

Summary of comments and opinions:

Consultation on future frequency assignments and on the liberalisation of the 900 MHz and 1800 MHz frequency bands

NON-BINDING-TRANSLATION

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1 Introduction

Now that the latest amendment to the Austrian Frequency Utilisation Plan has gone into effect, the Telekom-Control-Kommission (TKK, Austria's telecoms regulator) has been placed in charge of a number of new tasks and decisions. The new legislation transposes the amended GSM Directive into Austrian law and thus creates the conditions necessary for a procedure pursuant to Art. 57 Par. 4 TKG 2003 regarding the liberalisation of GSM frequencies. At the same time, the assignment of the "digital dividend" is also planned in the near future. As these developments are closely interrelated, the regulatory authority considers it important to coordinate these procedures with each other. The objective of the consultation carried out by the regulatory authority was to gather suggestions and discuss possible ways to approach these procedures.

In response to the consultation document, the regulatory authority received a total of 18 opinion documents from the following companies and individuals:

- A1 Telekom Austria AG
- BEGAS Netz GmbH
- Ericsson Austria GmbH
- Walter Hofer
- Hutchison 3G Austria GmbH
- ITM GmbH
- KSC
- Orange Austria Telecommunication GmbH
- Österreichs E-Wirtschaft
- Austrian Broadcasting Corporation (ORF)
- Österreichische Rundfunksender GmbH & Co KG
- Qualcomm Europe Inc.
- SES
- Franz Staffel
- T-Mobile Austria GmbH
- UPC Austria GmbH
- Austrian Federal Economic Chamber (WKO)
- ZTE Austria GmbH

This document provides a summary of the comments and opinions received.

2 Austria's mobile communications market

Question 2.1.: How do you predict that this market will develop in the longer term? Please estimate the number of mobile subscribers who will be using mobile broadband services (smart phones, USB modems) three years from now. What average monthly data volume per customer would you predict?

Comments:

The respondents attribute considerable growth potential to mobile broadband services. One respondent estimates that the number of mobile customers will grow at an annual rate of 15% to 20% in the coming years. Another respondent expects the number of broadband customers to double in the next five years. Yet another respondent projects that the number of broadband customers will rise to approximately 4.9 million by 2014, while another estimate foresees 5 million in the year 2016. One participant estimates that mobile broadband users (smart phones and USB modems) will account for 90% of its customer base three years from now.

Accordingly, the estimates of growth in data traffic are also very high. Estimates of the average customer's data transfer volume range from 100 MB to 2 GB per month for smart phones and up to 5 GB per month for mobile PCs and tablets.

Question 2.2.: What coverage level do you plan to attain or expect in the coming years?

Comments:

With regard to voice services, the respondents expect population coverage of approximately 98% to 99% and geographical coverage of approximately 80% in the medium to long term. Their expectations varied more widely with regard to medium to long-term coverage with mobile broadband services, with estimates ranging from 82% population coverage and 38% geographical coverage to 98% population coverage and 80% geographical coverage by the year 2015.

Question 2.3.: What will a typical mobile communications network (or your network) look like in 3 to 5 years, and what technologies will be deployed?

Comments:

All of the respondents believe that multiple technologies (GSM, UMTS/HSPA+ and LTE) will co-exist in the coming years. However, their expectations regarding the medium to long-deployment of technologies diverge more widely: One respondent believes that GSM will primarily be used for voice services in the 900 and 1800 MHz bands in the next 3 to 5 years, while UMTS/HSPA+/LTE will mainly be deployed for data services in the other bands (800 MHz, 2.6 GHz, etc.). In contrast, another respondent assumes that GSM will no longer be relevant in 5 years' time.

Question 2.4.: When do you expect UMTS (HSPA), LTE and WiMAX technologies to be ready for the mass market in the 800 MHz, 900 MHz and 1800 MHz frequency bands?

Comments:

Coverage with	Network	Modems	(Smart) Phones
UMTS in the 800 MHz band	<i>Not expected</i>	<i>Not expected</i>	<i>Not expected</i>
UMTS in the 900 MHz band	<i>Already exists</i>	<i>Already exists</i>	<i>Already exists</i>

UMTS in the 1800 MHz band	2011	2011-2013	2012-2013
LTE in the 800 MHz band	2011-2015	2011-2015	2012-2015
LTE in the 900 MHz band	2011-2012	2012-2015	2013-2016
LTE in the 1800 MHz band	2011	2011	2012-2013

Question 2.5.: When do you expect that LTE will support voice telephony?

Comments:

The majority of respondents expect Voice over LTE to become available in the year 2013. One respondent expects this technology to be available as early as 2012, while another indicated 2015 at the earliest.

Question 2.6.: What are the long-term spectrum needs of your organisation / of a typical mobile operator?

Comments:

	FDD spectrum requirement	TDD spectrum requirement
Frequencies below 1 GHz	2x20-2x40	
Frequencies above 1 GHz	2x45-2x70	25-45

One respondent estimates the long-term spectrum requirements of the mobile communications industry to be approximately 1000 MHz.

Question 2.7.: Do you consider it necessary for an operator to operate in all bands designated for mobile communications, or do you consider it more sensible in the long term to focus on "core bands" (e.g., 900 MHz only as opposed to 800 and 900 MHz)?

Comments:

Some respondents do not consider it sensible (or possible under real conditions) to focus on core bands due to differences in the availability of technologies; other respondents indicated that such a focus would be sensible and efficient.

Question 2.8.: How important is the assignment of frequencies below 1 GHz to your organisation / to mobile network operators? What advantages do you see in these assignments?

Comments:

All respondents consider spectrum below 1 GHz to be indispensable or extremely important (at least for their own companies) in order to roll out a cost-effective nationwide mobile communications network. One respondent gave a quantitative estimate of the cost disadvantages (based on a greenfield approach) of a network which does not use frequencies below 1 GHz compared to a network which does, indicating additional costs to the tune of tens/hundreds of millions of euro. Another respondent believes that the cost advantages of frequencies below 1 GHz are limited to coverage beyond the 95% population coverage mark. On the basis of demand and cost advantages, yet another respondent estimated the additional gains (producer surplus) of an operator with

assignments below 1 GHz at up to EUR 2 billion compared to an operator without such assignments. Better indoor coverage was also mentioned as an advantage of frequencies below 1 GHz.

Question 2.9.: What other obstacles to the future expansion of mobile broadband can you identify (e.g., connection of base stations, etc.)?

Comments:

The respondents mentioned a number of obstacles:

- *Insufficient available frequency spectrum leads to higher costs and thus lower coverage.*
- *High costs of high-speed links to base stations, in the case of both microwave radio (fees) and optical fibre*
- *Requirements regarding the preservation of a town's overall appearance and the protection of landscapes serve to delay (or increase the costs of) establishing new sites and adapting existing sites to new frequencies.*
- *"Assessment values" (limits) in regional policy*
- *Limits on site sharing based on RTR's position paper*
- *Neighbours'/citizens' initiatives serve to delay the expansion/construction of sites due to fears of adverse effects on health.*
- *Availability of LTE terminal devices*

Question 2.10.: Do you expect mobile technologies (UMTS, LTE, WiMAX) to be available to the mass market in the 3600 – 3800 MHz frequency band in the foreseeable future? If yes, when do you expect them to be available, and when could that frequency band be used?

Comments:

Those consultation respondents who submitted comments on this question do not believe that any mass-market-ready mobile technology will be available in the short to medium term, while several consider this band to be important for LTE Advanced, which they see as the future technology for the band. However, they also indicated that it is currently difficult to estimate when mass-market-ready equipment will be available for this frequency band.

Please also refer to the responses to Question 4.22 ff.

Question 2.11.: Would you consider it useful to assign frequencies in the 450 MHz band in the near future? If yes, when? How would this band be used?

Comments:

Only few respondents provided a comment on this question. Most of the comments received indicate that assignment would not be useful in the near future. As reasons, they cited a lack of standards for mobile communications technologies and the availability of technologies. Two respondents see the possibility of machine-to-machine applications in this band, and one respondent advocates immediate assignment.

Please also refer to the responses to Question 4.1 ff.

3 Refarming

3.1 Background

Question 3.1.: In your opinion, how much longer will GSM remain in use? What share of the 900 MHz / 1800 MHz band will still be used for GSM in the year 2015 and in the year 2020? In what sub-ranges of these frequency bands should GSM be deployed in the longer term?

Comments:

Assessments regarding the medium to long-term use of GSM varied quite widely. Most respondents consider it inevitable that GSM will remain in use in the long term. However, they provided very different estimates of the duration of such use and the corresponding spectrum requirements. One respondent was of the opinion that growth in traffic volumes would not reach a plateau until 2015, and that a reduction in GSM traffic could not be expected until 2020. One respondent sees the 900 MHz band as a key band for the further operation of GSM. Another respondent believes that GSM will no longer be profitable by the year 2020. Next, another respondent believes that GSM usage does not pose an obstacle to the intensive use of the 900 MHz band for broadband technologies from 2015 onward: First of all, the share of GSM-only terminal devices will have fallen to 30% by 2014, thus creating great potential for the migration of voice services to 3G/4G technologies. Second, the respondent in question also noted that it will be possible to produce the majority of GSM traffic (except in rural areas) in the 1800 MHz band. One respondent is of the opinion that GSM will not play a role in either frequency band by the year 2020.

Question 3.2.: In the longer term, would you consider the current frequency assignments in the GSM bands to be compatible with an efficient use of those frequencies for 3G/4G technologies? Please provide reasons for your response.

Comments:

All of the respondents regard the current frequency assignments in the GSM bands as an obstacle to the efficient use of those frequencies for 3G/4G technologies. In addition to the 5 MHz channel spacing, the assignment of adjacent blocks is regarded as an important requirement for efficient frequency use. One respondent stated that the problem is more substantial in the 900 MHz band than in the 1800 MHz band. Another respondent suggested changing over to 5 MHz channel spacing as quickly as possible.

Question 3.3.: If the 900 MHz and/or 1800 MHz band is liberalised, do you see any risk that distortions of competition will arise? If yes, please provide precise indications of the form in which such distortions would arise.

Comments:

In terms of content, the comments received on this question can be summarised in three main groups.

One group of respondents would expect massive distortions of competition if the 900 MHz were to be liberalised without requirements (or accompanying measures). The reasons cited for this distortion include the following (cf. also Question 3.2):

- Cost advantages arising from the use of frequencies below 1 GHz (sub-1 GHz frequencies) compared to other frequencies; demand advantages due to better coverage (indoor coverage, coverage of rural areas). In the case of refarming without the imposition of requirements, liberalisation could generate windfall profits for existing frequency assignment holders. The cost advantages / windfall profits / producer surplus amounts are estimated to

be between EUR 100 million and over EUR 1 billion depending on the reference values and scenarios used.

- Due to higher spectral efficiency, the use of UMTS in the 900 MHz band would lead to a virtual expansion of the frequency band, thus creating a capacity advantage for operators with existing assignments.
- UMTS900 (including the relevant terminal devices) is already available and in use. This will make it possible to ramp up mobile broadband more rapidly at an important time in terms of market development.
- The 800 MHz band is currently not a substitute for 900 MHz frequencies (cf. Question 3.7).
- Existing 900 MHz operators can build on an existing grid compatible with frequencies below 1 GHz (including sites and infrastructure), thus enabling those operators to roll out their broadband networks more quickly and efficiently in rural areas. This advantage would come at an important time in terms of market development.
- Existing 900 MHz operators have access to sites for large-area antennas, which are especially scarce in urban areas.
- Existing first-mover advantages resulting from sequential licensing in the past would be maintained or even reinforced in such a scenario.
- UMTS900 deployment would bring about a number of advantages compared to GSM900, including higher spectral efficiency, which would in turn lead to a virtual improvement of capacity or of indoor coverage.
- The competitive distortions are capable of causing one or more companies to leave the market, which could lead to a re-establishment of a monopoly on the mobile communications market.

The respondents called for a number of measures and requirements (cf. Question 3.2).

In this context, another group of respondents pointed out that the joint assignment of the 900 MHz band with the 800 MHz band would give all operators the chance to satisfy their need for sub-1 GHz spectrum, and that the 800 MHz band has advantages as well as disadvantages compared to the 900 MHz band.

A third group of respondents believe that liberalising the 1800 MHz band would lead to massive distortions of competition. This is regarded in connection with the uneven distribution of frequencies (among other things) and thus with unequal opportunities in the rollout of LTE1800. The respondents called for a number of measures and requirements (cf. Question 3.9).

A fourth group of respondents does not believe that distortions of competition would arise if frequencies in the 1800 MHz band were refarmed.

Question 3.4.: Do you believe that the time remaining between refarming and the expiration of current GSM licences will be sufficient to justify investments in 3G/4G technologies in those bands? Please provide reasons for your response.

Comments:

Most of the respondents who commented on this question are of the opinion that the time remaining is not sufficient for investments in 3G/4G technologies. One respondent believes that under certain conditions, 5 years could be sufficient for such investments, while another respondent would expect the operators in question to make investments in any case in order to realise the accompanying

competitive advantages; the latter respondent referred to the reduction of investment risk through technological advancement (e.g. software-defined radio).

Question 3.5.: In the long term, the frequency bands in question will be used in a technology-neutral manner with various technologies, especially near national borders. What effects do you believe this will have?

Comments:

Based on the current "preferred frequencies" arrangement, which was optimised for GSM channels, the consultation participants expect a number of effects. On the one hand, the deployment of UMTS/LTE is expected to create an advantage due to the higher reusability of frequencies (Reuse 1). On the other hand, the respondents fear that disadvantages would also arise because the new 5 MHz channels are not optimised for the current preferred spacing. Respondents expressed concerns that technological neutrality – a policy which is generally welcomed – could increase interference near national borders, which would make it more expensive to cover border regions. Through detailed agreements with neighbouring assignment holders, it is possible to increase efficiency and thus reduce losses in value. The duplex mode should remain harmonised near national borders in any case, as otherwise deployment along the borders would become highly inefficient.

Question 3.6.: Can you identify any other problems in connection with refarming? If yes, please explain.

Comments:

The following additional problems and suggestions were mentioned:

- *Proposal to prolong GSM usage rights*
- *Complete rejection of the prolongation of GSM usage rights*
- *General reservations about the premature liberalisation of GSM frequencies (before the expiration of existing licences)*
- *Return and re-auctioning or redistribution of GSM licences in connection with the liberalisation of those usage rights*
- *Indication that the potential for using GSM bands for broadband services (and thus the economic benefits of refarming) in the coming years is considered low because GSM is very unlikely to be replaced.*
- *Indication of the urgency of a solution to the problem of fragmentation.*
- *Indication of the need to align license periods in order to enhance efficiency in the use of frequencies*
- *Transfer of refarming-related windfall profits to the government*
- *(Asymmetric) spectrum caps in the upcoming assignments in order to secure competition, to compensate for existing asymmetries in assignments and to compensate for "historical first-mover advantages"*
- *Combination of early liberalisation of GSM frequencies with the successful defragmentation of GSM frequencies by the sector*
- *Consideration of infrastructure cooperation arrangements in future frequency assignment procedures*

- *Increased probability of interference through technology-neutral usage and the resulting need to make special arrangements*
- *Concern that the discussion and review of competitive distortions linked to refarming could lead to a delay in the liberalisation of usage rights and thus to an inefficient use of frequencies*

3.2 Refarming in the 900 MHz band

Question 3.7.: Do you agree with this analysis? If not, please provide precise reasons why you disagree.

Comments:

The participants' responses to this question can be subdivided into three groups:

One group agrees with the analysis and broadly supports the position of the regulatory authority. From their perspective, the assignment of the 800 MHz frequencies would give every operator access to sub-1 GHz frequencies, meaning that any arguments against refarming the 900 MHz frequencies would no longer be justified. Any limitations on the use of the 800 MHz band will be offset by the later availability of LTE in the 900 MHz band. In addition, respondents highlighted the economic advantages of rapid refarming and pointed out that it would give operators the opportunity to acquire an optimal quantity of spectrum in both bands.

The second group of respondents criticised the assumption in the analysis that 800 MHz frequencies can serve as substitutes for 900 MHz frequencies. From their standpoint, the 800 MHz frequencies are not a sufficient substitute for liberalised 900 MHz frequencies. Refarming the 900 MHz band without imposing appropriate requirements would therefore lead to distortions of competition pursuant to the amended GSM Directive. Among other things, the following causes and problems were mentioned (for additional arguments regarding distortions of competition, please see the responses to Question 3.3 ff.):

- *In the coming years, LTE will be the only technology available in the 800 MHz band. In contrast, there are multiple alternatives in the 900 MHz band (UMTS, GSM).*
- *In contrast to LTE800, UMTS900 (including the relevant terminal devices) is already available and in use. This will make it possible to ramp up mobile broadband more rapidly at an important time in terms of market development.*
- *LTE currently does not support voice services. This means that – in contrast to the 900 MHz band – voice telephony cannot (currently) be offered in that band. This severely limits the usage of the 800 MHz frequencies in rural areas for operators who do not have 900 MHz frequency assignments. The 800 MHz band can only be regarded as a substitute for 900 MHz frequencies once LTE supports voice services and the relevant terminal devices are available (cf. also the responses to Question 2.5).*
- *Advantages due to existing sites (grid) and (large-area) antennas; possibility of rapid, low-cost rollout of mobile broadband networks in rural areas at an important time in terms of market development.*
- *Advantages of UMTS900 over GSM900, such as superior spectral efficiency (virtual expansion of capacity) and better indoor coverage.*

The following measures/requirements were mentioned in this context:

- *A far-reaching and detailed examination of the effects of refarming on the competitive landscape*

- *No refarming before the redistribution of frequencies*
- *Redistribution or re-assignment of frequency licenses*
- *Transfer of refarming-related windfall profits to the government*
- *(Asymmetric spectrum caps) in order to correct asymmetries in frequency assignments and to compensate for "historical first-mover advantages"*

The third group generally argued against early refarming prior to the re-assignment of frequencies or the expiration of existing licences.

Question 3.8.: Can you identify any other options? How would you assess those options in terms of the objectives discussed above?

Comments:

The following additional options were suggested:

- *Suggestion of liberalising GSM frequencies simultaneously with a joint assignment procedure (instead of after joint allocation)*
- *Indication that the assignment of frequencies below 1 GHz is not sufficient to create a level playing field. Instead, it is necessary to ensure that all operators can offer broadband services on the market at the same time.*
- *Preference assignment and refarming of 900 MHz frequencies at a far later time (but simultaneously with the 800 MHz frequencies)*
- *No early refarming before the reassignment of frequencies or expiration of existing licences*
- *In order to create an incentive for operators to defragment the spectrum, it was suggested that the early liberalisation of GSM licences could be combined with successful defragmentation.*

3.3 Refarming in the 1800 MHz band

Question 3.9.: Do you agree with this assessment? Please provide reasons for your response.

Comments:

Most of the respondents agreed with the regulatory authority's analysis, which stated that each operator has sufficient spectrum above 1 GHz at its disposal and no operator would suffer an irreparable competitive disadvantage due to the liberalisation of those bands.

One group of respondents believes that liberalising the 1800 MHz band would lead to (massive) distortions of competition. This is regarded in connection with the uneven distribution of frequencies in the 1800 MHz band (among other things) and thus with the lack of equal opportunities in the rollout of LTE1800.

The respondents suggested the following measures in this context:

- *No early liberalisation prior to the reassignment of frequencies and expiration of existing licences*
- *Combination of early liberalisation with successful defragmentation of spectrum*

- *Transfer of liberalisation-related windfall profits to the government*
- *Redistribution of usage rights for frequencies (with comparable characteristics) in order to compensate for competitive advantages*

4 Upcoming frequency assignments

4.1 450 MHz band

Question 4.1.: For what purpose(s) could this frequency band be used? What general conditions would be important for the use of this frequency band?

Comments:

The respondents mentioned the following potential areas of use:

- *Broadband services in rural areas with low capacity requirements*
- *Wireless machine-to-machine applications*
- *Applications in e-business*

Please also refer to the responses to Question 2.11.

Question 4.1.: Do you intend to acquire frequencies in this band? If no, why not? If yes, when would you plan to start using the frequencies?

Comments:

The majority of respondents did not express a direct interest in this spectrum.

Question 4.2.: In your view, which services/applications would be especially well supported by this frequency band? What technologies will be deployed / would you deploy?

Comments:

See responses to Question 4.1.

Question 4.3.: Please give an estimate of your frequency requirements / a network operator's frequency requirements in this band. How many interested parties would you expect?

Comments:

No responses.

4.2 Assignment of the 800 MHz band

Question 4.4.: Do you intend to acquire frequencies in this band? If no, why not? If yes, when would you plan to start using the frequencies?

Comments:

Multiple respondents expressed an interest in the frequencies. The actual demand for (and time of deployment of) the frequencies depends on usability (e.g. interference by foreign broadcasting transmitters), and on the availability of terminal devices and complementary frequencies.

Question 4.5.: In your view, which services/applications would be especially well supported by this frequency band? What technologies will be deployed / would you deploy?

Comments:

The respondents consider the 800 MHz band suitable for wireless broadband. The respondents all indicated LTE as a suitable technology, and one respondent also mentioned LTE Advanced as a possibility from 2015 onward.

Question 4.6.: Please give an estimate of your frequency requirements / a network operator's frequency requirements in this band. How many interested parties would you expect?

Comments:

The respondents have different expectations of frequency requirements, ranging from 2x10 to 2x20 MHz per operator; they also explained that frequency requirements in the 800 MHz band would depend on the assignments received in the 900 MHz band.

Question 4.7.: In your view, what is the smallest possible bandwidth an operator should be able to acquire in this frequency band?

Comments:

Most respondents estimate that the minimum required bandwidth would be 2x10 MHz. Two respondents estimated the minimum bandwidth required (in order to use the band) at 2x5 MHz, with one respondent explaining that multiple channels would be necessary for optimal deployment (at least 2x10 MHz).

Question 4.8.: In your view, what subdivision of the frequency band would be most reasonable? How many frequency packages (in what size) should be put up for assignment?

Comments:

The vast majority of the respondents who commented on this question approved of the subdivision of the frequency band suggested in the consultation document (6 blocks, 2x5 MHz each). One respondent suggested a subdivision into 3 licenses with 2x10 MHz each.

Another respondent highlighted the need for a 1 MHz guard band between broadcasting channel 60 and the lowest downlink channel (D1).

Question 4.9.: Would it be important to obtain adjacent frequency blocks?

Comments:

All of the respondents who commented on this question consider it essential to obtain adjacent frequency blocks. Certain comments pointed out that it will be possible to use fragments in LTE Advanced, but that such use would involve a 20% loss of efficiency.

Question 4.10.: Please describe the rollout scenario you expect or plan to implement. In what regions will these frequencies primarily be used?

Comments:

The respondents expect the frequencies to be used primarily to cover rural areas and to achieve better indoor coverage. The frequencies will enable area- coverage.

Question 4.11.: In your view, how homogenous/heterogeneous is this spectrum? What usage limitations can you identify? Which parts of the band would be affected by those limitations?

Comments:

The respondents expect differences in usage conditions due to broadcasting in neighbouring countries, due to broadcasting in the channels below the band (especially channel 60), due to broadcasting on channel 65 and due to cable TV networks. One respondent expects major interference problems in the 791-801 MHz frequency range.

Question 4.12.: When do you believe the frequencies should be auctioned off? Would you prefer another time, for example if it made it possible to define specific conditions of use or if it enabled simultaneous assignment with 900 MHz frequencies?

Comments:

The vast majority of respondents did not express a specific preference for a rapid assignment of the frequencies. Instead, the respondents believe that the auction should not be held until the general conditions have been defined sufficiently to enable a commercial valuation of the frequencies (e.g. terms of use). In addition, most respondents consider it a high priority to ensure a simultaneous auction with other frequency bands. One respondent advocated an auction in the first half of 2012, while another argued that the auction should be held as soon as possible.

4.3 Assignment of 900 MHz frequencies

Question 4.13.: Would you acquire frequencies in this band? If no, why not?

Comments:

Multiple respondents expressed an interest in the frequencies.

Question 4.14.: In your view, which services/applications would be especially well supported by this frequency band? What technologies will be deployed / would you deploy?

Comments:

The respondents expect GSM to be used for voice services, while UMTS (as well as LTE in some cases) would be used for broadband services; in this context, their expectations varied widely with regard to the mix of technologies to be used over time. One respondent believes that this band will still be used mainly for GSM in the future. On the other hand, another respondent indicated that GSM would only be operated in this band for a few more years. Finally, another respondent remarked that this band will primarily be used for UMTS due to its higher spectral efficiency (compared to GSM).

Question 4.15.: Please give an estimate of your frequency requirements / a network operator's frequency requirements in this band. How many interested parties would you expect?

Comments:

Estimates of frequency requirements varied widely. Some comments indicated a minimum requirement of 2x5 MHz, while others mentioned requirements of up to 2x25 MHz. These requirements are also considered dependent on the frequency assignments received in the 800 MHz band and on the number of technologies used by an operator in this band.

Question 4.16.: In your view, what is the smallest possible bandwidth an operator should be able to acquire in this frequency band?

Comments:

Most respondents who commented on this question estimate the minimum requirement to be 2x5 MHz. One respondent's estimate was 2x10 MHz, and another respondent mentioned better chances on the market with an assignment of 2x10 MHz.

Question 4.17.: In your view, what subdivision of the frequency band would be most reasonable? How many frequency packages (in what size) should be put up for assignment? Would it be important to obtain adjacent frequency blocks?

Comments:

All of the respondents who commented on this question approved of the subdivision suggested in the consultation document (7 blocks, 2x5 MHz each). The respondents consider it important or essential to be assigned adjacent blocks. It was explained that this facilitates the coexistence of multiple technologies (e.g. GSM and UMTS) as well as the deployment of LTE.

Question 4.18.: Please describe the rollout scenario you expect or plan to implement. In what regions will these frequencies primarily be used?

Comments:

The respondents expect (full) coverage with voice and broadband, especially in rural areas and indoors.

Question 4.19.: In your view, how homogenous/heterogeneous is this spectrum? What usage limitations can you identify? Which parts of the band would be affected by those limitations?

Comments:

The respondents see a lack of homogeneity in border regions due to the existing preferred channel arrangements (which are optimised for GSM) with neighbouring countries. Two respondents indicated that they consider the band to be fairly or largely homogenous.

Question 4.20.: In your opinion, when should the auction take place if the frequencies are auctioned off early? Should the frequencies be auctioned off together with the digital dividend in a simultaneous auction? If not, please provide precise reasons.

Comments:

All of the respondents except for one explicitly indicated that the frequencies should be assigned as soon as possible. One respondent advocated assignment by the year 2013 at the latest, while another indicated that the frequencies should not be assigned until 2013 or thereafter.

However, the vast majority of respondents who commented on this question advocated the simultaneous assignment of the 900 MHz and 800 MHz bands. The reasons cited include the bands' close interdependencies in terms of value, flexibility and security for operators to be able to acquire the optimal combination of frequencies in both bands, and legal certainty. One respondent does not believe that simultaneous assignment is absolutely necessary. Another respondent indicated that the 900 MHz and 1800 MHz frequencies should not be assigned separately under any circumstances due to their close substitution characteristics and specific conditions (same services, existing customers, GSM usability, reorientation of voice traffic, expiration of a substantial share of licenses at the same time as 900 MHz licences). Finally, one respondent argued that at least those parts of the 1800 MHz band which expire simultaneously with the 900 MHz licenses should also be auctioned off in the course of the simultaneous assignment of the 800 and 900 MHz bands.

Question 4.21.: Would you consider selling existing spectrum to other operators in the course of redistribution in order to ensure a more efficient redistribution process more quickly? What minimum time would you require for the transition?

Comments:

Some respondents do not rule out the possibility that operators might give up parts of their licences in order to enhance efficiency (e.g. defragmentation, shifts to alternative bands which offer advantages from a business standpoint). In this context, however, respondents also indicated limits or general conditions, for example that such a transaction must not involve a reduction in the operator's bandwidth, or that companies would have to be compensated financially.

4.4 3600 – 3800 MHz band

Question 4.22.: Do you intend to acquire frequencies in the 3600 – 3800 MHz band? If no, why not? If yes, when would you plan to start using the frequencies?

Comments:

The comments pointed to two interest groups: One has a more long-term interest in the spectrum and would like to use these frequencies for LTE Advanced, especially in urban areas with high peak loads. The other group indicates a more short-term interest in the frequencies (see also the responses to Question 4.23).

Question 4.23.: In your view, which services/applications would be especially well supported by the 3600 – 3800 MHz band? What general conditions would be important for the use of this frequency band? What technologies will be deployed / would you deploy? Are there any differences in usage possibilities compared to the 3400 – 3600 MHz frequency band? If yes, how do the bands differ?

Comments:

The respondents consider the following applications/services to be especially suitable for this frequency band:

- *Use for LTE and LTE Advanced*
- *Replacement of existing narrowband systems, point-to-multipoint wireless data services, remote monitoring and control, remote management for data communications, extension of local LANs, remote maintenance, remote meter reading, smart grids, control of central heating plants and contracting systems, backhauling of smart metering aggregation points.*
- *In-house applications/services*
- *Use of IEEE 802.16e/WIMAX standard*
- *One response indicated potential usage by geostationary satellites.*
- *Applications in e-business*

Please also refer to the responses to Question 2.10.

Question 4.24.: Please give an estimate of your frequency requirements / a network operator's frequency requirements in the 3600 – 3800 MHz band. What minimum block size would be appropriate in your opinion?

Comments:

According to the respondents, the frequency requirements would range from 5 to 20 MHz. For the LTE Advanced technology, 20 MHz blocks should be made available. For smaller-scale requirements, however, it should also be possible to use 5, 7 or 10 MHz blocks.

Question 4.25.: Would you prefer to use the 3600 – 3800 MHz frequency band for TDD or FDD?

Comments:

In general, the respondents mentioned TDD as well as FDD. Several respondents recommended waiting for the standardisation of LTE Advanced by 3GPP.

Question 4.26.: How much interest in these frequencies would you expect to see?

Comments:

Several respondents do not expect any need for these frequencies, while others showed widely varied levels of interest. A third group of respondents mainly sees long-term demand for this spectrum in connection with LTE Advanced.

Question 4.27.: How should the usage areas be defined? In small areas, by federal province, or throughout Austria? Or would you prefer a different usage area (e.g., by base station)? How should different usage areas be delimited?

Comments:

Most respondents did not comment on this question or considered it too early to make a statement on the topic. Several respondents advocated a geographical subdivision into (relatively small) usage areas. One respondent suggested a "first come, first served" assignment model based on a catalogue of criteria.

5 Future steps

The respondents provided a number of suggestions which are currently being reviewed and discussed extensively. Among others, these suggestions include the following:

- Joint assignment of the 800 MHz band, 900 MHz band and 1800 MHz band
- Strong preference for an auction no earlier than mid-2012
- General conditions to ensure competition in connection with refarming

In order to ensure planning certainty for market participants, the regulatory authority intends to publish a timetable for future steps in these procedures once the internal discussions have come to an end.