

Consultation document regarding APEK's frequency management strategy

1. General Considerations

1.1. General policy goals

“Europe 2020”¹ as the overriding strategy of the European Union for economic policy sets three mutually reinforcing priorities:

- Smart Growth: developing an economy based on knowledge and innovation.
- Sustainable Growth: promoting a more resource efficient, greener and more competitive economy.
- Inclusive Growth: fostering a high-employment economy delivering social and territorial cohesion.

These priorities are seen as the key elements for successful long-term development of the European Union for the time period from 2010 to 2020. Economic policy, including telecommunication policy of the European Union based on these priorities should succeed to lead the European Union out of the current economic crisis, promote growth and jobs and international competitiveness of the Member States of the European Union. The priorities clearly show that the Union envisages the greatest potential for growth in developing a knowledge based, sustainable economy with high employment and social cohesion. It is also obvious that modern information and communication systems play already and will in the future play an important role in achieving these strategic economic and social policy objectives.

Europe has identified new “engines” to boost growth and jobs. These areas are addressed by 7 “flagship initiatives”. Within each initiative, both the European Union and national authorities have to coordinate their efforts so they are mutually reinforcing. The European Commission has presented most of these initiatives in 2010.

In the policy area of Smart Growth, the “Digital Agenda for Europe”² is the flagship initiative, which deals with electronic communications policy. The Digital Agenda for Europe is one of the major strategic initiatives of the Europe 2020 Strategy with the overall objective to ensure sustainable economic and social benefits derived from a digital Single European Market based on seven pillars. In particular, Pillar IV: Fast and ultra-fast Internet access, focuses on Internet access in the EU. In this Pillar IV of the Digital Agenda the EU has set a target that by 2013 all citizens of the European Union should have access to basic broadband, by 2020 access to internet speed exceeding 30 Mb/s, and 50% of European households or more should have access to internet speed exceeding 100 Mb/s. Modern mobile communications technologies are seen to play an extremely important role in these considerations, by not only providing high-speed broadband access in densely populated urban areas, but also in areas where fixed access networks are economically not viable. Consequently, the EU considers a harmonized spectrum policy as vital for the development of mobile broadband services. The Radio Spectrum Policy Programme (from here after: *RSPP*)³, as one of the 8 Policy Actions of Pillar IV⁴ establishes the legal framework for this harmonized spectrum policy. Within the overall context of the initiatives of Europe 2020 and the Digital Agenda for Europe, the RSPP identifies, amongst others, the following main objectives:

¹ Communication from the Commission, Europe 2020, A strategy for smart, sustainable and inclusive growth, COM(2010) 2020 final, Brussels, 3.3.2010

² Communication from the Commission to the European Parliament, the Council, the European economic and social committee and the Committee of the regions, A Digital Agenda for Europe, COM(2010) 245 final/2; Replacing the document COM(2010) 245 final of 19.5.2010; Brussels, 26.8.2010

³ Radio Spectrum Policy Programme has been adopted by Decision No. 243/2012/EU of the European Parliament and of the Council, O.J. 2013, L 81/7, 21.03.2012;

⁴ Policy Actions 42 to 49 of the Digital Agenda

- encourage efficient management and use of spectrum;
- seek to allocate sufficient and appropriate spectrum in a timely manner;
- bridge the digital divide and contribute to the objectives of the Digital Agenda for Europe;
- promote innovation and investment through enhanced flexibility in the use of spectrum;
- maintain and develop effective competition, in particular in the markets for electronic communication services,

which are governed by general regulatory principles, to promote the efficient use of available frequency spectrum in accordance with Articles 8a, 9, 9a and 9b of Directive 2002/21/EC and with Decision No. 676/2002/EC and with special reference to spectrum needs for wireless broadband communications. These legal provisions are targeted towards:

- applying the most appropriate and least onerous authorisation system possible in such a way as to maximise flexibility and efficiency in spectrum use;
- fostering development of the internal market by promoting the emergence of future Union-wide digital services and by fostering effective competition;
- promoting competition and innovation, taking account of the need to avoid harmful interference and of the need to ensure technical quality of service in order to facilitate the availability of broadband services and to respond effectively to increased wireless data traffic;
- promoting technology and service neutrality in the rights of use of spectrum, where possible.

With regard to the goal of enhanced flexibility in the use of spectrum, amongst other measures, the RSPP (see Art. 4 (2)) urges Member States and the European Commission to cooperate to enhance flexibility in the use of spectrum, in order to promote innovation and investment, through the possibility of using new technologies and through the transfer or lease of rights of use of spectrum.

The policy goal of timely allocation of sufficient spectrum for broadband access requires Member States “.....to carry out the authorisation process in order to allow the use of the 800 MHz band for electronic communications services” by 01.01.2013⁵. The European Commission may grant derogations under special national circumstances. Slovenia applied for derogation by letter 381-3/2010 dated 26.10.2012.

In the area of competition rules (see Art. 5, RSPP), Member states shall promote effective competition and shall avoid distortions of competition in the internal market for electronic communications services in accordance with the EU Regulatory Framework for electronic communications, in particular with Directives 2002/20/EC and 2002/21/EC. The RSPP allocates obligations and strong powers to the competent national authorities, to ensure that the authorisation and selection procedures for electronic communications services promote effective competition for the benefit of citizens, consumers and businesses in the European Union. The following list summarizes these powers:

1. APEK may, if appropriate, reserve a certain part of a frequency band or group of bands for assignment to new entrants.
2. In addition, APEK may refuse to grant new rights of use of spectrum or to allow new spectrum uses in certain bands, or attach conditions to the grant of new rights of use of spectrum or to the authorisation of new spectrum uses, in order to avoid the distortion of competition by any assignment, transfer or accumulation of rights of use;
3. Furthermore, APEK may impose obligations prohibiting or imposing conditions on transfers of rights of use of spectrum, not subject to national or Union merger control, where such transfers are likely to result in significant harm to competition.
4. Finally, APEK is empowered to amending the existing rights in accordance with Directive 2002/20/EC where this is necessary to remedy ex post the distortion of competition by any transfer or accumulation of rights of use of radio frequencies.

Article 24 of the Slovenian Electronic Communication Act⁶ stipulates that on the basis of public authority APEK administers the radio frequency spectrum of the Republic of Slovenia taking into

⁵ RSPP, Art. 6 (4)

⁶ Electronic Communication Act-1 (Official Gazette, nb. 109/2012, 31.12.2012)

account the strategic objectives of the Ministry and strategic documents of the Republic of Slovenia and of the European Union.

These EU political and legal requirements determine the room for APEK's strategy for frequency management for mobile communications (short: frequency management strategy).

In addition to these European political and legal requirements, APEK's frequency management strategy has to be consistent with Slovenian national strategy policies and legislation. With regard to national (broadband) policies, APEK will integrate the provisions of the »Broadband Network Development Strategy in the Republic of Slovenia«⁷. This national broadband initiative has been adopted by the Government of the Republic of Slovenia in July 2008 in support of the EU policy goals. It strongly encourages the construction of wireless broadband networks as well as the liberalization of spectrum which is allocated to mobile services including the upper Digital Dividend⁸.

1.2. Summary political goals and legal provisions

The EU and national frame for APEK's strategy for frequency management with regard to mobile communication services can be summarized as follows:

- APEK shall release the scarce spectrum resources for mobile communication services (i.e. 800MHz, 2,6GHz) in a timely manner
- Slovenia should liberalize the conditions to use licensed spectrum in a way, which allows fast implementation of modern, spectrum efficient technologies in all available frequency bands⁹ ("refarming")
- Slovenia may support the goal of bridging the digital gap by imposition of special license conditions in the 800 MHz band
- APEK shall promote a competitive environment for mobile wholesale and end user markets, exercising the powers given by the RSPP as far as necessary.

According to strategic guidance of the Ministry¹⁰ APEK shall immediately start procedures for preparation of public tender/auction for available frequency bands 800 MHz, 1800 MHz, unpaired 2100 MHz and 2600 MHz. APEK, as the competent Slovenian Authority¹¹ will provide frequency management solutions, which cover all these requirements in a later chapter of this document.

2. Slovenian Markets for Mobile communications

2.1. Operators and licenses

The history of digital public mobile communication networks in Slovenia shows a series of frequency assignment through "beauty contests", which resulted in a market situation with four mobile network operators (MNOs) and four service providers (SPs). Their respective market shares and their development can be seen in **Diagram 1: Market shares of mobile operators in Slovenia**. As can be seen, in terms of active end users, Telekom Slovenije (Telekom Slovenia) continues to be the largest mobile operator, with continuously dropping market share. Si.mobil (a subsidiary of Telekom Austria) is the second largest operator with increasing market share. Tasmobil, starting to offer services in 2007 has surpassed the 11% mark, while T-2 entering the market even later in 2008 is below the 5% mark, close to both SPs Debitel and Izimobil. Western Wireless, as the original third MNO in Slovenia terminated its operations by the end of May 2006. In 2012 new SPs entered the market, namely Telemach. Consequently their market share is yet significantly lower than others.

⁷ http://www.arhiv.mvzt.gov.si/si/delovna_podrocja/informacijska_druzba/strategije_s_podrocja_informacijske_druzbe/
http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/DEK/Elektronske_komunikacije/Strategije/Strategija_BB_2008-07-10_SI.pdf

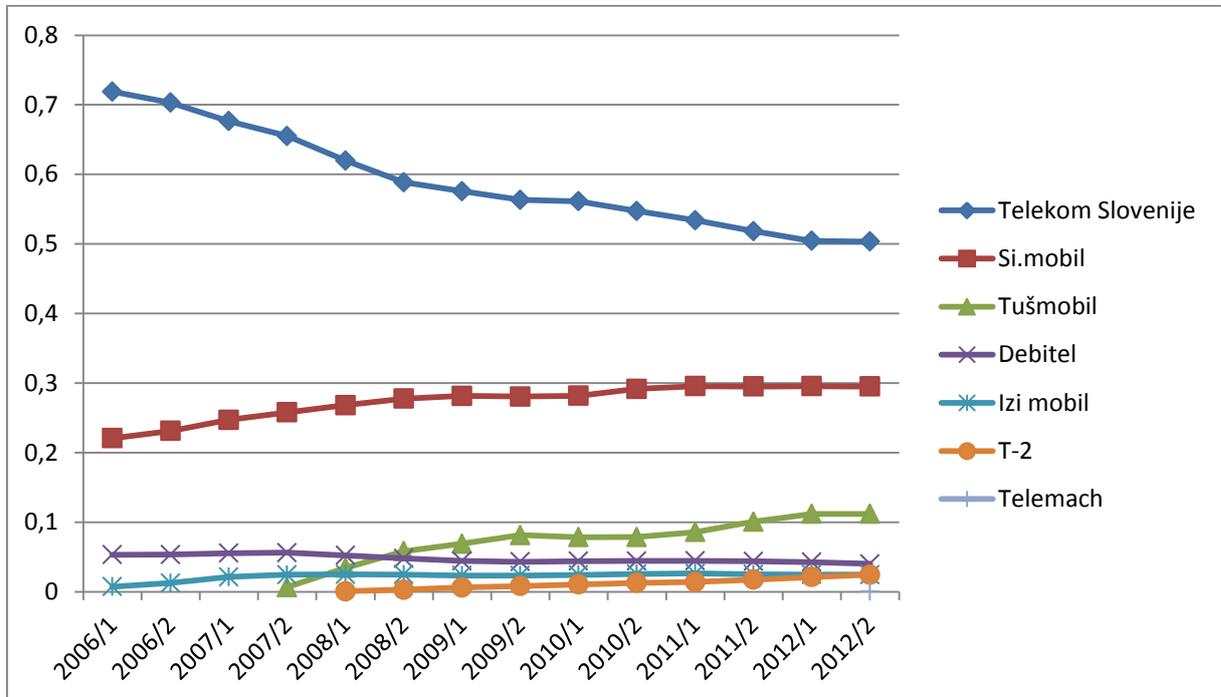
⁸ Digital Dividend in 790—862 MHz

⁹ The decision of the European Commission (EC/2009/766/ES) has been implemented by amendments to the licenses of mobile operators in July 2010.

¹⁰ Letter from Ministry of Education, Science, Culture and Sport, No. 381-8/2011-MVZT/11 of 8.10.2012

¹¹ Article 24 and Article 171 of Electronic Communications Act 2012

Diagram 1: Market shares of mobile operators in Slovenia 2006 - 2012:



Source: APEK, 2013

These figures show a highly concentrated mobile communication market with an Hirschmann-Herfindahl-Index close to 3700 and a combined market share of the two biggest operators at approximately 80%. This picture is not uncommon for a situation of successive market entries and shows very clearly the strength and persistence of first mover advantages in mobile communications.

2.2. Mobile voice and data markets in Slovenia

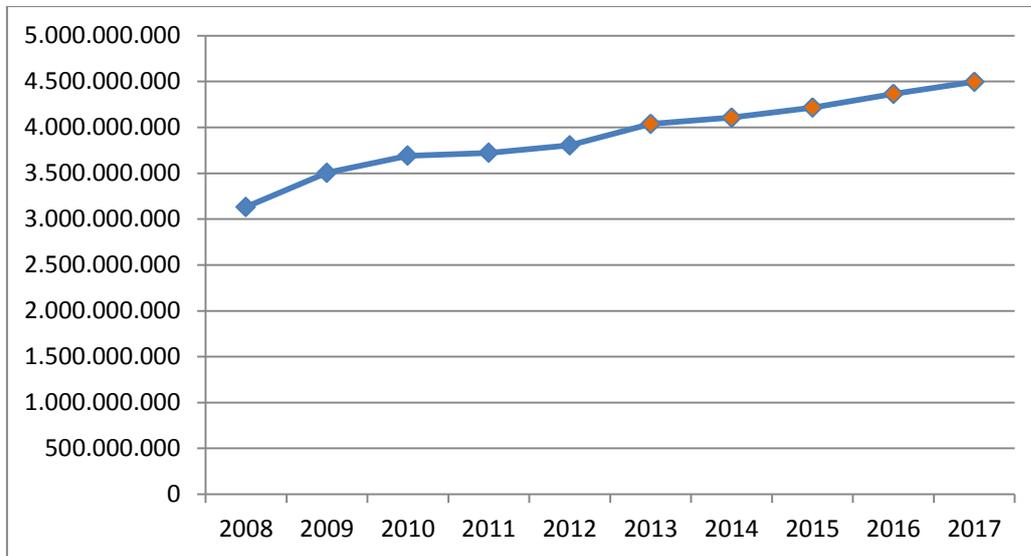
This chapter gives a short overview on the possible future development of mobile voice and data markets in Slovenia for 2013 to 2017 as predicted by APEK. APEK expects - similar to international experience¹² - that traffic volumes for mobile voice telephony will still be increasing in the next five years, but the most challenging development will occur in mobile data traffic.

As **Diagram 2:** Predicted mobile voice telephony in Slovenia 2013 -2017 shows, mobile voice traffic will increase steadily from 3,8 billion minutes to approximately 4,5 billion minutes in 2017. A similar development can be expected for SMS, which will grow by roughly 30% over the next five years. MMS will growth slightly faster, without reaching significant data volumes in the next five years.

The major change, as already indicated, will occur in mobile data. APEK expects for mobile data a dramatic increase of data volumes by a factor of approximately 12 in the next 5 years. Data traffic is expected to grow from 4.450TB/year to 53.000TB/year in 2017, further dramatic increases highly probable. This expected, dramatic growth of mobile data traffic requires substantial adjustments and investments in mobile communications networks and triggers additional demand for frequency resources.

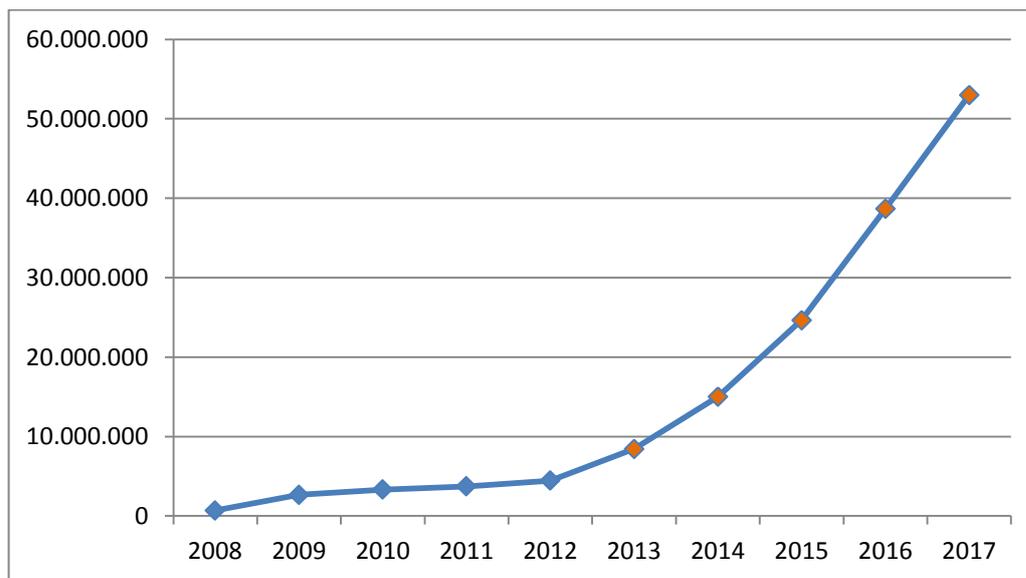
¹² see e.g. Cisco: http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html

Diagram 2: Predicted mobile voice telephony minutes in Slovenia: 2013 -2017



Source: APEK, 2012

Diagram 3: Predicted volumes mobile data in Slovenia, 2013 – 2017



Source: APEK, 2012

2.3. Frequency assignments: status and outlook

The second area of special consideration is the situation of frequency assignments for mobile operators in Slovenia. The existing assignments of frequencies (licenses) are shown in **Table 1: Spectrum assignments in Slovenia.**

Table 1: Spectrum assignments in Slovenia

900MHz	Bandwidth	Expiration Date
Telekom Slovenije	2x12,4 MHz	02.04.2013
Simobil	2x12,4 MHz	11.10.2013
Tusmobil	2x9,8MHz	03.01.2016
— 1800 MHz	Bandwidth	Expiration Date
Telekom Slovenije	2x15MHz	03.01.2016
Simobil	2x15MHz	03.01.2016
Tusmobil	2x5,2MHz	03.01.2016
Unused spectrum	2x39,8MHz	-
FDD: 2100MHz	Bandwidth	Expiration Date
Telekom Slovenije	2x15MHz	21.09.2021
Simobil	2x15MHz	21.09.2021
Tusmobil	2x5MHz	08.04.2023
T-2	2x15MHz	21.09.2021
Unused Spectrum	2x10MHz	-
TDD: 2100MHz	Bandwidth	Expiration Date
Telekom Slovenije	5MHz	21.09.2021
Simobil	5MHz	21.09.2021
T-2	5MHz	21.09.2021
Unused Spectrum	20 MHz	-
— 2600MHz		
Unused FDD	2x70MHz	-
Unused TDD	50MHz	-

This table shows that Telekom Slovenije and Si.mobil hold the same amount of spectrum in all frequency bands, which have been allocated in Slovenia; most importantly, added together, both of them hold with 2x12.4MHz the largest part of the 900MHz frequency band. Partly, as a result of stepwise frequency assignments in the past, both newcomers have frequency portfolios, which do not contain all frequency bands and contain only smaller bandwidth. T-2 does not command over 900MHz and 1800MHz frequencies. As **Diagram 3** indicates, there will be significant demand for additional spectrum capacity in the near future to meet the emerging demand for mobile data communications. This additional demand will be apparent in all different frequency bands, including also the yet unassigned frequencies of the 800MHz, 1800MHz, 2100MHz (TDD) and 2.600MHz bands.

Following EU policy and practice, APEK will consider to impose special coverage conditions on at least one 800MHz license to support one of the major goals of the Digital Agenda, i.e. bridging the digital gap for areas, which otherwise cannot be served with high speed broadband services.

In the next future, according to studies on LTE implementations¹³, the 1800 MHz band will probably be the most attractive frequency band for operators, with network equipment and end user appliances readily available. 800MHz and 900MHz will in the next few years be used for GSM and LTE coverage and deep indoor penetration, whereas 2.100MHz and 2.600MHz frequencies will most probable provide 3G and LTE capacity in the densely populated areas. 1800MHz frequencies with propagation properties somewhere in between sub 1GHz and 2100MHz frequencies might in future be used as the “workhorse” for LTE based mobile data services.

Table 1 allows further insights in the licensing situation in Slovenia. The 900MHz licenses of Telekom Slovenije and Si.mobil are to expire in 2013, Tasmobil’s license for 900MHz frequencies and all existing licenses for 1800MHz frequencies will expire by 3.1.2016. This situation requires immediate action by APEK and will be of high priority for the frequency management strategy. Furthermore, the unused 2x39,8MHz of 1800MHz frequency provides APEK with the opportunity to immediately offer additional frequencies in significant amounts to the market, in particular for the implementation of LTE, without interfering with current usage of frequencies. The same is true for the two unused paired blocks of 2100MHz frequencies.

2.4. Summary: mobile markets and frequency assignments

Summarizing the situation on the Slovenian mobile markets and the existing frequency situation, APEK states that

- explosive growth of data services will create demand for additional frequencies,
- existing licenses for 900MHz and 1800 frequencies will expire very soon in a period of less than three years,
- 800MHz frequencies are not yet assigned and have to be assigned very soon
- assignment procedures for the 800 MHz frequency band should reflect the policy goals of the Digital Agenda,
- unused 1800MHz and 2100MHz (FDD) frequencies are available to be assigned to mobile operators,
- 2600MHz frequencies are also still unassigned,
- the upcoming procedure of frequency assignments requires a special focus on competition issues.

¹³ see e.g. Vgl.Northstream White Paper , March 2012, <http://northstream.se/wp-content/uploads/2012/03/LTE-and-the-1800-Mhz-opportunity.pdf>

3. Frequency Management Strategy of APEK

APEK's strategy for frequency management consists of several major building blocks, which will be described briefly in the following sections. These building blocks and their role in APEK's strategy will first be summarized and then more thoroughly described in the following section.

3.1. Summary

According to the Slovenian and European policies to develop electronic communications markets, in particular the markets for mobile communications and to promote the implementation of recent highly efficient mobile communications technologies, APEK will pursue a frequency management strategy, which

- supports the development of the mobile voice and data markets in Slovenia and
- the evolution of mobile communications technologies;
- takes account of the competitive situation on the mobile end-user markets and
- of the historically grown situation of frequency assignments and the resulting challenges for APEK and of
- the legal obligation to assign the frequencies in the 800 MHz band (790 MHz – 862 MHz) by 01.01.2013, which could not be met due to legal uncertainty and coordination problems with neighbouring countries.

The core of this strategy is APEK's plan to assign licenses for all frequencies of the 800MHz, 900MHz, 1800MHz and 2600MHz, as well as the unassigned frequencies in the 2100MHz bands in one simultaneous auction early 2014, to be able to issue all licenses by latest 1.6.2014.

APEK started to develop its management strategy for frequency assignments already early in 2012. The delay in the legislative procedure of the new Electronic communication Act did not allow APEK to officially announce its detailed plans for the upcoming frequency assignments. The older legislation required beauty contests for frequency assignments. The recent Electronic communication Act also allows APEK to use auctions as its preferred procedure for frequency assignments. This is a fundamental change in paradigm with far reaching consequences. Besides that, the recent change of the legal foundations for frequency assignments in Slovenia is responsible for the delay in the preparations for the re-assignments of those licenses, which will expire in 2013.

Basically, there are two major options for APEK to use auctions as primary assignment procedure. APEK could organize separate auctions for all different frequency bands according to their expiration date ("staggered" assignment) or APEK could put all frequencies in the 800MHz, 900MHz, 1800MHz, 2100MHz (TDD) and 2600MHz bands, which will expire in the next future, or are yet unassigned, simultaneously on the market and to align expiration dates as far as possible.

Such a simultaneous, multifrequency auction will give all existing network operators and potential entrants equal access to frequencies and will create more certainty for investors and network operators. APEK does firmly believe that a simultaneous auction procedure is superior to staggered assignment procedures, because it does away with the so called exposure problem. Staggered procedures are prone to anti-competitive behaviour during the bidding process, in particular by giving ample opportunities for anti-competitive behaviour such as to selectively outbid other operators in auctions for strategic frequency bands («exposure problem») and they involve higher costs and consequently increase risks for network operators and investors. Advocates of staggered assignments often mention the flexibility they offer to network operators to adjust to changing market conditions APEK cannot see that the flexibility offered by staggered assignments will outweigh the downsides. The operators themselves can achieve the desired flexibility in frequency assignments by using secondary trading of frequencies, as it is foreseen in the regulatory framework and in the RSPP.

Independently of the chosen auction design, due to simple time reasons, APEK has to extend the existing licenses of Telekom Slovenije and Si.mobil for 900 MHz frequencies until 3.1.2016 to allow for proper preparation and execution of the chosen licensing procedure, as will be explained later.

As already mentioned, there are substantial - still - unused frequency resources available in the 1800MHz band and in the 2100MHz band, which could immediately be put to use in the mobile



communications markets. Taking into account the dynamic increase in demand for mobile broadband services, APEK considers to assign (intermediary) licenses for the unused 2x39,8MHz frequencies of the 1800 MHz band and for the yet unassigned frequencies of the paired 2100MHz band for a time period starting with the issuing of these licenses and ending by 3.1.2016 for 1800MHz and 21.9.2021 for 2100MHz (the envisaged day of issuing all licenses in all frequency bands assigned in the simultaneous licensing procedure) and by 21.09.2021 for 2100MHz). The licenses for the 1800MHz band can be seen as an opportunity for operators for pilot use of LTE 1800 without having to reorganize existing traffic patterns in their networks.

APEK's approach can be summarized as follows:

- Implement auctions as primary procedure for frequency assignments for mobile communications
- Extend existing licenses of Telekom Slovenije and Si.mobil for 900MHz until 03.01.2016
- Issue limited validity period licenses for the yet unassigned parts of the 1800MHz and 2100MHz (FDD) spectrum.
- Assign all available frequencies in the 800MHz, 900MHz, 1800MHz, 2100MHz (TDD), 2600MHz in one simultaneous frequency auction in early 2014.
- Align expiration dates and license periods accordingly.
- The re-assignment of the bulk of the 2100MHz spectrum will occur in a timely way before the respective expiration date in 2021.
- The mobile markets require a special focus on competition issues.
- Spectrum, which is not yet available as the lower Digital Dividend and which might be allocated to mobile services and other available spectrum will be assigned after careful market studies and in close cooperation with the European institutions.

3.2. Extension of existing licenses

In the given situation, one prerequisite of the re-assignment of 900MHz is that those operators, who hold licenses, which will expire earlier than the conclusion date of the re-assignment procedure are still able to run their business. Given APEK's strategy to use a simultaneous multifrequency auction early 2014 to re-assign these frequencies, this implies that Telekom Slovenije's and Si.mobil's assignments of 900 MHz frequencies, which expire in the course of 2013 will have to be extended until latest 3.1.2016.

APEK will require financial compensation for these extensions of frequency assignments. The procedure of license extension has already started.

3.3. Limited validity period assignment of unused 1800MHz and 2,1GHz spectrum

The second major building block of the frequency management strategy is a limited validity period assignment of those 2x39,8MHz of 1800MHz and the two 2x5 MHz blocks of 2,1GHz (FDD) spectrum, which have not yet been assigned. The assignment will be temporary until the expiration dates of the existing 1800MHz (2,1GHz) licenses and should enable market parties to test LTE 1800 (LTE 2,1GHz) under market conditions. APEK will take precautions against frequency speculation. These frequencies will be assigned in a single round, sealed bid auction in the first half of 2013, which has already started 15.3.2013.

3.4. Main frequency auction

This chapter will give more, but still tentative information on the planned frequency auction in early 2014 of the frequencies of the 900MHz, 1800MHz bands, as well as the yet unassigned frequencies of the 800MHz, 2,1 GHz and 2,6GHz bands. In the following text

- *Simultaneous, multi-frequency* will mean that all frequency bands are auctioned in one simultaneous procedure;
- *multi-round* will mean that bidding occurs in several rounds until the best bidders have been determined by the bidding process,



- *combinatorial* will mean that the bidders will be invited to bid on combinations of frequencies from different frequency bands.

APEK intends to assign all frequencies of the 900MHz, 1800MHz bands, as well as the yet unassigned frequencies of the 800MHz, unpaired 2100 MHz and 2600 MHz bands, in one complex assignment procedure by February 2014. The format of the assignment procedure is intended to be a simultaneous, multi-frequency, combinatorial, multi-round clock auction. In the course of this assignment procedure, APEK wants to harmonize as far as possible the expiration dates of all frequency assignments in the 800 MHz, 900 MHz and 1800 MHz bands. The license period will be 15 years, according to the legal situation in Slovenia. APEK's goal is to choose the starting date of the:

- 800 MHz and 2600 MHz licenses as the date of license issue, latest 1.6.2014,
- 900MHz and 1800 MHz licenses equal to the expiration date of the 900 MHz license assigned to Tusbobil (03.01.2016).

The intended auction format as well as the harmonization of expiration dates is regarded as to

- reducing the risk of current and future investments,
- ensuring competition and long-term benefit of end-users, as well as also
- enabling the most appropriate transition to an appropriate and comprehensive assignment of user rights of various frequency bands,
- paving the way for the implementation of modern mobile communications technologies, including the introduction of LTE technology.

The auction objects, i.e. the technical and usage parameters of the frequency blocks in all frequency bands auctioned will be described in a separate document, which will be published in due course.

APEK is currently developing the tender documentation for the search for an experienced consultant to support APEK with the design of the main frequency auction and the execution of the auction. Details of the auction design, procedures for qualification, frequency caps, activity rules, increments etc. will have to be decided in cooperation with the consultancy chosen. The results of these considerations will be consulted with the interested parties later this year.

Nevertheless, some policy issues, which concern highly important parameters of the auction, have to be discussed beforehand. These topics include spectrum caps, cooperation between network operators, as well as rollout obligations in particular for 800 MHz licensees.

The main multi-band frequency auction is planned to take place after public consultation and detailed preparations early 2014 and will be completed by 1st of June 2014. Agreement with the Ministry on reserve prices will have to be reached before the start of tender/auction procedure.

3.5. Spectrum caps and other competition issues

Frequencies are the most important production factor for mobile network operators. Grossly unbalanced frequency distributions may create competitive distortions by influencing cost of service provision, allowing operators with better frequency endowments to save costs for increasing the density of their networks. This has been recognized by the European legislation e.g. in Art 5.6 of the Authorization Directive and in Decisions of the EC in several Merger Cases. Consequently, the competent authority may take precautions by defining frequency caps, i.e. maximum bandwidth, which can be acquired by mobile network operators in the course of the frequency assignment procedure. APEK plans to restrict the excessive acquisition of frequencies by frequency caps on two levels: (a) at the level of each frequency band, (b) total amount of frequencies. Spectrum caps are included as important topic to this consultation.

3.6. Network cooperation

Network sharing in its different versions allows operators to significantly reduce infrastructure costs. On the other hand, there exist risks for the competitiveness of mobile communication markets, if network cooperation leads to close links between network operators. To provide legal certainty in the

field of cooperation between operators, APEK is encouraging passive infrastructure sharing¹⁴ while active network sharing should only be allowed if compatible with competition law, i.e. if the competitive independency of operators is not jeopardized by too intensive network cooperation. The competitive independency will have to be examined on a case by case basis, pondering intensity, geographical extension and other parameters.

3.7. Rollout obligations

APEK finds it necessary to impose certain coverage obligation on each frequency band (900, 1800, 2100 and 2600 MHz) awarded. However, in cases when one operator is awarded with more than one frequency band, such coverage obligations should apply not per each separate band but rather on the operators' coverage provided by all frequency bands. Nevertheless, such general coverage obligation should not be lower than the highest requested coverage obligation of awarded spectrum. In addition to that, the lowest coverage obligation for each awarded frequency band should apply due to the fact that frequency spectrum is a scarce resource and must be utilised if assigned.

On the other hand, the propagation properties of 800 MHz frequencies allow cost effective coverage with broadband services in areas with low population density. For that reason APEK considers to impose separate roll-out and coverage obligations for this frequency band. These obligations will make sure that almost all habitations/citizens in Slovenia, which are not already served with fast broadband services ("White Spots") will be covered and that the scarce resource of 800 MHz frequency with its with excellent propagation properties will be utilised most efficiently.

3.8. Separate rollout obligations for 800MHz licenses

Nonwithstanding that certain rollout obligations will be applicable for all auctioned frequency bands, special obligations will be suggested for 800 MHz band.

As mentioned above, the propagation properties of 800MHz frequencies allow cost effective coverage with broadband services in areas with low population density. APEK considers various options for rollout obligations for the use of 800MHz frequencies, as well as different options for network cooperation and other means to reduce rollout costs in such areas. These obligations will make sure that almost all habitations/citizens in Slovenia, which are not already served with fast broadband services ("White Spots") will be covered. In addition, APEK will publish its rules for monitoring the rollout obligations. In particular, APEK considers the models used in EU Member States as the UK, Sweden, Denmark, Germany and others. The crucial question is to impose obligations in a way, which maximize the social value of the use of 800MHz frequencies in low density areas, without imposing unnecessary costs on licensees.

4. Questions for consultation

4.1. Topics for the consultation

APEK is highly interested to receive inputs from all interested parties on all issues connected to the upcoming frequency assignment procedures. APEK invites all interested parties to give general comments on the basic issues and on the general approach and in particular to the questions which are summarized in the following chapters of the consultation document.

4.1.1. General questions

APEK invites all interested parties to comment on APEK's general approach. Please note that the auction design itself is not yet under consultation here.

¹⁴ This is in conformity with RSPP's policy objectives (Art.3, h), to encourage passive infrastructure sharing, where this would be proportionate and non-discriminatory, as envisaged in Article 12 of Directive 2002/21/EC



4.1.2. Special questions related to auction format

APEK also invites to comment on the following detailed questions, related to APEK's general approach:

1. Do you think, that combining all frequency assignments in one assignment procedure is efficient and will contribute to more transparency and certainty for investors? Please give reasons.
2. Where would you see more benefits if the frequency bands in question would be assigned separately?
3. Does the alignment of expiration dates of frequency assignments contribute to regulatory certainty and better planning conditions for mobile network operators? Please give your reasons.
4. Should all described alignments of expiration dates be considered?
5. Which auction formate do you find more appropriate: SMRA or CCA ?
6. To avoid unnecessary rollout costs, APEK might consider to auction exemptions from coverage obligations for a limited number of frequency blocks in the 800MHz band analogue to the frequency auctions in Denmark. Do you think, that auctioning of coverage exemptions be an appropriate way to exempt operators from coverage obligations in the 800 MHz band for certain rural subareas?
7. Should APEK consider the Swedish model, which stipulates only one license in the 800MHz band having coverage obligations, but at the same time allows the winning bidder to use a significant part of his winning bid to finance coverage obligations?
8. Should Apek consider a model for coverage obligations in the 800MHz spectrum band, where only one 2x10MHz license would carry a coverage obligation (UK-Model)?
9. Should APEK consider the Danish model for 800MHz coverage obligations?

4.1.3. Spectrum caps

10. Do you see spectrum caps as an appropriate tool in order to guarantee competitive conditions on the mobile market?
11. Please describe your suggested options for spectrum caps and give your reasons for your proposed version of spectrum caps.

4.1.4. Reserved spectrum

12. In some recent auctions, there were discussions about reserved spectrum for new entrants. Should APEK reserve any spectrum for a possible new entrant or later capacity needs?
13. In which frequency band and to what extend do you think should frequencies be reserved?

4.1.5. Coverage and roll out obligations

APEK intends to impose general coverage and roll out obligations for the following services:

1. Voice and narrow band data;
2. Broadband data (2Mbit/s).

Please specify your proposed coverage percentages and roll out obligations for these services, for existing operators and for new entrants.

Service	x% of households in first year	y% of households in three years	z% of households in five years
Voice and narrow band data			
Broadband data (2Mbit/s)			

4.1.6. Special coverage obligations for 800 MHz

Referring to Recital 23 of the RSPP¹⁵ which states that special coverage obligations to promote the rollout of broadband services in sparsely populated areas may be imposed by the NRAs, APEK plans to impose special rollout obligations for 800 MHz frequencies.

APEK asks for comments on the following possible coverage obligations criteria or combinations of them:

14. Should the 800 MHz frequencies primarily be used to provide broadband services in the "White Spots" before they are allowed to be used elsewhere and/or for other purposes as »indoor coverage«? Give your detailed reasoning.
15. Should the "White Spots" be identified by means of the statistics of regions in Slovenia and should in each statistical region 95% of post addresses should be covered with mobile broadband services? In addition, should 98% of post addresses of all Slovenia be covered with mobile broadband services? Mobile broadband services should allow an effective throughput at the cell edge of 2 Mbit/s. What would be your proposed percentage of post addresses covered? What would be your proposed throughput at the cell edge? Give your reasons.
16. Should the "White Spots" be identified by means of the statistics of settlements in Slovenia? A White Spot would be assumed, if 75% of post addresses are not covered with a throughput at the cell edge of 2 Mbit/s (low cell occupation), if the number of households in these settlements is larger than or equal 10 and households do not have broadband coverage. The White Spots will be determined by simulating 800 MHz coverage on the already existing 900 MHz base stations.
17. What would you suggest as a reasonable coverage percentage of post addresses in these White Spots?
18. Do you agree that the minimum downlink speed in these areas should be 2Mbit/sec? (If not, please specify whether 1Mbit/s or 5Mbit/s is more appropriate)
19. Do you agree that these coverage obligations should be met by the license holders at latest 2 years after the assignment of 800 MHz frequencies? (If not, please specify the roll out obligations)

4.1.7. Network cooperation between operators

Article 91 of the Slovenian Electronic Communication Act empowers APEK to impose network cooperation between network operators on passive¹⁶ network elements. Since it is expected that rollout of mobile broadband services in the White Spots will request substantial investment, APEK considers to allow more intensive network cooperation between network operators primarily restricted to these White Spots. Notwithstanding - as one important cornerstone - APEK will insist on the principle of competitive independency of network operators, which appears to be met by RAN sharing as defined in the BEREC/RSPG document BoR(11)26¹⁷, as long as the geographic areas of shared RANs is only small.

20. Please comment on the general concept of network sharing and the special situation in White Spots!
21. Would you support network consortia for covering the White Spots?
22. Please, supply your opinion on these issues.

¹⁵ »Considering the capacity of the 800 MHz band to transmit over large areas, coverage obligations could be attached to rights, where appropriate«

¹⁶ According to paragraph 2 of Article 91 of Electronic Communication Act sharing is possible only on buildings, entries to buildings, building wiring, masts, antennae, towers and other supporting constructions, ducts, conduits, manholes and cabinets

¹⁷ See BEREC-RSPG report on infrastructure and spectrum sharing in mobile/wireless networks. BoR (11) 26. June 2011

5. Closing statement

Consultation on this consultation document is starting with the date of publication APEK's web site. We invite interested parties to provide us with their written comments and suggestions and answers to the questions which will be taken into account if they arrive at our offices before 22.04.2013.

All submitted contributions to this consultation document will be published on APEK's web site.

APEK will analyse the written contributions by the interested parties and will publish a summary of this analysis in due course.

6. Annexes

6.1. Provisional timetable of the proposed frequency management strategy

Action item	Date
Publication of consultation document on APEK's frequency management strategy	22 March 2013
Deadline for submission of comments	22 April 2013
APEK's consultation report (start of new consultation round, if needed)	22 May 2013
Licence extension 900MHz	end March 2013
Limited period licence auction for 1800MHz and 2100MHz frequencies – start date	15 March 2013
Limited period licence auction for 1800MHz and paired 2100MHz frequencies – licence issue	1 June 2013
Publication of the draft tender documentation for public consultation (information memorandum)	1 September 2013
Deadline for comments on the draft tender documentation	1 October 2013
Start of the tender for frequency licences ¹⁸	15 November 2013
Start of auction	1 February 2014
Issue of licences	Latest by 1 June 2014

¹⁸ Start date depends on agreement on reserved prices for frequency blocks