



Bundesnetzagentur

Translation¹

Key Elements Paper

**Official proceedings for identifying demand
in the 900 MHz and 1800 MHz bands**

(Project 2016 Key Elements Paper)

Communication 365/2011, Bundesnetzagentur Official Gazette 13/2011

¹ In case of divergent interpretation of the German and English text, the German text shall prevail.

A. Key elements

KEY ELEMENTS for identifying demand in the bands 900 MHz and 1800 MHz for the use of spectrum for wireless access for the provision of telecommunications services as from 1 January 2017.

Key element 1:

In the bands from 880 to 915 MHz (lower band), from 925 to 960 MHz (upper band), from 1725 to 1780.5 MHz (lower band) and from 1820 to 1875.5 MHz (upper band) frequencies have been assigned for the protected GSM licences until 31 December 2016 (cf **Annex 1**).

Thus in these bands the following spectrum is available as from 1 January 2017.

Band	Available spectrum	Amount
900 MHz	880 – 915 MHz and 925 – 960 MHz	2 x 35 MHz
1800 MHz	1725 – 1730.1 MHz and 1820 – 1825.1 MHz	2 x 5.1 MHz
	1735.1 – 1758.1 MHz and 1830.1 – 1853.1 MHz	2 x 23 MHz
	1763.1 – 1780.5 MHz and 1858.1 – 1875.5 MHz	2 x 17.4 MHz

Table 1

The Bundesnetzagentur plans to make this spectrum, totalling 161 MHz, available at one and the same time.

In the past, 100 kHz less than was entered in the Frequency Usage Plan was assigned in the 900 MHz band at both the upper and the lower end to secure the protection of other services in adjacent bands. However, the Frequency Usage Plan designates the entire band at 880 – 915 MHz and 925 – 960 MHz for wireless access for the provision of telecommunications services. In light of this, the total volume of spectrum of 2 x 35 MHz (paired) will therefore be provided for use. It should be emphasised, however, that in future too, services in the adjacent bands are to be protected at the upper and the lower end of the band by the particular assignee in this band. The spectrum not previously assigned in the 1800 MHz band of 2 x 100 kHz (paired; 1730 – 1730.1 MHz and 1825 – 1825.1 MHz) and 2 x 200 kHz (paired; 1752.5 – 1752.7 MHz and 1847.5 – 1847.7 MHz) has thus been included in the total spectrum available (cf **Annex 1**).

Key element 2:

The Chamber will identify ex officio, in timely manner, demand for frequency usage rights in the bands at 900 MHz and 1800 MHz for use as from 1 January 2017. To this end it will open official proceedings for identifying demand most probably in the fourth quarter of 2011. Interested undertakings will be invited to state their interest in specific usages for 900 MHz und 1800 MHz spectrum within a period of four weeks (see key elements 7 and 8 for subsequent steps).

The purpose of this is to establish whether demand is likely to exceed supply, the basis for forecasting whether frequencies are not expected to be available for assignment in sufficient numbers (section 55(9) sentence 1 1st alternative TKG). Thus notified requirements which, besides a statement of interest in specific usages, also set out the objective and subjective criteria for future frequency assignment (section 55 subsections (3), (4) and (5) TKG), are particularly informative.

Objective and subjective criteria for putting forward spectrum requirements

1. Participation in proceedings to identify demand is not restricted.
2. Each interested undertaking will be called on to state its requirements once. This also applies in respect of consortia. Undertakings that have merged under section 37 of the Restraints of Competition Act are deemed to be one undertaking.
3. Each interested undertaking will be asked to show, in its notification of requirements, that it will meet the legal requirements associated with an assignment of frequencies (cf **Annex 2**). These are that "their compatibility with other frequency usages [is given]", and that "their efficient and interference-free use by the applicant [is] secured" (see section 55(5) sentence 1 paras 3 and 4 TKG). Of particular importance here will be an account of the applicant's reliability, specialist knowledge and, most notably, financial capability.

Showing sufficient financial capability is appropriate, given that the economic value of the 900 MHz and 1800 MHz spectrum is extremely high.

For efficient use of these frequencies, an aim to which the TKG is committed, it is appropriate for applicants to provide a frequency usage concept based on their particular business model. This is particularly relevant if they already hold suitable spectrum.

The notifications will identify whether demand exceeds supply and thus how to proceed in accordance with the law. The frequencies will be assigned by the Bundesnetzagentur as individual assignments only upon written application or, as the case may be, 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.

Key element 3:

The President's Chamber will publish the demand identified thus.

Key element 4:

Spectrum in the bands at 900 MHz and 1800 MHz is to be used for wireless access for the provision of telecommunications services. There are no restrictions on the deployment of any technologies.

The technical conditions of frequency use are taken from Commission Decision (2009/766/EC) of 16 October 2009 on the harmonisation of the 900 MHz band and 1800 MHz band for terrestrial systems capable of providing pan-European electronic communications services in the Community; last amended by Commission Implementing Decision (2011/251/EU) of 18 April 2011 amending Commission Decision 2009/766/EC.

Key element 5:

The above-mentioned frequencies are to be made available for use across the Federal Republic of Germany.

Key element 6:

The Chamber will determine the frequency usage conditions, including the degree of coverage with the frequency usage and the time required for this, in accordance with the legislation.

Key element 7:

To guarantee non-discriminatory, clear and objective proceedings final decisions on whether frequency assignment is to be preceded by award proceedings and if so, on the details of the award conditions will be made by the Chamber only after consultation with persons likely to be affected, as required by the law.

Key element 8:

The Chamber intends to take a decision on subsequent use in timely manner, three years before expiry of the current assignments.

B. Explanatory notes to the key elements**I. Background**

- The frequencies in the bands from 880.1 – 914.9 MHz (lower band), from 925.1 – 959.9 MHz (upper band), from 1725 – 1730 MHz, 1735.1 – 1752.5 MHz, 1752.7 – 1758.1 MHz, 1763.1 – 1780.5 MHz (lower band) and from 1820 – 1825 MHz, 1830.1 – 1847.5 MHz, 1847.7 – 1853.1 MHz, 1858.1 – 1875.5 MHz (upper band) have been assigned to the network operators E-Plus Mobilfunk GmbH & Co. KG (E-Plus), Telefónica Germany GmbH & Co. OHG (Telefónica), Telekom Deutschland GmbH (Telekom) and Vodafone D2 GmbH (Vodafone) for their GSM licences for a limited period expiring on 31 December 2016 (for a history of the separate assignments and licences see the overview in the Bundesnetzagentur's discussion paper (*Impulspapier*), page 6ff and the GSM concept (*GSM-Konzept*)). Consequently, these bands are available again from as from 1 January 2017.
- The Bundesnetzagentur in 2009 gave top priority to making spectrum available in the 900 MHz and 1800 MHz bands for wireless access for the provision of telecommunications services (for details see the Chamber's flexibilisation decision of 12 October 2009). The objective was to withdraw individual regulatory specifications that had outlived their usefulness and thus constituted removable barriers to achieving the desired aims. This freed up additional radio frequencies for wireless services, ones that could also be used for a nationwide offer of innovative broadband access services.
- In its flexibilisation decision of 12 October 2009 the Chamber already announced, as a measure for the flexibilisation of usage rights for wireless access in the bands at 900 MHz and 1800 MHz, its intention of deciding about the assignment of these frequencies in timely manner, ie approximately three years before expiry of the current time limit (31 December 2016) (loc cit page 3576):

"Measure 3: *The Bundesnetzagentur will decide ex officio, in timely manner before the current frequency usage rights in the bands at 900 MHz and 1800 MHz expire, on the assignment of this spectrum from 1 January 2017.*

The same applies in the case of an assignee applying for an extension of the time limit beyond 31 December 2016."

In its rationale the Chamber said the following (loc cit, page 3610f):

"The Bundesnetzagentur will decide ex officio, in timely manner before the current frequency usage rights in the bands at 900 MHz and 1800 MHz expire, on the assignment of this spectrum from 1 January 2017.

(...) the Bundesnetzagentur will decide in timely manner, ie approximately three years before the current time limit expires (31 December 2016), on the further grant of frequency usage rights. The Chamber has taken particular note of the outcome of the most recent consultations.

(...) In the Chamber's view, the issues are particularly complex and the decision to be taken of great importance for the market. To do justice to the complexity, the Chamber will open proceedings to reach a robust decision in timely manner."

- On account of the protected GSM licences the use of frequencies for GSM systems currently achieves a degree of coverage of the population topping 98% for mobile voice communication offers. Use of the frequencies in the 2 GHz band for UMTS systems that can also provide mobile voice communication does not, by contrast, achieve such a high degree of coverage (for more details see the explanatory notes on key element 5).

In the public consultations on the flexibilisation of frequency usage rights and the examination of frequencies distribution (downloadable from www.bnetza.de) GSM operators said that their GSM networks were operating practically at full capacity and that demand for GSM services existed beyond the current usage rights period. Thus it was proposed, amongst other things, to extend the time limits for the GSM assignments to the end of 2030, for instance.

The expert opinion of 25 March 2011 on the examination of frequencies distribution commissioned by the Bundesnetzagentur and drawn up by Prof. Dr. Christoph Mecklenbräuker (Vienna University of Technology) focuses on the economic and technical aspects of how long, and to what extent, GSM systems are expected to be domiciled at 900 MHz (downloadable from www.bundesnetzagentur.de). The authors come to the following conclusion (page 103):

"GSM technology is optimised for voice and will be needed for voice and roaming in the next decade to the same extent as today, at least. A phase out is likely between 2020 and 2025. A scenario is also conceivable in which GSM is kept on at the end of its actual life in such a way that a certain level of basic service is guaranteed.

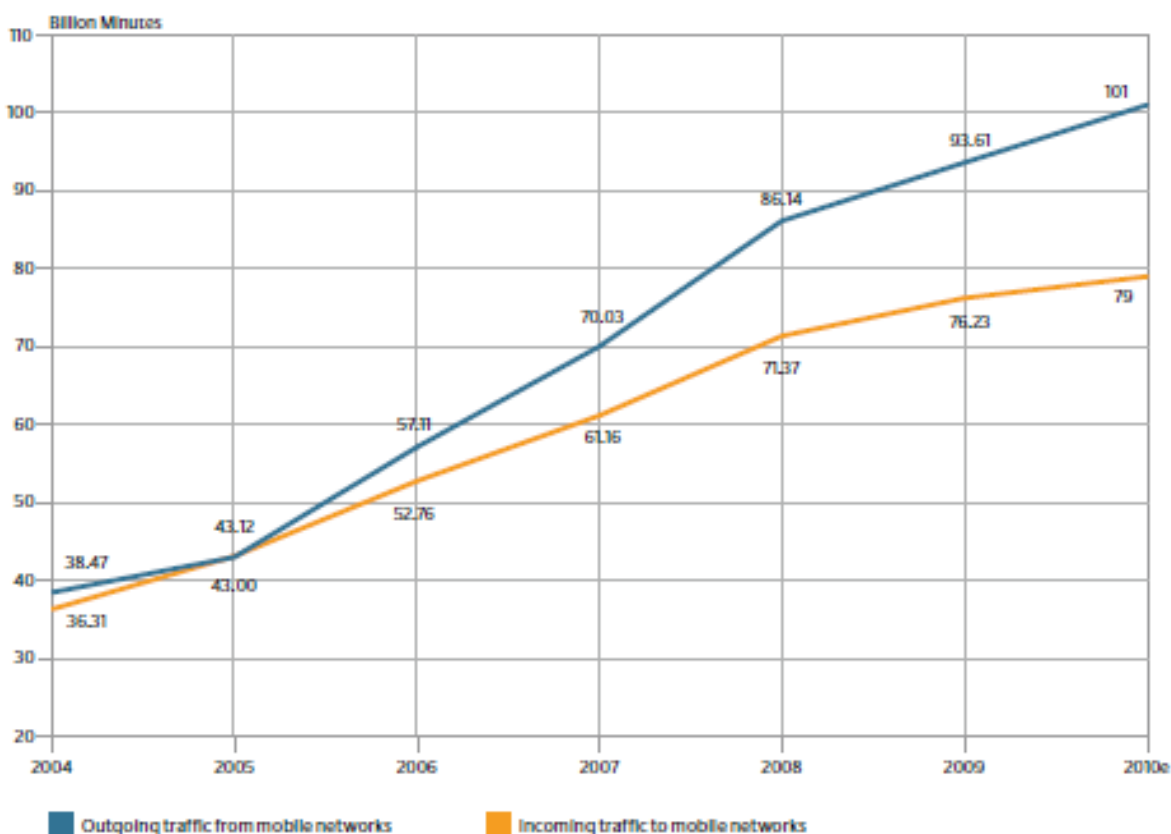
Vigorous demand for mobile data services and the success of the new smartphones means that the new UMTS/HSPA+ and LTE mobile generation needs to be rolled out swiftly. The preferred successor technology to GSM will be LTE, particularly where UMTS/HSPA+ has not yet been rolled out. The new technologies will then be used in the 800 and 900 MHz bands, too.

Parallel operation of UMTS 900/LTE 900/GSM 900 is possible and can deliver cost benefits for operators. Cooperation agreements among the operators – commonly known as "resource sharing" – can further progress the technology change for the benefit of the end customers and bring about noticeable CAPEX and OPEX reductions for the operators."

The Bundesnetzagentur, too, is also assuming continued high demand for mobile voice services. Its Annual Report 2010 had the following to say on this:

"The volume of calls made in mobile networks again grew substantially in 2009. (...) The majority of calls were made in the subscriber's own network and to the German fixed network."

Volume of calls made in mobile networks 2004-2010¹⁵



¹⁵ Excluding volume using international SIM cards (international roaming)

[Source: Bundesnetzagentur Annual Report 2010, page 87]

- Back in 2006 the two mobile operators E-Plus and Telefónica applied for the assignment of further frequencies in the bands 880 to 915 MHz and 925 to 960 MHz. The aim in doing so was to "adjust to the greatest possible degree" the legacy asymmetric distribution of spectrum between the four existing operators in the 900 MHz and 1800 MHz bands in order to avoid regulatory framework conditions that, it was feared, might distort competition between them. Specifically, the two applicants wanted spectrum currently used by the D networks to be redistributed in favour of the E network operators who, in turn, would give up usage rights in the 1800 MHz band.
- In its letter of 1 August 2008 Airdata AG applied for assignment of the frequencies 890.1 – 914.9 MHz and 935.1 – 959.9 MHz. The Bundesnetzagentur rejected this application in its notice of 25 August 2010.

- Auction of spectrum in the bands 800 MHz, 1.8 GHz, 2 GHz and 2.6 GHz (BK1a-09/002) also showed the great demand for spectrum for wireless access services. This is particularly true of spectrum below 1 GHz. In these proceedings the applicants, in their application to qualify for the auction, demonstrated requirements that, altogether, far exceeded the amount of spectrum available.

II. Efficient and effective spectrum management

- For technical reasons, there is a finite supply of useable radio frequencies. This is why they are regarded as a scarce public resource, a resource of considerable value to society and the market. Coordination and management of this scarce resource by government bodies is therefore necessary (cf government draft of section 53(1) of the draft TKG, page 105). It is in the public interest to make sure, through efficient and effective regulation, that such spectrum can be used with maximum efficiency from the economic and social points of view – especially considering the great importance of the radio spectrum for electronic communications.
- These demand identification key elements provide for the radio spectrum to be made available in accordance with the principles of spectrum efficiency and flexibility, technology and service neutrality, and competition. They also give scope for spectrum trading. They aim to protect and promote effective competition between market participants and to prevent hoarding, in particular. Demand identification provides not just an analysis of existing usages, including technologies and service offers, in the interests of transparency and detecting any inefficiencies, but is also an important step in terms of future fitness, that is to say being prepared for the market's requirements and being able to promote efficient usages.
- In the Chamber's view, the issues are particularly complex and the decision to be taken of great importance for the market (see Background section above). To do justice to the complexity, the Chamber will open proceedings to reach a robust decision in timely manner. Ideally, proceedings should be completed three years before the current frequency usages expire so as to give operators and other interested parties the planning and investment certainty they need.
- An initial analysis of the decisions needed for frequency assignment
 - ordering award proceedings (yes or no)
 - and therefore, if appropriate,
 - choice of award proceedings,
 - award conditions,
 - award rules

and the sequence of these gives the Chamber scope for efficient award:

- So as to organise proceedings efficiently, the Chamber is already presenting its **first key elements to identify demand for the future assignment** of frequencies in the bands at 900 MHz and 1800 MHz. This proactive approach will enable the Chamber to prepare the individual steps to such an extent that the frequencies can be awarded promptly once demand has been identified.

- The Chamber therefore intends to open official demand identification proceedings in the fourth quarter of 2011 in a first step, in order to establish ex officio the demand for spectrum in the above bands. It has drawn up its first key elements on this, which provide the framework conditions for these proceedings.
- Publishing the key elements for identifying demand before official proceedings begin the Bundesnetzagentur gives an overview of the separate steps and of the frame within which the further decisions stipulated in the legislation may take shape. At the same time, it gives interested parties ample opportunity to prepare for participation.
- The demand identification survey will be carried out rapidly in order to have early, predictable clarity on whether scarcity exists and if so, to prepare a decision on award. There is to be legal and planning certainty by the end of 2013 on how the frequencies are to be used as from 2017.
- In the public hearing on the examination of frequencies distribution on 4 April 2011 the Chamber declared that it would follow a "parallel approach", aligning the time of the consultation on demand identification with the consultation on the examination of frequencies distribution. The purpose of doing so is to give participants in the examination of frequencies distribution a complete picture of future decisions on frequency assignment in the bands at 900 MHz and 1800 MHz too.

III. Considerations on the individual key elements

Re key element 1 (Spectrum availability)

- Frequencies have been assigned in the 900 MHz and 1800 MHz bands for the GSM licences until 31 December 2016:

Band	Assignee	Assignments	Amount
900 MHz	E-Plus	880.1 – 885.1 MHz and 925.1 – 930.1 MHz	2 x 5 MHz
	Telefónica	885.1 – 890.1 MHz and 930.1 – 935.1 MHz	2 x 5 MHz
	Vodafone	890.1 – 892.5 MHz and 935.1 – 937.5 MHz	2 x 2.4 MHz
		899.9 – 906.1 MHz and 944.9 – 951.1 MHz	2 x 6.2 MHz
		910.5 – 914.3 MHz and 955.5 – 959.3 MHz	2 x 3.8 MHz
	Telekom	892.5 – 899.9 MHz and 937.5 – 944.9 MHz	2 x 7.4 MHz
906.1 – 910.5 MHz and 951.1 – 955.5 MHz		2 x 4.4 MHz	
914.3 – 914.9 MHz and 959.3 – 959.9 MHz		2 x 0.6 MHz	
1800 MHz	Telekom	1725 – 1730 MHz and 1820 – 1825 MHz	2 x 5 MHz
	Telefónica	1735.1 – 1752.5 MHz and 1830.1 – 1847.5 MHz	2 x 17.4 MHz
	Vodafone	1752.7 – 1758.1 MHz and 1847.7 – 1853.1 MHz	2 x 5.4 MHz
	E-Plus	1763.1 – 1780.5 MHz and 1858.1 – 1875.5 MHz	2 x 17.4 MHz

Table 2

- The bands are available as from 1 January 2017 for assignments for wireless access.

- In the past, 100 kHz less than stated in the Frequency Usage Plan was assigned in the 900 MHz band at both the upper and the lower end to secure the protection of other services in the adjacent bands. The entries in the Frequency Usage Plan designate the entire band at 880 – 915 MHz and 925 – 960 MHz for wireless access for the provision of telecommunications services, however. Thus the total volume of spectrum, 2 x 35 MHz (paired), is to be provided for use in future. It should be emphasised, however, that services in the adjacent bands must continue to be protected at the upper and the lower end of the band by whoever is assigned the frequencies in this band.
- The spectrum not previously assigned in the 1800 MHz band of 2 x 100 kHz (paired; 1730 – 1730.1 MHz and 1825 – 1825.1 MHz) and 2 x 200 kHz (paired; 1752.5 – 1752.7 MHz and 1847.5 – 1847.7 MHz) will likewise be made available for wireless access from 1 January 2017 (cf **Annex 1**).
- The frequencies above 1780.5 MHz (1780.5 – 1782 MHz) and above 1875.5 MHz (1875.5 – 1880 MHz), designated in principle for the mobile service, are not designated for use in the Frequency Usage Plan, that is to say they act as a guard band affording protection for the DECT (Digital Enhanced Cordless Telecommunications) service.
- The Bundesnetzagentur intends to make provision of the spectrum available in the two bands, totalling 161 MHz, available at one and the same time.

Band	Amount of spectrum available
900 MHz	2 x 35 MHz
1800 MHz	2 x 45.5 MHz

Table 3

Thus potential assignees know there will be enough spectrum both for service in rural areas and for capacity coverage.

- Joint award of all the spectrum available reflects the Bundesnetzagentur's practice of providing all the available frequencies, as far as possible, in one set of proceedings so as to avoid artificial scarcity.

Re key element 2 (Demand identification)

The Chamber believes the following considerations to be fundamental to the organisation and conduct of proceedings for use of the above spectrum from 2017.

1. Time of opening proceedings

- In its flexibilisation decision the Chamber already announced, as a measure for the flexibilisation of usage rights for wireless access in the 900 MHz and 1800 MHz bands, its intention of deciding about the assignment of these frequencies in timely manner, ie approximately three years before expiry of the current time limit (31 December 2016) (loc cit page 3576):

"Measure 3: The Bundesnetzagentur will decide ex officio, in timely manner before the current frequency usage rights in the bands at 900 MHz and

1800 MHz expire, on the assignment of this spectrum from 1 January 2017.

The same applies in the case of an assignee applying for an extension of the time limit beyond 31 December 2016."

In its rationale the Chamber said the following (loc cit, page 3610f):

"The Bundesnetzagentur will decide ex officio, in timely manner before the current frequency usage rights in the bands at 900 MHz and 1800 MHz expire, on the assignment of this spectrum from 1 January 2017.

(...) the Bundesnetzagentur will decide in timely manner, ie approximately three years before the current time limit expires (31 December 2016), on the further grant of frequency usage rights. The Chamber has taken particular note of the outcome of the most recent consultations."

- Opening proceedings in the fourth quarter of 2011 is considered timely by the Chamber if it is to be able to take a final decision on use of the spectrum as from 1 January 2017 as far as possible three years before the current time limit ends on 31 December 2016. In its rationale the Chamber said the following (loc cit, page 3610f):

"(...) In the Chamber's view, the issues are particularly complex and the decision to be taken of great importance for the market. To do justice to the complexity, the Chamber will open proceedings to reach a robust decision in timely manner."

- An early opening of proceedings to identify demand reflects the interests of all interested undertakings as well as, most notably, those of the four parties in the administrative proceedings (BK1-11/001) concerning the examination of frequencies distribution required by Article 1(2) of Directive 87/372/EEC. Simultaneous publication of the two drafts for consultation, in particular, will give the latter an overview of the preparations for a decision on assigning frequencies in the 900 MHz and 1800 MHz bands. It will give the network operators a comprehensive view of the upcoming provision of spectrum above and below 1 GHz, enabling them to assess their own requirements and access to spectrum in light of both draft documents for consultation. Equally, all interested undertakings will be given the opportunity to exercise their right to equal access to spectrum in the 900 MHz and 1800 MHz bands.
- To guarantee clear, objective and non-discriminatory proceedings the Chamber will issue an invitation to apply for usage rights shortly before conducting particular proceedings for assigning the spectrum and thus verify the demand identified.

2. Demand identification – requirements

- 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(9) sentence 1 TKG can result from either the established fact of a surplus of applications (section 55(9) sentence 1 2nd alternative) or the forecast of an insufficient number of frequencies being available (section 55(9) sentence 1 1st alternative.). An order as per section 55(9) TKG is at the discretion of the Chamber.
- At present, scarcity does not appear improbable. This is indicated not least by the extent of the requirements stated in the applications to qualify for participation in the 2010 auction. Introducing proceedings to identify demand was also motivated, for instance, by the reasoned interpretation of the request for assignment of further 900 MHz spectrum made by

E-Plus in its application of 22 September 2006. The scarcity assumed in the two alternatives in section 55(9) sentence 1 TKG can also result from the forecast of an insufficient number of frequencies (section 55(9) sentence 1 1st alternative). In consideration of the wording of the law and of the connection between the two possible cases referred to in section 55(9) sentence 1 TKG the forecast just mentioned refers to demand exceeding supply at the time of assignment, to a greater number of applications being made than frequencies are available. This forecast is based on identified excess demand.

- Here, in the shape of demand identification proceedings in which the Chamber, paving the way for a decision on issuing an order for award proceedings, makes a public call for requirements for particular frequencies to be notified within a suitable period, is a tried and tested, informative, multistage procedure that takes proper account of the criteria of objectivity, transparency and non-discrimination and grants applicants equal opportunity to spectrum. If demand is then shown potentially to exceed available spectrum, the Chamber may open an application procedure by announcing a deadline for applications and specifying the application requirements in its Official Gazette.
- Official demand identification proceedings are not explicitly prescribed in section 55(9) TKG. However, if they are not carried out prior to an order for award proceedings being issued, the Chamber will have to draw on information that offers a comparable guarantee for the accurate recording of current demand and is hence not less suitable as a basis for a forecast of – possibly – insufficient spectrum. Against this background the Chamber considers it appropriate and efficient to take a proactive stance and open official demand identification proceedings as a step in the overall process, to make sure it has objective, transparent and non-discriminatory proceedings for assigning the frequencies.
- The purpose of identifying demand is 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). The government draft explanatory notes show this to be possible if the Chamber concludes that frequencies are not available for assignment in sufficient numbers (cf government draft of section 53(9) TKG, page 109). Here the Chamber must work on assumptions that reflect not only current knowledge and experience, but which are also comprehensible and take into account the regulatory aims.
- 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) – notified requirements that also cover 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 paras 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 para 4 TKG will be secured at the time of assignment. This clear and conclusive account must cover both the subjective requirements of reliability, efficiency and specialist knowledge and presentation of a convincing concept for intended use of the frequencies for assignment (for more details see **Annex 2**).
- Showing sufficient financial capability is appropriate in light of the fact that the 900 MHz and 1800 MHz spectrum has extremely high economic value. 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.

- The notified requirements serve to identify whether demand will likely exceed supply and thus how to proceed in accordance with the law. The frequencies will be assigned by the Bundesnetzagentur as individual assignments only upon written application or, as the case may be, only after participation in award proceedings. The Bundesnetzagentur will issue a call to apply for usage rights shortly before holding proceedings for assigning the spectrum. All applicants that have declared their interest in specific usages in the 900 MHz and 1800 MHz bands in the demand identification proceedings are also required, under section 55(3) and (4) TKG, to submit a written application for assignment of frequencies and accordingly to provide more detailed accounts and evidence of compliance with the legal requirements for assignment.

3. Applications for frequency assignment – requirements

- An assignment of frequencies presupposes that applicants meet particular minimum specialist and other requirements that the Bundesnetzagentur has to verify. That is why the undertakings signalling definite interest in the use of frequencies in the demand identification proceedings will also have to demonstrate their efficiency, in particular, as well as their reliability and specialist knowledge when they later make their application.
 - Future applicants then have to demonstrate, in particular, that they have sufficient financial resources
 - for assignment of the frequencies,
 - for the investments in build and rollout as set out in the frequency usage concept, possibly with reference to a coverage obligation, and for long term operation of the wireless network, and
 - how this is to be financed.
 - Declarations of intent or pledges of endeavour will not be recognised in the assignment proceedings as evidence of guaranteed efficiency.
- Given the legal subjective and objective requirements for assignment, applicants have a duty to demonstrate more than the personal characteristics of reliability, efficiency and specialist knowledge. Section 55(5) sentence 1 para 4 TKG, for instance, requires the applicant to secure efficient and interference-free use of frequencies. To this end, every applicant should set out, in the form of a frequency usage concept, how they intend to secure efficient use. This concept must be clear and conclusive and, most notably, contain information on the technical planning for the particular business model and service concept.
- The applicant must show that the requirements for assignment with regard to efficient and interference-free use of the frequencies are met (see section 55(4) sentence 2 TKG). As part of the process for granting rights to use a radio frequency the Bundesnetzagentur may verify whether applicants will be able to comply with the conditions attached to these rights. For this purpose they may be asked to submit the information needed to prove their ability to comply. Where such information is not provided, an application for the right to use a radio frequency may be rejected (recital 13 of the Authorisation Directive).

- In the case of award proceedings being held, interested parties will also have to submit an application to qualify as referred to in section 61(4) sentence 2 para 1 TKG in addition to their notified requirements, and supply evidence of the above minimum legal qualification requirements.

4. Spectrum of extremely high economic value

- Great social importance is attached to wireless spectrum in the 900 MHz and 1800 MHz bands in connection with rolling out wide-area infrastructures for innovative mobile broadband services (cf the regulatory aims in section 2(2) TKG). It is therefore in the public interest for this spectrum to be used as efficiently as possible as a result of efficient and effective regulation.
- Accordingly, the fees for assignment decisions in the Frequency Fees Ordinance should be set in such a way as to act as a steering mechanism for optimum use of spectrum, in line with the aims of the TKG.
- The 900 MHz and 1800 MHz spectrum has great economic importance for electronic communications. For the assignment of spectrum with the same or comparable technical conditions of use and wireless access as the designated purpose of use the 2010 auction delivered the following outcomes (downloadable from www.bundesnetzagentur.de):
 - The minimum bid for a frequency block of 2 x 5 MHz (paired) was set at 2,500,000 euros (cf for details the award decision of 12 October 2009).
 - For spectrum of 2 x 30 MHz (paired) in the 800 MHz band a sum of 3,576,475,000 euros was paid.
 - For blocks of 2 x 5 MHz (paired) in the 1.8 GHz band a sum of around 21 million euros was paid on average.
 - For blocks of 2 x 5 MHz (paired) in the 2 GHz band a sum of around 87 million euros was paid on average.

Re key element 3 (Publication of identified demand)

The Chamber will publish the demand it identifies. This will accommodate the public's need for information and, in particular, create transparency for potential applicants.

Re key element 4 (Purpose of use)

- The spectrum in the 900 MHz and 1800 MHz bands is dedicated in the frequency usage subplans (entry nos 227 011, 228 001, 228 005, 228 006, 267 001 and 267 008) to *wireless access for the provision of telecommunications services*.
- The technical conditions of use are taken from Commission Decision (2009/766/EC) of 16 October 2009 on the harmonisation of the 900 MHz band and 1800 MHz band for terrestrial systems capable of providing pan-European electronic communications services in the Community; last amended by Commission Implementing Decision (2011/251/EU) of 18 April 2011 amending Decision 2009/766/EC. The conditions of use will be reviewed and updated as part of European harmonisation.
- The conditions of use support all available technologies.

Re key element 5 (Nationwide Use)

- In the past, the Bundesnetzagentur assigned all the GSM usage rights (900 MHz and 1800 MHz) for nationwide use. In light of this, it is recommended that the spectrum again be assigned for a rollover period from 1 January 2017 for nationwide use. Nationwide

assignment allows potential new entrants to enter the wireless access market and existing network operators to continue to use the frequencies for their nationwide mobile networks.

- The Chamber last awarded spectrum from the 1800 MHz band for wireless access in 2010. Spectrum from the 800 MHz band, which has comparable propagation properties to spectrum in the 900 MHz band, was also awarded in 2010 for nationwide use (for details see the Chamber's spectrum award decision).
- In its decision on the award of spectrum at 800 MHz, 1.8 GHz, 2 GHz and 2.6 GHz (loc cit, pages 3628 and 3679) the Chamber identified the relevant geographic market as per section 61(4) para 2 TKG for which the frequencies to be assigned may be used in observance of the Frequency Usage Plan, as follows:

"The relevant geographic market for which the frequencies to be assigned may be used in observance of the Frequency Usage Plan is the territory of the Federal Republic of Germany."

- Currently, there would not appear to be any reason to diverge from stipulating the Federal Republic of Germany as the geographic market for assignment of the 900 and 1800 MHz spectrum. Just as the spectrum in the bands at 800 MHz, 1.8 GHz, 2 GHz and 2.6 GHz awarded in 2010, so too is the spectrum from the above bands at 900 MHz and 1800 MHz to be available for nationwide wireless access and hence able to be assigned on a nationwide basis.
- Nationwide award of these frequencies will enable networks for innovative mobile broadband services to be set up in rural areas, too.
- Moreover, the regulatory aim of efficient and interference-free frequency use within the meaning of section 2(2) para 7 TKG can best be achieved by means of nationwide award of the 900 and 1800 MHz frequencies, as less coordination than with regional or local award will be required.

Re key element 6 (Frequency usage conditions)

Technical conditions of use

- The frequency usage conditions are set individually on the basis of international recommendations and decisions. The frequency usage conditions are taken from Commission Decision (2009/766/EC) of 16 October 2009 on the harmonisation of the 900 MHz band and 1800 MHz band for terrestrial systems capable of providing pan-European electronic communications services in the Community; last amended by Commission Implementing Decision (2011/251/EU) of 18 April 2011 amending Decision 2009/766/EC.

Article 5 of Commission Decision (2009/766/EC) stipulates the following in respect of coexistence:

- "(1) Member States may designate and make available the 900 MHz and 1800 MHz bands for other terrestrial systems not listed in the Annex, provided that they ensure that:*
- a) such systems can coexist with GSM systems;*
 - b) such systems can coexist with other systems listed in the Annex, both on their own territory and in neighbouring Member States.*

- (2) *Member States shall ensure that other systems referred to in Article 3 and Article 4(2) and paragraph 1 of this Article give adequate protection to systems in adjacent frequency bands."*

The Commission bases this on the following consideration:

"Any other system deployed in the 900 MHz and 1800 MHz bands needs to ensure technical compatibility both with adjacent networks operated by other right holders in these bands and with the use of frequency bands adjacent to the 900 and 1800 MHz bands."

- The conditions of use will be reviewed and updated as part of European harmonisation.

Basic spectrum package:

- The Bundesnetzagentur's preferred approach is for each undertaking to determine its own requirements, rather than having abstract packages stipulated.

Time limit for usage rights:

- Section 55(8) sentence 1 TKG makes provision for frequencies to be assigned for a limited period. Under section 55(8) sentence 2 TKG the time limit must be appropriate to the service concerned.
- In setting the time limit, the Bundesnetzagentur will take into account, on the one hand, the interest of the assignees in having an appropriate payback period for their investment. On the other, the Bundesnetzagentur's scope should not be unduly restricted, so that the time limit should not exceed a proportionate period in order to retain a measure of control.
- The Bundesnetzagentur sets the time limits as it sees fit. Terms of 15 and 20 years have been agreed for mobile communications in the past. The GSM licences initially ran for 15 years. Within the framework of the GSM concept they were subsequently all extended until 31 December 2016. The term of the UMTS/IMT-2000 licences is 20 years. Then, in 2006, the term of the assignments for Broadband Wireless Access (BWA) in the 3.5 GHz band was set at 15 years. The assignments in the bands for wireless access at 800 MHz, 1.8 GHz, 2 GHz and 2.6 GHz have all been limited to 15 years (cf frequency award decision, page 3712). This is set out in the table below.

Band	Spectrum	Expiry
800 MHz	791 – 821 MHz and 832 – 862 MHz	31.12.2025
900 MHz	880.1 – 915 MHz and 925.1 – 960 MHz	31.12.2016
1800 MHz	1725 – 1730 MHz and 1820 – 1825 MHz 1735.1 – 1758.1 MHz and 1830.1 – 1853.1 MHz 1763.1 – 1780.5 MHz and 1858.1 – 1875.5 MHz	31.12.2016
1800 MHz	1710 – 1725 MHz and 1805 – 1820 MHz 1730.1 – 1735.1 MHz and 1825.1 – 1830.1 MHz 1758.1 – 1763.1 MHz and 1853.1 – 1858.1 MHz	31.12.2025
2 GHz	1905.1 – 1920.1 MHz	31.12.2020

	1920.3 – 1930.2 MHz and 2110.3 – 2120.2 MHz 1940.1 – 1950 MHz and 2130.1 – 2140 MHz 1959.9 – 1979.7 MHz and 2149.9 – 2169.7 MHz	
2 GHz	1900.1 – 1905.1 MHz 1930.2 – 1940.1 MHz and 2120.2 – 2130.1 MHz 1950 – 1959.9 MHz and 2140 – 2149.9 MHz 2010.5 – 2024.7 MHz	31.12.2025
2.6 GHz	2500 – 2570 MHz and 2620 – 2690 MHz 2570 – 2620 MHz	31.12.2025
3.5 GHz	3410 – 3494 MHz and 3510 – 3594 MHz	31.12.2021

Table 4

Coverage obligation:

At present, coverage obligations are attached to all the rights to use frequencies in the bands at 900 MHz and 1800 MHz as well as those in the 800 MHz, 2 GHz, 2.6 GHz and 3.5 GHz bands. This is to make sure that network build begins promptly and is continued in an ongoing process and that services can be developed at the earliest possible time.

- The currently protected rights in the 900 MHz and 1800 MHz bands have different coverage obligations, as set out below:

Operator	Degree of coverage of the population
E-Plus	98%
Telefonica	75%
Telekom	75%
Vodafone	94%

Table 5

The coverage requirements in the GSM licences in the 900 and 1800 MHz bands resulted from the tendering process in which the level of coverage was one of the selection criteria. Those responding to the invitation to tender committed voluntarily to particular targets. Details of the coverage volunteered by the successful applicants were then incorporated in the assignments (licences). Targets beyond the agreed minimum were set by the applicants themselves by means of voluntary commitments and not – as in the case of the auction of spectrum for wireless access in 2010 – ex officio.

- For spectrum from the 1.8 GHz, 2 GHz and 2.6 GHz bands the Bundesnetzagentur required assignees to cover at least 25% of the population after three years and at least 50% five years after assignment. For spectrum from the 800 MHz band a 50% minimum target after five years was likewise set, in addition to a separate statutory coverage requirement.
- For the available 900 MHz and 1800 MHz spectrum one of the considerations in determining the degree of coverage will be whether an extension of the protected rights as provided for by section 55(8) TKG or a (re-)award of spectrum as provided for by sections 55(9) and 61 TKG is appropriate.

- The TKG does not explicitly say how the degree of coverage for the assignees is to be determined. Instead, it focuses on the regulatory aims set out in section 2(2), which have to be considered and weighed against each other. The coverage obligation should ensure first, that network build is started promptly, and second, that this build is ongoing. The aim is to provide consumers with telecommunications networks and services at the earliest opportunity. A benefit of this is efficient spectrum use at an early point in time. 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 Constitutional Law). 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 TKG), encouraging efficient investment in infrastructure (section 2(2) para 3 TKG) and securing efficient and interference-free use of frequencies (section 2(2) no 7 TKG) are thereby achieved.
- A coverage obligation must accommodate these aims, so that it cannot be dispensed with as a general rule.

Transfer and lease:

- Under section 150(8) TKG, section 62 subsections (1) to (3) TKG do not apply to rights granted under section 2(1) of the Telecommunication Installations Act (FAG) or to licences granted or frequencies assigned under sections 10, 11 and 47(5) TKG (1996) for the period of validity specified for such licences and frequencies.
- Under Article 5(2) of the Authorisation Directive the regulatory authorities, in granting rights of use, specify whether and under which conditions these rights can be transferred.
- Assignees with frequencies assigned under section 55 TKG can enter into cooperation agreements and lease frequencies, as long as this is permitted under the regulatory and competition law frameworks. The Bundesnetzagentur has published a guide on possibilities and procedures for the trading, transfer and lease of assignments under the Telecommunications Act (Communication *Frequenzübertragung*).

Re key element 7 (Further steps in the proceedings)

- For assignment of the 900 MHz and 1800 MHz spectrum the Chamber's initial assessment is that eligible procedures are essentially those of extension under section 55(8) TKG or (re-)award under section 55 subsections (3) and (9) and section 61 TKG in the case of scarcity.
- Under section 55(9) sentence 1 TKG in conjunction with section 132(3) sentence 1 TKG the Chamber, after hearing the views of persons likely to be affected, decides in the first instance whether or not scarcity is present for spectrum in the 900 MHz and 1800 MHz bands.
- Based on the demand for 900 MHz and 1800 MHz spectrum that it identifies, the Chamber will consider, together with the interested undertakings, whether it would be more appropriate to extend the time limits for the existing rights of use (section 55(8) sentence 1 TKG) or to conduct award proceedings (sections 55(9) and 61 TKG). The Chamber will make public the demand it identifies to create transparency for potential applicants.

- Under section 55(8) TKG rights of frequency use can be extended if scarcity is not present.
- If frequencies are not available for assignment in sufficient numbers, the Chamber can order that assignment be preceded by award proceedings. Persons likely to be affected are to be heard before the decision is taken (section 55(9) sentence 2 TKG).
- When the Bundesnetzagentur orders that assignment of the frequencies be preceded by award proceedings as provided for by section 55(9) TKG, section 61(2) TKG states that an auction is to be held as a general rule, except where such proceedings are not likely to secure the regulatory aims set out in section 2(2) TKG.
- In administrative practice the auction has shown itself to be a swift and efficient instrument. Furthermore, an auction is well suited to achieving the statutory aim for all award proceedings, namely to select those bidders who are best placed to use the frequencies efficiently. The following is stated on this in the explanatory notes to section 61(5) TKG (section 59(5) of the government draft, Bundesrat printed paper, page 109):

"The successful bid typically demonstrates the willingness and ability to make optimum use of the particular frequency in the market and the desire to use it economically."
- Under section 61(1) sentence 1 TKG the Chamber decides on the choice of proceedings and the conditions and rules of award after hearing the parties concerned.
- Additionally, section 132(3) sentence 3 TKG lays down that decisions in the cases specified in section 61(4) paras 2 and 4 TKG are to be taken in consultation with the Advisory Council.

Re key element 8 (Timely decision on assignments)

- In its flexibilisation decision of 12 October 2009 the Chamber already announced, as a measure for the flexibilisation of frequency usage rights for wireless access in the bands at 900 MHz and 1800 MHz, its intention of deciding about the assignment of these frequencies in timely manner, ie approximately three years before expiry of the time limit (31 December 2016) (loc cit, page 3576):

"Measure 3: The Bundesnetzagentur will decide ex officio, in timely manner before the current frequency usage rights in the bands at 900 MHz and 1800 MHz expire, on the assignment of this spectrum as from 1 January 2017.

The same applies in the case of an assignee applying for an extension of the time limit beyond 31 December 2016."

In its rationale the Chamber said the following (loc cit, page 3610f):

"The Bundesnetzagentur will decide ex officio, in timely manner before the current frequency usage rights in the bands at 900 MHz and 1800 MHz expire, on the assignment of this spectrum as from 1 January 2017.

(...) the Bundesnetzagentur will decide in timely manner, ie approximately three years before the current time limit expires (31 December 2016), on the further grant of frequency usage rights. The Chamber has taken particular note of the outcome of the most recent consultations.

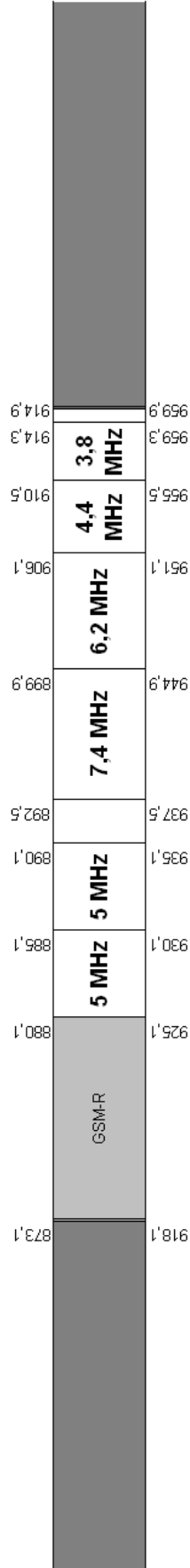
(...) In the Chamber's view, the issues are particularly complex and the decision to be taken of great importance for the market. To do justice to the complexity, the Chamber will open proceedings to reach a robust decision in timely manner."

- The following steps are needed so that a final decision on use of the frequencies as from 1 January 2017 can be taken in timely manner:
 - Responses can be submitted after publication of this draft until the closing date of 12 August 2011.
 - It is planned officially to begin the demand identification survey in the fourth quarter of this year. Requirements can be notified within a period of four weeks of publication of the survey.
 - The Chamber intends to publish the findings of the survey before the end of the year and to convene a public meeting, if appropriate.
 - The Chamber will take the decision referred to in section 55(9) TKG on whether assignment should be preceded by award proceedings with reference to the findings of the survey and a hearing.
 - To open particular proceedings for assigning spectrum the Bundesnetzagentur will invite applications and thus verify the demand it has identified.
 - If award proceedings as referred to in section 55(9) TKG are ordered, the Chamber wishes to draw attention to the fact that in such a case further decisions as set out in section 61 TKG have to be taken by the Chamber (choice of proceedings, conditions and rules of award). The Chamber will then decide on these matters by 2013 so that award can take place subsequently and a final decision on use of the spectrum after 1 January 2017 will be taken.

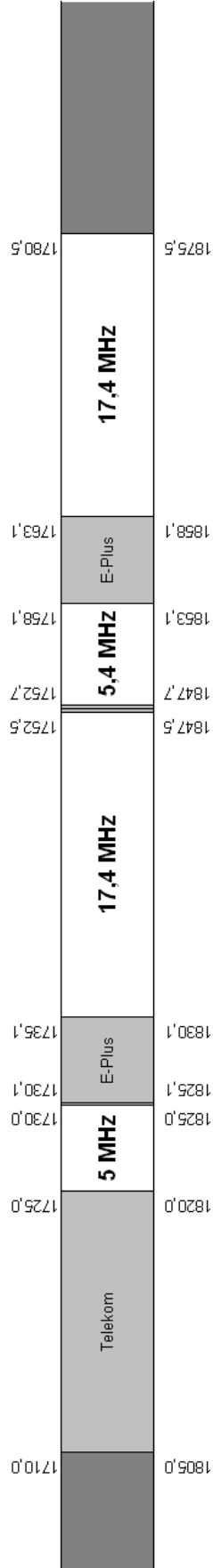
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Annex 1

Frequency band 900 MHz



Frequency band 1800 MHz



x MHz

spectrum available after 31. December 2016

Annex 2**Information needed for a notification of requirements**

A notification of requirements must include the following information:

A. Details of the undertaking

- name and address
- legal form
- seat, and
- financial interests

B. Information on reliability

A declaration whether

- a frequency assignment has been revoked in the past,
- conditions have been imposed on account of failing to honour obligations from a frequency assignment,
- legal action has been taken on account of having breached telecommunications or data protection regulations, or
- proceedings in the above cases are pending and if so, with which public authority.

C. Information on efficiency

Declarations that there will always be sufficient financial means

- for assignment of the frequencies, and
- for the build and rollout investments set out in the frequency usage concept and for operation of the wireless network,
- and how financing is to be ensured.

D. Information on specialist knowledge

Declarations that the persons engaged in building and operating the wireless network have the necessary knowledge, experience and skills.

E. Frequency usage concept

Presentation of a frequency usage concept showing, in particular, how efficient use of the frequencies will be ensured. Undertakings should state what degree of coverage of the population they are looking to provide. Details should be given of the following, in particular:

- spectrum requirements with reference to their business model and the minimum period of use,
- planned service concept, and
- business planning and its implementation as from 2017.

Annex to the *Project 2016* key elements paper

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