MALTA COMMUNICATIONS AUTHORITY

Assignment Process for Additional Spectrum for Wireless Broadband

Final Decision

MCA/D/14-1933

Publication Date:

31st July 2014

Malta Communications Authority
Valletta Waterfront, Pinto Wharf, Floriana, FRN 1913
Tel: (+356) 21 336 840 Fax: (+356) 21 336 84

www.mca.org.mt

DOCUMENT REVISION HISTORY			
Date	**Revision**	**Comments**	**Authors/ Contributors**
31/07/2014	1.0	First Version	Malta Communications Authority

DISTRIBUTION		
Date	**Revision**	**Comments**
31/07/2014	1.0	Publication on Authority's corporate website

TABLE OF CONTENTS

1. INTRODUCTION

1.1 BACKGROUND

In March 2014, the Malta Communications Authority ("Authority") published a consultation paper[1] outlining a proposed methodology for the assignment of spectrum in the 800 MHz, 1800 MHz and 2.5 GHz bands together with the applicable licence conditions. Responses to consultation were received from the following entities:

- GO plc;
- Melita Mobile Ltd; and
- Vodafone Malta Ltd.

The submissions received put forward a number of considerations and differing opinions regarding the proposed assignment process.

The Authority takes the opportunity to thank all respondents for their contributions.

1.2 PURPOSE

The purpose of this document is to inform the public of the assignment process that will be adopted in respect of spectrum in the 800 MHz, 1800 MHz and 2.5 GHz bands and the conditions that will be attached to the resulting rights of use.

Specifically this document provides information related to the steps that will be taken by the Authority in respect of the assignment of these frequencies and sets out a clear course for the selection of prospective rights of use holders.

This decision supersedes the Authority's preliminary position on the 2.5 GHz band published on 19 November 2008[2]. This decision also revises certain aspects established in the Authority's decision of 2010 in respect of the 1800 MHz band[3].

The outcome of the public consultation launched in March 2014 with respect to the assignment of spectrum in these bands is annexed to this document.

1.3 PRINCIPLES UNDERPINNING SPECTRUM MANAGEMENT

The assignment of spectrum is based on a set of fundamental principles:

- spectrum is a limited national resource and must be used efficiently and effectively;
- operators have time-bound rights of use of spectrum and NOT ownership;

[1] MCA/C/14-1839

[2] http://www.mca.org.mt/sites/default/files/attachments/decisions/2012/final-position-2-5.pdf

[3] MCA/10/44/D

- if demand exceeds supply, a fair, transparent and non-discriminatory competitive assignment process is necessary to determine who is entitled to hold the rights of use; and
- a competitive selection process for the award of radio spectrum can be based on qualitative (beauty contest) and/or quantitative (auction) criteria depending on circumstances.

The above principles underpin the assignment methodology and the licence conditions that are being put forward in this decision.

2. SPECTRUM TO BE AWARDED

2.1 SPECTRUM BANDS

The spectrum bands that are the subject of this decision are the 800 MHz (790 - 862 MHz), the 1800 MHz (1710 – 1785 MHz / 1805 – 1880 MHz) and the 2.5 GHz (2500 - 2690 MHz) bands.

In this respect the Authority is hereby placing on the market all the available spectrum in these bands. To date the 2.5 GHz band is entirely unassigned. Likewise, once the migration of the relevant broadcasting transmissions is completed, the 800 MHz band will be completely available. In addition as outlined in Figure 1, following the 2011 re-assignment process, there are still six unassigned channels in the 1800 MHz band.

FIGURE 1: CURRENT SPECTRUM ASSIGNMENTS IN THE 1800 MHZ BANDS

2.2 CHANNELLING PLAN

The channelling plan for the 800 MHz, 1800 MHz and 2.5 GHz bands will be as follows:

The 800 MHz Band: The Authority will adopt the channelling arrangement established in 2010/267/EU.

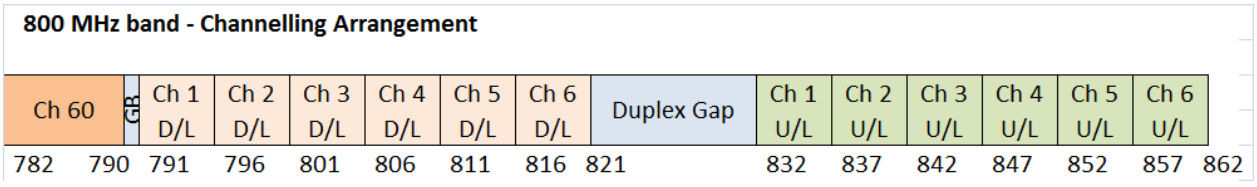


FIGURE 2: CHANNELLING PLAN FOR THE 800 MHZ BAND

The 1800 MHz Band: In line with the Authority's decision of 2010[4], the channelling arrangement established in 2009/766/EC will be retained.

[4] MCA/10/44/D

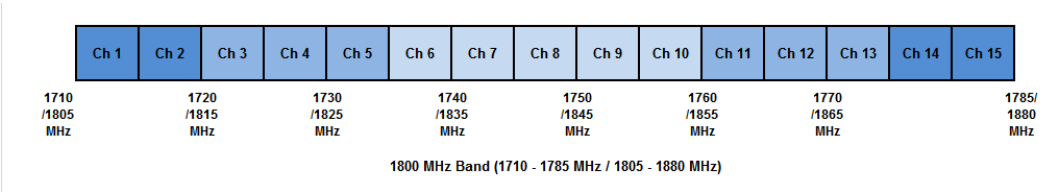


FIGURE 3: CHANNELLING PLAN FOR THE 1800 MHZ BAND

The 2.5 GHz Band: In this case the Authority will adopt the preferred channelling arrangement established in 2008/477/EC. This results in a combination of paired (FDD) and unpaired (TDD) channels, which in both instances are based on a channel bandwidth of 5 MHz.

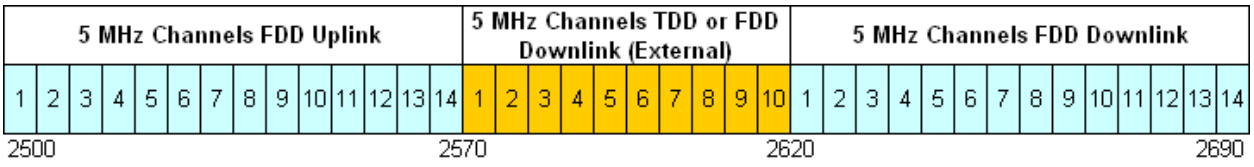


FIGURE 4: CHANNELLING PLAN FOR THE 2.5 GHZ BAND

2.3 LOT DEFINITION

A 'lot' is the minimum amount of spectrum an interested party can apply for and is defined in terms of the spectrum band, the amount of spectrum and the technical conditions linked to the spectrum use. Lots with different technical characteristics will be classified in separate lot categories.

In view of this the Authority establishes the following:

800 MHz Band: Each 5 MHz paired channel will be considered a single lot, six lots in total are available in the band. However, Channel 1 will be subject to greater technical constraints than the others (see Section 4.6). Two lot categories are therefore being established in this band.

1800 MHz Band: Each 5 MHz paired channel will be considered a single lot. There are six unassigned channels and all channels are subject to the same technical conditions, therefore in total there will be six lots in one lot category.

2.5 GHz Band (Paired spectrum): Each 5 MHz paired channel will be considered a single lot, fourteen lots in total. Since all channels are subject to the same technical conditions, all lots will be classified in one lot category.

2.5 GHz Band (Unpaired spectrum): The spectrum will be split in two 25 MHz lots and each lot will be classified in a distinct lot category given that one of the lots will be subject to greater technical constraints. Specifically one of the lots will have only one restricted channel as an interface to the adjacent FDD operation (i.e. Channel 1 of TDD), whilst the other will have two as an interface to the adjacent TDD and FDD operations (i.e. Channels 6 and 10 of TDD).

2.4 SPECTRUM CAPS

In order to strike a balance between allowing applicants that value this spectrum most to acquire it via the assignment process and ensuring the desired level of competition in the market, the following spectrum caps will be applied:

- A cap of two (2) 5 MHz paired channels will apply in the 800 MHz band;

- The spectrum cap established in the Authority's decision of 2010 (MCA/10/44/D) will be retained, namely an overall cap of eight (8) 5 MHz paired channels will be applied over the 900 MHz and 1800 MHz bands with a limit of four (4) channels in the 900 MHz band. This spectrum cap will be inclusive of any channels already assigned in these bands; and

- An overall spectrum cap of 210 MHz that takes into consideration all assignments in the 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz and 2.5 GHz bands. For the avoidance of doubt this includes also unpaired spectrum and the applicant's spectrum holdings at the time of the call of applications. For the purposes of the spectrum cap calculation or spectrum already assigned, a paired 5 MHz channel will be considered as 10 MHz.

2.4.1 RELAXATION OF SPECTRUM CAPS IN THE 800 MHZ AND 1800 MHZ BANDS

If following the submission of the applications it results that:

- there is still unassigned spectrum in either the 800 MHz or 1800 MHz bands, or both; and
- there is no excess demand for spectrum in any of the lot categories,

then the Authority will relax the spectrum caps in the band/s in question as follows:

- **A** cap of three (3) 5 MHz paired channels will apply in the 800 MHz band;
- A spectrum cap of eleven (11) 5 MHz-channels in the 900 MHz and 1800 MHz bands, with a maximum cap of four (4) in the 900 MHz band, inclusive of any channels already assigned in these bands.

In this case these new spectrum caps would come into effect straightaway in the assignment process.

For the sake of clarity it should also be noted that in any case the overall spectrum cap of 210 MHz will not be relaxed and will remain unaltered.

In case there is excess demand for spectrum in any of the lot categories, the Authority reserves the right to relax the spectrum caps as outlined above, as part of the brokered meetings. However, should an auction be required, then the spectrum caps will not be relaxed and the caps established in Section 2.4 will apply.

2.4.2 APPLICABILITY OF SPECTRUM CAPS

The applicable spectrum caps, whether relaxed or otherwise, will also apply following the finalisation of the assignment process and no person shall at any point in time, hold rights of use of spectrum in these bands in excess of these caps. Thus, the amount of spectrum awarded to any one single applicant will not exceed the spectrum caps established above.

Furthermore it should be noted that any one or more companies forming part of a group of companies or otherwise associated with each other will not be able to submit more than one application. This is to ensure that no entity can acquire rights of use in excess of the caps thus allowing for competitiveness in the use of the spectrum.

3. ASSIGNMENT PROCESS

3.1 PROCESS OVERVIEW

The Authority intends to initiate the assignment process in case of market demand. The Authority will split the assignment process into two main stages i.e. the Assignment stage and the Grant stage.

The **Assignment Stage** will establish the number and type (i.e. in which lot category) of lots to be assigned to each successful applicant.

The **Grant Stage** will establish the specific lots that will be awarded to the successful applicants and will be concluded with the issuance of the rights of use documents.

The process for the assignment of spectrum in these bands will be as follows:

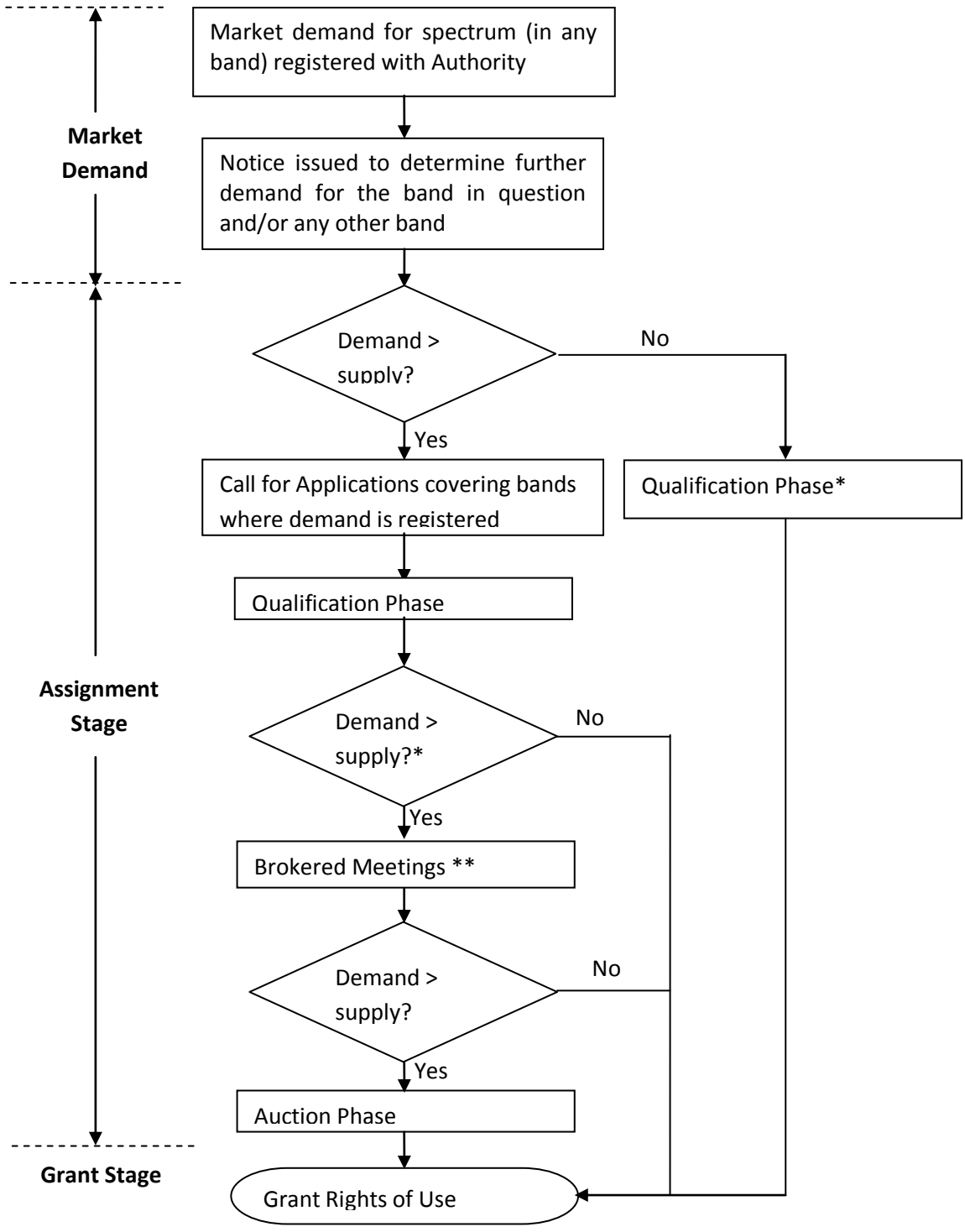


FIGURE 5: ASSIGNMENT METHODOLOGY

* If the Call for Applications includes spectrum in the 800 MHz band then the process will only move to the next phase subject to a successful completion of the co-ordination process. See further details in Section 3.3.2.

** The Brokered Meetings will be held at the Authority's discretion.

3.2 MARKET DEMAND

The Authority will initiate the assignment process if it receives a formal request for spectrum[5]. This request could be for any spectrum in any of the bands under consideration in this document.

At this point the Authority will publish a notice announcing the receipt of this request and will request any other interested parties to come forward within a given timeframe. Moreover, considering that the spectrum bands being considered are complementary and substitutable, the Authority will also request the interested parties to indicate any demand for spectrum in any of the other bands under consideration in this document.

If on the expiry of this timeframe it results that there is excess demand in any lot category, then the Authority will issue a formal Call for Applications. This will put on offer all the available spectrum in the bands for which market demand was registered. Otherwise the Authority, following the qualification of the applicants, will proceed to a direct assignment.

3.3 ASSIGNMENT STAGE

3.3.1 CALL FOR APPLICATIONS

The process will be launched with a Call for Applications ('Call').

The call for applications will include:

- a non-refundable application fee;
- an appropriate bid bond/performance guarantee. The bid bond is intended to ensure an applicant's commitment to the assignment process, lasting up to the award of a grant of rights of use. In the case of unsuccessful applicants the bid bond will be released at the end of the assignment process and once the successful applicants have been announced. In the case of successful applicants the bid bond will be maintained as a performance guarantee. The performance guarantee will serve as evidence of good faith, to guarantee that the licensee will honour the winning bids and will abide by the licence conditions; and
- an appropriate deposit which will be reflective of the first year spectrum fees and the applicant's spectrum requirements.

Applicants will not apply for specific frequencies in the different bands but for a number of lots in each lot category as established in Section 2.3. Applicants will need to state the maximum number of lots in each lot category that they may eventually apply for throughout the course of the process ('Maximum Interest').

In addition applicants will be required to state their preferred combination of lots in the different lot categories ('Preferred Option'). The overall demand for lots in each of the different lot categories will be determined by the Authority on the basis of the Preferred Option submitted by all the applicants.

[5] http://www.mca.org.mt/sites/default/files/pageattachments/Formal%20Request%20for%20Spectrum.pdf

In addition to the Preferred Option, applicants will be required to indicate alternative options that would suit their needs in the case that demand for the spectrum exceeds supply ('Alternative Options'). This information will be used in confidence by the Authority in the event that brokered meetings need to be held.

In expressing both their Preferred and Alternative Options, the applicants must abide by the spectrum caps mentioned in Section 2.4 and the Maximum Interest declared by them as mentioned above. Any application containing an option that exceeds either of these limits will be disqualified.

3.3.2 QUALIFICATION PHASE

The qualification process will assess whether applicants have the necessary standing to fulfil the licence obligations should they be successful in acquiring the spectrum rights. It will not rank applicants. The outcome of this phase will be a pass/fail result based on a set of criteria including but not be limited to:

- The applicant's credentials;
- The applicant's experience in the establishment, operation and commercialisation of electronic communications networks;
- The applicant's business plan; and
- Access to adequate financing for the venture.

In this case, it is important to point out that, the spectrum assignment in the 800 MHz band is dependent on the successful completion of the frequency co-ordination process. However, for the sake of expediting the process, the Authority is considering the co-ordination and assignment processes as two distinct work streams that can run in parallel. In view of this, the Authority is introducing the following safeguards in the assignment process.

In case of a successful co-ordination outcome

At the end of the Qualification Phase an assessment of the demand for spectrum by the qualifying applicants will be carried out. If demand in each lot category (as expressed in the applicants' Preferred Options) does not exceed supply, then the rights of use of spectrum will be granted directly to the applicants in line with the process outlined in Section 3.4 below.

In case co-ordination not yet successfully concluded

If by the time the qualification process is completed successful co-ordination has not yet been achieved, the Authority will retain the right, at its discretion, to halt the assignment process for all the spectrum in question for a maximum period of six months. Should a successful co-ordination be achieved during this period, then the Authority will proceed as outlined above. Should no successful co-ordination be achieved by this time the Authority will retain the right to abort the assignment process.

In case the process is aborted, all the material related to the individual submissions will be returned to the respective applicants.

3.3.3 BROKERED MEETINGS

In the event that demand exceeds the availability of spectrum in any of the lot categories, the Authority reserves the right, at its own discretion and without binding itself to do so, to carry out a set of brokered meetings with the qualifying applicants. The objective of these meetings will be to reach an agreement on an assignment plan that addresses the requirements of all the qualifying applicants. In order to protect commercial interests, the meetings will be held separately with each qualifying applicant.

In developing the proposals cognisance will be taken of the spectrum requests put forward by the applicants, the preferences indicated, their business and technical plans and the outcome of the discussions during the meetings.

If the proposal so developed is accepted by all the parties, then the Authority will proceed with the granting of rights of use in accordance with the agreement reached.

In the absence of a full agreement being reached at the end of the brokered meetings, the Authority reserves the right to attempt to reach agreement to assign parts of the spectrum, whereby only the remaining channels would be auctioned.

Any proposed solution reached between the Authority and each of the qualifying applicants will be binding on the individual applicants but not on the Authority in view of the fact that the Authority will first have to ensure that the proposed solution reached fits within an overall solution acceptable to all the qualifying applicants.

In the event that no agreement (whether full or partial) is reached between the qualified applicants and the Authority, or should the Authority decide not to hold brokered meetings, then all the spectrum in the bands under consideration in the Call will be auctioned.

3.3.4 AUCTION

The auction design will take due account of the complementary and substitutable characteristics of the bands in question and will provide for:

- package bidding: applicants will be required to simultaneously bid for lots in all the bands[6]. All combination bids submitted by each applicant at any stage of the auction must be in line with its expressed "maximum interest", the spectrum caps mentioned above and any other criteria that would be established in the Auction Rules ; and
- avoidance of default by bidders: measures such as deposit top-ups will be in place, as the case may be.

The Authority will retain the option to publish the auction rules only if, following the qualification phase, demand exceeds supply. In this case the Authority will publish the said Rules prior to the Brokered Meetings and the applicants will be given the opportunity to withdraw their applications at that stage.

[6] For sake of clarity it is being emphasised that applicants will apply and eventually bid for "a number" (quantity) of channels in each lot category and not for specific (identified) channels in each band

Qualifying applicants who at that stage do not withdraw their application will be obliged to take part in at least the first round of any eventual auction. Failure to do so will result in a forfeit of the bank guarantee.

3.4 GRANT STAGE

The Authority will have the sole and unlimited discretion to award the particular channels in the way it deems best in the interest of spectrum efficiency.

This notwithstanding, as part of their submissions to the Call, interested parties will be invited to indicate their ranked preferences for particular frequency channels in a given band/s and provide a justification for such preference. However, this in no way will tie down the Authority to assign the frequencies in accordance with the expressed preferences of applicants.

Once the outcome of the assignment stage[7] is known, the Authority will proceed to the award of the specific contiguous[8] swathes of spectrum to each successful applicant, as may be possible when taking into consideration existing spectrum assignments. Should there be no way to easily reconcile the applicants' preferences, then a lottery will be used to determine the band assignments.

3.5 FUTURE OF UNASSIGNED SPECTRUM

In the event that any spectrum remains unassigned, this will become available to any interested party under the conditions being established by this decision. Any request will be published and should further interest be expressed this will trigger the above outlined process.

[7] The **Assignment Stage** establishes the number of lots in each lot category awarded to each successful applicant.

[8] The channels assigned to each applicant within a given band will be contiguous. Contiguity of channels sitting in different bands will not be guaranteed.

4. CONDITIONS OF RIGHTS OF USE

4.1 SPECTRUM PRICING

The annual spectrum fees will be established by Government in due course but before the launch of the assignment process. It is expected that these fees will be established through an amendment of the Eighth Schedule of the Electronic Communications Networks and Services (General) Regulations (S.L. 399.28 of the Laws of Malta).

4.2 LICENCE DURATION

The rights of use of spectrum will be granted for a term of fifteen (15) years.

In the case of the 800 MHz band, the licence duration will commence from the grant date or the date when the band becomes available for mobile services, whichever comes latest.

4.3 TECHNOLOGY NEUTRALITY

In line with the principles established in the Framework Directive (2002/21/EC as amended by 2009/140/EC) the spectrum will be assigned on a technology neutral basis. Therefore licensees will be free to deploy any technology as long as they comply with the relevant EU spectrum harmonisation decisions namely, 2010/267/EU for the 800 MHz band, 2011/251/EU for the 1800 MHz band and 2008/477/EC for the 2.5 GHz band.

The Authority retains its right to amend the assignments made, and any of the terms and conditions of the licence to reflect legal developments that are imposed upon it, EU harmonisation requirements and to cater for other pressing needs that the local market may have throughout the term of the licence, taking due account of its obligations at law.

4.4 SERVICE NEUTRALITY

In line with the principles established in the Framework Directive (2002/21/EC as amended by 2009/140/EC), no limitations with respect to the services that may be offered over the spectrum acquired in this process will be imposed. However, the Authority will reserve unto itself the power to impose certain service obligations, in accordance with law.

4.5 NETWORK ROLLOUT AND COVERAGE OBLIGATIONS

In order to ensure maximum benefits for all the users, licensees will be required to make any technology they offer available on a nationwide basis. Licensees will have up to 24 months from the date of assignment to come in line with this obligation and to maintain it from then onwards for the whole duration of the licence.

Specifically licensees will be required to use all the spectrum assigned to them within a 24 month timeframe from the date of assignment.

In the case of licences which include spectrum in the 800 MHz band, the 24 month timeframe will commence from the grant date or the date when the band becomes available for mobile services, whichever comes latest.

In addition, whenever a new technology is launched throughout the term of the licence, the licensee will be bound to offer this technology nationwide within a 24 month timeframe from the said launch.

4.6 INTERFERENCE MITIGATION CONDITIONS

4.6.1 THE 800 MHZ BAND

The deployment of mobile services in the 800 MHz band is anticipated to give rise to interference with the broadcasting service. As a result the Authority will include the following mitigation measures in the rights of use.

Technical conditions included in rights of use

The Authority will adopt the harmonised technical conditions for the deployment of electronic communication services in the 790 – 862 MHz band established in the European Commission decision 2010/267/EU.

In particular:

- The in-block EIRP for Channel 1 will be set at 56 dBm/5 MHz, whilst for the other channels it will be set at 60 dBm/5 MHz.
- The baseline requirements for the base station BEM out-of-block EIRP limits over frequencies below 790 MHz will be those established under Case A in Table 4 of the said EU decision.

The Authority reserves the right to relax these technical conditions at any point throughout the term of the licence, particularly in case of material changes to the local terrestrial broadcasting scenario or as a result of technological developments. The Authority will also consider relaxing the technical conditions should licensees reach an agreement to this effect with the digital terrestrial television (DTTV) operator.

The Authority shall also have the right to adjust these limits in cases of interference of any kind with other licensed operators.

The outcome of the co-ordination process might include technical restrictions that would need to be adhered to so as to ensure co-existence of the local 800 MHz mobile services with the broadcasting services operated in neighbouring countries. Should this be the case, these technical conditions will form an integral part of the licence.

Interference Mitigation Obligation – Establishment of a Fund

A fund will be established between the 800 MHz band licensees. The fund will cover the costs related to the mitigation measures that may be required to solve interference issues to aerial

television reception installations resulting from the deployment of outdoor base stations operating in the 800 MHz band to the detriment of the various viewers making use of such aerials.

Holders of rights of use in the 800 MHz band will be required to contribute to this fund in proportion with the number of assigned channels, irrespective of their individual rollout and coverage plans for the band or specific channels within the band.

For example consider that two licensees acquire rights of use in this band. Licensee A gets the rights for 3 channels and Licensee B gets the rights for 1 channel. Then Licensee A will fund 75% of the costs and Licensee B 25%.

The licensees in question will not be required to deposit the full fund instalment immediately. Instead a system of periodic instalments will be established.

If not all channels are assigned simultaneously and a subsequent assignment of spectrum in the 800 MHz band takes place, there will be a recalculation of the maximum contribution due by each licensee. In this case the new licensee will be required to pay an upfront contribution proportionate to the number of channels acquired and the fund paid to date, calculated as per the example above.

This fund will be capped to cover only the costs for any interference issues suffered by aerial television reception installations that were already in place as at the date of completion of the 800 MHz band clearance. Thereafter the necessary equipment required to avoid interference problems should be installed as part of any new installation and funded by the installation owner.

On the basis of the subscriber information currently in hand the fund cap is set at €4.5 million. The exact figure will be established in the Call for Applications to reflect any changes in the number of subscribers till then. However, it is not expected that this will result in substantial changes to this figure.

The fund will be operative for the entire duration of the 800 MHz rights of use or up to such time that the fund is exhausted or national coverage on all six (6) channels in the band is achieved. The Authority reserves the right to terminate the fund earlier, as a result of developments which render it redundant.

Once the fund is terminated any residual funds will be redistributed amongst the contributing licensees, pro-rata on the basis of their contribution.

It will be the responsibility of the 800 MHz band licensees to establish a fund management plan. Licensees will have a period of three months from the date of grant of rights of use to present a fund management plan. In this respect the Authority will specify a priori a number of aspects that will need to be addressed in this plan which will include, but not be limited to:

- Consumer complaint handling process that includes active participation of any DTTV operators and that establishes resolution timeframes;
- Payment terms of the periodic fund instalments;
- Auditory measures to ensure proper administration of the fund.

In all instances, the Authority will remain an escalation point to resolve any outstanding issues/disputes. In this respect the Authority will retain the right to take any measures it deems appropriate for the case in accordance with its powers at law and under the licence.

Should the 800 MHz licensees fail to present an adequate management plan within the stipulated timeframes, the Authority reserves the right to manage the fund (or outsource it) on their behalf. In this case, the relevant costs will be borne by the licensees in question and will be in addition to the fund cap and the licence fees.

Furthermore, the establishment of the fund, the management plan and the deposit of the first fund instalment, will be preconditions for the licensees to start using their 800 MHz spectrum holdings.

The first LTE deployments in the 800 MHz band will constitute a learning experience for all the parties involved. The Authority will therefore be requiring a staggered and managed rollout in the initial period. This will help all the stakeholders gain a better understanding of the issues involved and the respective resolution measures.

Siting conditions

In order to minimise the possibility of interference with Program Making and Special Events (PMSE) equipment operating in the 800 MHz duplex band in line with the upcoming EU decision, the licensees will not be authorised to deploy indoor cells operating on the 800 MHz band in buildings wherein the use of PMSE is essential for the fulfilment of the said building's function for example theatres, studios and auditoriums.

4.6.2 THE 1800 MHZ BAND

The conditions established in the EU decision on the harmonisation of the 900 MHz and 1800 MHz bands (2011/251/EC) will apply.

4.6.3 THE 2.5 GHZ BAND

The Authority will adopt the technical conditions established in the EU decision on the harmonisation of the 2500 – 2690 MHz band (2008/477/EC).

4.7 HANDBACK CONDITIONS

In the case that demand for spectrum in a given band does not exceed supply at any stage in the assignment process, then licensees will be able to hand back all or part of their spectrum assignment in **that** band. In this case these licensees will not be required to pay any future spectrum fees related to the channels handed back, but will not be entitled to a refund of those fees already paid or that were due by them until the date of the handback.

The handback provision however does not exonerate the licensee in question from honouring its rollout obligations in accordance with the licence awarded to it. In the event that the licensee fails to comply with these obligations, penalties including, but not limited to, a forfeit of the bank guarantee, will apply.

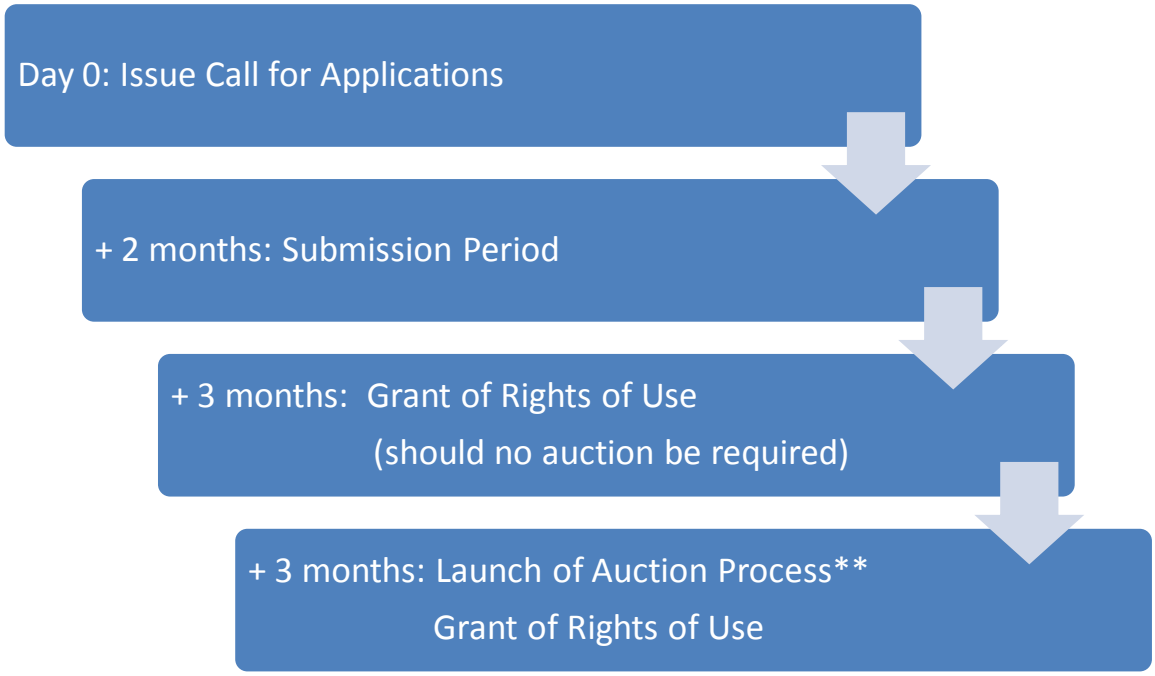
In case that a licensee rescinds spectrum in a band where demand exceeded supply, then the licensee will be bound to pay the equivalent of three (3) annual fees in addition to any fees already due.

4.8 SANCTIONS

Clear sanctions will be included in the rights of use in the event of non-compliance with any obligations stipulated therein. These sanctions will include 'use it or lose it' clauses.

5. IMPLEMENTATION

The assignment process will start upon market demand and the envisaged timeframes are as follows[9]:



** If required

Note:
The above timeframes are indicative and do not bind the Authority to adhere to them.

[9] The envisaged timelines do not bind the Authority to adhere strictly to the timings laid down. Whereas the Authority shall make all reasonable endeavours to comply with the said timings, it shall not be responsible in any way whatsoever for any deviation from these envisaged timelines, and may change these as it deems fit according to the circumstances.

6. SUMMARY OF AUTHORITY'S DECISION

- The channelling arrangements established in 2010/267/EU, 2009/766/EC and 2008/477/EC will be adopted for the 800 MHz, 1800 MHz and 2.5 GHz bands respectively.
- Spectrum in the 800 MHz, 1800 MHz and the paired sub-band in the 2.5 GHz bands will be assigned in multiples of paired 5 MHz channels.
- The unpaired spectrum in the 2.5 GHz bands will be assigned in two 25 MHz lots.
- The spectrum caps will be as follows:
  - A cap of two (2) 5 MHz paired channels will apply in the 800 MHz band;
  - The spectrum cap established in the Authority's decision of 2010 (MCA/10/44/D) will be retained, namely an overall cap of eight (8) 5 MHz paired channels will be applied over the 900 MHz and 1800 MHz bands with a limit of four (4) channels in the 900 MHz band. This spectrum cap will be inclusive of any channels already assigned in these bands; and
  - An overall spectrum cap of 210 MHz that takes into consideration all assignments in the 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz and 2.5 GHz bands. For the avoidance of doubt this includes also unpaired spectrum and the applicant's spectrum holdings at the time of the call of applications. For the purposes of the spectrum cap calculation or spectrum already assigned, a paired 5 MHz channel will be considered as 10 MHz.
- Should there be unassigned spectrum in the 800 MHz and/or 1800 MHz bands and there is no excess demand in any lot category, the respective caps will be relaxed as follows:
  - **A** cap of three (3) 5 MHz paired channels will apply in the 800 MHz band.
  - A spectrum cap of eleven (11) 5 MHz-channels in the 900 MHz and 1800 MHz bands, with a maximum cap of four (4) in the 900 MHz band, inclusive of any channels already assigned in these bands.
  - In any case the overall spectrum cap of 210 MHz will not be relaxed and will remain unaltered.
- The Authority reserves the right to relax the spectrum caps as outlined above, as part of the brokered meetings. However, should an auction be required, then the spectrum caps will not be relaxed and the caps established in Section 2.4 will apply.
- The assignment process will be initiated upon market demand.
- A Call for Applications will be issued for spectrum in all the bands where there is registered market demand.

- The assignment process will be as follows:
  - The first step will be a qualifying phase based on a number of criteria.
  - Should the available spectrum be sufficient to cater for the registered demand, then the spectrum will be assigned directly to all qualified applicants in line with their requirements.
  - The second step will kick in should demand exceed supply. The Authority reserves the right to hold brokered meetings with the qualifying applicants aimed at finding an acceptable assignment for all parties.
  - If no solution is arrived at, or should the Authority decide not to hold brokered meetings, an auction for all the spectrum in all the bands will be held.
- If the Authority decides to attempt a solution through brokered meetings, applicants may be given the option to accept a partial assignment of spectrum with only part of the spectrum going to auction. Such an approach will be adopted if all applicants take up this option. If a common agreement cannot be reached, then all the spectrum in all the bands will be auctioned.
- Rights of use will be granted for a fifteen year term.
- Rights of use will be service neutral.
- The 800 MHz band licensees will be required to establish a fund between them to make good for the costs related to the mitigation measures. The fund cap will be established by the Authority in the Call for Applications.
- Rights of use will be granted under the technical conditions stipulated in the 2010/267/EU, 2011/251/EC and 2008/477/EC decisions. In particular for the 800 MHz band the following parameters will apply:
  - The in-block EIRP for Channel 1 will be set at 56 dBm/5 MHz, whilst for the other channels it will be set at 60 dBm/5 MHz.
  - The baseline requirements for the base station BEM out-of-block EIRP limits over frequencies below 790 MHz will be those established under Case A in Table 4 of the said EU decision.
- The successful applicants will be required to make any technology they deploy available nationwide within 2 years from the grant date. If the assignment includes spectrum in the 800 MHz band then the 24 month timeframe will initiate upon grant or the date when the 800 MHz band becomes available for mobile services, whichever comes latest.
- The successful applicants will be required to use all the assigned spectrum within 2 years from the grant date or the date when the 800 MHz band becomes available for mobile services, whichever comes latest.
- Handback conditions will be included in the licence.
- Sanctions such as a 'use it or lose it' clauses will be included in the licence.

ANNEX 1 - ANALYSIS OF RESPONSES AND AUTHORITY'S POSITION

This section treats the specific questions put forward in the consultation.

A.1 CHANNELLING PLAN

A.1.1 Authority's Consultation Proposals

In the consultation paper the Authority proposed that so as to maximise flexibility in spectrum usage by the operators, the channelling plans established in 2010/267/EU, 2009/766/EC and 2008/477/EC should be adopted for the respective spectrum bands as follows:

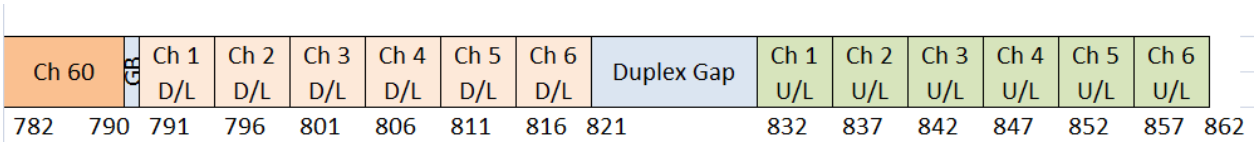


FIGURE A.1: PROPOSED CHANNELLING PLAN FOR THE 800 MHZ BAND

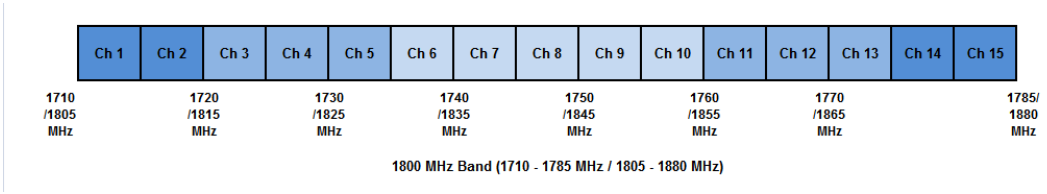


FIGURE A.2: CHANNELLING PLAN FOR THE 1800 MHZ BAND

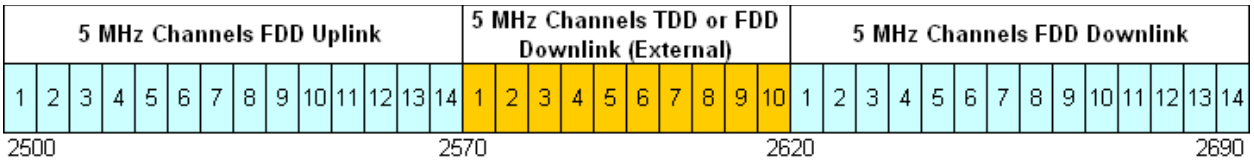


FIGURE A.3: PROPOSED CHANNELLING PLAN FOR THE 2.5 GHZ BAND

A.1.2 Responses Received

All three respondents were in favour of this proposal.

A.1.3 Response Evaluation

Based on the responses received the original proposal will be retained.

Summary of Authority's position:

The channelling plans established in 2010/267/EU, 2009/766/EC and 2008/477/EC will be adopted for the 800MHz, 1800 MHz and 2.5 GHz bands respectively.

A.2 LOT DEFINITION

A.2.1 Authority's Consultation Proposals

A 'lot' is the minimum amount of spectrum an interested party could apply for and is defined in terms of its size and its technical characteristics.

The technical characteristics of the lot are primarily defined by the spectrum band and additional technical conditions that might be applied to specific channels, if any. Lots with different technical characteristics would be classified in separate lot categories.

In the consultation paper the Authority proposed the following:

800 MHz Band: Each 5 MHz paired channel to be considered a single lot, six lots in total. In case some of the channels are subject to greater technical constraints than others, the lots in this band will be classified under two distinct lot categories depending on the applicable technical conditions.

1800 MHz Band: Each 5 MHz paired channel to be considered a single lot, six lots in total. Since all channels are subject to the same technical conditions, all lots will be classified in one lot category.

2.5 GHz Band (Paired spectrum): Each 5 MHz paired channel to be considered a single lot, fourteen lots in total. Since all channels are subject to the same technical conditions, all lots will be classified in one lot category.

2.5 GHz Band (Unpaired spectrum): The Authority proposed assigning the unpaired spectrum either as a single 50 MHz lot or as two 25 MHz lots. In the latter case each lot would be classified in a distinct lot category[10].

A.2.2 Responses Received

800 MHz Band:

All the respondents agreed with the lot definition proposed by the Authority.

1800 MHz and 2.5 GHz Band (paired spectrum):

Two of the respondents agreed with the lot definition proposed by the Authority for the paired spectrum under consideration. On the other hand, the third respondent suggested that the lot structures in the 1800 MHz and the paired sub-band of the 2.5 GHz bands should be composed of 10 MHz paired channels.

[10] One of the lots will have only one restricted channel as an interface to the adjacent FDD operation (i.e. Channel 1 of TDD), whilst the other will have two as an interface to the adjacent TDD and FDD operations (i.e. Channels 6 and 10 of TDD).

Unpaired spectrum in the 2.5 GHz band:

One of the respondents expressed a preference for two 25 MHz lots. A second respondent stated that at this stage it did not have any preference on whether the unpaired spectrum is assigned as one 50 MHz lot or two 25 MHz lots. The third respondent felt it was not in a position to provide the Authority with an answer to this question at this point in time. It also suggested that the lot structure and allocation for the unpaired spectrum in the 2.5 GHz band should be defined once operators have expressed their interest in being assigned this spectrum.

General

On a general note, one of the respondents also stressed the importance of assigning operators contiguous spectrum.

A.2.3 Response Evaluation

1800 MHz and 2.5 GHz Band (paired spectrum):

A lot based on a 5 MHz paired channel gives potential applicants the maximum flexibility in applying for spectrum in line with their requirements. On the other hand, a lot based on a 10 MHz paired channel would restrict applicants that may be interested in small amounts of spectrum. In addition in the case of the 1800 MHz band changing the lot definition at this stage would result in a fragmented channelling plan.

Unpaired spectrum in the 2.5 GHz band:

In the case of the unpaired spectrum in the 2.5 GHz band, the Authority notes that by assigning the spectrum as two 25 MHz lots, it does not preclude an interested party from acquiring all 50 MHz of unpaired spectrum, subject to the relevant spectrum cap limitations. Moreover, the Authority could still review this position in the future should the spectrum remain unassigned.

General

Finally as outlined in the consultation document the Authority would like to reiterate that it will guarantee contiguous spectrum assignments within a given band, as may be possible when taking into consideration existing spectrum assignments.

Summary of Authority's position:

800 MHz Band: Each 5 MHz paired channel to be considered a single lot, six lots in total. Channel 1 will be in a separate lot category.

1800 MHz Band: Each 5 MHz paired channel to be considered a single lot, six lots in total.

2.5 GHz band paired spectrum: Each 5 MHz paired channel to be considered a single lot, fourteen lots in total.

2.5 GHz band unpaired spectrum: Two lots of 25 MHz each.

A.3 SPECTRUM CAPS

A.3.1 Authority's Consultation Proposals

In the consultation paper the Authority had proposed the following spectrum caps:

- **A c**ap of three (3) 5 MHz paired channels in the 800 MHz band;
- A spectrum cap of eight (8) 5 MHz-channels in the 900 MHz and 1800 MHz bands, inclusive of any channels already assigned in the 900 MHz band; and
- An overall spectrum cap of 210 MHz; This overall cap would be calculated over the 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz and 2.5 GHz bands, including any unpaired spectrum, and taking account of the applicant's spectrum holdings in these bands at the time of the call for applications. For the purposes of the spectrum cap calculation, a paired 5 MHz channel would be considered as 10 MHz.

A.3.2 Responses Received

800 MHz band cap

Two of the respondents agreed with the Authority's proposals. The third respondent was not in agreement and contested that the proposed spectrum cap "would not prevent both mobile incumbents from gaining all the available spectrum in the 800 MHz band between them to the exclusion of all other interested parties." It proposed that the Authority should establish a spectrum cap in the 800 MHz band that makes a distinction between those operators who already hold substantial spectrum in the 900 MHz band and those who do not.

1800 MHz band cap

All respondents agreed with the proposal to retain the spectrum cap established in 2010 for the 1800 MHz band.

2.5 GHz band cap

Two of the respondents expressed strong reservations on the proposal not to impose a specific cap for the 2.5 GHz band. In this respect one of them suggested that a spectrum cap of six (6) 5 MHz channels should be introduced. The other respondent proposed that in the 2.5 GHz band a cap of 40 MHz should apply in the case of GO and Vodafone, while no spectrum cap should apply in the case of all other applicants.

The third respondent agreed with the Authority's proposal.

Overall cap

All respondents agreed with the overall cap. However one of the respondents proposed that the 2.5 GHz unpaired spectrum is excluded from the overall spectrum cap so that the operator's mobile

spectrum allocation is not consumed by spectrum that will probably be used for very different use cases.

General

One of the respondents proposed that "any spectrum that remains unallocated following the conclusion of this assignment process, be made readily available to any party that shows interest therein. This should include unutilised spectrum pertaining to bands within which an interested party has already reached the respective established caps." This respondent envisaged that this could be done on a separate licensing mechanism subject to specific conditions and pricing terms.

A.3.3 Response Evaluation

800 MHz Band Cap

To take into account the existing spectrum holdings in the 900 MHz band, the Authority would need to establish a sub-1GHz cap. However, this would have made sense only had it been established prior to the re-assignment of the 900 MHz and 1800 MHz bands as it would have given applicants the necessary visibility to define their spectrum acquisition strategy for the bands in question. As things stand today, the 900 MHz band was assigned in 2011 and the current spectrum assignments in this band reflect the market demand at the time. There is, at this stage, limited value in establishing a sub-1GHz spectrum cap since all the spectrum in the 900 MHz band is assigned, and thus interested parties are confined to the current scenario. Therefore the introduction of a sub-1GHz cap covering both the 800 MHz and 900 MHz bands is currently not intended.

The Authority however notes that there is merit in lowering the spectrum cap in the 800 MHz band to two (2) channels. This change would allow for a minimum of three (3) operators to acquire spectrum in this band and enhance competition in the mobile market. Experience in other jurisdictions shows that, a spectrum cap of two channels would not unduly limit the operators' commercial possibilities.

1800 MHz Band Cap

The Authority intends to retain the original spectrum cap of eight (8) 5 MHz-channels in the 900 MHz and 1800 MHz bands, inclusive of any channels already assigned in the 900 MHz band.

2.5 GHz Band Cap

The introduction of a specific cap for the 2.5 GHz band would limit the applicants' flexibility to acquire spectrum in this band. At the same time the overall spectrum cap imposes an indirect constraint on the amount of spectrum that can be acquired in this band. Therefore the Authority is of the view that there is no need for a band specific cap for the 2.5 GHz band.

Overall Cap

The reason for introducing an overall cap was to establish a limit on the amount of spectrum that can be acquired by a single entity, whilst ensuring an overall equitable access to spectrum.

It should be noted that the inclusion of the unpaired spectrum in the overall spectrum cap calculation does not affect an applicant's allowance, unless that applicant sees commercial value in and thereby acquires unpaired spectrum.

Relaxation of the 800 MHz and 1800 MHz Caps

A cap of two (2) channels in the 800 MHz band increases the possibility of unassigned spectrum. Therefore should it result that demand does not exceed supply in any of the lot categories and that there is unassigned spectrum in the 800 MHz band, then the Authority intends to relax the 800 MHz spectrum cap from two (2) to three (3) channels.

Similarly, should it result that demand does not exceed supply in any of the lot categories and that there is unassigned spectrum in the 1800 MHz band, then the Authority intends to relax the spectrum cap to eleven (11) channels in both the 900 MHz and 1800 MHz bands retaining however the limit of four (4) channels in the 900 MHz band.

In either case, applicants would be able to apply for additional spectrum in the bands in question subject to the new spectrum cap limitations as well as the overall spectrum cap.

Based on this analysis, the following will be adopted:

Summary of Authority's position:

The following spectrum caps will apply:

- A cap of two (2) 5 MHz paired channels will apply in the 800 MHz band;
- The spectrum cap established in the Authority's decision of 2010 (MCA/10/44/D) will be retained, namely an overall cap of eight (8) 5 MHz paired channels will be applied over the 900 MHz and 1800 MHz bands with a limit of four (4) channels in the 900 MHz band. This spectrum cap will be inclusive of any channels already assigned in these bands; and
- An overall spectrum cap of 210 MHz that takes into consideration all assignments in the 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz and 2.5 GHz bands. For the avoidance of doubt this includes also unpaired spectrum and the applicant’s spectrum holdings at the time of the call of applications. For the purposes of the spectrum cap calculation or spectrum already assigned, a paired 5 MHz channel will be considered as 10 MHz.

The Authority retains the right to relax the spectrum caps in the 800 MHz and 1800 MHz

bands in case of unassigned spectrum in these bands, subject to no excess demand in any lot category.

A.4 ASSIGNMENT PROCESS

A.4.1 Authority's Consultation Proposals

In the consultation paper the Authority proposed that the assignment process is initiated upon market demand. The first step would entail a call for applications. The next step would consist of a qualification phase which would assess whether applicants have the necessary standing to fulfil the licence obligations should they be successful in acquiring the spectrum rights.

If, following the qualification phase, it results that demand for the available spectrum exceeds supply then the Authority proposed to reserve the right to hold brokered meetings. The Authority further proposed that in the event that no agreement is reached between the qualified applicants, or should the Authority decide not to hold brokered meetings, then all the spectrum in the bands under consideration in the Call would be auctioned.

However, the assignment of the 800 MHz band is dependent on the clearance of the said band from any broadcasting transmissions, which in turn depends on the successful co-ordination of an alternate broadcasting channel. This notwithstanding, for the sake of expediting the process, the Authority is considering the co-ordination and assignment processes as two distinct work streams that can run in parallel. In view of this the Authority proposed to introduce certain safeguards in the assignment process to take into account any delays in the co-ordination process.

A.4.2 Responses Received

Two of the respondents were in favour of the proposed assignment process. One of these respondents further welcomed the proposal that the assignment process is triggered by demand. It also shared the Authority's wish to safeguard the process in case where international frequency co-ordination is not finalised. However, it pointed out that in case international co-ordination is delayed or unsuccessful, direct granting of spectrum to applicants where demand does not exceed supply may leave applicants for the affected 800 MHz spectrum stranded to an extent, since the request for 800 MHz spectrum would have been made within a wider spectrum strategy context. In this case this respondent suggested that an alternative could be to ring fence the affected lots in the 800 MHz band and proceed with the unaffected ones.

The third respondent expressed its preference for a beauty contest. It also expressed its concern at the proposed requirement for a bank guarantee.

A.4.3 Response Evaluation

As explained in Section 3.2 of the Consultation Document should co-ordination not be completed by the end of the qualification phase the Authority reserves the right to halt the process. Should this be the case no assignments will be made irrespective of whether there was excess demand or not.

It should be further noted that the continued use of the 800 MHz band for broadcasting transmissions severely limits the amount of usable spectrum for mobile services. Ring fencing affected lots risks creating an element of artificial scarcity, distorting the efficient outcome of the assignment process. The timing for granting the rights of use is critical. If the rights of use for the unaffected 800 MHz channels are issued significantly earlier than the rights of use for the remaining channels, there is a risk of distorting competition and the Authority's position is that halting the whole process is more temporarily beneficial for the market.

For the sake of clarity, the Authority notes that, if there is no market demand for spectrum in the 800 MHz band, this band will not be included in the assignment process, which would then proceed independently from the co-ordination process.

Comparative and competitive assignment processes answer different regulatory requirements. Auctions do not take into account any considerations, other than the price, awarding the spectrum to the applicants that value the spectrum most. On the other hand, a beauty contest involves a more complex evaluation and does not give any weighting to financial considerations.

The Authority has therefore put together a process that aims to strike a balance between the two approaches, by making the necessary evaluations to ensure the ability of the applicant to utilise the spectrum effectively, whilst still awarding the spectrum on the basis of an auction in the event that demand exceeds supply.

In fact the first step in the process will be a qualification phase which will take the form of an extended due diligence. This step in the process has the objective of establishing those applicants that can be considered for the award of spectrum and will not establish any applicant ranking.

Furthermore the bank guarantee acts as an assurance of the applicant's commitment to the assignment process and to the fulfilment of rollout obligations.

Together these two measures are intended to safeguard the process from rogue applicants and ensure that any successful applicant is capable of fulfilling its licence obligations, whilst at the same time minimising the element of subjectivity inherent in a beauty contest.

Summary of Authority's position:

- The assignment process will be initiated upon market demand.
- A Call for Applications will be issued for spectrum in all the bands where there is registered market demand.
- The assignment process will be as follows:
  - The first step will be a qualifying phase based on a number of criteria.
  - Should the available spectrum be sufficient to cater for the registered demand, then the spectrum will be assigned directly to all qualified applicants in line with their requirements.

  - The second step will kick in should demand exceed supply. The Authority reserves the right to hold brokered meetings with the qualifying applicants aimed at finding an acceptable assignment for all parties.
  - If no solution is arrived at, or should the Authority decide not to hold brokered meetings, an auction for all the spectrum in all the bands will be held.
- If the Authority decides to attempt a solution through brokered meetings, applicants may be given the option to accept a partial assignment of spectrum with only part of the spectrum going to auction. Such an approach will be adopted if all applicants take up this option. If a common agreement cannot be reached, then all the spectrum in all the bands will be auctioned.
- Provisions will be included in the process to safeguard against delays in the co-ordination process.
- A number of conditions including financial commitments will be required to safeguard the process.

A.5 ISSUES OF CO-EXISTENCE

A.5.1 Authority's Consultation Proposals

In the consultation paper the Authority analysed a number of possible issues of co-existence that could arise following the rollout of mobile services in the 800 MHz band, namely:

- Co-existence with Cable Services;
- Interference due to the Mobile Uplink;
- Co-existence issues with Microphones; and
- Co-existence with DTTV installations.

Based on this analysis the Authority proposed a number of measures, namely:

- Stricter technical conditions for Channel 1 in the 800 MHz band; and
- Establishment of a fund between the 800 MHz licensees to make good for the costs arising as result of the mitigation measures deployed. The fund would be indicatively capped at € 4.5 million.

A.5.2 Responses Received

One of the respondents argued that the proposed mitigation proposals mean that cable and DTTV operators are not being treated equally.

This respondent also sustained that "there are problems in relation to the mitigation measures proposed in the consultation document as in its opinion these measures are unlikely to work in practice". In particular, this respondent argued that the issue of direct interference with TVs and STBs has to be considered a likely scenario, given that one of the key advantages of deploying LTE in the 800 MHz band is the ability to offer good indoor coverage. Considering that DTTV receivers in

modern TV sets are typically located either inside the TV or in the STB adjacent to it, this respondent argued that the proposed mitigation measures could prove ineffective in practice.

This respondent further considered the Authority's proposal to establish a fund to deal with mitigation measures in the 800 MHz band as ill-advised and not properly thought out. First of all it sustained that these problems relate to legacy services operating within the 800 MHz band and an alternative approach would be to ensure that responsibility for dealing with any interference problems is placed on all legacy providers and not on providers of 4G services. Moreover it maintained that there is no evidence to show that the expensive, interventionist approach adopted in the UK (which the respondent considered to broadly mirror the Authority's proposal) is likely to prove any better than the hands-off approach being used in relation to the same issue in Ireland. In addition, the respondent argued that it is not aware that interference in the 800 MHz band has emerged as a material issue at all in either country, despite the fact that 4G services in the 800 MHz band have already been launched in both countries. It therefore proposed that the Authority should adopt a 'wait-and-see' approach and monitor international developments more closely in relation to best practice in dealing with this matter. Finally this respondent stated that the cost figures put forward in the consultation document in relation to the proposed fund lack credibility and appear to be extremely inflated.

Another respondent agreed with the Authority's proposals in respect of Co-existence with Cable Services; Interference due to the Mobile Uplink and Co-existence issues with Microphones. However this respondent noted that whilst the deployment of mobile services in the 800 MHz band is expected to affect the reception of DTTV services, since no field tests have been carried out locally, there is currently no visibility as to the extent of interference that is likely to occur and which areas are likely to be affected. This respondent further sustained that instead interested parties have simply the exorbitant figure of €4.5 million as a guiding figure. In the light of this, whilst acknowledging the system of periodic instalments proposed by the Authority, this respondent stated that it does not agree with the proposed mitigation mechanism. Instead it proposed that the Authority should first conduct the necessary field tests and impact assessments, publish the findings, consult with interested parties on the proposed mitigation mechanism and then issue the call for interested parties to register their interest in being awarded spectrum in the 800 MHz band. In the light of the above, this respondent suggested that the consultation regarding the mitigating mechanisms is tackled separately from the call for applications. Finally this respondent, whilst acknowledging that the 800 MHz licensees should bear some of the costs required to mitigate the interference, if any, that will be suffered by DTTV services, proposed that the DTTV operators should bear the brunt of this burden.

The third respondent requested a clarification on the last sentence in the second paragraph of page 13 of the consultation document i.e. "*However, such liability should not be extended to other issues which come to the fore after the change in use of spectrum, but where the underlying cause is not directly related to such change of use.*"

It also commented that whilst in most cases interference occurs primarily via the TV antenna, it has however been established that LTE signals enter a TV/STB receiver via a route other than the antenna socket and cause interference. It stated that studies have shown that set top boxes that have ventilation slots have also exhibited symptoms of interference when the LTE signals are relatively high.

This respondent also pointed out that aside from a filter before the set-top box and/or a filter prior to a mast head amplifier, indoor amplifiers and/or launch amplifiers may be required. It also suggested that the mitigation measures to be covered by the fund be extended to include “installation and removal of amplifiers, and associated installations in DTTV systems". Furthermore it suggested that the second bullet (of Section 4.5 sub-section ‘Establishment of a Fund’) should read "The migration of affected installations to an alternative TV platform, in case remedial action taken in accordance with established criteria fails to resolve the problem". This respondent also argued that the consumer complaint handling process should be agreed in conjunction with the DTTV operator and that ideally the fault resolution process is also managed by the said operator.

With respect to the computation of the fund, this respondent pointed out that the filter cost depends on its specifications and having filters with adequate specifications is crucial to ensure that their performance is effective. This respondent stated that it presumes that assumptions made by the Authority provide for adequate specifications in areas such as insertion loss, cut off frequency, roll-off, rejection band attenuation and others. However this respondent argued that, without visibility of these, it cannot effectively comment on the reasonability of the assumptions. Furthermore it argued that costs should also include other equipment that may be required, such as attenuators, low gain line amplifiers to compensate for loss introduced by filters or more directive antennas that may be required to mitigate LTE interference. In view of this it reserved its final position given that upcoming technical results from the field on the effectiveness of filters could materially affect the costs.

This respondent also pointed out that no local 800 MHz LTE field tests have been conducted and thus technical observations from tests carried out in other countries cannot be applied in their entirety as the local DTTV network topology and environment are different. Therefore this respondent believes that it is imperative that the Authority:

1. considers the need to provide adequate time to study the effects of actual LTE deployments (especially in Channel 1 of the 800 MHz band) on DTT services;
2. ensures it will have the power and authority to take corrective measures and re-adjust LTE levels to lower levels further in order to address interference issues on DTT services
3. is fully aware that the measures that will be required to overcome interference are not simply limited to inserting a filter, but should include various other options such as the use of different types of filters, using more directional antennae, redirecting the antenna, changing or eliminating the line amplifier, replacing an indoor antenna by a rooftop one etc. Moreover the costs to compensate for these materials and solutions should be determined when the list of possible solutions is confirmed after the actual field tests.
4. must allow enough time for actual trials to be conducted and subsequently enough time to procure the appropriate materials required for remedial action.
5. ensures that the above mitigation measures are of sufficient quality to ensure the ultimate aim and are funded completely through the fund.

A.5.3 Response Evaluation

The rollout of mobile services in the 800 MHz band could potentially give rise to interference with the broadcasting service.

In the cable network the shielding of the coaxial cabling allows the transmission network to operate over a wide range of frequencies, despite the fact that these are allocated to other services including terrestrial radio and broadcasting services. This co-existence therefore exists at present without any

problems and this scenario should not change with the change of use of the 800 MHz band from broadcasting to mobile services.

Once the 800 MHz band is cleared of any broadcasting transmissions, the local DTTV networks will no longer operate over the said frequencies. Therefore the deployment of mobile services therein is not expected to cause any interference to DTTV transmission networks.

All network operators have an obligation to retain a certain level of quality in their network deployment. Therefore, it is considered that any interference problems on the cable or DTTV transmission networks should be handled directly by the respective operators, with any costs being borne by the said operators.

Customer premises equipment, such as STBs, TV receivers and cable modems, could pick up an external signal on the 800 MHz band thereby disrupting the TV or data service. This signal could originate either from an outdoor base station, an indoor cell or a nearby mobile device. Studies and experience in foreign jurisdictions have concluded that the significance of this issue is negligible. This is expected to be even more so locally given the increased signal strength attenuation caused by local building characteristics. Furthermore the avoidance of indoor cells operating in the 800 MHz band would further limit the possibility of occurrence of this type of issues. It is therefore considered that any issues in this respect should be handled by the end users or network providers as the case may be.

The final element one has to consider is the rooftop antenna. These were designed to operate on a wide range of frequencies including the 800 MHz band given that it is currently used for broadcasting. Once the 800 MHz band is cleared of broadcasting and mobile services are deployed therein, these antennae will pick up the mobile signal resulting in disruption to the broadcasting reception. Technical conditions on the operation of the LTE base stations help limit this issue but they do not eliminate it completely. There are however a number of mitigation measures that can be adopted to restore the broadcasting service to the affected viewers.

The rooftop antennae and associated equipment are owned by the individual viewers. Taking into account that:

- Unless an alternate solution is found end users would have to foot the bill in order to restore their broadcasting service;
- These issues will be triggered as a direct result of the change in use; and
- This change in use benefits the mobile network operators,

Then the Authority considers that the 800 MHz licensees, as the prime beneficiaries of this change, should make good for the related mitigation measure costs.

For this purpose the 800 MHz licensees will be required to establish a fund between them. The fund will cover the costs solely related to the mitigation measures required to solve interference issues to aerial television reception installations resulting from the deployment of outdoor base stations operating in the 800 MHz band.

The licensees will be in charge of the fund administration and will amongst other things be responsible for establishing:

- the customer complaint handling process, which needs to include the active participation of any DTTV operators; and
- fund management, including tranche deposits and payment outlays.

The Authority further reiterates that the €4.5 million fund cap quoted in the consultation paper was intended to establish a worst case scenario. Also as suggested in the consultation paper the licensees would be able to carry out the payments in tranches and hence the financial outlay will be limited to what is strictly necessary.

In establishing the fund cap the Authority has taken into consideration technical solutions adopted in other jurisdictions. The Authority acknowledges that field trials could shed further light on this point, however, it would be difficult to guarantee replicability nationwide. The Authority has therefore adopted a cautionary approach when establishing the fund cap. In fact as evidenced by the responses received, it is highly unlikely that the findings would result in an upward revision of the fund cap. Hence, the Authority is of the opinion that the €4.5 m fund cap should be retained.

Summary of Authority's position:

- **The 800 MHz band licensees will be required to establish a fund between them to make good for the costs related to the mitigation measures.**
- **On the basis of the subscriber information currently in hand the fund cap is set at €4.5 million. The exact figure will be established in the Call for Applications to reflect any changes in the number of subscribers till then.**

A.6 CONDITIONS OF RIGHTS OF USE

A.6.1 Authority's Consultation Proposals

In the consultation paper the Authority proposed that the spectrum be assigned for a licence term of fifteen (15) years.

The Authority also proposed that the rights of use are technology neutral as long as they comply with the relevant EU spectrum harmonisation decisions namely, 2010/267/EU for the 800 MHz band, 2011/251/EU for the 1800 MHz band and 2008/477/EC for the 2.5 GHz band

The Authority was also of the view that any rights of use of spectrum in these bands should be service neutral.

The consultation paper also proposed a 24 month nationwide service roll out obligation. In this respect the Authority proposed that two sub-categories should be created with services capable of offering speeds in excess of 100 Mbps being classified as very high speed mobile data services.

In terms of interference mitigation techniques, the Authority proposed that the parameters established in 2010/267/EU for the 800 MHz band, 2011/251/EU for the 1800 MHz band and

2008/477/EC for the 2.5 GHz band should be adopted. Specifically for the 800 MHz band it was proposed that:

- The in-block EIRP for Channel 1 should be set at 56 dBm/5 MHz, whilst for the other channels it should be set at 60 dBm/5 MHz.
- The baseline requirements for the base station BEM out-of-block EIRP limits over frequencies below 790 MHz should be those established under Case A in Table 4 of the 2010/267/EU decision.

In addition the Authority proposed that a fund should be established between the 800 MHz band licensees to make good for the costs related to the mitigation measures.

In view of an upcoming EU decision concerning PMSE, the Authority also proposed to prohibit the deployment of indoor cells operating in the 800 MHz band.

The Authority further proposed that sanctions, including 'use it or lose it' clauses, are included in the licence.

A.6.2 Responses Received

Licence Term:

One of the respondents proposed a 25-year licence duration. It also proposed the alignment of existing spectrum licence expiration dates.

Rollout obligations

Two of the respondents requested a clarification that the proposed rollout and coverage obligations refer to the services/technologies being offered nationwide within a 2-year period and not to the operator having that particular spectrum rolled out nationwide within the said timeframe.

The third respondent suggested that the rollout timeframes should be longer than 24 months. This respondent also requested clarifications on how the arrangements proposed in the last paragraph of Section 5.4 of the Consultation Document (i.e. the creation of two sub-categories of services with services capable of offering speeds in excess of 100 Mbps being classified as very high speed mobile data services) will be applied in practice.

Interference mitigation measures

One of the respondents suggested that any power limitations in the 800 MHz band should be decided following the carrying out of adequate field tests. In addition it suggested that given the possibility of their being technical advancements that would allow for the increasing of power levels without the risk of interference, the Authority should retain an arbitration function in order to decide whether to allow such increases in power levels or not.

Another respondent suggested that "the use of Block Edge Masks should be a requirement in the conditions of rights of use of spectrum where possible interference with TV signals is involved. (see

4th para of section 5.5)". This respondent also proposed that "the technical conditions of the licence should extend the proposed provisions to cater for restrictions arising from international co-ordination process to possible issues that arise from the actual local experience of interference from LTE to TV. "

Siting Conditions

One respondent considered the proposal to prohibit the deployment of small cells operating in the 800 MHz band disproportionate and counter to the approach being increasingly adopted by converged operators. It sustained that regulators in other countries, for example Ofcom in the UK, have dealt with this issue by clearing the 800 MHz band of PMSE use altogether.

Other

A respondent suggested that the hand back conditions should not be tied with an obligation to pay for the whole duration of the licence period. This respondent also suggested that the Authority should put in place measures to cater for technological progress.

A.6.3 Response Evaluation

Licence Term:

The proposal for a 25 year licence duration was made by the European Parliament in response to the Commission's proposal for the new EU framework and is still under discussion. Thus the Authority considers it premature to pin the licence duration to these proposals. Likewise the harmonisation of licence termination dates is still under discussion at European level. If and when this concept is established at law, the Authority would need to establish a holistic approach taking into account all the relevant licences. The Authority will therefore maintain the policy it has used to date in respect of licence duration.

Rollout obligations

The Authority notes that recent similar nationwide rollouts were carried out in less than two years from the date of assignment and this timeframe has been a standard requirement in the rights of use of spectrum in other related bands. Therefore it considers that its proposals are justified.

The nationwide rollout obligation is linked to the technology deployed by the licensee not with the specific spectrum bands. For example if a licensee launches an LTE network then it will be bound to deploy that network nationwide within a two year timeframe from the date of award of the licence. In doing so it will be free to deploy the said technology using any spectrum awarded to it which may also consist of spectrum in different bands.

However, through the 'use it or lose it' clause, the licensee will also be bound with an obligation to use all the spectrum awarded to it.

It should be further noted that in case the award includes spectrum in the 800 MHz band, the two year timeframe will be initiated upon grant or from the date when the 800 MHz band becomes available for mobile services, whichever comes latest.

Interference mitigation measures

The technical conditions are in line with the EU Decision 2010/267/EU, with the most stringent conditions applied to channel 1. As stated in the consultation document the Authority reserves the right to relax these technical conditions at any point throughout the term of the licence, particularly in case of material changes to the local terrestrial broadcasting scenario or as a result of technological developments. The Authority will also consider relaxing the technical conditions should licensees reach an agreement to this effect with the digital terrestrial television (DTTV) operator.

The Authority shall also have the right to adjust these limits in cases of interference of any kind with other licensed operators.

The Authority also takes note of the respondent's proposal to set the technical conditions following the trials. In this respect, given that the proposed technical conditions for Channel 1 are set at the most stringent level, then the trial results would, if anything, result in the possibility to relax these conditions, a situation which, as stated above, is already catered for.

The Authority takes the opportunity to clarify that the BEMs as reflected in the technical parameters established in the respective Commission Decisions will be included in the technical annex of the rights of use.

Siting Conditions

In response to the growing need for harmonised spectrum for PMSE, CEPT report 50 identified the 800 MHz and 1800 MHz gap bands as prime candidates. The outcome of this report is expected to be adopted as an EU commission decision in short order. The CEPT studies also pointed out to the need to avoid indoor cells operating in these bands as a way to avoid harmful interference to PMSE developed to operate in line with the new EU decision. In view of this the Authority will prohibit the deployment of indoor cells operating in the 800 MHz band in buildings wherein the use of PMSE is essential for the fulfilment of the said building's function for example theatres, studios and auditoriums.

Other

The Authority considers that it should retain the conditions established for the 900 MHz and 1800 MHz bands licences. In the case that demand for spectrum in a given band does not exceed supply at any stage in the assignment process, then licensees will be able to hand back all or part of their spectrum assignment in **that** band. In this case these licensees will not be required to pay any future spectrum fees related to the channels handed back, but will not be entitled to a refund of those fees already paid or that were due by them until the date of the handback.

The handback provision however does not exonerate the licensee in question from honouring its rollout obligations in accordance with the licence awarded to it. In the event that the licensee fails to comply with these obligations, penalties including, but not limited to, a forfeit of the bank guarantee, will apply.

In case that a licensee rescinds spectrum in a band where demand exceeded supply, then the licensee will be bound to pay the equivalent of three (3) annual fees in addition to any fees already due.

Summary of Authority's position:

- Rights of use will be granted for a fifteen year term.
- Rights of use will be service neutral.
- Rights of use will be granted under the technical conditions stipulated in the 2010/267/EU, 2011/251/EC and 2008/477/EC decisions. In particular for the 800 MHz band the following parameters will apply:
  - The in-block EIRP for Channel 1 will be set at 56 dBm/5 MHz, whilst for the other channels it will be set at 60 dBm/5 MHz.
  - The baseline requirements for the base station BEM out-of-block EIRP limits over frequencies below 790 MHz will be those established under Case A in Table 4 of the said EU decision.
- The successful applicants will be required to make any technology they deploy available nationwide within 2 years from the grant date. If the assignment includes spectrum in the 800 MHz band then the 24 month timeframe will initiate upon grant or the date when the 800 MHz band becomes available for mobile services, whichever comes latest.
- The successful applicants will be required to use all the assigned spectrum within 2 years from the grant date or the date when the 800 MHz band becomes available for mobile services, whichever comes latest.
- Handback conditions will be included in the licence.
- Sanctions such as a 'use it or lose it' clauses will be included in the licence.

A.7 OTHER CONSIDERATIONS

A.7.1 Authority's Consultation Proposals

The Authority had also requested interested parties to put forward any issues related to the subject which were not specifically raised in the consultation document.

A.7.2 Responses Received

One of the respondents suggested that the assignment process of the 800 MHz band should take place as soon as possible however not prior to the completion of the migration process mentioned in the Consultation document especially since this process is dependent on third parties and therefore

timelines cannot be guaranteed. This respondent suggested that the migration process for the clearing of the 800 MHz band is carried out prior to its assignment for wireless mobile services and in any case prior to the end of December 2014.

A.7.3 Response Evaluation

The process to clear the 800 MHz band consists of two phases: the international co-ordination of an alternate broadcasting channel and the subsequent migration of the transmissions currently operating in the 800 MHz band to the new channel. These are distinct from the assignment process and hence they can be carried out in parallel.

The co-ordination process is heavily dependent on third parties and thus timelines cannot be guaranteed. For this reason the assignment process includes a checkpoint once the qualification phase is concluded. If by that time the co-ordination process is not completed then the assignment process will be halted.

On the other hand the timeframes for the migration process are easier to establish and monitor. Hence once the co-ordination phase is completed, interested parties would have visibility of the timeframes leading to the clearing of the 800 MHz band.

Summary of Authority's position:

The assignment process will be initiated upon market demand.

A.8 SPECTRUM PRICING

Section 6 of the consultation document published in March included a consultation on behalf of Government on the proposed spectrum fees.

The responses received were forwarded to Government.

Government's decision on the matter will be published through a Legal Notice.