

Results of the consultation procedure and future measures

**regarding future frequency assignments and
the liberalisation of the 900 MHz and 1800 MHz
frequency bands**

NON-BINDING-TRANSLATION

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1 Future measures

After reviewing the comments and opinions received in the course of the consultation, the Austrian regulatory authority has now defined key features for the upcoming frequency assignment procedures and for the liberalisation of existing frequency usage rights on the basis of the relevant provisions of Austrian law. First of all, it is important to note that any decisions taken in this context must pursue the following objectives:

- Ensuring the efficient use of frequencies;
- Ensuring sustainable competition;
- Legal certainty;
- Investment planning certainty.

The key features defined by the regulatory authority are presented below. In this context, it is crucial to note that each of these points is subject to the timely availability of terms of use for the frequencies, to the (practical) feasibility of a multi-band auction involving three frequency bands, and to the approval of the invitation to tender by the Austrian Federal Minister of Transport, Innovation and Technology.

1.1 Joint auction of 800, 900 und 1800 MHz frequency bands

Up to this point, the regulatory authority has rejected the idea of a joint auction of all three bands because such an auction would increase the complexity of the frequency assignment procedure and because an initial assessment made it appear questionable whether the benefits of a joint assignment procedure would justify this additional complexity. In terms of value, there are obviously close interdependencies between the 800 MHz and 900 MHz bands as well as between the 900 MHz and 1800 MHz bands; therefore, the regulatory authority now plans to auction off all three bands jointly. This arrangement will reduce the substitution risk for bidders in the auction procedure. Re-auctioning the GSM bands early will ensure certainty in investment planning in a timely manner, and the simultaneous assignment of frequencies in the 1800 MHz band will enable operators to reduce the load on the 900 MHz band by shifting part of their GSM traffic (in certain areas).

The following points are also considered crucial with regard to the frequency assignment procedure:

- Subdivision of frequency band: The regulatory authority believes that subdividing the available spectrum into paired blocks of 5 MHz is the most expedient and appropriate solution and will therefore base its further considerations on this assumption.
- Adjacent frequency blocks: In designing the auction, the regulatory authority will account for this requirement to the greatest extent possible.
- Safeguards for competition: In order to prevent the emergence of spectrum monopolies and to ensure functioning competition after the auction, the regulatory authority will specify safeguards (especially spectrum caps) in the assignment specifications and auction rules.
- Terms of use: In the course of preparing the invitation to tender and designing the auction, the regulatory authority will make efforts to account for any differences in the possible uses of frequencies.

1.2 Planned time of auction: mid-2012

The regulatory authority plans to hold the auction in the summer of 2012. This time results from the need for extensive preparations as well as the preferences voiced in the course of the consultation. The specification of terms of use (especially for the "digital dividend") will require extensive coordination with neighbouring countries. The regulatory authority assumes that those terms will not be completed until next year. Only then will a sufficient basis of information be available for a commercial valuation of the frequencies and for the invitation to tender. The further schedule will be defined on the basis of legally required time periods and the appropriate lead time required by the

regulatory authority and the bidders. In preparing the schedule for the tender procedure, the regulatory authority will also consider the increased complexity of a multi-band auction.

1.3 Liberalisation of GSM usage rights for UMTS and LTE deployment after the auction procedure considered less problematic regarding distortions of competition

The regulatory authority is of the opinion that the liberalisation of GSM frequency usage rights will bring about numerous advantages. This step will make it possible to use more spectrum for (more efficient) broadband technologies, thus enabling operators to provide a larger quantity of (broadband) services using the same amount of spectrum. Moreover, the 900 MHz band can be used to supply rural areas with mobile broadband services in a cost-effective manner (using existing sites) and to improve indoor coverage. These advantages should be realised as soon as possible. Unjustified delays of the use of these frequency bands for (more spectrum-efficient) broadband technologies would run counter to the objectives mentioned above. However, the regulatory authority considers it appropriate to wait until the upcoming frequency assignment procedures are completed to liberalise the GSM frequencies; this view is supported by multiple arguments:

- Assessments of competition can be carried out on the basis of the actual long-term frequency assignments held by all market participants.
- The assessment can account for the fact that all operators had access to certain frequency resources.
- The assessment can account for any cooperation arrangements between operators.
- At that time, more reliable information will be available regarding technological developments.
- Any initial advantages (or disadvantages) arising from the different availability of various technologies and services in different frequency bands (e.g. voice over LTE) will be mitigated over time.

With regard to competition, therefore, the regulatory authority believes that the liberalisation of GSM frequency usage rights will be less problematic after the assignment procedure than prior to the procedure.

Should distortions of competition be identified in the course of reforming, the regulatory authority will have to impose suitable obligations (or to refrain from liberalisation). If it is necessary to impose such obligations, then the regulatory authority will make every effort to avoid major interventions in existing rights and the resulting legal risks in any case. The objective is to apply the least intrusive obligations which are still capable of remedying the (essentially temporary) competition problems. In this context, possible obligations can be derived in particular from the GSM Directive.

In addition, the regulatory authority is of the opinion that the amended GSM Directive is to be interpreted in such a way that reforming applications can only be rejected in cases where potential distortions of competition or technical limitations are identified and cannot be remedied by imposing appropriate obligations. Without objective technical and economic reasons, it therefore does not appear justified to delay the liberalisation of these frequency bands until the licence period has expired.

2 Results of the consultation procedure

2.1 Introduction

When the amendment to the Austrian Frequency Utilisation Plan went into effect in February 2011, the Telekom-Control-Kommission (TKK) was placed in charge of a number of new tasks and decisions. The new legislation transposed the amended GSM Directive into Austrian law and thus created 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 regulatory authority published its initial considerations for discussion in a consultation procedure, after which it reviewed the ideas on the basis of the respondents' comments and opinions and then defined future measures on that basis.

The sections below present the regulatory authority's perspective on the arguments presented in the course of the consultation procedure as well as the key conclusions and the arguments which led to the future measures defined by the authority. In this context, the regulatory authority's considerations are centred around the following four objectives:

- **Ensuring the efficient use of frequencies:** In the regulatory authority's view, the efficient use of frequencies involves a number of requirements. First, it is important to allocate available spectrum (the digital dividend) as quickly as possible once the requirements for assignment have been fulfilled, that is, as soon as the terms of use, market developments and available technologies allow a commercial valuation of the frequencies. Second, the spectrum in question should be assigned on the basis of economic efficiency considerations. Third, existing usage rights should be liberalised as soon as possible in order to ensure that new and more spectrum-efficient technologies can be deployed. Fourth, it is necessary to ensure that frequency assignments are adapted to the requirements of new technologies (channel spacing) as soon as possible. In addition, the transition process should be designed in a way that minimises the risk of any discontinuity in usage and the amount of temporarily unusable spectrum.
- **Ensuring sustainable competition:** The upcoming decisions and procedures should not lead to a structural weakening of competition.
- **Legal certainty:** Large investments in network infrastructure are made on the basis of frequency assignments. It is not least for this reason that the regulatory authority wishes to find a solution which ensures a maximum of legal certainty. This certainty can be ensured if the solution requires only a minimum of intervention in existing usage rights and if any requirements imposed in connection with refarming are reasonable (i.e. not excessive) as a means of eliminating potential distortions of competition in connection with refarming. In addition, it is necessary to ensure that access to frequencies is provided exclusively on the basis of non-discriminatory, transparent and objective procedures.
- **Investment planning certainty:** Investments in new and more spectrum-efficient broadband technologies will only be made to an economically desirable extent if sufficient investment planning certainty is ensured. This is especially true of the (remaining) licence periods for GSM frequencies. The regulatory authority believes that a licence period of at least ten years will be necessary, otherwise there is a risk that the liberalisation of frequencies will not have material effects.

2.2 General framework

2.2.1 Broadband development

Even conservative forecasts point to enormous growth in mobile broadband services in the coming years. Above all, we can expect data transfer volumes to grow more quickly than the frequency resources that can be made available for mobile communications in the near future.

The results of the consultation clearly indicate that the demand for frequencies anticipated by respondents (especially in the range below 1 GHz) will exceed supply by a considerable margin. Therefore, one of the authority's key regulatory objectives is to ensure the efficient use of the available frequencies. Where no technical or competition-related reasons for limitations exist, the requirements for efficient frequency usage include the following:

- No operator should be prevented from using more spectrum-efficient technologies;
- No operator should be prevented from deploying broadband technologies in all of the frequency bands at its disposal;
- The assignment of frequencies designated for mobile communications and mobile broadband services should not be delayed unnecessarily;
- A sufficient level of investment planning certainty should be ensured so that operators actually make investments in (more spectrum-efficient) mobile broadband technologies.

2.2.2 Frequencies below 1 GHz

The majority of consultation respondents are convinced that mobile broadband service coverage requirements will exceed the present coverage level by a substantial margin. This means that considerable investments will be required to roll these services out in rural areas. Given their propagation characteristics, frequencies below 1 GHz (i.e. sub-1 GHz frequencies) are especially well suited for this purpose. In addition, these frequencies make it possible to offer superior indoor coverage with mobile broadband services. Austria's consumers and the Austrian economy as a whole will benefit from a more cost-effective rollout using sub-1 GHz frequencies. However, spectrum below 1 GHz is an especially scarce resource; in fact, these frequencies account for less than 25% of the spectrum assigned to mobile network operators.

The comments and opinions received indicate that the excess demand for these frequencies is considerable. All respondents consider spectrum below 1 GHz to be indispensable or extremely important (at least for their own companies) in order to operate a cost-effective nationwide mobile communications network. With the assignment of the digital dividend and the liberalisation or re-assignment of the 900 MHz frequency band, the mobile communications sector will gain access to the only frequency resources that enable the cost-efficient provision of mobile broadband services in rural areas as well as improved indoor coverage with those services in the coming years. The results of these procedures will define the competitive landscape in Austria in the years to come. Those operators which have not been assigned sub-1 GHz frequencies will also have the opportunity to acquire such frequencies and thus roll out and/or convert their networks. Depending on the prices of the frequencies, operators which are unable to secure frequencies in this range could suffer competitive disadvantages. At the same time, a considerable share of sub-1 GHz frequencies are also currently used (and will be used in the future) for GSM voice services. In addition, individual frequency needs may vary widely on the basis of different business models and market shares.

In light of these considerations, it is especially important to ensure that the frequency bands in question are used efficiently. In designing the upcoming procedures, the regulatory authority will do the following:

- ensure that every company has the opportunity to acquire such frequencies;
- ensure through the appropriate competition safeguards that those frequencies are not monopolised and that competition is not adversely affected by any such monopolies;

- ensure that the rapid deployment of new (more spectrum-efficient) technologies is promoted (or at least not prevented) in the 900 MHz frequency band so that more sub-1 GHz frequencies can be used (sooner) for mobile broadband services.
- ensure that operators have sufficient flexibility to acquire the amount of spectrum they require for their respective business cases in the course of the auction;
- ensure through an efficient auction procedure that the licence fees reflect the economic value of each frequency to be assigned (thus promoting efficient usage and limiting distortions of competition).

2.2.3 Technological development

The consultation respondents generally agree that multiple technologies will be deployed in parallel in the short and medium term, but their forecasts of the medium to long-term development of technologies differ vastly, as their comments refer to very different scenarios and strategies with regard to the (optimal) mix of technologies in the medium to long term.

In this context, the regulatory authority sees its primary duty as one of creating a general framework in which each operator can pursue a development path optimised for its own purposes. This includes the following:

- ensuring sufficient flexibility so that operators can deploy the most efficient technology (technology and service neutrality);
- preventing unnecessary delays in the assignment of new frequencies and the digital dividend;
- ensuring the rapid re-assignment of the GSM frequency bands in order to ensure sufficient levels of planning certainty, in particular with regard to investments;
- ensuring the rapid liberalisation of the GSM frequency bands in line with the amended GSM Directive.

2.2.4 Interrelationships between frequency bands

Most of the consultation respondents agreed with the regulatory authority's view that there are close economic interdependencies between the 800 MHz and 900 MHz bands (cf. the discussion in the consultation document).

In addition, the respondents pointed to close interdependencies between the value of the 900 MHz band and that of the 1800 MHz band. Both bands are suitable for GSM deployment. In densely populated areas, for example, an operator could shift GSM traffic from the 900 MHz band to the 1800 MHz band and use the resulting available capacity for mobile broadband services, which in turn increases the substitutability of the 800 MHz and 900 MHz bands. The regulatory authority shares this opinion.

The respondents expressed a wide variety of views on the question of whether operators should focus on specific core bands. Some do not consider it sensible (or possible under real conditions) to focus on specific bands due to differences in the availability of technologies, while other respondents indicated that such a focus would be sensible and (cost-)efficient, at least in the medium to long term or in part.

The economic interdependencies between the values of the frequency bands will pose certain risks for the bidders in the frequency auction (substitution and aggregation risk). In designing the assignment procedures, the regulatory authority plans to account for this in the following ways:

- The authority plans to auction off all three frequency bands (800, 900 and 1800 MHz) simultaneously, as the risks mentioned above can be controlled more effectively in an appropriately designed simultaneous auction than in a sequential auction;
- These risks will be taken into account wherever possible in the design of the auction.

2.2.5 Additional frequency bands

In the near future, no further frequency bands will become available for mobile broadband services. The propagation characteristics of the 450 MHz band would be highly favourable for this purpose, but the relevant technologies and bandwidth are not available in this frequency band. In the long term, frequencies in the 3400 to 3800 MHz band could be used for LTE Advanced in urban areas. However, the propagation characteristics of those frequencies are rather unfavourable, and LTE Advanced is not yet available at this time.

These considerations also highlight the need for efficient use of all frequency bands available for mobile communications.

2.3 Refarming

2.3.1 Economic effects

The majority of respondents who voiced their opinions on this topic agree with the regulatory authority's view. One respondent was concerned 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. Another respondent expressed general reservations about an early liberalisation of GSM frequencies (i.e. prior to the end of the licence period) and regards the potential of using GSM frequencies for broadband services – and thus the economic benefits of refarming – as low in the coming years (as the respondent considers it highly improbable that GSM will be replaced).

The regulatory authority is still of the opinion that the liberalisation of GSM frequency usage rights will not be detrimental to the Austrian economy. Liberalisation will make it possible to use more spectrum for new broadband technologies, thus enabling operators to transport larger quantities of data using the same amount of spectrum. Moreover, the 900 MHz band can be used to supply rural areas with mobile broadband services in a cost-effective manner (using existing sites) and to improve indoor coverage. Under normal market conditions, the resulting overall effect on economic welfare is clearly positive (i.e. an increase in supply combined with a simultaneous decrease in costs will increase the sum of consumer and producer surplus). The sooner these advantages are realised, the greater the gains in economic welfare will be.

With regard to the concerns voiced about early liberalisation in general, the regulatory authority wishes to note that delaying the deployment of (more spectrum-efficient) broadband technologies in these frequency bands runs counter to the objectives cited above, and especially that the respondents who expressed such concerns did not indicate exactly how or where economic benefits should arise from delaying the liberalisation until the licences expire (which is as late as 2019 in some cases). Even if the frequencies in question can only be used for new technologies to a very limited extent in the short term (e.g. because they are currently being used for GSM services), liberalisation would not bring about any discernible economic disadvantages.

In addition, the regulatory authority is of the opinion that the amended GSM Directive is to be interpreted in such a way that refarming requests can only be rejected in cases where potential distortions of competition or technical limitations are identified and cannot be remedied by imposing appropriate obligations. Without objective technical and economic reasons, it therefore does not appear justified to delay the liberalisation of these frequency bands until the licence period has expired.

2.3.2 Importance of GSM

Opinions regarding the medium to long-term importance of GSM varied quite widely. One consultation respondent believes that GSM traffic will not reach a plateau until 2020, while another respondent believes that GSM will not be used to any significant extent after the year 2015.

From the regulatory authority's perspective, the future use of GSM is hardly predictable, but the operators in question can control this use to a certain extent (e.g. by shifting voice traffic from the 900 MHz band to the 1800 MHz band, by shifting voice traffic from GSM to UMTS, by creating incentives for customers to switch handsets, etc.). Ultimately, the transition process will be driven by market developments and business considerations.

In the eyes of the regulatory authority, therefore, it is of primary importance to create a framework which ensure that the frequencies in question can be used efficiently in the future. This requires the following:

- The use of the frequency bands in question must be liberalised in a timely manner so that those bands can be used for (more spectrum-efficient) broadband technologies alongside GSM; for example, this would enable operators to handle part of their broadband traffic in rural areas using the 900 MHz band, which would in turn mitigate the scarcity of resources in the 800 MHz band.
- Re-auctioning the GSM frequencies early must make it possible to ensure investment planning certainty in a timely manner.
- The licence fees for the frequency bands in question must reflect opportunity costs and thus promote the optimal investment decisions.
- Frequencies in the 1800 MHz band must also be auctioned off quickly (see below) so that operators are able to reduce the load on the 900 MHz frequency band by partially shifting GSM traffic (in certain areas).

2.3.3 Fragmentation issues

The assignments in the GSM bands are fragmented over time and in terms of bandwidth/position in the spectrum. This places limits on the use of new broadband technologies (cf. also the discussion in the consultation document). The issue of fragmentation is also addressed in the consultation document, which points to the need to align licence periods in order to increase the efficiency of frequency usage and suggests that the problem of fragmentation must be resolved by taking the appropriate measures prior to liberalising GSM usage rights (see also below).

At the same time, it is necessary to note – and there was vast consensus among the consultation respondents on this point – that the frequency bands in question will still be used for GSM services for several years to come (even if other technologies are deployed in parallel). This puts into perspective the potential efficiency losses in connection with the use of these bands for new broadband technologies in the short to medium term.

In light of this situation, defragmenting the spectrum appears desirable but not absolutely necessary prior to the expiration of the current GSM assignments, especially as defragmentation by the regulatory authority would constitute a major intervention in existing usage rights which could only be justified if these frequency bands could be used immediately and in their entirety for new broadband technologies. At present, this is not a foreseeable development over the remaining validity period of most GSM assignments.

However, the respondents agree that the fragmentation of frequency assignments in the GSM bands will certainly stand in the way of deploying new technologies in the medium to long term. Due to the greater scarcity of frequencies in the 900 MHz band, it is more urgent to resolve this problem in that frequency band than in the 1800 MHz band. Therefore, the regulatory authority considers it desirable to change over to 5 MHz channel spacing as quickly as possible (with due preservation of existing usage rights).

An early auction of the GSM bands as envisaged by the regulatory authority would ensure defragmentation at the earliest possible point in time (and at the same time serve to avoid official intervention in existing usage rights). In contrast, extending the validity of the current assignments would perpetuate the problem unnecessarily.

Prior to the expiration of the corresponding licences, these bands can only be defragmented by means of frequency trading among the operators themselves. Experience has shown that it is not easy for the

operators to reach agreements to this end. The regulatory authority is of the opinion that the conditions will be far more favourable for such agreements once the frequencies have been re-allocated. However, strategic interests and differences in usage between specific frequencies (e.g. preferred frequencies) may still stand in the way of defragmentation.

In the consultation, it was suggested that the early liberalisation of GSM frequencies should be made contingent on a mutual, multilateral solution to the problem of defragmentation. According to this suggestion, the relevant refarming requests should be rejected until such a solution is negotiated. The regulatory authority generally welcomes any proposals which would increase the efficiency of frequency usage. However, the authority does have the following reservations regarding this suggestion:

- In the regulatory authority's interpretation of the amended GSM Directive, fragmentation does not constitute sufficient grounds for the rejection of a refarming request, especially as more than 50% of the 900 MHz frequency band and more than 70% of the 1800 MHz frequency band can be used for UMTS/LTE in the short to medium term. Considering the fact that the operators plan to continue using these bands heavily for GSM services, fragmentation does not constitute a technical hindrance to liberalising GSM usage rights.
- The suggestion brings about a major disadvantage in that an individual operator could block the liberalisation process for strategic reasons, thus preventing the more efficient use of frequencies by other market participants.

2.3.4 Distortions of competition

Naturally, the respondents expressed very different views on the question of whether and to what extent the liberalisation of the GSM bands (without imposed obligations) would create distortions of competition. Overall, the comments and opinions received reflect the regulatory authority's position (i.e. that competitive distortions would be more probable and more severe in the liberalisation of the 900 MHz band than in the 1800 MHz band), but a number of consultation respondents pointed out that distortions of competition could also arise in the 1800 MHz band in the case of liberalisation.

Several respondents also suggested measures to counteract such distortions. The suggested measures ranged from the redistribution or re-assignment of existing usage rights to the transfer of any windfall profits to the government or the definition of asymmetric spectrum caps in the course of the upcoming frequency auctions (see also the summary of comments and opinions). This would remedy any distortions of competition arising from the liberalisation of this spectrum and compensate for "historical first-mover advantages" resulting from the sequential assignment of existing usage rights. In addition, it was suggested that infrastructure cooperation arrangements could be taken into account in the examination of competitive distortions and that the corresponding measures could be provided for in the course of the assignment procedures.

The assessment of effects on competition will be one of the key issues related to the early liberalisation of GSM frequencies. Above all, the availability of alternatives (e.g. the 800 MHz band as an alternative to the 900 MHz band, etc.) will have to be assessed in this context. The results of this assessment will also depend on the time of refarming. The later the frequencies are liberalised, the more probable it is that e.g. the 800 MHz band will constitute an (equivalent) alternative to the 900 MHz band.

At present, the respondents' expectations vary widely with regard to the question of when specific technologies will be ready for market in which bands, and which services will (or will not) be supported by each technology. In general, the regulatory authority currently believes that this situation will have to be assessed at or around the same time as liberalisation (after the digital dividend auction has been concluded), and that more reliable information will be available at that time. This also applies to the liberalisation of the 1800 MHz frequency band. At present, the concerns voiced in this context (competitive advantages due to LTE1800) are hardly verifiable. The regulatory requirements for the use of LTE in the GSM bands are still being developed.

The regulatory authority considers it appropriate to wait until the upcoming frequency assignment procedures are completed to liberalise the GSM frequencies; this view is supported by multiple arguments:

- Assessments of competition will be carried out on the basis of the actual long-term frequency assignments held by all market participants.
- The assessment will account for the fact that all operators had access to certain frequency resources.
- The assessment will account for any cooperation arrangements between operators.
- At that time, more reliable information will be available regarding technological developments.
- Any initial advantages (or disadvantages) arising from the different availability of various technologies and services in different frequency bands (e.g. voice over LTE) will be mitigated over time.

With regard to competition, the regulatory authority still believes that the liberalisation of GSM frequency usage rights will be less problematic after the assignment procedure than prior to the procedure.

Should distortions of competition be identified in the course of GSM refarming, it will be necessary to consider imposing suitable obligations (or to refrain from liberalisation). In this context, the redistribution or re-assignment of existing frequency usage rights (as suggested by some respondents) would be the most intrusive instrument. The regulatory authority's plan is to avoid far-reaching interventions in existing rights wherever possible (in line with the objective of ensuring legal certainty). In this context, it is also important to note that the regulatory authority could impose less intrusive obligations in order to address the (essentially temporary) competition problems. For example, the regulatory authority could consider imposing a temporary access obligation limited to rural areas. Such an obligation would be less intrusive and could also be more appropriate and more compatible with the principle of proportionality. Besides, it is not currently possible to rule out the possibility that if certain conditions are met (once the assignment procedure has been completed), the liberalisation of GSM frequencies might be possible without imposing obligations at all.

Concerning the "historical first-mover advantages" cited in the consultation responses, the regulatory authority would like to make the following statement: The majority of the GSM licences in question were allocated in multiple open, fair and non-discriminatory procedures over a period of 15 years. The current assignments and frequencies held by operators – and the resulting specific advantages and disadvantages – are (among other things) the result of business decisions. In addition, the majority of frequency licences for mobile communications services were assigned by means of auctions, and one can assume that the licence fees inherently reflect specific differences with regard to terms of use and the market environment (growth expectations, risk and uncertainty). In the eyes of the regulatory authority, there is no doubt that it will be necessary to review the effects of refarming on competition in the course of liberalising GSM usage rights. However, the regulatory authority does not see a need to remedy "historical first-mover advantages" after the fact.

Likewise, symmetry in frequency assignments is not among the regulatory authority's objectives. Operators may have very different frequency requirements due to their individual frequency assignments, business models, competitive positioning and market shares. This form of competitive differentiation is also common in other sectors of the economy. Asymmetry in frequency assignments does not necessarily cause distortions of competition as long as the terms of access to frequencies are fair and non-discriminatory and the frequency licence fees reflect opportunity costs.

Apart from that, the regulatory authority will provide for the appropriate safeguards in the course of the upcoming assignment procedures in order to prevent frequencies from being monopolised, which would endanger competition.

In the course of the consultation, it was suggested that the windfall profits arising from refarming should be transferred to the government. Notwithstanding the question of whether and to what extent such profits might be generated, the regulatory authority does not believe that there is a basis for such a measure in Austrian law.

2.3.5 Investment planning certainty

The majority of comments and opinions received are in line with the regulatory authority's opinion that the remaining time period is too short in order to justify significant investments in 3G/4G technologies. Although individual investments in the deployment of broadband technologies in the GSM bands cannot be ruled out in the case of immediate liberalisation, the regulatory authority still believes that the remaining validity period of most GSM licences is too short to use these bands intensively (or to an economically optimal extent) for new technologies.

Therefore, the regulatory authority believes that it is important to create the necessary planning certainty (especially with regard to investments) for an appropriate time horizon as soon as possible. From the regulatory authority's perspective, holding the auction early would be the most effective means of pursuing this objective. A short-term extension of GSM licences for just a few years would not achieve this objective.

2.3.6 Extension of licences

In the course of the consultation, several respondents suggested extending the validity of the current GSM licences as an alternative to re-auctioning the frequencies early. Apart from references to international practice, however, no arguments were presented as to why extending the licences' validity would be more effective than an early auction for the purpose of achieving the objectives pursued. One respondent was decidedly against the idea of an extension.

On the basis of the current legal situation, the regulatory authority does not consider it possible to extend the validity of the licences. In addition, the regulatory authority is also critical of this option in light of the four objectives mentioned above:

- Extending the current licences would not meet the standard of open, transparent and non-discriminatory access to frequencies and would thus – in contrast to an early auction – run counter to the requirements of Austrian law.
- Such an extension would prolong the fragmentation caused by the current frequency assignments. In contrast, an early auction would resolve the problem of defragmentation at the earliest possible point in time. Extending the validity of existing licences would therefore conflict with the objective of efficient frequency usage.
- An extension by just a few years would not create the long-term investment planning certainty necessary for an economically desirable level of investment in more spectrum-efficient broadband technologies. In contrast, an early auction would create ensure planning certainty (especially with regard to investments) over a far longer time horizon.
- Not all operators would benefit to the same extent (or in some cases at all) from such an extension. Extending the licences would affect the operators' relative competitive positions and could trigger or exacerbate the distortions of competition which might arise in connection with the liberalisation of these frequencies. Such a situation would require far-reaching intervention in existing usage rights, meaning that an extension would conflict either with the objective of legal certainty or that of ensuring competition.

2.4 Assignment procedure

2.4.1 Simultaneous assignment of 800, 900 and 1800 MHz frequency bands

A vast majority of consultation respondents explicitly support the regulatory authority's proposal to auction off the frequencies in the digital dividend along with those in the 900 MHz band. This position

is underpinned by the close economic interdependencies between the two frequency bands and the lower risk involved in a simultaneous auction for the bidders (substitution and aggregation risk).

In addition, a number of respondents presented arguments in favour of auctioning off the 1800 MHz frequency band at the same time as the 900 MHz band:

- The majority of licences in the 1800 MHz frequency band will expire at the same time as those in 900 MHz band.
- As both can be used for GSM services, there are close substitution relationships between these two bands.
- At least in more densely populated regions, the load on the 900 MHz band can be reduced by shifting GSM traffic to the 1800 MHz band, thus making it possible to use the former for broadband services more rapidly and intensively.
- This would also ensure planning certainty (especially with regard to investments) for the deployment of broadband technologies in the 1800 MHz band.

Up to this point, the regulatory authority has rejected the idea of a joint auction of all three bands because such an auction would increase the complexity of the frequency assignment procedure and because an initial assessment made it appear questionable whether the benefits of a joint assignment procedure would justify this additional complexity.

The arguments presented by the respondents have prompted the authority to re-evaluate this position. In terms of value, there are obviously close interdependencies between the 800 MHz and 900 MHz bands as well as between the 900 MHz and 1800 MHz bands; therefore, the regulatory authority now plans to auction off all three bands jointly. This arrangement will reduce the substitution risk for bidders in the auction procedure. For example, when valuating the 900 MHz band, an operator could account for its resources in the 1800 MHz band (and vice versa).

However, given the increased complexity of such a procedure, the appropriate lead time will also be required. Moreover, this plan is subject to the timely availability of the corresponding terms of use, to its practical feasibility and to the approval of the invitation to tender by the Federal Minister of Transport, Innovation and Technology.

2.4.2 Time of auction

The regulatory authority plans to hold the auction in the summer of 2012. This time results from the need for extensive preparations as well as the preferences voiced in the course of the consultation.

The specification of terms of use (especially for the digital dividend) will require extensive coordination with neighbouring countries. The regulatory authority assumes that those terms will not be completed until next year. Only then will a sufficient basis of information be available for a commercial valuation of the frequencies and for the invitation to tender. The further schedule will be defined on the basis of legally required time periods and the appropriate lead time required by the regulatory authority and the bidders. In preparing the schedule for the tender procedure, the regulatory authority will also consider the increased complexity of a multi-band auction.

In this context, no consultation participants expressed a preference for an auction prior to mid-2012. Most respondents clearly indicated that it is a higher priority to specify the basis for commercial valuation of the frequencies (e.g. through terms of use) and to hold a simultaneous auction with other frequencies than to auction off individual frequencies as soon as possible. Therefore, the plan to allocate the frequencies in the summer of 2012 is in line with the comments and opinions received in the consultation.

2.4.3 Demand for frequencies

The results of the consultation clearly show that preferences vary widely with regard to demand for spectrum as well as minimum spectrum requirements. Some bidders estimate their minimum requirements per band at 2x10 MHz, while others expect to need a minimum of 2x5 MHz.

Some respondents see are close interdependencies between the value of the 800 MHz and 900 MHz bands. It was also argued that there are interdependencies between the 900 MHz and 1800 MHz bands (see above).

With regard to the design of the auction, these arguments give rise to specific requirements which the regulatory authority will take into account wherever possible in the procedure.

2.4.4 Subdivision of frequency bands

The vast majority of respondents advocated a subdivision into paired 5 MHz blocks in the assignment of the 800 MHz and 900 MHz bands. The regulatory authority will therefore base its considerations on this preference.

2.4.5 Adjacent frequency blocks

The respondents' comments and opinions indicate a clear preference for the assignment of adjacent frequency blocks to each successful bidder. In designing the auction, the regulatory authority will account for this requirement to the greatest extent possible.

2.4.6 Safeguarding competition

In order to prevent the emergence of spectrum monopolies and to ensure sustainable competition after the auction, the regulatory authority will specify safeguards in the assignment specifications and auction rules.

In this regard, a number of consultation respondents made suggestions ranging from (asymmetric) spectrum caps to the consideration of infrastructure cooperation arrangements in the process of admitting bidders to the auction.

The regulatory authority will review these and other mechanisms/aspects in the course of preparing the invitation to tender and the auction. At this point in time, any specification of safeguards would be premature because their actual definition will depend on the market environment at the time of the assignment procedure.

2.4.7 Terms of use

Several consultation recipients pointed to differences in the terms of use, especially with regard to the 800 MHz frequency band. One respondent mentioned the increased probability of interference that would arise from technology-neutral usage as well as the importance of defining the appropriate regulations to address this problem.

In preparing the invitation to tender and designing the auction, the regulatory authority will make efforts to account for any differences in the possible uses of frequencies.

As regards other topics addressed in connection with terms of use, such as interference with other frequency uses (e.g. broadcasting, cable television networks), the regulatory authority would like to point out that the Austrian Federal Minister of Transport, Innovation and Technology is responsible for such issues. Accordingly, the regulatory authority has passed on all comments received in this regard.