



The assignment process for the 1.5 GHz band (1427-1517 MHz band) for terrestrial systems capable of providing electronic communications services in Malta

Amending Decision

Final Decision

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1. Introduction

1.1 Background

In response to the recommendations made by the Radio Spectrum Policy Group ('RSPG') concerning the availability of sufficient and appropriate radio spectrum for wireless broadband, on 8 May 2015 the Commission adopted Commission Implementing Decision (EU) 2015/750 on the harmonisation of the 1452-1492 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Union.

In order to make available this harmonised radio spectrum for terrestrial systems capable of providing electronic communications services, the Malta Communications Authority ('MCA') has, following a public consultation (MCA/C/16-2612¹) published a Decision MCA/D/17-2868² on the assignment and applicable licence conditions for this band.

The Commission, on the 26 April 2018, adopted the Implementing Decision (EU) 2018/661. The latter, amended the Implementing Decision (EU) 2015/750 so as to harmonise additional radio spectrum in the 1.5 GHz frequency range, namely 1427-1452 MHz and 1492-1518 MHz ('1.5 GHz extension bands'), for terrestrial wireless broadband communications services in the Union. It should be noted that the 1.5 GHz extension bands were identified for International Mobile Telecommunications worldwide by the 2015 World Radiocommunication Conference.

The MCA, through this amending Decision (hereafter referred to as the 'Decision') is compelled to adopting the necessary measures so as to make the '1.5 GHz extension bands available locally, as required by the Commission Implementing Decision (EU) 2015/750 as amended by Decision (EU) 2018/661.

1.2 Scope

The aim of this Decision is to establish the assignment process that will be adopted in respect to the 1.5 GHz band together with the conditions that will be attached to the resulting rights of use.

¹ <https://mca.org.mt/consultations-decisions/assignment-process-15-ghz-band-use-wireless-broadband-electronic>.

² <https://mca.org.mt/consultations-decisions/assignment-process-15-ghz-band-terrestrial-systems-capable-providing>.

1.3 Principles underpinning spectrum management

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

- 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;
- 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 a 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 The 1.5 GHz Decision

Following the adoption of the Commission Implementing Decision (EU) 2015/750 as amended by Commission Implementing Decision (EU) 2018/661 (hereinafter referred to as the 'Commission Decision'), as per Regulation 75 of the Electronic Communications Networks and Services (General) Regulations³ (hereinafter 'the ECNSR'), the MCA, through the National Frequency Plan, designated the 1.5 GHz frequency band to be used by terrestrial systems capable of providing electronic communication services in compliance with the technical parameters set out in the Commission Implementing Decision. The Plan, in accordance with the Commission Decision, has made available the 1.5 GHz band for wireless broadband supplemental downlink (WBB SDL) services.

In order to complement with the 1.5 GHz band harmonisation measures, the MCA is issuing this Decision governing the assignment and management approach for the 1.5 GHz band. Such a measure is in line with the National Frequency Plan, adopted and published in accordance with the Electronic Communications (Regulation) Act (Chapter 399 of the Laws of Malta).

In addition, following the publication of the Decision on the assignment process for the 1.5 GHz band, the MCA, depending on the market demand shall assign the right of use for the said spectrum on a non-exclusive basis, without prejudice to other measures at law.

The MCA is listing the following key characteristics with regard to the assignment and governance conditions for the 1.5 GHz band.

2.1 Spectrum Characteristics

2.1.1 Spectrum Band, Channelling Plan and Lot Configuration

The MCA, in line with the National Frequency Plan and the Commission Decision, is making **available for assignment a total of 18 lots across the entire 1.5 GHz band**. It should be noted that a **single lot consists of an individual (1) slot of unpaired 5 MHz bandwidth**.

Harmonising the full 90 MHz bandwidth in the 1.5 GHz band, in addition, will allow the possibility to accommodate multiple operators and therefore drive economies of scale to the benefits of consumers.

³ Subsidiary Legislation 399.28 of the Laws of Malta

1427 MHz																	1518 MHz				
1427	1432	1437	1442	1447	1452	1457	1462	1467	1472	1477	1482	1487	1492	1497	1502	1507	1512				
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1517	1518
(Lot 1)	(Lot 2)	(Lot 3)	(Lot 4)	(Lot 5)	(Lot 6)	(Lot 7)	(Lot 8)	(Lot 9)	(Lot 10)	(Lot 11)	(Lot 12)	(Lot 13)	(Lot 14)	(Lot 15)	(Lot 16)	(Lot 17)	(Lot 18)				
Downlink (base station transmit)																			Guard band		
90 MHz (18 blocks of 5 MHz)																			1 MHz		

Figure 1: channel arrangement in the 1.5 GHz band

The adopted channelling arrangement for the full 90 MHz bandwidth in the 1.5 GHz band, as established in the Commission Decision, is designed to accommodate eighteen (18) frequency blocks of 5 MHz each for wireless broadband use.

2.1.2 Spectrum Caps

Since spectrum is a finite and scarce resource, a balance has to be achieved between the need to promote competition by allowing as many operators in the market as may be interested while at the same time providing the industry with adequate resources to effectively deploy reliable services.

In line with the rationale provided in MCA/C/16-2612, the Authority is setting **the 1.5 GHz band spectrum cap to four (4) 5 MHz channels**. Such a cap will put the 1.5 GHz spectrum in line with the future needs.

In addition, the Authority establishes an **overall spectrum cap of 230 MHz** in order to cater only for the additional potential spectrum in the 1.5 GHz band. This overall cap will be calculated over the 800 MHz, 900 MHz, 1.5 GHz, 1.8 GHz, 2.1 GHz and 2.5 GHz bands, including any unpaired spectrum, and will take account of the applicant’s spectrum holdings at the time of the 1.5 GHz band assignment process.

Relaxation of the spectrum caps

The MCA, at its sole discretion, may **relax the established spectrum caps from four (4) 5 MHz channels to a maximum of eight (8) 5 MHz channels** provided that (i) a request for acquiring additional spectrum in excess of the established spectrum cap of four channels is expressed by one or more authorised ECS providers that are eligible for such spectrum and (ii) that the overall demand, based on the established spectrum cap of four channels, as expressed by the interested stakeholders during the assignment process does not exceed the supply of the 1.5 GHz band spectrum available. The caps shall be relaxed following the assessment of demand for spectrum by the qualifying applicants at the end of the qualification phase. In addition, the MCA may deem adequate other instances for which the established spectrum caps merit to be relaxed.

Such measures are being introduced in order to ensure maximum utilisation of spectrum by allowing interested stakeholders, who may already hold the right of use for spectrum in the 1.5 GHz band the possibility to acquire channels within such a band, whilst ensuring the presence of competition and enhanced services within the market.

In the case where the 1.5 GHz band spectrum caps are relaxed, **the overall spectrum cap will also be relaxed to an overall maximum spectrum cap of 250 MHz.**

The increase in the overall spectrum cap, whether relaxed or otherwise shall only apply for the assignment of the 1.5 GHz band.

In the case where the overall demand expressed by the interested parties for 1.5 GHz spectrum is less than the spectrum lots available, the excess 1.5 GHz spectrum will remain un-assigned until such date when new demand is registered.

The applicable spectrum caps, whether relaxed or otherwise, will also apply following the finalisation of the assignment process and no authorised provider of terrestrial systems capable of providing electronic communications services shall at any point in time, hold rights of use of spectrum in the 1.5 GHz band in excess of the applicable caps.

The MCA maintains the right to, following a public consultation, amend or update the spectrum caps at its discretion as deemed necessary due to any technical or market changes or for the purpose of regulatory compliance.

2.2 Assignment process and applicable criteria

The MCA, in the 1.5 GHz band assignment mechanism is adopting a process that aims to strike a balance between 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 a competitive mechanism in the event where demand exceeds supply.

The Authority intends to initiate the assignment process in case of market demand. The assignment process will be split into two main stages namely the *Assignment Stage* and the *Grant Stage*. The **Assignment Stage will establish the number of non-specific lots** to be assigned to each successful applicant while the **Grant Stage will establish the specific lots or individual channels** that will be awarded to the successful applicants and will be concluded with the issuance of the licence documents. The assignment methodology is depicted in Figure 2 below.

2.2.1 Market Demand

The Authority shall initiate the assignment process of the 1.5 GHz band following the receipt of a formal request by an authorised ECS undertaking for such spectrum⁴. At this point the Authority will publish a notice announcing the receipt of this request together with an Expression of Interest inviting interested parties to express their interest in acquiring lots in the 1.5 GHz band. Interested parties shall do so within a three (3) week timeframe from the publication of the announcement on the MCA's website. Depending on the interest expressed for the 1.5 GHz spectrum lots, the MCA will either issue a Request for Information (hereinafter 'RFI') or a formal Call for Applications (hereinafter 'Call'). Both the RFI and the Call will be binding on the applicant.

Due to the supplemental use characteristic of the 1.5 GHz spectrum, only those ECS operators which are already holders of the rights of use for spectrum that is used by terrestrial systems capable of providing electronic communication services may express their interest in acquiring the right of use for the 1.5 GHz band.

2.2.2 Assignment Stage

Request for Information

In the case where the expressed demand for the 1.5 GHz spectrum lots does not exceed the total number of lots available, the MCA will commence the assignment process by issuing an RFI. The MCA, through the information requested in the RFI will assess the suitability for assignment of spectrum and qualify the individual candidates (Qualification Phase).

The RFI submission by the interested candidate must include an appropriate bid bond / performance guarantee in the form of a bank guarantee to ensure the applicant's commitment to the assignment process, lasting up to the award of a grant of rights of use. In addition, an appropriate deposit reflective of the first year spectrum fees for the applicant's indicated spectrum requirements (based on the applicable caps) must accompany the RFI submitted by the interested party. In the case of unsuccessful applicants, the bank guarantee and the deposit 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 bank guarantee 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. The value and duration of the bank guarantee will be established in the RFI.

⁴ <https://servizz.gov.mt/en/Pages/Transport-and-Communications/Communications/Communications/WEB2071/default.aspx>

The applicants shall not apply for specific frequencies but for a lot or a number of lots (based on the applicable caps) in the available frequency spectrum. The applicants will however be requested to indicate in their respective RFI their preferences for specific channels. This information would be used in confidence by the Authority when awarding the channels (Grant Stage) or in the event where the Authority will not be able to reconcile the applicant's preferences and brokered meetings need to be held.

In case where the applicants do not submit the complete RFI on time, the relevant expression of interest will be discarded and eventually the respective candidate will be unable to acquire spectrum rights in the 1.5 GHz band during the assignment procedure in progress.

Call for Applications

In the case where the expressed demand for the 1.5 GHz spectrum lots exceeds the total number of lots available, the MCA will commence the assignment process with the launch for a Call for Applications (hereinafter referred to as 'Call'). The MCA, through the information requested in the Call will assess the suitability for assignment of spectrum and qualify the individual candidates (Qualification Phase).

The submission of the call by the interested candidate must include a non-refundable application fee together with an appropriate bid bond / performance guarantee in the form of a bank guarantee to ensure the applicant's commitment to the assignment process, lasting up to the award of a grant of rights of use. In addition, an appropriate deposit reflective of the first year spectrum fees for the applicant's indicated spectrum requirements (based on the applicable caps) must accompany the Call submitted by the interested party. In the case of unsuccessful applicants the deposit together with the bank guarantee 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 bank guarantee 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. The value and duration of the bank guarantee will be established in the Call.

The applicants shall not apply for specific frequencies but for a lot or a number of lots (based on the applicable caps) in the available frequency spectrum. The applicants shall specify the maximum number of lots that they may eventually apply for throughout the course of the process ('Maximum Interest') together with alternative options that would suit their needs in the case where demand for spectrum exceeds supply ('Alternative Options'). The applicants will additionally be requested to indicate in the submission their preferences for specific channels. This information would be used in confidence by the Authority when awarding the channels (Grant Stage) or in the event where the Authority will not be able to reconcile the applicant's preferences and brokered meetings need to be held.

In case where the applicants do not submit their application for the Call in time, the respective candidate will be unable to acquire spectrum rights in the 1.5 GHz band during the assignment procedure in progress.

Qualification Phase

The Authority shall carry out a qualification process to assess whether applicants have the necessary standings to fulfil the license obligations should they be successful in acquiring the spectrum rights. This process will not rank applicants. The outcome of this phase will be a pass or fail result based on a set of criteria including but not 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;
- Access to adequate financing for the venture; and
- Possession of Rights of Use for complementary uplink spectrum.

In view of the fact that the eligible candidates are already holders of spectrum that is used by terrestrial systems capable of providing electronic communication services, the MCA may reserve the right to restrict the criteria under review.

At the end of the Qualification Phase, an assessment of demand for spectrum by the qualifying applicants will be carried out. In the case where demand does not exceed supply of spectrum, then the lot assignment will be granted directly to the applicants (Direct Assignment). In the event that demand exceeds the availability of spectrum lots, 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 prior to proceeding to the lot assignment by a competitive process.

Brokered Meetings

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 applicants in the event that demand exceeds the availability of spectrum in any of the lot categories. The objective of these meetings would be to reach an agreement on a lot or channel assignment plan that addresses the requirements of all the applicants. In order to protect commercial interests, the meetings would be held separately with each applicant.

In developing the proposals cognisance would be taken of the spectrum requests put forward by the applicants, 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 would proceed in accordance with the agreement reached. Any proposed solution reached between the Authority and each of the applicants would be binding on the individual applicants but not on the Authority in view of the fact that the Authority would first have to ensure that the proposed solution reached fits within an overall solution acceptable to all the applicants.

In the absence of a full agreement being reached at the end of the brokered meetings between the applicants and the Authority, or should the Authority decide not to hold brokered meetings, then the Authority reserves the right to (i) assign the number of nonspecific lots by a competitive mechanism and (ii) assign the specific lots or individual channels by lottery.

Competitive Assignment Process

If, following the brokered meetings, an agreement is not yet reached, the lot assignment will be carried out via a competitive assignment mechanism. The Authority is selecting the auction mechanism as the preferred competitive assignment process. The Authority reserves the right to publish the auction rules only if, following the qualification phase, demand still 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. The qualifying applicants are obliged to take part in at least the first round of the auction stage. Failure to do so would result in a forfeit of the bank guarantee.

Direct Assignment Process

In the case where demand does not exceed the supply of spectrum lots, and provided that the qualification assessment of the applicant results positive, a number of spectrum lots will be assigned directly to the successful applicants.

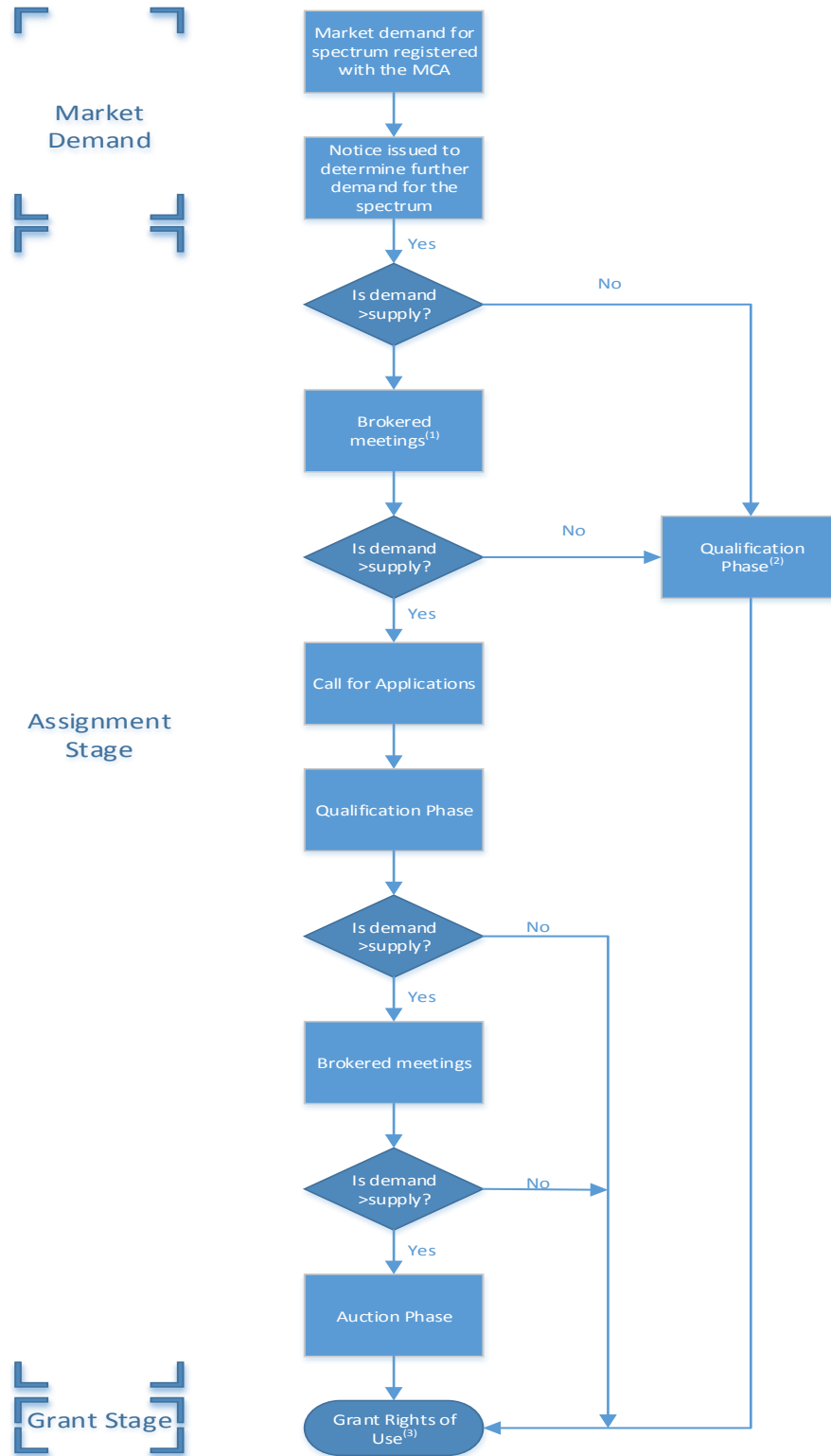
2.2.3 Grant Stage

During the grant stage, the authority will assign specific frequency channels to the qualified applicants. It is up to the sole and unlimited discretion of the MCA to award the particular channels in the way it deems best in the interest of spectrum efficiency and potential risks of harmful interference to radio services operating in radio spectrum adjacent to the 1.5 GHz band (refer to section 2.3.6).

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

Once the outcome of the assignment stage is known, the Authority would proceed to the award of the specific contiguous blocks of spectrum or specific channels to each successful applicant. Should there be no way to easily reconcile the applicants' preferences, then 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 to reach an agreement on the contiguous channel assignment plan that addresses the requirements of all the qualifying applicants.

In case where an agreement is not reached or the MCA fails to setup the brokered meetings, a lottery would be used to determine the channel assignments. The lottery mechanism shall identify a channel or contiguous channels which are then eventually drawn in rounds amongst the interested parties. After each draw, the following channel or contiguous channels are drawn amongst the remaining candidates until the last channel or contiguous channels are assigned automatically to the remaining eligible candidates.



- (1) as deemed necessary by the MCA
- (2) leased to direct assignment and includes RFI
- (3) based on preference or by lottery

2.3 Conditions of Rights of Use

2.3.1 License commencement and duration

The Authority is establishing that the 1.5 GHz spectrum shall be assigned with a **nominal licence term of fifteen (15) years provided that during such a licence term the mobile operator is a holder of the rights of use for primary spectrum that is used by terrestrial systems capable of providing electronic communication services**. The time period proposed is in line with the usability timeframe of telecommunication technologies as well as to the terms applied in recent spectrum assignments and European best practice.

In addition, the license period shall commence when the right of use for the specific Lot/s or frequency channel/s are assigned to the mobile operator and shall remain in force until the expiry date of the 1.5GHz spectrum or the expiry date of primary spectrum with which the 1.5 GHz spectrum can be paired, unless otherwise lawfully terminated as per the terms and conditions assigned with the right of use.

2.3.2 Hand back

The licensee can, on providing the MCA with objective reasons, request the hand back of all or part of the spectrum assignment in the 1.5 GHz band. The MCA shall review such requests on a case-by-case basis taking into utmost consideration the current state of play for such a spectrum band as well as any other criteria that the Authority deems appropriate at that point in time. However the MCA reserves the right to unconditionally reject such requests.

In the event that the MCA accepts the hand back request, the licensee, amongst abiding with any obligations that the Authority deems necessary to impose on condition of handback, will not be entitled to a refund of those fees already paid or that were due by the licensee until the date of the hand back. In addition, on the basis of international obligations, the MCA may request the licensees, amongst other obligations to hand back all or part of the spectrum assignment in the 1.5 GHz band.

2.3.3 Technology Neutrality

In line with the principles established in the Framework Directive (2002/21/EC as amended by 2009/140/EC) the Authority establishes that the 1.5 GHz band spectrum may be operated on any technology that supports Supplementary Downlink so as to be in compliance with the EU spectrum harmonisation decision 2015/750/EU as amended.

2.3.4 Service Neutrality

In line with the principles established in the abovementioned Framework Directive, independently from the technology of choice, the Authority establishes that the rights of use for spectrum in the bands under consideration does not include any constraints on the type of services that are offered over the resulting networks.

2.3.5 Rollout and Coverage Obligations

Given that the 1.5 GHz band is intended as a capacity spectrum, the MCA is not imposing on the licensees any roll-out obligations in terms of geographical coverage. Thus, the network supporting such spectrum maybe rolled out in stages driven by demand for capacity rather than to provide wide area coverage. The allocated spectrum shall however be put into service by the licensee in selected areas where a minimum of 10% of its active data users may avail themselves of such services within a period of eighteen (18) months from the date when the right of use of the frequency band is assigned. The licensee will be in breach of the obligations in case of failing to roll out such spectrum within the stipulated timeframe or providing inadequate or inaccessible services over a time period following the commissioning of such spectrum.

Such a “use it or lose it” condition is introduced in order to address any specific risks of spectrum right’s holders anti-competitiveness as well as speculatively hoarding which will eventually result in otherwise inefficient use of spectrum.

The MCA retains its right to change its decision on the matter in the future even if the conditions of use for such spectrum remain unchanged.

2.3.6 Interference Mitigation Conditions

All wireless network operators are legally bound to ensure that their networks do not create any undue interference to other networks providing similar services or services of other nature provided in the same or adjacent spectrum bands. In Malta, radio spectrum adjacent to the 1.5 GHz band is being used for radio astronomy observations and for mobile satellite communications.

In this context, Commission Implementing Decision (EU) 2018/661 recognises that whilst the harmonised parameters ensure that Supplementary Downlink services in the 1427-1517 MHz frequency band provide appropriate protection to the adjacent services, **further measures may be needed at national level**. Such measures are necessary in order to enhance the coexistence with services in the adjacent 1400-1427 MHz and 1518-1559 MHz frequency bands accordingly.

As a measure to mitigate the potential risks of harmful interference to the adjacent services, the MCA will initially award 1.5 GHz spectrum in channels 6 to channel 13 respectively. Such an assignment mechanism provides additional frequency separation between the supplementary downlink services and the adjacent services. The 1.5 GHz spectrum in the channels 1 to 5 and channels 14 to 18 will eventually be assigned in the case where further demand for the respective spectrum is registered with the Authority.

It should be noted that deliverables adopted by the Electronic Communications Committee (ECC), notably, CEPT Report 065⁵ and ECC Report 263⁶, already deal with adjacent band compatibility issues with services adjacent to the 1.5 GHz band. Moreover, the ECC is developing an additional report which will be addressing the potential blocking of 1.5 GHz mobile satellite services terminals in specific areas or locations⁷.

In the circumstances the MCA considers that it is still premature to define any specific national restrictions to be made applicable to all or any of the channel 1 to 5 and channels 14 to 18, additional to those specified in the Commission Decision. The MCA, based on the results of the aforesaid ECC studies, will consider implementing any specific measures which the MCA will consider applicable to the national context, to enhance the coexistence between supplementary downlink networks with other adjacent systems. These may include the application of a protection measure based on power flux density (PFD) limits and/or restricting the deployment of 1.5 GHz base stations to indoor locations only. The MCA would like to highlight that prior adopting any such measures it will undertake a further consultation with stakeholders.

Notwithstanding the above, in view of the potential risks of harmful interference, holders of rights of use of 1.5 GHz spectrum will be required to rollout their mobile network in a staggered and managed manner as required by the MCA.

2.3.7 Sanctions

The Authority notes that in the case of any departure or non-compliance with any condition or obligation as set out in this Decision or licence, the Authority has the right to take action in accordance with the powers prescribed at law, including those provided in Articles 31 to 33 of the Malta Communications Authority Act⁸, which include the imposition of an administrative fines and the revocation or suspension of the licence.

⁵ <https://www.ecodocdb.dk/document/1018>.

⁶ <https://www.ecodocdb.dk/document/967>.

⁷ https://eccwp.cept.org/WI_Detail.aspx?wiid=638.

⁸ Chapter 418 of the Laws of Malta

3 Pricing

The annual spectrum fees for the 1.5 GHz band, as established in the Eight Schedule of the ECNSR, is set at a base price of eight thousand Euro (€8,000) for a 5 MHz channel (one lot).

It should be noted that in the event of an auction, the reserve price shall be the fee for the right of use of such spectrum as establish at law. The successful bidders shall then pay the difference in price between the reserve price and the final bid immediately upon the conclusion of the auction.

The applicable annual spectrum fees can be settled either on a quarterly or yearly basis during the entire duration of the license for the rights of use of the spectrum awarded.

In the case where the MCA consents the hand back of the allocated spectrum, the 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 hand back.

Annex 1 - General Technical Operating Parameters within the 1.5 GHz Band

The information contained in this Annex is for information purposes only. The parameters as specified in the Commission Implementing Decision (EU) 2015/750, as amended, prevail.

A. GENERAL PARAMETERS

1. The mode of operation within the 1427-1517 MHz frequency band shall be limited to base station ('downlink-only') transmission.
2. Block sizes within the 1427-1517 MHz frequency band shall be assigned in multiples of 5 MHz. The lower frequency limit of an assigned block shall be aligned with or spaced at multiples of 5 MHz from the lower band edge of 1427 MHz.
3. Base station transmission must comply with the block edge mask in this annex.

B. TECHNICAL CONDITIONS FOR BASE STATIONS — BLOCK EDGE MASK

The following technical parameters for base stations called 'block edge mask' (BEM) shall be used in order to ensure coexistence between neighbouring networks in the absence of bilateral or multilateral agreements between operators of such neighbouring networks. Less stringent technical parameters, if agreed among the operators or administrations concerned, may also be used provided that these parameters comply with the technical conditions applicable for the protection of other services or applications, including in adjacent bands or subject to cross-border obligations.

The BEM is an emission mask that is defined as a function of frequency in relation to the edge of a block of spectrum for which rights of use are granted to an operator. It consists of in-block and out-of-block power limits. The in-block power limit is applied to a block owned by an operator. The out-of-block power limits are applied to spectrum used for wireless broadband electronic communications services (WBB ECS) within the 1427-1517 MHz frequency band which is outside a block granted to an operator. They are set out in Table 2.

The out-of-band power limits are applied to spectrum outside the portion of the 1427-1517 MHz frequency band, which is used for WBB ECS at national level.

Furthermore, coexistence power limits are defined for WBB ECS within the 1427-1517 MHz band in order to ensure compatibility between these services and other radio services or applications, including when a portion of the 1427-1452 MHz and the 1492-1517 MHz bands is not designated for WBB ECS. The coexistence power limits with regard to services or applications in the adjacent bands (i.e. outside the spectrum used WBB ECS) are set out in Table 3, 4 and 5 and also cater for national flexibility in assigning spectrum for WBB ECS within the 1427-1517 MHz frequency band.

In-block requirements

An in-block equivalent isotropically radiated power (EIRP)² limit for base stations is not obligatory except for the 1512-1517 MHz frequency block (channel 18), for which such limit is given in Table 1. For frequency blocks other than the 1512-1517 MHz frequency block, Member States may set an EIRP limit not exceeding 68 dBm/5 MHz which can be increased for specific deployments, for example for the aggregated use of spectrum within the 1427-1517 MHz band and spectrum in lower frequency bands.

Table 1

Maximum in-block EIRP per cell⁽¹⁾ for WBB ECS base stations operating in the 1512-1517 MHz

Frequency block	Maximum in-block EIRP	Measurement bandwidth
1512-1517MHz	58 dBm	5 MHz

(1) In a multi-sector site, the value per “cell” corresponds to the value for one of the sectors.

Explanatory note to Table 1:

These requirements are intended to ensure compatibility between WBB ECS operating in the 1512-1517 MHz frequency block and mobile satellite services operating in the 1518-1525 MHz frequency band.

Out-of-block requirements

Table 2

Base station BEM out-of-block EIRP limits per antenna within the 1427-1517 MHz frequency band

Frequency range of out-of-block emissions	Maximum mean out-of-block EIRP	Measurement bandwidth
-10 to -5 MHz from lower block edge	11 dBm	5 MHz
-5 to 0 MHz from lower block edge	16.3 dBm	5 MHz
0 to +5 MHz from upper block edge	16.3 dBm	5 MHz
+5 to +10 MHz from upper block edge	11 dBm	5 MHz
Frequencies within the 1427-1517 MHz band spaced more than 10 MHz from the lower or upper block edge	9 dBm	5 MHz

Coexistence requirements for adjacent bands

Table 3

Base station unwanted emission power limits in the 1400-1427 MHz frequency band for base stations operating in the 1427-1452 MHz frequency band

Frequency range of out-of-band emissions	Maximum unwanted emission power level ⁽¹⁾	Measurement bandwidth
1400-1427 MHz	-72 dBm	27 MHz

(1) The unwanted emission power level is to be understood here as the level measured at the antenna port.

Explanatory note to Table 3:

This requirement is intended to protect radio astronomy and passive earth exploration satellite services in the 1400-1427 MHz passive frequency band from WBB ECS operating in the 1427-1452 MHz frequency band, including when only a portion of this frequency band is assigned for WBB ECS. Further national measures may be needed to improve protection of radio astronomy observations in passive frequency band 1400-1427 MHz from WBB ECS.

Table 4

Base station out-of-band EIRP limits per cell⁽¹⁾ in the 1518-1559 MHz frequency range for base stations operating in 1492-1517 MHz frequency band

Frequency range of out-of-band emissions	Maximum out-of-band EIRP	Measurement bandwidth
1518-1520 MHz	-0.8 dBm	1 MHz
1520-1559 MHz	-30 dBm	1 MHz

(1) In a multi-sector site, the value per “cell” corresponds to the value for one of the sectors.

Explanatory note to Table 4:

These requirements are intended to provide appropriate protection of mobile satellite services operating in the 1518-1559 MHz frequency band, in particular at sea ports, airports and search and rescue ground stations of the mobile satellite service, from WBB ECS operating in the 1492-1517 MHz frequency band, including when only a portion of this frequency band is assigned for WBB ECS. Further national measures may be needed to improve protection of mobile satellite services in the band 1518-1559 MHz.

Table 5

Base station out-of-band EIRP limits per cell below 1452 MHz and above 1492 MHz for base stations operating in the 1452-1492 MHz frequency band

Frequency range of out-of-band emissions	Maximum out-of-band EIRP	Measurement bandwidth
below 1449 MHz	-20 dBm	1 MHz
1449-1452 MHz	14 dBm	3 MHz
1492-1495 MHz	14 dBm	3 MHz
above 1495 MHz	-20 dBm	1 MHz

Explanatory note to Table 5:

These requirements are applicable when WBB ECS are not deployed either below 1452 MHz or above 1492 MHz, or both. They are intended to ensure compatibility of WBB ECS within the 1452-1492 MHz frequency band with coordinated fixed links, mobile services and aeronautical telemetry services limited to ground stations, deployed in adjacent frequency bands below 1452 MHz or above 1492 MHz.

When WBB ECS are deployed within the blocks immediately below 1452 MHz, the limits indicated in Table 5 for frequencies below 1452 MHz are not applicable. When WBB ECS are deployed within the blocks immediately above 1492 MHz, the limits indicated in Table 5 for frequencies above 1492 MHz are not applicable. This is without prejudice to the out-of-band requirements laid down in Tables 3 and 4 and to the out-of-block requirements laid down in Table 2.