide by maintaining or promoting existing provision by the four mobile network operators of telecommunications services which cannot be replaced by other intermodally competing services or infrastructures. Permanently increasing demand for mobile services and promotion of the ability of users to be reached anywhere can only be achieved if mobile networks provide a high level of coverage. It appears unlikely that this degree of coverage could again be achieved in competition within such a short period of time, eg by a new entrant. At the same time it is possible to ensure that the assigned frequencies can also be used efficiently over a large area.

229 Hence imposing a coverage obligation is one way of achieving the regulatory aims flowing from the Federation's mandate to ensure the availability of telecommunications infrastructure (Article 87f of the Basic Law, or constitution). In particular, the regulatory aims of safeguarding user, most notably consumer, interests in telecommunications (section 2(2) para 1 TKG), promoting telecommunications markets with sustainable competition in services and networks and in associated services and facilities (section 2(2) para 2), ensuring efficient use of frequencies (section 2(2) no 7) and the principle of encouraging efficient investment in infrastructure (section 2(3) no. 4 TKG), are thereby achieved.

230 The coverage obligation can ensure that the aim of guaranteeing nationwide appropriate and sufficient mobile services – including voice communication in particular – can continue to be provided for consumers in the future. The Chamber also included consumers' coverage with mobile broadband services (section 2(2) para 5 TKG) in its considerations. Even if imposition of coverage obligations does not mean that specific minimum transmission rates can also be imposed, the Chamber nonetheless assumes that network operators will offer competitive services which meet consumer demand.

231 The imposition of coverage obligations of this kind does not constitute an unfair burden on network operators. According to the information provided by the four mobile operators they each provide almost 100 percent of the population with mobile services, including voice communication in particular. The required coverage level of 99 percent of the population can be achieved using existing infrastructures and consequently only requires relatively modest additional investment, if any at all.

232 In addition, the requirement to ensure coverage with the particular frequency assignments does not mean that coverage must be provided with the 2 x 5 MHz (paired) in the 900 MHz band. This applies to the mobile networks of each assignee. While the assignee must use all the frequencies assigned, all that is actually required is that the prescribed coverage level is achieved with the entire assigned spectrum, not however

with every single frequency block. All that is necessary, therefore, is that the coverage level is achieved with the entire spectrum assigned for wireless access to an assignee.

233 The Chamber points out that the purpose of assigning 2 x 5 MHz (paired) spectrum in the 900 MHz band on the application of the four mobile operators is to safeguard continuing coverage for consumers. In this context the Chamber is considering imposing a duty on mobile operators to allow service providers non-discriminatory access to services (cf also section 150(4 TKG, Annex). This may be appropriate in the interest of maintaining secure service provision in accordance with section 2(2) para 1 TKG with regard to the number of service providers' customers and the fostering of sustainable competition within the meaning of section 2(2) para 2 TKG. On the other hand, it is important to consider that the obligation to admit service providers would be imposed in the framework of a new assignment. Article 8(3), 1st indent, of the Authorisation Directive with Article 5(1) and (2) Access Directive applies in this context.

234 The Chamber also points out that it is envisaged that the frequency assignments for all the frequencies in these proceedings – frequency usage rights of 2 x 5 MHz (paired) for the four mobile operators in the 900 MHz band and all the frequency usage rights acquired in the auction – must be time limited for a period of approximately 15 years to a single final date (cf Annex).

2 Choice of award proceedings under section 61(1) TKG

235 The Chamber orders that the assignment of frequencies in the 700 MHz, 900 MHz, 1800 MHz and 1.5 GHz bands must be preceded by an auction procedure, sections 61(1) and (2) TKG.

236 The auction in combination with the assignment of 2 x 5 MHz (paired) in the 900 MHz band on the application of the four mobile operators is an appropriate way of ensuring that the regulatory aims of section 2(2) TKG are met. With this combination it is possible to ensure that nationwide competitive services are provided on the basis of the existing four infrastructures.

237 Under section 61(1) sentence 1 TKG award proceedings can take the form of an auction or tendering procedure. Under section 61(2) sentence 1 TKG an auction based on section 61(5) TKG should always be held, unless such a procedure is not a suitable way of achieving the regulatory aims of section 2(2) TKG. The Federal Administrative Court has ruled on this matter as follows (cf BVerwG, ruling of 10 October 2012, reference: 6 C 13/11, no. 33):

> *"While the Bundesnetzagentur does not have any discretionary powers to determine the procedure given that, under section 61(2) sentence 1 TKG, an auction must be held in all cases unless, in exceptional cases, this procedure would not be suitable for the purpose of achieving the regulatory aims. With regard to this evaluation, however, the Bundesnetzagentur does have certain scope for discretion as far as the factual elements of the norm are concerned. This is legitimated by the need - to determine the suitability or lack of suitability of the auction procedure - to enter into a complex process of weighing up regulatory aims concerning the relative importance of public and private concerns."*

238 Under section 61(2) sentence 1 TKG an exception may be made to rules in favour of an auction procedure and this procedure can therefore be fundamentally regarded as a suitable means of achieving the regulatory aims. An auction is one way of achieving the legal aims of award proceedings, ie to select applicants who are best able to make efficient use of the frequencies. In this context the explanatory notes to section 61(5) TKG (section 59(5) of the government draft, Bundesrat printed paper, page 109) state the following:

"The successful bid typically demonstrates the willingness and ability to make optimum use of the particular frequency in the market and the intention to use it economically."

239 The Chamber takes the view that the auction procedure is an appropriate way of fostering the economic and optimum use of spectrum resources. The auction procedure creates incentives for the use of the most efficient mobile systems possible combined with the optimum and most economic competitive use of frequency spectrum.

240 Under section 61(2) sentence 2 TKG doubt may be cast in exceptional cases on the suitability of auction proceedings to secure the regulatory aims if frequencies have already been assigned for the for the uses permitted in the frequency plan without prior auction proceedings or an applicant for the assignable frequencies is able to assert a legally founded preference.

241 In the past, frequencies in the 900 MHz and 1800 MHz bands have been assigned in different procedures. With the opening of the market for digital cellular mobile communications these frequencies were awarded in the framework of GSM licenses (licenses for the establishment and operation of digital cellular mobile networks based on the GSM or DCS 1800 standard). In the early 1990s the 900 MHz band with a total of 2 x 12.4 MHz (paired) spectrum was assigned to "D network" operators (now Telekom Deutschland GmbH and Vodafone GmbH); this was followed subsequently by the assignment of the 1800 MHz band to "E network" operators (now E-Plus Mobilfunk GmbH & Co. KG and Telefónica Germany GmbH & Co. OHG) with a total of 2 x 22.4 MHz (paired) spectrum; in both cases the spectrum was assigned in a tendering procedure. In 1999 additional available spectrum in the 1800 MHz band was awarded for mobile applications under the GSM 1800 Standard as part of an auction among the four mobile operators active at that time (cf decision of the President's Chamber, Reg TP of 21 June 1999; Order no 70/1999, Reg TP Official Gazette No. 11/1999, page 1751). The spectrum package of e-network operators in the 900 MHz band for GSM mobile communications of 2 x 5 MHz (paired) spectrum is based, according to the GSM concept 2005 (concept for the award of further spectrum for cellular digital mobile communications below 1.9 GHz - GSM Concept – Order no 88/2005, Bundesnetzagentur Official Gazette 23/2005, page 1852; Com no 168/2012, Bundesnetzagentur Official Gazette 3/2012, page 361 ff.) on individual assignments (frequency displacement assignments).

242 These GSM frequency usage rights will all expire on 31 December 2016 and will be provided in the framework of these proceedings in accordance with the dedications made in the frequency plan for wireless access for the provision of telecommunications services – without being limited to the GSM Standard. In this respect doubt cannot be cast on the suitability of the auction procedure, as defined in section 61(2) sentence 2 TKG, for the purpose of awarding new uniformly available frequencies in the 900/1800 MHz band for wireless access simply because these had been assigned for other purposes in the past without an auction being held. An auction procedure would eliminate the heterogeneous market entry conditions for parties requesting assignment. This means that equitable and non-discriminatory access to frequency (section 2(2) para 2, section 55(1) sentence 3 TKG) is available to all parties requesting assignment.

243 All the frequencies for mobile broadband have so far been awarded by auction. This applies to the auction of frequencies in the 2 GHz band in the year 2000 and of frequencies in the 3.5 GHz band in 2006. Accordingly, and in line with the dedication for wireless access for the provision of telecommunications services, newly available frequencies in the 800 MHz, 1800 MHz, 2 GHz and 2.6 GHz bands were auctioned in the year 2010 on the basis of the President's Chamber ruling of 12 October 2009 (Order no 59/2009; Bundesnetzagentur Official Gazette 20/2009, page 3623).

244 The auction is an appropriate means of securing the regulatory aims of section 2(2) TKG. Even if the examples in section 61(2) TKG are not fulfilled word for word, the Chamber has nonetheless performed a detailed assessment of how well the regulatory aims would be met by auctioning the individual assignment of 2 x 5 MHz (paired) foreseen in the proceedings to the four mobile operators.

245 A combination of an auction and the envisaged individual assignments provides an objective, open, transparent and non-discriminatory procedure for the competitive allocation of spectrum. A combination of an auction and individual assignments is one way, in particular, of taking adequate account of the mandate to ensure the availability of telecommunications infrastructure (Article 87f of the Basic Law, or constitution) and simultaneously of promoting telecommunications markets with sustainable competition in services and networks in rural areas as well.

246 Specifically:

An auction combined with the individual assignment of 2 x 5 MHz (paired) in the 900 MHz band to the four mobile operators is the appropriate award procedure for meeting the regulatory aims of safeguarding consumer interests as required by section 2(2) para 1 TKG.

247 Awarding frequencies in an incentive-driven auction can optimise frequency allocation. This injects maximum flexibility into the market in accordance with the respective business models which could then be used by network operators in the interests of consumers as regards price, quality and choice. Awarding frequencies in an auction will create incentives which ensure that frequencies are put to use as quickly as possible in the interest of consumers and can be used to offer innovative competitive services.

248 At the same time, proceedings to assign 900 MHz frequencies of 2 x 5 MHz (paired) to the four mobile operators would adequately serve the interests of consumers in the continued existence of established infrastructures and, as a result, continued coverage for almost the entire population. The provision of a total of 2 x 20 MHz (paired) for the four mobile operators without holding an auction will not, however, cast fundamental doubt on the aim of holding an auction for the purpose of optimising frequency allocation. Owing to the total amount of spectrum available in the 700 MHz, 900 MHz, 1800 MHz and 1.5 GHz bands an auction would give both mobile operators and new entrants the flexibility to acquire spectrum package which is appropriate to their particular business models.

249 An auction combined with the individual assignment of 2 x 5 MHz (paired) in the 900 MHz band to the four mobile operators is the appropriate award procedure for meeting the regulatory aims of safeguarding consumer interests as required by section 2(2) para 1 TKG.

250 An auction would provide the four mobile operators and new entrants access to the spectrum resources in consumers' interests in an open, non-discriminatory and transparent procedure. A procedure of this kind would offer new entrants in particular the highest possible degree of transparency and flexibility in terms of value and user interdependencies between different frequencies in the 700 MHz, 900 MHz, 1800 MHz and 1.5 GHz bands.

251 In this respect, and with regard to decisions under section 61(3) sentence 2 TKG and section 61(4) TKG which will be taken at a later stage of the procedure, the Chamber emphases that it is considering eliminating all restrictions on participation in the auction provided that parties requesting assignment meet the minimum competencies for eligibility.

252 In order to secure equitable access – and particularly for new entrants – there are plans to define corresponding measures for a later stage of the procedure (such as spectrum caps). In this respect, and with regard to decisions under section 61(3) sentence 2 TKG and section 61(4) TKG which will be taken at a later stage of the proce-

dure, the Chamber points out that a spectrum cap was defined in the BK1a-09/002 proceedings of 12 October 2009 which included the 900 MHz band. Point IV.3 of the decision states that:

> *"Basic spectrum package and bidding rights restrictions, sections 61(4) sentence 2 para 3 TKG, 61(5) sentence 1 in conjunction with section 61(2) sentence 1 TKG*
>
> *A basic spectrum package as referred to in section 61(4) sentence 2 para 3 TKG will not be stipulated.*
>
> *For the band 790 to 862 MHz bidding rights will be restricted to a maximum of 2 x 20 MHz (paired). Existing spectrum packages in the band at 900 MHz (of the GSM operators) will count towards this. This means the following rights restrictions for the GSM operators:*

GSM operators	*Bidding rights restricted to*
D network operators	*2 x 10 MHz (paired) in the band at 800 MHz*
E network operators	*2 x 15 MHz (paired) in the band at 800 MHz"*

253 The specific assignment of 2 x 5 MHz (paired) in the 900 MHz band to the four mobile operators combined with an auction is one way of ensuring that the four competing wide-area mobile infrastructures continue to exist. In this way it will be possible to avoid cost and efficiency disadvantages for existing network operators by ensuring that competition across large areas is not endangered and that consumers benefit as a result. This measure therefore encourages sustainable competition in rural areas as well. In this respect public interest in this measure outweighs the interests of any new entrants to access to total spectrum resources. What is more, sufficient account is taken of the interests of new entrants by providing equally appropriate spectrum in the 800 MHz band, which is particularly appropriate for cost-efficient rollout to rural communities, in addition to 900 MHz spectrum.

254 In this connection it is also worth pointing out that the amount of spectrum which is to be assigned to the four mobile operators is limited to the absolute minimum necessary and will also be subject to coverage obligations for each assignee of 99 percent of the population from 1 January 2017. It would be both inappropriate and unreasonable to define coverage obligations of this kind for a new entrant as well.

255 The Chamber's decision to make assignment to the four mobile operators takes account of the interests of new entrants in having equitable access to spectrum. The stipulation of a necessary but sufficient volume of assignments of 2 x 5 MHz (paired) for each of the four mobile operators does not create any disproportionate disadvantages for new entrants given that the lion's share of the overall spectrum – including spectrum below 1 GHz in particular – is provided for all parties requesting assignment as part of an open, transparent and non-discriminatory auction. On the one hand, the stipulation of a spectrum cap will limit the amount of spectrum that each of the four mobile operators will be able to bid for. On the other, it is not clear how a new entrant might suffer from unreasonable cost disadvantages compared to the four mobile operators as a result of asymmetrical frequency costs.

256 The Chamber points out at this early stage that, under section 55 TKG, the Bundesnetzagentur charges fees and expenses for decisions on assignments of frequencies. Fees under section 142(1) TKG are always charged subject to section 142(4) TKG to cover administrative expenses, section 142(2) para 1 TKG. Under section 142(4) TKG fees for a decision to assign rights of use can also be set in such a way, that they regulate and ensure optimum and efficient use of frequencies in line with the objec-

tives of the TKG, particularly in terms of the regulatory aim of accelerating the rollout of high-speed next-generation public telecommunications networks and the regulatory principle of encouraging efficient investments and innovations in the new and improved infrastructures.

257 The minimum bids for the auction will be stipulated at a later stage of the procedure. In the auction in 2010 (cf decision of the President's Chamber BK1a-09/002, loc cit.) minimum bids were based on assignment fees.

258 An auction combined with the individual assignment of 2 x 5 MHz (paired) in the 900 MHz band to the four mobile operators is an appropriate way of accelerating the rollout of high-speed next-generation public telecommunications networks within the meaning of section 2(2) no. 5 TKG. The highest bids in an auction will create incentives for ensuring that frequencies are used promptly and in tune with demand for mobile broadband to ensure that the acquisition costs can be paid back as quickly as possible. This is not invalidated by the fact that the assignment of 900 MHz frequencies of 2 x 5 MHz (paired) to each of the four mobile operators in this procedure does not create direct corresponding incentives within the meaning of section 2(2) para 5 TKG. The Chamber does, however, expect that the frequencies will also be used for the rollout as quickly as possible to meet growing demand. What is more, the frequency assignment fee provided for by section 142(4) TKG should also create incentives for these frequency usage rights to be used with new efficient technologies for the rollout of high-speed next-generation telecommunications networks.

259 An auction combined with the individual assignment of 2 x 5 MHz (paired) in the 900 MHz band to the four mobile operators is an appropriate way of making efficient use of frequencies within the meaning of section 2(2) no. 5 TKG. The auction is appropriate for encouraging the optimum and economic use of resources and creates incentives for the use of the most efficient mobile systems possible combined with the optimum and most economic competitive use of frequency spectrum.

260 The individual assignment of 2 x 5 MHz (paired) to the four network operators also ensures that frequencies are used efficiently within the meaning of section 2(2) para 5 TKG. Mobile operators are currently using 900 MHz and 1800 MHz frequencies to provide mobile services coverage to almost the entire population. The Chamber is convinced that, in the event of the individual assignment of 2 x 5 MHz (paired) in the 900 MHz band, existing mobile operators will continue to make efficient use of these frequencies to meet their obligation to provide coverage to 99 percent of the population. Mobile operators have already presented detailed frequency usage concepts in the framework of demand identification proceedings which show how they will make efficient use of frequencies in the 900 MHz and 1800 MH7 bands in the future.

3 Information on legal remedies

Actions against this notice may be filed in writing with the Cologne Administrative Court, Appellhofplatz, 50667 Köln, Federal Republic of Germany, or placed on record with the registry clerk within one month of its publication. The complaint must name the plaintiff, the defendant and the matter in dispute. It should specify the remedy pursued and state the facts and evidence justifying the action. Under section 137(1) of the Telecommunications Act legal actions do not have suspensory effect.

The complaint and all supporting documents should be accompanied by a sufficient number of copies for all parties concerned.

Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen

The President's Chamber

Bonn, [add date]

Vice President	President	Vice President
Dr. Henseler-Unger	Homann	Franke
Vice Chair	Chair	Vice Chair

Annex

Initial considerations on the rules for award

It is appropriate, in connection with the hearings on the draft (document) for consultation on the order for and choice of award proceedings under section 55(10), (61) TKG to publish the initial considerations relating to further decisions (rules for award conditions and auction rules) and to request comments in order to obtain a firm basis upon which award and auction rules may be determined.

The stipulations on award conditions and auction rules under section 61(3) sentence 2 TKG and section 61(4) TKG are currently based on the following considerations:

1 Intended use of frequencies, section 61(3) sentence 2 para 2 TKG

The frequency plan envisages the frequencies intended for award being used for the purpose of wireless network access. Frequencies will be assigned throughout Germany.

This will enable the frequencies to be used in accordance with the purpose stated in the frequency plan of providing "wireless access for the provision of telecommunications services" without any restrictions on a technology and service neutral basis.

2 Frequency blocks

The available frequencies should – as far as possible – be awarded in 5 MHz blocks. In this case it would appear appropriate to auction frequency in abstract blocks.

3 Restriction of bidding rights

It is also envisaged that measures will be taken to secure equitable access – in particular for new entrants as well. Consideration is being given in this procedure to limiting the volume of spectrum below 1 GHz which can be purchased in an auction by each bidder (the spectrum cap).

It should be noted that a spectrum cap which included the 900 MHz band was stipulated in the BK1a-09/002 proceedings of 12 October 2009. Point IV.3 of the decision states:

> *"Basic spectrum package and bidding rights restrictions, sections 61(4) sentence 2 para 3 TKG, 61(5) sentence 1 in conjunction with section 61(2) sentence 1 TKG*
>
> *A basic spectrum package as referred to in section 61(4) sentence 2 para 3 TKG will not be stipulated.*
>
> *For the band 790 to 862 MHz bidding rights will be restricted to a maximum of 2 x 20 MHz (paired). Existing spectrum packages in the band at 900 MHz (of the GSM operators) will count towards this. This means the following rights restrictions for the GSM operators:*

GSM operators	*Bidding rights restricted to*
D network operators	*2 x 10 MHz (paired) in the band at 800 MHz*
E network operators	*2 x 15 MHz (paired) in the band at 800 MHz“*

4 Basic spectrum package, section 61(3) sentence 2 para 3 TKG

A basic spectrum package as referred to in section 61(3) sentence 2 para 3 TKG should not be stipulated.

The "frequency reserve" which is needed to safeguard existing availability of infrastructure is not part of the basic package which is needed for the purpose of providing telecommunications services.

Technical and economic developments in particular make it inappropriate for the Bundesnetzagentur to stipulate minimum frequency requirements in the sense of required basic spectrum package, particularly for new entrants. Suitable rules should give scope for the individual minimum frequency which a bidder's business model may require.

5 No restrictions on participation, section 61(3) sentence 2 para 1 TKG

Eligibility for participation in the auction should be open to parties requesting assignment which have the minimum competencies.

6 Frequency usage conditions, section 61(3) sentence 2 para 4 TKG

Frequency usage conditions are stipulated in accordance with international framework conditions. The current status of international harmonisation, in particular for the frequency bands 700 MHz and 1.5 GHz, is outlined in the "Strategic Aspects of the Availability of Spectrum for Broadband Rollout in Germany" paper (cf Strategic Aspects, loc cit.).

7 Obligation to admit service providers

The Chamber is considering imposing a duty on mobile operators to allow service providers non-discriminatory access to services (cf also section 150(4) TKG). This may be appropriate in the interest of maintaining reliable service provision in accordance with section 2(2) para 1 TKG with regard to the number of service providers' customers and the fostering of sustainable competition within the meaning of section 2(2) para 2 TKG. On the other hand, it is important to consider that the obligation to admit service providers would be imposed in the framework of a new assignment. Article 8(3), 1st indent, of the Authorisation Directive with Article 5(1) and (2) Access Directive will also apply.

8 Time limits on frequency assignments, section 55(9) TKG

Section 55(9) TKG makes provision for frequencies to be assigned for a limited period. Time limits must be appropriate to the particular use and allow for an appropriate payback period for the necessary investments, section 55(9) sentence 2 TKG. The frequency assignments for all the frequencies in these proceedings – frequency usage rights of 2 x 5 MHz (paired) for the four mobile operators in the 900 MHz band and all the frequency usage rights acquired in the auction – should be time limited for a period of approximately 15 years to a single final date.

Most recently, the President's Chamber placed time limits on the frequency assignments for wireless access up to 21 December 2005 in the BK1a-09/002 proceedings of 12 October 2009. A time limit of 15 years would take account of both assignees' interest in an appropriate payback period for their investments and appropriate scope for planning.

9 Coverage obligation, section 61(3) sentence 2 para 4 TKG

The assignees should be subject to the obligation to provide the population with mobile services. Under section 61(3) sentence 2 para 4 TKG the Bundesnetzagentur stipulates the frequency usage conditions, including the degree of coverage for frequency use and the timing of its implementation, before launching award proceedings. Section 61(7) TKG provides that this coverage obligation shall form part of the frequency assignment under section 55 TKG.

The purpose of assigning 2 x 5 MHz (paired) spectrum in the 900 MHz band on the application of the four mobile operators is to ensure continuing provision of mobile services to consumers. The assignments to the four mobile operators are intended, as provided by sections 55(5), 60 and section 61 TKG, to fulfil the mandate to provide a telecommunications infrastructure (Article 87 f GG) as well as to secure the regulatory aims of section 2(2) TKG to ensure that 99 percent of the population are provided with services as of 1 January 2017. The decision to impose coverage obligations for the use of frequencies in the 900 MHz band is based on the following considerations:

At least 99 per cent of the population must be served to ensure that the regulatory aims of assigning 2 x 5 MHz (paired) in the 900 MHz band are in fact achieved. The four network infrastructures must be able to provide the population with almost 100 percent coverage, most notably with mobile voice communication services but also, with a view

to the broadband strategy, to continue rolling out the network throughout the entire assignment area.

The aim is to serve the interests of consumers nationwide by maintaining or promoting the existing provision by the four mobile network operators of telecommunications services which cannot be replaced by other intermodally competing services or infrastructures. Permanently increasing demand for mobile services and promotion of the ability of users to be reached anywhere can only be achieved if mobile networks provide a high level of coverage. It appears unlikely that this degree of coverage could again be achieved in competition within such a short period of time, eg by a new entrant. At the same time it is possible to ensure that the assigned frequencies can also be used efficiently over a large area.

All the frequency assignments in these proceedings should moreover be coupled with an obligation to provide service to 25 percent of the population with three years and 50 percent within five years.

10 Minimum bid, section 61(4) sentence 2 TKG

A minimum bid per frequency block should be stipulated, section 61(4) sentence 2 TKG. In the auction in 2010 (cf decision of the President's Chamber BK1a-09/002, loc cit.) the minimum bids were based on assignment fees.

The Chamber points out at this early stage that, under section 55 TKG, the Bundesnetzagentur charges fees and expenses for decisions on assignments of frequencies. Fees under section 142(1) TKG are always charged subject to section 142(4) TKG to cover administrative expenses, section 142(2) para 1 TKG. Under section 142(4) TKG fees for a decision to assign rights of use can also be set in such a way, that they regulate and ensure optimum and efficient use of frequencies in line with the objectives of the TKG, particularly in terms of the regulatory aim of accelerating the rollout of high-speed next-generation public telecommunications networks and the regulatory principle of encouraging efficient investments and innovations in the new and improved infrastructures.