



Information & Communications Technology Authority

Public Consultation

on

**A Policy for the Assignment
of 700 MHz Spectrum**

(Ref: CD 2011-1)

Launch Date: 29 June 2011

Closing Date: 27 July 2011

1. Introduction

The Information and Communications Technology Authority ("Authority") is responsible, under section 9 of the Information and Communications Technology Authority Law (2010 Revision) ("the Law"), for the management of the electromagnetic spectrum in the Cayman Islands. Section 9 of the Law states that:

- 9. (1) Subject to this Law, the Authority has power to do all things necessary or convenient to be done for or in connection with the performance of its functions under this Law.*
- (2) For the purposes of this section, the Authority shall -*
- (a) allocate the electromagnetic spectrum for facilities and specified services within the Islands, or between the Islands and elsewhere;*
 - (b) determine methods for assigning the electromagnetic spectrum;*
 - (c) issue licences authorising the use of specified portions of the electromagnetic spectrum, including those used on any ship, aircraft, vessel or other floating or airborne contrivance or spacecraft registered in the Islands; and*
 - (d) institute procedures for ensuring the compliance by licensees with any obligations regarding the use of the electromagnetic spectrum, imposed by or under the licence, this Law or any regulations made hereunder.*

This statutory mandate is supplemented by a directive issued on the 10th July 2003 by the Minister for Planning, Communications, Works and Information Technology under section 11 of the Law, stipulating that the Authority must make decisions consistent with, and give effect to, the Regulatory Principles outlined in Schedule 1 of the Agreement between Cable & Wireless (Cayman Islands) Limited, the Governor in Cabinet of the Cayman Islands and the Authority, also dated 10th July 2003 ("Agreement"). Paragraph 4 of the Regulatory Principles states that "[e]lectromagnetic spectrum shall be allocated in a fair, transparent and non-discriminatory manner".

In ICT Decision 2008-1, Decision and Further Process – Policy for the Management and Allocation of Spectrum in the Cayman Islands (6th March 2008), the Authority noted that, when allocating spectrum, it attempts to balance the following, sometimes competing, requirements:

- To encourage the provision of quality and innovative ICT services to consumers;
- To satisfy Licensees' spectrum requirements;
- To ensure the effective and efficient use of spectrum, a scarce national resource; and
- To promote sustainable competition in the ICT sector.

- Spectrum in the Cayman Islands has never been auctioned or sold, but rather has been assigned on a first-come first-served basis, provided the applicant can demonstrate that:
 - a. The spectrum will be used to provide, directly or indirectly, new or enhanced ICT services which will be of benefit to the Cayman Islands.
 - b. The new or enhanced services will be commercially launched within a timescale acceptable to the Authority.
 - c. Efficient use will be made of the spectrum.
 - d. His use of the spectrum will not cause interference with the systems of other Licensees or third parties.
 - e. His use of the spectrum is consistent with the allocations recommended for ITU Zone 2.
 - f. The assignment will not adversely impact the development of competition in the ICT sector.
- The Authority has no plans to change this procedure.

Reference: <http://www.icta.ky/docs/Decisions/ICT%20Decision%202008-1%20Spectrum%20Management.pdf> to view complete document

The Authority conducted a public consultation, previously, on the assignment of 700 MHz Spectrum (CD 2009-3), however, the responses did not provide enough information on intended use for the Authority to come to a definitive conclusion on the best way of assigning channels in this spectrum. Further, as there were no immediate plans by licensees to use this spectrum, it was decided to wait until there was a specific planned use before looking to finalise any policy for the assignment of the 700 MHz spectrum. The uses and technology have advanced considerably since then, and in recent months the Authority has noted a renewed interest, with specific use, for bandwidth in the 700 MHz range (698-806 MHz, for a total of 108 MHz). Accordingly, under section 9 of the Law and paragraph 4 of the Regulatory Principles, the Authority seeks comment on a policy for the assignment of 700 MHz spectrum in the Cayman Islands

2. Overview of the 700 MHz Spectrum

The 700 MHz spectrum is considered valuable due to its propagation characteristics, which enables radio communication systems operating in this band to cover wide geographical areas and achieve high levels of indoor penetration with relatively few base stations. These characteristics are particularly desirable for broadband communications and public-safety uses. Further, the cost of building a network using 700 MHz is substantially less than the cost of building a similar network using higher frequencies.

In the Cayman Islands, the 700 MHz spectrum is allocated by the Authority to broadcasting services on a primary basis and to fixed and mobile services on a secondary basis. This approach is consistent with the allocations recommended by the International Telecommunications Union ("ITU") for Region 2, which includes the Cayman Islands. However, unlike other jurisdictions in Region 2, such as the United States and Canada, the 700 MHz spectrum in the Cayman Islands is currently not in use.

Internationally, the 700 MHz spectrum was previously assigned to, and used for, analog television broadcasting. This use of the 700 MHz spectrum, however, is generally considered to be inefficient, given the emergence of digital television. Over the past decade, a number of jurisdictions have therefore decided to reallocate the 700 MHz spectrum from analog television broadcasting to new broadband wireless applications and public safety uses.

In the United States, this process was initiated by the Federal Communications Commission ("FCC") in 2002 and was completed in June 2009. The FCC conducted three separate auctions for 700 MHz spectrum over this period, the most recent of which was completed in March 2008. Other jurisdictions, including Canada and Europe, are planning similar auctions in the near future.

3. Channelization of The 700 MHz Spectrum

Traditionally, the 700 MHz spectrum has been divided by international telecommunications regulators into 18 channels of 6 MHz each. This channelization was due to the fact that the 700 MHz spectrum was primarily used for analog television broadcasting (where each analog television channel requires 6 MHz). However, over the past decade, as international telecommunications regulators began the process of reallocating the 700 MHz spectrum to new broadband wireless applications and public safety uses, it has become increasingly recognized and accepted that there is no longer a requirement to channelize this spectrum on the basis of 18 channels of 6 MHz each.

The FCC, for instance, chose to divide the 700 MHz spectrum on the basis of two separate "bands": (1) the Lower 700 MHz band, which corresponds to 698-746 MHz (or channels 52-59) and (2) the Upper 700 MHz band, which corresponds to 746-806 MHz (or channels 59-69). Each of these two bands is sub-divided by the FCC into "blocks", with letters from "A" to "D" (e.g. Lower block A, Upper block C, etc). Some of these blocks are paired (specifically the Lower A, B and C blocks, and the Upper A, B, C and D blocks), meaning that it includes two distinct and equal frequency bands, one assigned to "downlink" from the towers to the mobile devices, and the other to "uplink". Most popular mobile phone technologies are designed to work with paired spectrum. In contrast, unpaired spectrum (specifically the Lower D and E blocks in the United States) provides a single band

used for both downlink and uplink. It is considered ideal for one-way broadcasting services such as Qualcomm's MediaFLO mobile television service.

Under the FCC regime, the size, or bandwidth, of each block is not fixed at 6 MHz. Instead, the size of each block varies from 2 MHz (2 X 1 MHz for the Upper A and B blocks) to 22 MHz (2 X 11 MHz for the Upper C block). Two blocks of 12 MHz have also been reserved for public safety radio systems at 763-775 MHz and 793-805 MHz.

As a result of the recent FCC auctions, the Upper C block is now predominantly assigned to Verizon. In February 2009, Verizon announced that it would use this spectrum to deploy a Long Term Evolution ("LTE") network using technology developed by Ericsson and Alcatel-Lucent. AT&T holds much of the spectrum in the Lower C block, primarily as a result of its acquisition of Aloha Partners in February 2008. Both Verizon and AT&T hold spectrum in the Lower B block in various markets and Cox Communications (a major cable operator) also acquired paired spectrum in the Lower A and B blocks in a number of large markets. Qualcomm is already using the Lower D and E blocks for its MediaFLO service, which is used to broadcast live television signals directly to mobile handsets. Frontier Wireless (a company controlled by Echostar) also acquired unpaired spectrum in the Lower E block.

The FCC will be holding another auction (Auction 92) in the 700 MHz spectrum to start on July 19th, 2011 for 16 licenses as shown below:

Block	Frequencies (MHz)	Bandwidth	Pairing	Area Type	Licenses
A	698-704, 728-734	12 MHz	2 x 6 MHz	EA	2
B	704-710, 734-740	12 MHz	2 x 6 MHz	CMA	14

The Authority notes that, in contrast to the FCC approach, some of the Caribbean jurisdictions have decided to retain the traditional channelization of the 700 MHz band into 18 channels of 6 MHz. The Eastern Caribbean Telecommunications Authority ("ECTEL"), for instance, decided to assign 12 paired channels (each pair consisting of two channels of 6 MHz, one for downlink and one for uplink). The remaining 6 channels were reserved for future use (4 unpaired channels of 6 MHz) or public safety uses (2 unpaired channels of 6 MHz). A graphical representation of the channelization of the 700 MHz spectrum in the United States and ECTEL is provided in the Appendix.

The Authority considers that both approaches have advantages and disadvantages. Clearly, given the assignments of 700 MHz spectrum in the United States, it is possible, and perhaps likely, that, over the coming years, large telecommunications providers such as Verizon (and their equipment vendors) will develop and deploy new equipment designed to operate within the channelization

set by the FCC. If that is the case, it is possible that the cost of deploying this equipment in the Cayman Islands will be lower if the local telecommunications industry operates within the same parameters.

On the other hand, the Authority also recognizes that the traditional channelization of the 700 MHz band is well entrenched in the telecommunications industry and therefore that the new equipment designed to operate in this spectrum is likely to be usable within the parameters of this traditional channelization. The Authority also notes that the 700 MHz equipment developed by the international telecommunications industry is likely to be digital and incorporate internet protocols that can easily be adjusted for minor variations in frequencies and bandwidth. Lastly, the Authority considers that the ECTEL approach may provide greater flexibility from a regulatory perspective because it does not include large spectrum blocks of up to 22 MHz (as is the case in the U.S.). The Authority considers that these advantages are significant and therefore proposes to divide the 700 MHz spectrum in the Cayman Islands based on equal channel bandwidth, rather than follow the FCC approach. The Authority would welcome the views of the Cayman telecommunications industry on this proposal.

Question 1: Do you agree that the 700 MHz spectrum should be channelized in the Cayman Islands based on 18 channels of 6 MHz each as was done in ECTEL and if so, why? If not, what channelization method do you consider appropriate (e.g. the FCC 'method') and why?

4. Number of Channels to be Assigned to Each Operator

Based on international experience, it is difficult to predict precisely how much bandwidth will be required by telecommunications providers operating in the 700 MHz band. In the United States, for instance, Verizon has purchased 22 MHz (Upper C block) of bandwidth across the entire continental U.S., plus an additional 12 to 24 MHz of spectrum in various markets as a result of its purchase of the Lower A and/or Lower B blocks, resulting in a total bandwidth of 34 MHz or 46 MHz in these markets (e.g. Chicago, Los Angeles and Miami).

AT&T, Cox and Qualcomm will be more restricted in terms of bandwidth. AT&T will operate either with 12 MHz of bandwidth (in markets such as Chicago, Los Angeles and Miami, where it was out-bid by Verizon) or 24 MHz (in markets where it won both the Lower B and Lower C blocks, including Boston, Dallas, New York, San Francisco and Washington). Cox acquired a mix of Lower A and Lower B blocks in certain markets (such as Las Vegas, Phoenix and San Diego) and will therefore operate with either 12 MHz or 24 MHz of spectrum in these markets. Qualcomm will operate with 12 MHz of unpaired spectrum in the Lower D and Lower E blocks in selected markets (such as Boston, Los Angeles, New York, Philadelphia and San Francisco).

In its 47th Board of Directors meeting in April 2009, ECTEL decided to keep its current subdivision method of assigning 6 MHz channels in the 700 MHz band, for a total of 18 channels. The subdivision of the band was allocated as follows:

- Six paired blocks with a total bandwidth of 12 MHz each (6 MHz up-link and 6 MHz down-link with guard band included) assignable to service providers.
- Two blocks for Public and Private Safety Network (emergency, police, etc) 6 MHz each for a total of 12 MHz.
- Four reserved blocks of 6 MHz each (totaling 24 MHz) for future use.

The Authority considers that, given the uncertainty in the bandwidth requirements of licensees wishing to operate in the 700 MHz spectrum and even of the technology that licensees may wish to deploy, it may be premature to impose a maximum number of channels for each operator. The Authority's preference is to allow the applicants to request the assignment of one or more channels. The Authority would consider these proposals on their merits and look to assign more than one channel to operators if the Authority determines that this is fully justified by their business and technical proposals.

Question 2: Do you agree that the number of channels to be assigned by the Authority to each operator and how they should be assigned should be left to the discretion of the Authority after consideration of the operators' business and technical proposals?

5. Reservations of 700 MHz Spectrum for Future Uses

The Authority proposes to reserve 24 MHz of the 700 MHz for use by public safety agencies and 24 MHz for future use. If in due course public safety does not require all of the 24 MHz reserved bandwidth, the bandwidth not required by them could be released for reassignment.

The "future use" reservation would allow the Authority to assign some additional spectrum at 700 MHz in response to future technological developments. As a result, a total of 60 MHz would be available for telecommunication providers immediately, with a possible assignment of 24 MHz to 36 MHz at a later date.

Question 3: Do you consider that it is appropriate to reserve 24 MHz of the 700 MHz for use by public safety agencies and 24 MHz for future use?

6. Previous Consultation Responses Summary

- Digicel did not have any objections to the allocation of 700 MHz based on the proposal to split the band in eighteen (18) 6 MHz channels
- Digicel stated that it would require 4 blocks of contiguous spectrum, looking forward at new technologies.
- Digicel agreed in principal with the concept to reserve a certain amount of bandwidth for future use and public safety - with a time limit to hold these channels in reserve.
- Digicel's recommendation was that the spectrum should be assigned on a first come first served basis but that the selection should be done to ensure that companies that are currently successfully operational in this market be given preference during the spectrum allocation process.

Reference: http://www.icta.ky/docs/700MHz/2009_05_29_Digicel_response.pdf for complete response

- Cable and Wireless (T/A LIME) ("LIME") was in favour of harmonizing our spectrum allocations in this band with that of the FCC model, as LIME believed this was where the most affordable CPE equipment would come from. LIME also indicated that if the Authority decided to split the 700 MHz band into equal segments that 5 MHz would be preferable to 6 MHz as the LTE technology did not require a guard band and this would be an inefficient use of the spectrum.
- LIME considered a service provider would have to be assigned at least 2 x 10 MHz blocks but considered that an assignment of 40 MHz would provide the company with the capability to provide an ideal service offering to its customers.
- In LIME's view, the reservation of two (2) channels for public safety would be adequate.
- LIME's considered that each service provider who applied for spectrum should be allocated the minimum amount - and a beauty contest (i.e. a comparative selection process) could subsequently be used as a tool to determine which operators were assigned additional spectrum

Reference: http://www.icta.ky/docs/700MHz/2009_05_29_LIME_response.pdf for complete response, also http://www.icta.ky/docs/700MHz/2009_05_29_LIME_letter_to_ECTEL.pdf letter to ECTEL.

7. Comments Requested

The Authority invites comments on all aspects of this consultation document. In particular, it seeks views on the following key questions:

Question 1: Do you agree that the 700 MHz spectrum should be channelized in the Cayman Islands based on 18 channels of 6 MHz each as was done in ECTEL and if so, why? If not, what channelization method do you consider appropriate (e.g. the FCC 'method') and why?

Question 2: Do you agree that the number of channels to be assigned by the Authority to each operator and how they should be assigned should be left to the discretion of the Authority after consideration of the operators' business and technical proposals?

Question 3: Do you consider that it is appropriate to reserve 24 MHz of the 700 MHz for use by public safety agencies and 24 MHz for future use?

All submissions on this issue should be in writing to be received by the Authority by 27th July 2011 at the latest.

The Authority will post any comments received on its website by 5 pm on 29th July 2011 and parties may file reply comments to any other party's comments by 12th August 2011. Parties who submit reply comments are to send a copy to any party whose comments are addressed in the reply comments at the same time the reply comments are submitted to the Authority.

8. Procedure

Submissions may be filed as follows:

By e-mail to:

consultations@icta.ky

Or by post:

Information and Communications Technology Authority
P.O. Box 2502
Grand Cayman KY1-1104
CAYMAN ISLANDS

Or by courier:

Information and Communications Technology Authority
3rd Floor, Alissta Towers
85 North Sound Road
Grand Cayman
CAYMAN ISLANDS

Or by fax to:

(345) 945-8284

Appendix

Channelization of 700 MHz Spectrum in the United States and ECTEL

