

THE ASSIGNMENT PROCESS OF RADIO SPECTRUM IN THE SUB-700MHZ BAND FOR DIGITAL TERRESTRIAL TELEVISION SERVICES IN MALTA

DECISION PAPER

MCA/D/20-3934

PUBLICATION DATE

27TH AUGUST 2020

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1. Introduction

In view of the expiry of the current DTTV spectrum licence in May 2021, the obligations resulting from Decisions of the European Commission¹, together with the goals identified in the National Roadmap for the UHF band between 470 – 790 (MHz (MCA/O/18-3256)², the Malta Communications Authority (hereunder referred to as “the Authority”) is hereby publishing its final Decision detailing the assignment process and the relevant license conditions concerning the twelve (12) available spectrum channels in the 470-694MHz band.

These spectrum channels consist of four (4) spectrum channels which form part of the spectrum channels registered for use by Malta under the Geneva 2006 Agreement (GE 06) and an additional eight (8) spectrum channels which are the result of the negotiation process between Malta and its neighbouring countries concerning the use of additional UHF channels for commercial DTTV broadcasting.

Between the 5th June and 17th July 2020, the Authority has conducted a public consultation on the proposed assignment process and the relevant license conditions for this respective spectrum band. A response to the consultation was submitted by GO Plc which is discussed in detail in Annex 1 of this Decision. The publication of this Decision paper concludes the consultation process.

The principles underpinning spectrum management:

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

- a) Spectrum is a finite resource and must be used effectively and efficiently.
- b) Operators have time bound rights of use of spectrum but they don't have ownership rights.
- c) If demand exceeds supply, a fair, transparent and non-discriminatory competitive assignment process is applied to determine who is entitled to hold the rights of use.

¹ Decision (EU) 2017/899 of the European Parliament and of the Council on the use of the 470-790 MHz frequency band in the Union - <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32017D0899>

² https://www.mca.org.mt/sites/default/files/700MHz%20Roadmap%20MCA_O_18_3256_0.pdf

- d) A competitive selection process for the award of radio spectrum can be either based on qualitative criteria (commonly known as beauty contest) or quantitative criteria (such as auction based), or a mix of both depending primarily on the spectrum and market conditions.

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

2. Spectrum Characteristics

Through this Decision, the MCA is making available on the market a total of twelve (12) UHF broadcasting channels in the sub-700MHz band. The bandwidth and channel spacing of each channel is 8MHz. These channels are organised into two (2) spectrum groups which are combined further into two (2) distinct lots. The technical parameters for the use of spectrum shall be determined by the respective spectrum group, while the lots determine the minimum amount of spectrum that can be assigned to an applicant as well as the duration of the assignments of the rights of use.

Spectrum Groups

Group 1– DTTV Spectrum registered for use by Malta under the GE06

Channel Number	Centre Frequency
28	530 MHz
31	554 MHz
38	610 MHz
45	666 MHz

Table 1 List of spectrum channels in Group 1

Group 2 – DTTV Spectrum coordinated between Malta and Italy

Channel Number	Centre Frequency
21	474 MHz
22	482 MHz
23	490 MHz
25	506 MHz
26	514 MHz
30	546 MHz
33	570 MHz
39	618 MHz

Table 2 List of spectrum channels in Group 2

Spectrum Lots

The spectrum available in these two (2) groups make up the two (2) lots as listed below.

An interest in the spectrum band 470 – 694 MHz may be expressed for either of the lots separately or both concurrently. Whilst ensuring consumer interests in the use of DTTV services are maximised, the Authority shall as part of the qualification process assess the submissions received on various criteria as will be detailed in the ensuing calls. Following this process any of the remaining valid applicants that have requested only one of the spectrum lots shall be disqualified in the presence of other applicant requesting both spectrum lots.

Lot 1 – Interim Lot

Lot 1 – the Interim Lot shall consist of all the channels in Group 1. The term of the rights of this lot shall start from 12th May 2021 and end on the 30th June 2022.

Table 3 below lists the individual spectrum channels that form Lot 1.

Channel Number	Centre Frequency	Band Number
28	530 MHz	IV
31	554 MHz	IV
38	610 MHz	V
45	666 MHz	V

Table 3 List of Spectrum Lot -1

Lot 2 – Future Lot

Lot 2 – the Future Lot consists of spectrum from Group 1 and Group 2 combined. The rights of use of this spectrum shall be granted between the 1st July 2022 and 31st December 2030.

Table 4 below lists the individual spectrum channels that form Lot 2.

Group	Channel Number	Centre Frequency	Band Number
1	28	530 MHz	IV
1	31	554 MHz	IV
1	38	610 MHz	V
1	45	666 MHz	V
2	21	474 MHz	IV
2	22	482 MHz	IV

2	23	490 MHz	IV
2	25	506 MHz	IV
2	26	514 MHz	IV
2	30	546 MHz	IV
2	33	570 MHz	IV
2	39	618 MHz	V

- Group 1 - GE06 coordinated Channels
- Group 2 - MT + IT coordinated UHF Channels

Table 4 List of spectrum channels in Lot 2

3. Assignment Process and applicable criteria

The assignment process for the aforementioned spectrum lots is depicted in Figure 1 below.

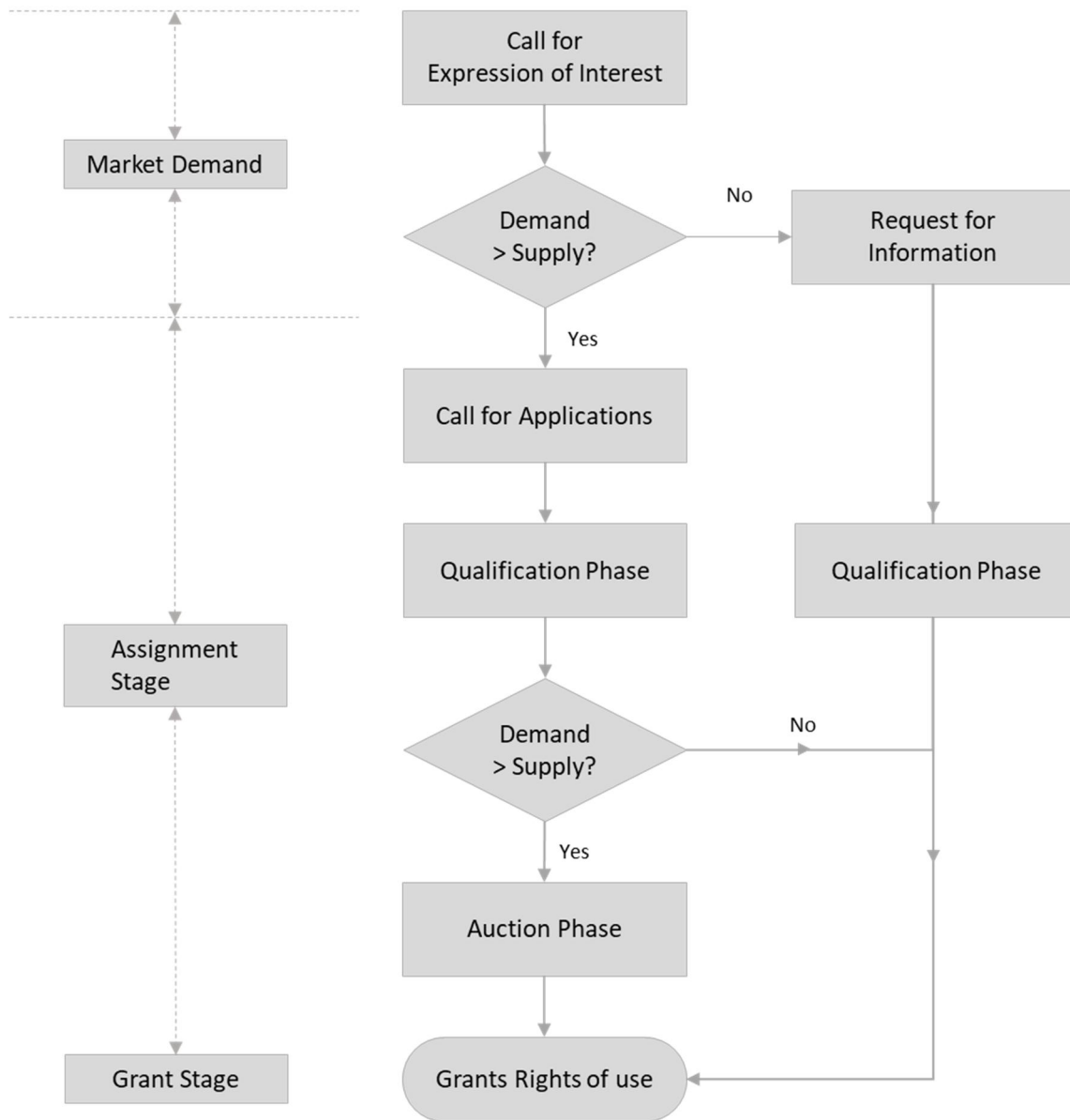


Figure 1 Overview of the spectrum assignment process

The assignment process is divided into the Market Demand Stage and the Assignment Stage.

Market Demand Stage

The Market Demand stage commences immediately upon the publication of this Decision (MCA/D/2020 – 3934) and shall remain open until demand for any or all of the spectrum channels listed in this Decision is formally registered with the Authority.

The Authority will initiate the assignment process if it receives a formal request for any of the lots. The Authority also reserves the right to initiate the process even in the absence of an expressed market demand, if this is deemed to be in the interest of the DTTV sector and its consumers. Therefore, the Authority will publish a notice announcing any demand for spectrum if such is received together with an Expression of Interest inviting any parties to submit their Interest. The Expression of Interest shall run for a period of three (3) weeks.

The demand for spectrum will be assessed for each lot individually. In the case where the expressed demand for any of the spectrum lots does not exceed supply, the Authority will issue a binding Request for Information restricted to those stakeholders who have expressed a formal interest with the Authority. Following the successful validation and qualification of the interested stakeholder, the Authority will then proceed with a direct assignment of the rights of use of the spectrum concerned.

If it results that the demand for spectrum exceeds the spectrum being made available, then the Authority shall issue a formal Call for Applications.

Assignment Stage

Call for Application

In the case where the expressed demand for any of the spectrum lot/s does exceed supply, the Authority will invite those interested parties who have submitted a valid Expression of Interest to participate in a Call for Applications for the pertinent spectrum lot/s.

The Call for Application will include the following elements:

- a) A non-refundable application fee which will be established with the issue of the Call for Applications.

- b) A bid bond/performance guarantee. The bid bond would initially serve to ensure the applicant's commitment towards the assignment process. This bid bond shall be kept for the entire duration of the assignment process and will only be released, subject to the terms of the whole assignment process, once the successful applicants have been announced. For successful applicants, the bid bond will be converted into a performance guarantee which will serve as evidence of good will, to guarantee that the licensee will honour the winning bid and abide by the spectrum license conditions. The bid-bond will be released when the licence coverage obligations are met, provided that the necessary coverage is reached within the timeframe established in the licence.
- c) First year radio spectrum licence fees in full, which shall be refunded to all unsuccessful applicants at the end of the assignment process.

Qualification Phase

The assignment process should not only establish the price for the spectrum but should also aim at identifying the applicant which is best positioned to maximise the use of the spectrum. The qualification phase, will not rank any of the applicants but will rather produce a pass/fail result based on a set of criteria. During the validation phase, applicants will be subjected to a qualification evaluation on the basis of the set criteria, including but not limited to:

- a) A **due diligence** process will be carried out which will establish, assess and verify the credentials and the good standing of the applicants for the spectrum.
- b) A **technical assessment** of the proposal during which the Authority ensures that applicants present their plans on how they intend to set up their networks to fulfil the technical requirements listed in this Decision. Applicants should also demonstrate their plans to maximise the efficiency of the spectrum using the latest technologies where such would be feasible.
- c) A **commercial assessment** of the long term business plan that will enable the execution of the technical solution presented in (b) above while ensuring healthy returns for the applicant throughout the whole operating period of the spectrum licence.

- d) **Access to finance mechanisms which are deemed** necessary to execute the business plan to completion.
- e) **Consumer interest and protection** gives due consideration to the ability of the applicant to minimise disruption of the commercial DTT service. There are potentially two transition periods. The first period, occurring between the termination of the current rights of use of spectrum and the rights of use of spectrum of Lot 1. The second transition period, occurs when the rights of use of Lot 1 are terminated and the rights of use for spectrum in Lot 2 are activated.

Following the qualification phase the Authority will reassess the demand for spectrum and the process will proceed as follows:

- a) Should there be no single applicant that passes the validation stage, then the process is suspended for a period of one (1) month thus allowing the applicants to revise their application. Following this period, and after any necessary reassessments, the assignment process will proceed to completion should there be at least one (1) valid applicant. In case where at this stage there are no applicants who have qualified through the validation phase, the current assignment process will be closed off/concluded.
- b) Applicants who have passed the qualification phase and requested both lots simultaneously will take precedence. In such eventuality, applicants expressing interest in single lots will be eliminated.

The demand for spectrum shall be evaluated individually for each lot. Should the supply meet the demand for the respective lot, then the Authority will proceed with the grant of rights of use of spectrum to the applicant. Otherwise, the respective lot under consideration in the Call will be auctioned.

Auction

Following the Qualification phase, in the eventuality that demand for the respective spectrum lot or lots exceeds supply, an auction shall be carried out as a fair mechanism suitable to establish the market value of the spectrum. Before proceeding with the said auction, the Authority shall publish the applicable rules. Following the publication of the rules, all remaining applicants shall be given the opportunity to withdraw their application without losing their bank guarantee. Beyond this stage, and hence once applicants have been invited to participate in an auction, all applicants shall be required to take part in at least the first round of the auction stage. Any applicants failing to participate in at least one (1) round of the auction shall be automatically disqualified from the process and have their bank guarantee forfeited.

Future of unassigned spectrum

In the eventuality that the spectrum lots remain unassigned, the unassigned spectrum lots will remain available to any interested party subject to the same conditions as listed in this Decision. Should future interest for the any of the lots, or parts thereof be expressed, the process outlined above will be initiated using the same applicable conditions.

4. Conditions of Rights of Use of Radio Spectrum

The technical conditions which will be associated with the spectrum are relevant to the RF network design. The conditions for the rights of use of radio spectrum may be summarised as follows:

1. Use of Spectrum to deliver digital terrestrial television network.
2. Network Coverage Obligations.
3. Obligation not to cause interference to other countries.
4. EMF Obligations.

Use of Radio Frequency

The National Frequency Plan, designates the primary use for the 470 – 694 MHz band for the establishment of digital terrestrial broadcasting networks which have a national scope, to deliver broadcasting services. On the basis of the latter, the radio frequency spectrum shall be used by the Licensee only to establish and operate a terrestrial network, using a Single Frequency Network³ configuration capable of providing electronic communication services suitable for digital terrestrial television services together with other services related to the broadcasting of television signal including but not limited to electronic programming guides and other services suitable for disabled end-users when these are available.

In view of the obligations imposed by the CION⁴ with regard to the equivalence of access to electronic communications services by disabled end users, the broadcasted signal shall be capable of delivering an audio, video and data stream concurrently without any significant degradation on the quality of the broadcasted stream. Such technical conditions shall allow the broadcasting of information which is required by a number of open standard features

³ Single-Frequency Network (SFN) as per Recommendation ITU-R-BT.1306 - A single-frequency network is a broadcast network where several transmitters simultaneously send the same signal over the same frequency channel.

⁴ Directive (EU) 2018/1972 of the European Parliament and of the Council establishing the European Electronic Communications Code - <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L1972&from=EN>

(such as subtitling and audio description) which will facilitate the experience of disabled end users.

Although DVB-T (ETSI EN-300. 744) or DVB-T2 (ETSI EN 302 755) are the preferred network technologies, in line with the principle of technology neutrality⁵, while ensuring that the spectrum is used in an efficient and effective way, the 470 – 694 MHz spectrum band will be awarded on a technology neutral basis. The holder of the right of use for such spectrum may deploy its DTTV network using any other compatible digital television standards provided that proof of compatibility and conformance to prevailing interference obligations lie with the rights holder.

Coverage Obligations

Coverage obligations shall be benchmarked against the fixed reception mode⁶ which is the widely used method to receive DTTV signal. In adopting the fixed reception mode, the Reference Planning Configuration (RPC 1) as established in the GE06 agreement shall be deemed appropriate and the equivalent median field strength for fixed antenna reception shall be used. The correct values and correction factors applicable to calculate the mean field strength of the values indicated for RPC 1 as calculated at a frequency of 650MHz (Band IV/V) is quoted as 56 dB(μ V/m) for transmission in the 550MHz band using DVB-T broadcasting technology⁷. An area is considered to be covered with DTTV signal if the measured signal strength at a height of 10m above ground level reaches or exceeds the quoted signal level.

Broadcasting networks with a national scope strive to maximise the reach of their services across the national territory. However, owing to the nature of the service, territorial coverage of 95% of the islands of Malta and Gozo excluding all of the unbuilt up areas as indicated in Annex 7 shall be deemed as nationwide coverage.

⁵ Article 40 of the Electronic Communications (Regulation) Act, Cap. 399 of the Laws of Malta.

⁶ Fixed Reception mode refers to signal signal reception mode using a directional antenna mounted at roof level, which antenna is optimised to receive high quality signal

⁷ In the case of DVB-T2 networks the Equivalent median field strength shall be revised to 54.3 dB(μ V/m) in line with Report ITU-R BT.2254-3 - https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-BT.2254-3-2017-PDF-E.pdf

Annex 7 presents a map the islands of Malta and Gozo indicating the areas where coverage is required.

An assessment of the coverage achieved by the spectrum licence holder shall be carried out by the Authority, after the award of the licence as part of the compliance checks of the licence conditions. This assessment will take the form of signal measurements across the islands Malta and Gozo.

Coverage obligations for Lot 1

In view of the short duration allocated for the use of the Lot, the Authority proposes that no spectrum coverage obligations shall apply for Lot 1.

Coverage obligations for Lot 2

The coverage obligations related to Lot 2 shall be equivalent to nationwide coverage which has to be achieved within twenty-four (24) months from either the date of the award of the spectrum licence or 1st July 2022 whichever date is the latest.

Applicable Criteria for the avoidance of cross-border harmful interference

Radio spectrum designated for the provision of terrestrial broadcasting services is also regulated by regulations adopted within the framework of the ITU to avoid risks of cross-border harmful interference. In this respect it should also be stated that in accordance with Directive 2002/21/EC, Member States shall respect relevant international agreements, including the ITU Radio Regulations.⁸

This section highlights the obligations attached to spectrum in Group 1 and Group 2.

The Authority shall carry out its assessment to ensure that DTTV networks do not cause undue cross-border harmful interference during (a) the validation process carried out during

⁸ Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services.

the Assignment stage and (b) on a continuous basis throughout the lifetime of an assigned spectrum licence.

The Authority shall adopt a common process for the validation of the network using the method listed in Annex 2

The Authority reserves the right to disqualify any application received, if on the basis of the aforementioned assessment it concludes that the proposed network would cause cross-border harmful interference. Similarly, a licence holder may be held in breach of its spectrum license conditions, if the Authority, through its assessment, determines that the deployed network may be creating cross-border interference.

On the basis of assessments carried out by the Authority which are based on implementations of ITU-R P. 1546, the Authority reserves the right to request adjustments to be applied to the network configuration under assessment in order to avoid interference in neighbouring third country, which are subject to existing or future coordination agreements.

In those cases, where adjustments are requested during the qualification stage of the Assignment Process, the applicant that does not consider such requests as fair and reasonable, may, subject to a valid justification, quit from the assignment process without incurring any penalties.

Spectrum in Group 1

Spectrum listed in Group 1 is registered for use in the GE06 agreement. Annex 3 lists the basis of the existing agreement. This is based on a total of seven transmitters of 30dBW each, with a distinct antenna radiation pattern and effective antenna height to match the topography of the location of the transmitter and its surroundings.

The Authority simulated the reference network using its propagation tools configured to meet the relevant parameters set out in the GE06, including those related to Recommendation ITU-R P1546. A number of test points were established at the border of third countries and the simulated received signal level is recorded and provided as a guideline in Annex 3 of this

Decision. A network is considered to be compliant with the GE06 agreement if the simulated received signal level does not exceed the values as reflected in the respective test points.

Spectrum in Group 2

Spectrum listed in Group 2 is not registered under the GE06 agreement. However, Malta has secured coordination agreements with Italy and Greece, allowing for the use of this spectrum as from 1st July 2022. This agreement establishes a coordination zone which includes the territory of Malta and Gozo and all the administrative borders of the provinces of Sicily, excluding the Provinces of Palermo and Messina as indicated in Annex 6. This agreement provides Malta with the rights to use spectrum subject to the condition that any signal originating from Malta from channels listed under this group does not reach any land based territory beyond the coordination zone with a field strength greater than the coordination trigger field strength⁹ as defined in the GE06 agreement and established at 21dB μ V/m for channels falling in Band IV and 23 dB μ V/m for channels in Band V.

A network is considered to be compliant with the coordination agreement if the simulated received signal level does not exceed the listed values outside the coordination zone.

Harmful Interference and EMF Obligations

All wireless network operators are legally bound to ensure that their networks do not cause harmful interference to other networks providing similar services or services of other nature offered in the same or adjacent band.

The operator of the DTTV network shall ensure that, the network is not susceptible to incoming signals from other networks operating in adjacent bands. This is typically achieved by ensuring that all receiving equipment is able to filter out signals which are out of the operating band.

⁹ The coordination trigger field strength is defined as the Field-strength which, when exceeded, determines that coordination is required.

In addition, the DTTV network operator enjoying the right of use for such spectrum shall ensure that the cumulative non-ionising radiation emissions from its DTTV network shall comply with any obligations as specified at law and any Decisions or Directives issued by the Authority or any other national competent authority in relation to electromagnetic radiation. Currently the standards for non-ionising radiation emissions refer to those standards adopted by the International Commission on Non-Ionising Radiation Protection (ICNIRP).

5. Transfer of Rights

As laid down in the National Frequency Plan¹⁰ currently in force, note MLT 09 identifies that rights of use for the respective spectrum cannot be traded, assigned or transferred to third parties. The Authority shall be notified of any impending repossession of spectrum rights in this band. No repossession of spectrum rights may be concluded without the approval of the Authority under the terms of Article 45 of the Electronic Communications (Regulations) Act, Cap. 399 of the Laws of Malta.

¹⁰ Refer to note MLT09 in the National Frequency Plan - https://www.mca.org.mt/sites/default/files/NFP_edition%206-1.pdf

6. License Duration

Lot 1 – Interim Lot

The rights of use assigned to this lot shall cover the period 12th May 2021 to 30th June 2022. These may be further extended for periods of twelve (12) months on an annual basis. The extension of the spectrum licence duration shall be granted subject if no demand is registered for spectrum under Lot 2, and a formal written request is to be sent to the Authority at least three (3) months before the expiry of the related license.

In reaching its decision on the renewal of the rights of use of spectrum in Lot 1, the Authority shall assess a number of factors concerning market conditions and spectrum utilization of the applicant. The Authority reserves the right not to extend the licence.

Provided further that should the rights of use for spectrum in Lot 2 be assigned, the rights of use of spectrum under Lot 1 are with immediate effect terminated on the assignment of the spectrum in Lot 2.

While requests for the rights of use of spectrum shall be made public by the Authority, a prior notice period of at least one (1) month shall be given to the Licensee before the termination of the rights of use of spectrum of Lot 1 is made. During this time, the Licensee of Lot 1 is obliged to notify its subscribers about the future of their service¹¹.

Lot 2 – Future Lot

The rights of use assigned to this lot shall commence from 1st July 2022 and run until 31st December 2030. The future use of the spectrum beyond December 2030 will be decided at later stage, in line with the outcome of a review expected to be carried out by the CION in the coming years and with any harmonisation rules applicable for this spectrum band at the time.

The Authority shall subsequently advise Government on the future of spectrum in this band after having carried out an assessment in line with: (i) any recommendations or harmonisation

¹¹ MCA Decision MCA-D/ms/11-0546 – Modifications to the Terms and Conditions of subscriber contracts.
<https://www.mca.org.mt/sites/default/files/decisions/Decision.pdf>

decisions published by CION; (ii) the state-of-the-art of the network deployed; (iii) the service offered; and (iv) the viability of alternative use of spectrum as suggested at the time in the national context, which shall be collectively taken into account.

Given that the future of the sub-700MHz spectrum beyond December 2030 is not yet know, it is proposed that should the Government decide to extend the use of the sub-700MHz spectrum for DTT broadcasting, the licence holder of Lot 2 shall be granted the right of first refusal subject to the licence conditions and obligations applicable at that point in time.

7. Spectrum Pricing

On assignment of the spectrum licence, the Licensee(s) shall be liable for the full amount of the rights of use fees for all the spectrum channels assigned for the whole term of the licence. The payment of such fees is structured such that these are to be paid on an annual basis at a yearly rate as established in the Eighth Schedule of the Electronic Communications Networks and Services (Regulation), S. L. 399. 28 of the Laws of Malta. These fees are currently set at five thousand, eight hundred and twenty-three Euros and forty three cents (€5,823. 43) for each 8MHz channel in the UHF band.

In the eventuality that the Government decides to alter the price of the respective spectrum while the assignment process is still in progress, **but not yet concluded**, prospective bidders will have the right to either exit from the spectrum award process without incurring penalties or accept the new price and proceed with the assignment process.

It should be noted that in the eventuality of an auction, the reserve price shall be the annual spectrum fee for each 8MHz channel as established at law and indicated above. 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.

8. Annexes

Annex 1 - Response to Consultation

The Paper “Consultation on the Assignment Process of Radio Spectrum in the sub-700MHz Band for Digital Terrestrial Television Services in Malta” was subject to a public consultation period from the 5th June 2020 until 17th July 2020. During this period, the MCA received feedback from GO plc. (hereinafter referred to as GO) which will be the basis for discussion in this section. The MCA thanks GO for the feedback provided.

Continuity of Existing DTTV Service

GO states that upon the expiry of its spectrum licence in mid-May 2020, it is expected that for various reasons, a number of its subscribers, may still need more time to migrate to alternative networks should the DTTV network be switched off. GO stresses on the importance of minimizing disruption to these customers. GO further notes that while the assignment process of the spectrum in this band will help alleviate the issues surrounding any eventual DTTV termination, some of the proposed mechanisms might not.

GO notes that the four channels which are available in Lot 1 are insufficient to support a fully-fledged commercial TV network that offers a sufficient number of channels able to compete with other wired TV platforms. At the same time, this Lot acts to bridge the transition period between May 2021 and June 2022, a transition which was also identified in the 700MHz roadmap published in June 2018 by the Authority.

GO also notes that the proposed mechanism gives precedence to applicants who have expressed an interest in both lots concurrently over those who have expressed an interest in any one of the lots. GO states that such a mechanism, especially in view of the lack of coverage obligations for Lot 1, may somewhat provide an opportunity for spectrum underutilisation. GO also noted that such a mechanism may result in the abrupt termination of service as offered over spectrum in Lot 1, eventually to the detriment of existing customers.

GO suggests that this type of priority should be removed and priority of Lot 2 over Lot 1 should only be granted when Lot 2 is assigned after July 2022.

Authority Response

Without prejudice towards the responsibility that a provider of electronic communications networks and services has towards its own subscribers the Authority understands the need to offer DTTV subscribers a smooth transition as possible from one network to the other. The availability of Lot 1 spectrum lends itself to serve this purpose.

The Authority notes that its proposal to prioritize applicants requesting both Lot 1 and Lot 2 was based on the grounds that applicants interested to maximise the utilization of the spectrum should be preferred over those applicants who are interested in short term plans. It was envisaged that this prioritisation will incentivise interested parties for the rights of use for spectrum in Lot 2 to also seek the rights of use for spectrum in Lot 1. This would allow an eventual DTTV service provider the possibility to offer an introductory service to their customers, thus ironing out the transition phase, followed by an enlarged service provision when the spectrum in Lot 2 becomes available. Although this would be the ideal scenario, the Authority understands that there may be the possibility of less optimal outcomes in view that there are no coverage obligations attached to the spectrum in Lot 1. The Authority notes that in view of maximising the interests of DTTV subscribers, the precedence mechanism needs to be reviewed accordingly.

The Authority notes that all interested parties will have to, amongst other documentation, submit their business plans as part of the qualification process. The evaluation of these business plans would shed important information on how each applicant intends to utilize the spectrum and hence would provide an indication about: (i) when the DTTV service will be made available to consumers; and (ii) mitigation plans to minimise disruption to existing DTTV subscribers during the transitional period May 2021 and June 2022. In support of its commitment towards the consumer interest, the Authority shall include an additional qualification criterion which ensures consumer interests.

The Authority also notes that the proposed priority mechanism shall not result in any abrupt termination of any existing networks services. The Authority notes that the process is primarily market driven and therefore, it is the market that shall invoke the need for spectrum. This is followed by a notification period where other players may express their demand. The same process will be followed if the process is triggered by the Authority when the market has not expressed its demand for spectrum. Therefore, there shall be a sufficient notification

period for any interested party to apply for the rights of use of spectrum and present a competitive application.

Finally, the assignment of Lot 2 shall bring about the termination of the rights of use of spectrum for Lot 1, only when the rights of use of spectrum are assigned beyond 30th June 2021 which is the original term of the licence. The Authority notes that any demand for spectrum will be notified and all parties will be allowed the opportunity to raise their demand for the lot. Therefore, the eventual termination of the rights of use of Lot 1 can never be considered as abrupt as a consequence of the assignment of Lot 2. Notwithstanding, the Authority is modifying the terms of renewal of Lot 1 to provide for a notice period of one (1) month to the holder of the rights of use of spectrum of Lot 1 before the license is terminated.

Interference with the Wireless Broadband Network operating in the 700MHz band

GO notes that the consultation paper does not make any reference to the possible interference on the DTTV networks that may originate from the future operation of wireless broadband networks in the 700MHz band.

Authority Response

The Authority is cognisant about the fact that the operation of a Wireless Broadband Network in the neighbouring 700MHz band is likely to cause disruption to DTTV networks. The Authority however deems it more appropriate to bring forward such a matter during the consultation process concerning the assignment of the 700MHz spectrum for WBB application.

Nevertheless, considering that the efficiency of digital networks partly rests on their ability to reduce interference as far as feasibly possible, DTTV networks, being aware of possible interference from neighbouring out-of-band signals, are to ensure mitigation measures are in place to minimise its ill effects on their service. The placement of equipment on the market which is able to receive signals beyond the sub 700MHz band, hence receiving signals from other neighbouring networks, may lead to possible instances of interference. Therefore, all licence holders of spectrum in the sub-700MHz band shall ensure that their receiving equipment is bound within the spectrum limits of the sub 700 MHz band.

Annex 2 - Applicable Process for the Network Assessment for the avoidance of cross-border harmful interference

This Annex lists the process to be adopted by the Authority in carrying out its assessments on new networks or modifications to existing networks. Such assessments will be carried out in order to ensure that the networks under assessment do not create any cross border harmful interference.

In order for the Authority to be able to carry out the cross border interference assessments on the respective DTTV networks, the following information shall be required: -

- a) a description of the network in a format as specified in Annex 5;
- b) the simulated radio propagation charts covering 1000km from Malta; and
- c) the simulated received field strength at the each of the test point listed in Annex 3.

This information is to be provided to the Authority upon request or whenever a significant change to the network is applied in accordance to article 11 of General Authorisations (Radiocommunications Apparatus) Regulations, S. L. 399. 40 of the Laws of Malta.

The Authority shall configure its simulation tool to simulate the network under test in accordance to ITU-R P. 1546 which tools are set up in accordance with Annex 4.

The Authority, as a spectrum administrator, liaises with the ITU in the domain of the international management for Radio Frequency spectrum. As specified in the Radio Regulations and various Regional Agreements, the ITU provides spectrum administrators a tool which utilises the P. 1546 prediction model in order to determine and validate the coordination zones with the ITU and other neighbouring countries. The output of such a tool is also utilised when spectrum administrators need to claim interference originating from networks in third countries and request mitigation measures. The use of such a tool is restricted only to national spectrum administrators.

In view of the restrictions on the use of the aforementioned ITU tool, the Authority shall simulate the DTT networks under assessment on behalf of the interested stakeholders/existing network operators. The outputs obtained through the ITU tool simulations will be passed on to the interested stakeholders or existing network operator for

their reference, since these include valuable information that could be useful to tweak the network designs.

Annex 3 – DTTV stations registered for Malta under the GE06

This Annex provides all the necessary information relating to the reference network for DTTV stations registered for Malta in the GE06 agreement.

In addition, this Annex refers to the following accompanying documents:

- a) Accompanying Document 1 – Presents the details of the transmitting stations which are listed in the GE06 agreement. The reference network referred to Section 4 is composed of all transmitters operating simultaneously as an SFN network.
- b) Accompanying Document 2 – Presents three (3) simulations of the reference network. In the first simulation, the transmitting powers are set at the registered power. In the other two simulations the transmitting powers for each transmitter are set at +3dB and -3dB from the registered power respectively. For each simulation, the border where the trigger field strength is reached is presented. This data is intended to assist the applicant understanding the variations that exist between the simulator tools provided by the ITU and simulator tool used by the applicant.

Table 6 below lists all the transmitting stations and their location as registered in the GE06. The complete set of details for each transmitter is provided in Accompanying Document 1.

Transmitter Name	Latitude DDMMSS	Longitude DDMMSS	Transmitting Channels
Cittadella Gozo	360253	0141429	28, 31, 38, 45
Dwejra	355419	0142310	28, 31, 38, 45
Nadur Gozo	360214	0141704	28, 31, 38, 45

Transmitter Name	Latitude DDMMSS	Longitude DDMMSS	Transmitting Channels
Naxxar	355507	0142654	28, 31, 38, 45
Portomaso Tower	355521	0142935	28, 31, 38, 45
San Leonardo	355250	0143330	28, 31, 38, 45
Zebbug Gozo	360418	0141414	28, 31, 38, 45

. Table 5 List of Transmitters, location and transmitting frequency

Table 6 below, provides the list of fields and their description relevant to the data included in Accompanying Document 1.

No	Data item
1	Plan entry code (1 – Assignment, 2 – SFN, 3 – Allotment, 4 – Allotment with linked assignment(s)) and SFN_id,
2	Name of the location of the transmitting station
3	Latitude (\pm DDMMSS)
4	Longitude (\pm DDMMSS)
5	Altitude of site above sea level (m)
6	Digital television system (A, B, C, D, E, F and 1, 2, 3, 5, 7)
7	Reception mode (FX, PO, PI, MO)
8	Polarization (H – Horizontal, V – Vertical, M – Mixed, U – Unspecified)

No	Data item
9	Maximum effective radiated power of the horizontally polarized component in the horizontal plane (dBW)
10	Antenna directivity (D – Directional, ND – Non-directional)
11	Height of transmitting antenna above ground level (m)
12	Maximum effective antenna height (m)
13	Effective antenna height (m), at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction
14	Antenna attenuation (dB) – horizontal: value of attenuation of the horizontally polarized component, normalized to 0 dB, at 36 different azimuths in 10° intervals, measured in the horizontal plane from True North in a clockwise direction

Table 6 Description of fields of information as applicable to Accompanying Document 1

Configuration for the network coverage software simulation tool

The following are the key points in ensuring proper configuration of tools and correct estimate of the transmission limits to prevent harmful cross border interference.

1. The propagation model is configured into the network simulation tool using the configuration setting accordance to the GE06 requirements which are also listed in Annex 4 of this Decision.
2. The reference network model detailed in Accompanying Document 3 is to be loaded in the simulator and simulated using the power setting of 30dB per transmitter having all transmitting stations transmitting simultaneously.
3. Using a simulations radius of at least 1000km, the contour plot is established as that region where the trigger field strength is not exceeded. This plot establishes the geographical boundary where the field strength cannot be exceeded.

Annex 4 – Propagation Model parameters

As discussed earlier different propagation tools may present a slightly different outcome even when using the same propagation model. The list of parameters necessary to be applied to the propagation model are listed in Table 8 of this Annex.

Any simulations which are carried out using parameters different to those listed in this Annex are automatically invalid.

Parameter	Setting	Remarks/Reference
Receiving/mobile antenna height	Enabled	Recommendation P. 1546-6, Annex 1, paragraph 10
Time variability	1%	Recommendation P. 1546-6, Annex 1, paragraph 8
Location variability	50%	Recommendation P. 1546-6, Annex 1, paragraph 13
Correction based on tropospheric scattering	Enabled	Recommendation P. 1546-6, Annex 1, paragraph 14
Path	Sea, warm	-
Transmitting antenna height	Effective antenna height	Recommendation P. 1546-6, Annex 1, paragraph 6

Table 7 List of Settings applicable to the P. 1546-6 model

Annex 5 – File formatting details for communication of network proposals

As indicated in Section 4 of this Decision an applicant is required to submit the details of its proposed network to the Authority for its assessment. The Authority shall make use of its network coverage simulation tools to verify the submissions received. As part of the submission, the applicant is to provide details of the proposed network in the format shown in Accompanying Document 3.

Accompanying Document 3 is a sample file which describes the reference model denoted in Annex 3 above.

The details of each field as listed in Accompanying Document 3 can be found in Section 1 of Chapter III of the Preface to the BR International Frequency Information Circular (Terrestrial Services) as published by the ITU¹²

¹² <https://www.itu.int/en/ITU-R/terrestrial/brific/Pages/default.aspx>

Annex 6 – Coordination zone between Malta and Italy

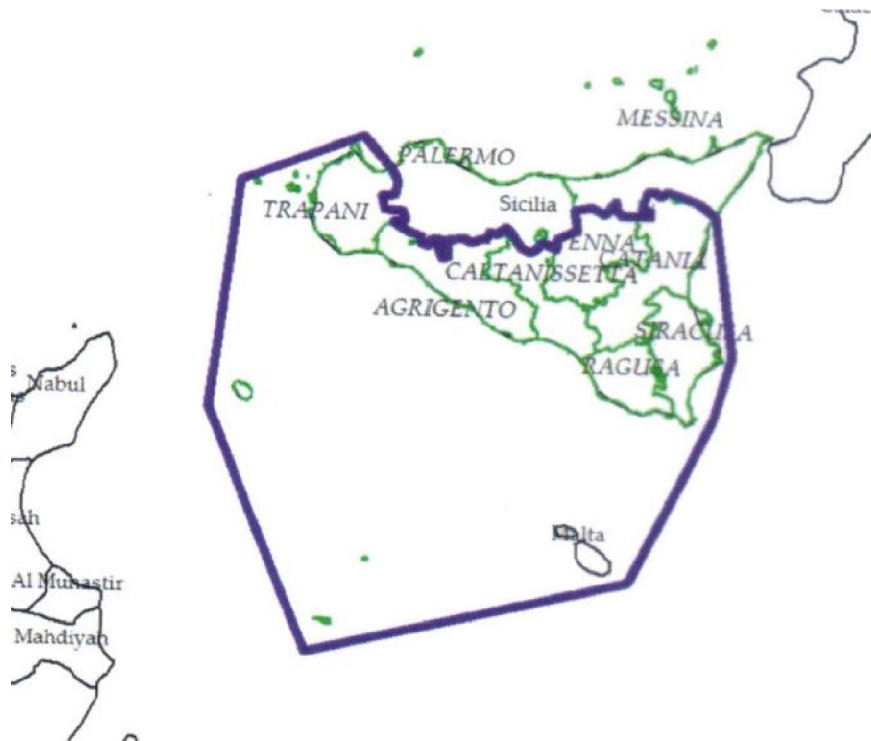


Figure 2 Coordination zone between Malta and Italy

The figure above depicts the zone which concerns the coordination agreement reached between the Maltese and Italian authorities. This figure applies only to spectrum forming part of Lot 2 and Group 2. The coordination zone includes the territory of Malta and Gozo, and all the administrative borders of the provinces of Sicily, excluding the Provinces of Palermo and Messina.

Annex 7 – Geographic map of Malta and Gozo indicating coverage obligations

Figure 3 below is a graphical representation of the land use in Malta. The legend includes the land mass areas over which the coverage obligation shall be due in line with Section 4.

Both the map and the legend are produced and published by Copernicus – Land Monitoring Service¹³. In addition, the map server provided by the Planning Authority allows the same map to be overlaid with more comprehensive map layers.

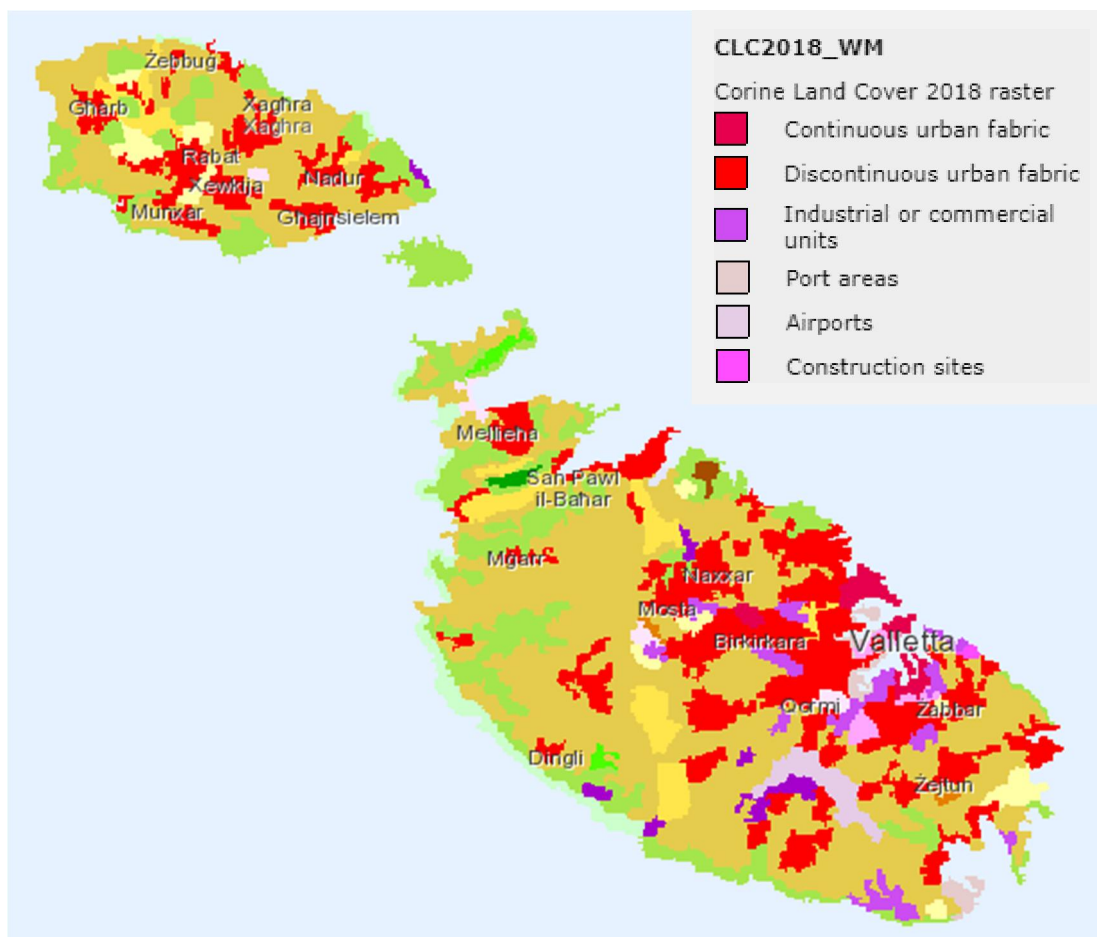


Figure 3 Land use map of Malta and Gozo

¹³ <https://land.copernicus.eu/pan-european/corine-land-cover/clc2018>

The coverage of the DTTV network across the built up areas of Malta and Gozo are denoted by the map areas indicated as follows:

- a) Continuous urban fabric
- b) Discontinuous urban fabric
- c) Industrial and commercial units
- d) Port areas
- e) Airports
- f) Construction sites

Annex 8 – Glossary

COIN – The European Commission

DTV – Digital Television

DTTV – Digital Terrestrial Television

ECNS – Electronic Communications Networks and Services

ECS – Electronic Communications Services

GE06 – Geneva Agreement 2006 (ITU)

<http://search.itu.int/history/HistoryDigitalCollectionDocLibrary/4.129.43.en.100.pdf>

ITU – International Telecommunication Union

MCA – Malta Communications Authority