MALAYSIAN COMMUNICATIONS AND MULTIMEDIA COMMISSION

DISCUSSION PAPER

CONCEPTS FOR THE INTRODUCTION OF DIGITAL TERRESTRIAL TELEVISION BROADCAST IN MALAYSIA

APRIL 28, 2003

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INTRODUCTION

The introduction of Digital Terrestrial Television Broadcasting (DTTB) in Malaysia poses a number of challenges to the country, the industry, as well as the general Malaysian public. This, no doubt has to be balanced in order to achieve the aspirations of the country, promote the development of the industry, as well as to create a mature and well-informed society.

The Communications and Multimedia Act 1998 (CMA) provides for robust and converged approach to the provision of facilities and services in the digital era, which promotes for an efficient management of resources while allowing it to adapt to the ever changing business models arising from digitalisation. Nonetheless, the Malaysian Communications and Multimedia Commission (MCMC) as the regulator will have to balance the needs of industry to the needs of the consumer in general, in order to ensure that the migration to digital television benefits all parties concerned.

In formulating policy direction and principles toward successful implementation of DTTB, the MCMC views the following as relevant challenges:

1. Providing coverage
2. Providing service
3. Planning for migration and adoption of digital television

This Discussion Paper seeks to invite submissions from interested parties on the issues raised in this Discussion Paper or any other matters relevant to the subject. Responses from this Discussion Paper may be used toward formulating policy directions in implementing Digital Terrestrial Television Broadcast in Malaysia. Written submissions, be it in hard copy or electronic copy, should reach the MCMC not later than 12.00noon on **Friday, June 27, 2003**. Submissions should be addressed to:

The Chairman
Malaysian Communications and Multimedia Commission
Level 11, Menara Dato' Onn
Putra World Trade Centre (PWTC)
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50480 KUALA LUMPUR

Attention : DTTB Working Committee
Industry Development Division

Tel. : +60 3 4047 7051
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The MCMC intends to hold a Briefing Session on the Discussion Paper before the closing date stated above. The Briefing Session will highlight relevant issues concerning the paper as well as the feedback required. Interested parties should contact the above address ***before Wednesday, May 14, 2003*** *to register their interest to participate in the proposed Briefing Session.*

The MCMC extends its appreciation to interested parties for their participation and for providing written submissions in this process.

BACKGROUND

TELEVISION BROADCASTING IN MALAYSIA

1 Forty years after its introduction, television broadcasting has grown to cover almost every household in Malaysia. During the forty years of its existence, television broadcasting has evolved from black and white to color, from limited coverage to nationwide coverage and from terrestrial to satellite. Terrestrial television broadcasting also has grown from only one government-owned channel to the existing four very competitive channels.

2 While these are "free terrestrial" channels, the Malaysian population are also able to receive (pay) satellite channels for the last six years. In addition to this, they also had had a brief "pay terrestrial" television service, which ceased operations in 2001.

3 It is worth noting that while terrestrial television broadcasting in Malaysia has seen significant changes and improvements, the programs are still transmitted over analogue means. Spectrum management in analogue transmission is challenging as there are overspill signals and the need to reduce interference between channels. This partly explains the limited number of nationwide television stations available in Malaysia at the moment.

TELEVISION BROADCASTING UNDER CMA

4 In Malaysia, television broadcasters are individually licensed as Content Applications Service Provider (CASP(I)), whereby the activities require a higher level of control in terms of market entry, and close regulatory supervision due to its pervasiveness and impact to the society.

5 Additionally, broadcasting ***distribution*** services are Individually licensed as Network Service Provider (NSP(I))[1]. As an NSP(I) license holder, a company is allowed to provide ***carriage*** of broadcast signals. The physical infrastructure required for the ***transmission*** of broadcast signals are individually licensed as Network Facilities Provider (NFP(I)).

6 As the licensing framework under the CMA is technology-neutral, the transmission of digital channels will be the responsibility of the assignee of the spectrum, and the broadcasters are responsible for the provision of broadcasting services, or "television programs". This arrangement, have in fact been partly undertaken

[1] Please refer to Communications and Multimedia (Licensing) Regulations 2000.

currently, whereby existing broadcasters uses the network facilities and services of a third party to transmit their programs.

7 Analogue television transmission is inefficient in that it requires heavy use of scarce resources, i.e. spectrum. As such, it is pertinent for the MCMC to provide and manage the demand and challenges arising from the changing business environment. This, in part, prompts the MCMC to facilitate the transition from analogue to digital transmission.

8 In carrying out its role to facilitate a smooth transition from analogue to digital transmission, the MCMC is guided by the Ten National Policy Objectives as set out in Section 3 of the CMA (please refer to **Attachment A**). In particular, the following objectives are what the MCMC considers to be the relevant main drivers in implementing Digital Terrestrial Television Broadcast in Malaysia:

(a) Upgrading network capabilities;

(b) Improving service quality and choice of services;

(c) Building capacity; and

(d) Managing resources efficiently.

DIGITAL TELEVISION

What is Digital Television?

9 Digital television, in the context of this Discussion Paper, refers to the **transmission technology** used to broadcast television signals to the viewer. Digital terrestrial transmission of broadcast signals brings about a number of improvements to the viewers. This is evident with better reception quality (no ghosting or snowing), more program channels, and depending on the method and technology used, used as mobile reception[2]. In a spectrum manager's point of view, digital terrestrial transmission also promotes efficient use of spectrum.

10 The Malaysian population has had more than five years experience in receiving digital television via satellite with the introduction of Astro by Measat Broadcast Network Systems Sdn Bhd (MBNS). The digital service, which is based on DVB-S standard, is delivered via the Ku-band channels from the Measat satellites, which covers Malaysia and a number of surrounding countries.

[2] It is difficult to provide a good quality mobile reception in analogue transmission.

CONSIDERATIONS

DIGITAL TERRESTRIAL TELEVISION BROADCAST (DTTB)

Transmission

11 Unlike analogue television, which is transmitted in a form of continuous wave, digital terrestrial television is transmitted in the form of bits of information. As such, digital terrestrial television is considered superior to that of analogue transmission as it provides better picture quality, better viewing experience, allows flexibility in programs, as well as maximizes the use of spectrum.

Reception

12 Viewers will be able to receive Digital Terrestrial Television programs via:

(a) A fully integrated Digital Television Receiver; or,

(b) A set-top box decoder to convert the digital signal to analogue form to be displayed on existing analogue TV set.

13 Depending on the aerial type used, location and other physical factors, viewers can instantly receive DTTB signals, provided they have acquired any of the equipment stated in Paragraph 12 above, much like the reception of existing analogue transmission.

DTTB Standards

14 Globally, analogue television is based on three (3) major standards viz., NTSC, PAL and SECAM[3]. The existing Malaysian analogue TV is based on PAL system.

15 As with analogue television transmission, there are also three 3 competing transmission standards being promoted worldwide for DTTB services:

(a) Advanced Television System Committee (ATSC) – adopted in North America,

(b) Digital Video Broadcast – Terrestrial (DVB-T) – adopted in Europe

(c) Integrated Services Digital Broadcasting (ISDB) – developed in Japan

16 It is also worth noting that with the differences aside, the three digital terrestrial television systems are closer to compatibility than their analogue counterparts, i.e. the PAL, NTSC and SECAM, where compression technology used is MPEG-2.

[3] **NTSC – National Television Standards Committee**. This is the oldest existing standard, and was developed in the United States. **SECAM (Système Électronique pour Couleur avec Mémoire),** as its name suggests, was developed in France. **PAL (Phase Alternating Line)**, on the other hand, was developed in the United Kingdom and Germany.

SDTV and HDTV

17 Standard Definition Television (SDTV) is similar to the existing television picture format. The PAL system adopted by Malaysia allows for resolution of 625 lines of 720 pixels and picture format of 4:3. Standard Definition Television (SDTV) utilizes the same format and resolution as existing analogue system. There are, however, a number of television set manufacturers that produce "wide-screen" television sets with picture format of 16:9. Irrespective of the picture format for SDTV, viewers can still receive digital television transmission provided that they install a set-top box or purchase a digital-ready television set.

18 High Definition Television (HDTV), on the other hand offers a higher resolution picture (up to 1080 lines by 1920 pixels; with picture format of 16:9). Similarly, viewers can receive digital television transmission on their HDTV sets or existing analogue TV sets equipped with the appropriate high definition transmission decoder.

19 In DTTB, one digital channel could multiplex several SDTV services together (up to 4 or 6 program channels) OR 1 HDTV and 1 or more SDTV services combined together.

20 In moving into digital terrestrial television, there have been opposing views on how best a "user experience" could be leveraged to allow higher take up of digital television. SDTV would allow a proliferation of television programs by 4 or more for each channel, while an HDTV program will occupy most of the channel.

Question A. Many viewers in other countries cannot differentiate the picture quality provided by SDTV to that of analogue television. HDTV sets, on the other hand, offers better image compared to analogue television. However, the cost of HDTV sets is extremely high currently. Do you think that the introduction of SDTV (with the many program channels it offers) assists the migration to digital broadcasting, or should Malaysia concentrate DTTB to HDTV? Other than the availability of extra channels and costs, what are other factors that a viewer would likely consider in migrating to digital?

Datacasting and other services

21 In addition to television program broadcast, DTTB channels can also be used for datacasting and other services. Interestingly, datacasting can also provide similar services to that of broadcasting, whereby it can transmit television programs or channels. More significantly, the release of spectrum for digital broadcasting will enable service providers to provide these services as well to those interested.

22 Notwithstanding the above, the MCMC will be guided by the feedback from the public on best approaches to be taken in allowing transmission of broadcast signals as SDTV or HDTV, as well as in taking into consideration of datacasting and other services in the planning of the frequency allocation.

23 As such, some principles would have to be applied to identify the right approach to implement this:

(a) Spectrum efficiency – which of the above approach would promote a more efficient use of spectrum in the long run? In particular, the decision to adopt HDTV will affect the efficiency in managing the spectrum whereby program channels in Malaysia will be limited, as opposed to SDTV whereby program channels will increase with each channels available.

(b) Consumer choice – which of the above approach provides choice to the consumer and maximizes user experience (in terms of better picture quality, mobility etc). In particular, how much bandwidth would datacasting require in order to provide an acceptable quality of service, and how would it affect the introduction of digital terrestrial television broadcast in Malaysia? With regard to television broadcast, would 8 MHz per channel be sufficient to provide the services needed?

(c) Industry development – which of the above approach provides better opportunity to industry players to leverage on their business approaches?

> ***Question B.*** The MCMC seeks comment from the public on the approaches proposed in Paragraph **23** above.

PROVIDING COVERAGE

Spectrum Plan and Spectrum Use

24 The Malaysian Spectrum Plan[4] currently allocates the following bands for terrestrial TV transmission:

(a) VHF Band I (47 – 68 MHz): Channel 2 to Channel 4

(b) VHF Band III (174 – 230 MHz): Channel 5 to Channel 12

(c) UHF Band 4 &5 (510 – 798 MHz): Channel 26 to Channel 61

25 An extract of Frequency Allocation in 470.00MHz – 890.00MHz is available in **Attachment B**.

26 Currently, analogue television signals are transmitted in all three bands, where the lower channels are being heavily used throughout Malaysia. The UHF Band is also used for *transposers* (where low-powered (<0.5kW) transmitters installed as **pocket-fillers**) to cover blind spots and remote areas isolated from the coverage of the main transmitter. Increasingly, the band is also used as replacement channels for VHF transmitters operating in Band I. By nature, spectrum-intensive analogue terrestrial transmission requires high power to cover the widest possible coverage, which at times requires border coordination and heavy spectrum planning in order to reduce interference.

27 The status of channel utilization throughout Malaysia is as illustrated in Table 1 below :

[4] Table of Frequency Allocation, Draft Malaysian Spectrum Plan, 2002 available from www.mcmc.gov.my

Table 1

Band	No. of Available Channels	No. of channels used
Band I (Channels 2-4) - VHF		
Peninsular	3	3 (fully utilized)
Sabah & Sarawak	3	3 (fully utilized)
Band III (Channels 5-12) - VHF		
Peninsular	8	8 (fully utilized)
Sabah & Sarawak	8	8 (fully utilized)
Band IV & V (Channels 21- 61)* - UHF		
Peninsular	40	26 (*14 "free"*)
Sabah & Sarawak	40	16 (*24 "free"*)

***Channel 38, 39 and 40 are reserved for the operation of IDR (Integrated Decoder Receiver) and DSR (Digital Satellite Receiver), while Channels 30, 31, 32, 33, 34 are reserved for VCR channels for different locations in Malaysia.**

28 The Draft Malaysian Spectrum Plan indicates that Band I (Channels 2-4) will be made available for Government's use, while Channels 21 to 25 in Band IV will be allocated to Mobile and/or Fixed Service. Eventually, all broadcast transmission in these eight (8) channels will have to be reallocated to some other channels.

29 Table 2 below illustrates the available (or "free") channels currently unoccupied in the UHF band:

Table 2

Area	Channels
Peninsular Malaysia	***41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 56, 57, 58, 59, 61***
Sabah and Sarawak	***27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61***

30 Based on Table 1 and Table 2 above, simple deduction will see that there are currently 19 channels available in Peninsular Malaysia and 18 channels available in Sabah and Sarawak. Subject to border coordination and other planning considerations, four (4) channels in Peninsular Malaysia (Channels 49, 51, 57 and 59) and six (6) channels in Sabah and Sarawak (Channels 27, 29, 31, 33, 39 and 41) could effectively be released for DTTB. *(However, it should be noted that spectrum planning for broadcast network is not simple as there are various technical, regulatory and environment factors that should be taken into consideration. As such, the discussion in this section should serve as an illustration only to gauge the readiness and applicability of the concepts proposed in these paragraphs).*

31 It should be noted from the preceding paragraph that the possible available channels are in the higher channels. Over time, there may be other channels in the lower frequency be made available. However, these may be constrained by the simulcasting requirements, as well as whether there is a need for Malaysia to have a combination of Single Frequency Network or Multiple Frequency Network. (Please refer the proceeding sections on discussion on Single Frequency Network and Multiple Frequency Network).

Question C. Should the MCMC make available a portion of the channels identified in Paragraph 30 immediately, or should the MCMC engage in "cleaning up" the lower channels and make them available in the immediate future? Respondents should take into considerations of the costs associated with "cleaning up" these channels.

Question D. If "portions" of the identified channels were made available immediately, how many channels should be made available to allow the introduction of expected services?

Question E. What are other factors that should be taken into consideration when deciding which channels are suitable for DTTB services?

32 The detailed **band plan** for the proposed service is included in **Attachment C**.

Analogue TV Transmission

Frequency Planning

33 The approach to frequency planning in terrestrial TV transmission (digital or analogue) is remarkably different from the methodology employed in mobile communications. Frequency planning for the allocation of channels to terrestrial TV transmission has been constrained by site locations and border co-ordinations which limits the availability of channels nationwide. The planning has also been guided by the "widest possible coverage" principle, whereby a high power transmitter (kilowatts) will be located at high altitudes to cover the widest possible coverage.

34 Due to this, the coverage of a TV transmission may extend up to 100 km from the transmitter and the coverage could extend further, depending on the terrains and varying environmental conditions. Consequently, there are problems of overspill signals across national boundaries. For example, coverage of a 10 kW VHF TV transmitter located on top of Gunung Jerai in Kedah could extend up to Songkhla in Southern Thailand. Similarly, viewers in Penang could receive TV signals from

Southern Thailand. Thus, frequency planning and utilisation near border areas are coordinated with neighboring countries to avoid interference.

Frequency Network

35 Due to the factors explained in the preceding paragraph, the frequency network of an analogue broadcasting system has evolved to become Multiple Frequency Network (MFN), whereby a television station operating in Kuala Lumpur will transmit its programs nationwide using various channels made available to them. Significant planning is involved in Multiple Frequency Network whereby the transmission has to be planned to avoid signal interference with other broadcasters, as well as with neighboring broadcasters. This has largely led to a collection of unusable channels in a certain area. To some viewers, this situation has also forced them to have more than one aerial pointing at different locations to receive different television signals.

36 Depending on transmission standards, digital transmission allows the use of same frequency channel (Single Frequency Network, or SFN) to transmit television broadcast throughout a wide coverage area, or even nationwide. Careful planning would allow low power transposers be installed using the same channel to provide coverage in dense and stratified housing areas – where it is currently a challenge in major cities like Kuala Lumpur.

37 Unlike analogue transmission where adjacent channels are often unusable in the same area of coverage, digital transmission also allows the use of these adjacent channels, thus maximizes the use of spectrum. Digital transmission also requires less distance between co-channel services than that of analogue services with the same coverage.

38 Theoretically, almost all the available channels in Bands IV and V can be used for DTTB. However, planning has to take into consideration, among others, of the following:

(a) Relocation of existing transmission in channels identified in Paragraph 28 above;

(b) Simulcast of existing analogue broadcasts;

39 In addition to the above, ***strategic*** planning of the spectrum would have to consider the following:

(a) Maximizing spectrum use;

(b) Planning for future use of other channels in the bands; and

(c) Providing for stable use of services in the allocated channels.

Question F. How would the proposed services be best served in the planning of broadcast network in Malaysia? Among the factors that will have to be considered by respondents are:

1. Would a nationwide SFN or MFN provide broadcasters the opportunity to improve its services, as well as provide for new and innovative services such as datacasting and mobile television, to the viewers?

2. How would a nationwide SFN or MFN facilitate early take up of DTTB? This decision will, in a way, affect the planning and release of spectrum, and eventually the switch-off date for analogue television.

3. Would a combination of nationwide SFN and regional MFN promote the development of nation-building, local content, regional innovation, and niche services? How would the viewer be best served eventually?

Transmission – Multiplex Operator

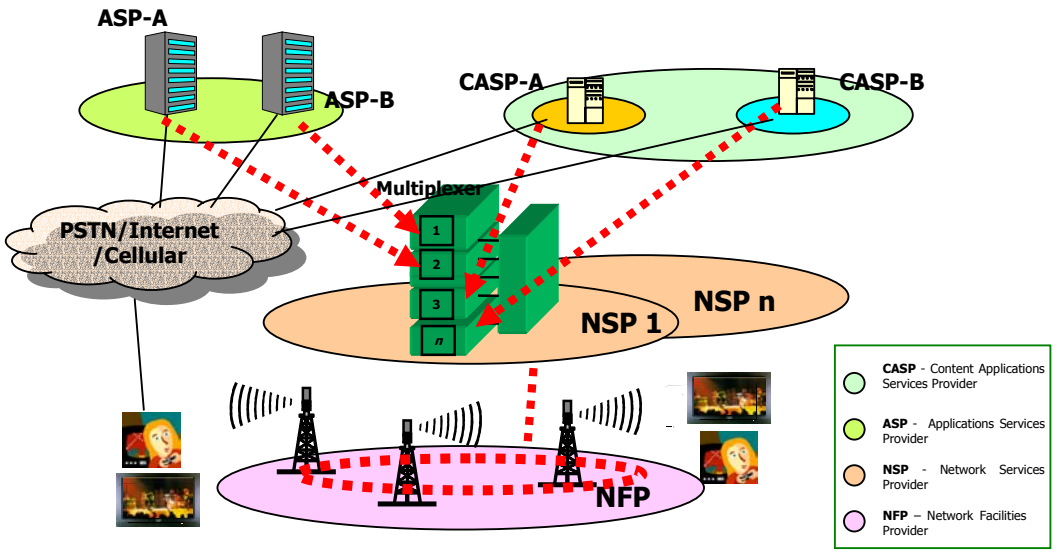
40 Unlike the analogue television business model, whereby the broadcaster is involved from production, to programming to transmission, the business models in DTTB allows for multiplex operator(s) to "assemble" the different television programs and services and transmit it over the air.

41 In this scenario, CASPs will make the necessary arrangements with multiplex operator or operators, or they can choose to become an operator itself to broadcast their services. Multiplex operator's role itself is very important whereby it performs the function of a 'gatekeeper' allowing transmission of television programs. This type of arrangement is similar to the arrangement where certain satellite television operators permit the retransmission of terrestrial television channels over satellite. In this instance, the satellite television station could be considered to be the 'multiplex operator'.

42 As indicated earlier, the converged licensing framework provided under the CMA is robust enough to cater for the above arrangements. In a DTTB environment, a CASP will have the opportunity to leverage on its production and programming expertise to provide the best service to the viewer, while the matters of transmission and coverage will be best taken by a network service provider.

43 Table 3 below illustrates broadcasting activities' relevance in a converged environment :

Table 3 :
Multiple service providers supported on a Network



Question G. What are the factors that should be considered in promoting access to multiplexers? What are the criteria that should be taken into consideration in assessing the suitability of assignment holders?

Use of Spectrum

44 The Communications and Multimedia (Spectrum) Regulations 2000 ("Spectrum Regulations") introduced Spectrum Assignment as a method of spectrum management. Under this concept, spectrum, which was previously managed wholly by the regulator, will be assigned to another party. The assigned party will then be responsible to maximize the use of the spectrum, either by employing all the services allocated under the spectrum, or to maximize the number of users in the specific services allocated in the most efficient way.

45 The Spectrum Regulations also provides the tools for which spectrum could be assigned, which include assignment by way of tender, auction or fixed price.

46 On the other hand, Apparatus Assignment can also be used to allow use of transmission equipment to transmit broadcast signals. In an Apparatus Assignment environment, the MCMC will plan the use of the spectrum, which is later to be applied by operators on a yearly basis. Apparatus Assignment, then, allows for the MCMC as the regulator to determine the best possible coverage for transmission. However, this will require extensive planning and management on the part of the regulator, which might, or might not be able to respond to the demand from the industry.

> ***Question H.*** What are the best methods in assigning this spectrum taking into consideration that the broadcasting industry has the responsibility to provide coverage and service to the Malaysian, without unduly increasing the cost or subsequently translating the cost to the consumer?

PROVIDING SERVICE

47 Until 1999, television set owners were required to pay RM24 for "television license fee"[5]. Other than this fee, free-to-air (or free-to-view) television has always been available to viewers without any fees. In addition to free-to-air, digital television allows for "selective" transmission whereby viewers can be differentiated by either payment of fees or location. One business model would provide an opportunity for a conditional access system to enable broadcasters to undertake a 'subscription-based' or 'pay-per-view' type broadcast. Similarly, DTTB can also be used to broadcast specific programs or channels to specific community in a specific location such as a university campus or a *kampung*, based on this "selective" transmission capability.

48 Taking into consideration existing situation, as well as to promote a healthy take-up of DTTB, it is opined that the Malaysian public should be able to receive existing programs (or "television stations") without any cost to them. This would mean that existing television stations would have to be simulcasted (for analogue) and free-to-view (for digital). In addition, the transmission of digital television will eventually provide the same coverage area as it is now.

[5] This requirement has since been revoked by Broadcasting (Licensing for Television Broadcast Receivers and Dealing in Radio and Television Broadcast Receivers) (Revocation) Regulations 2000 (P.U.(A) 123) dated March 29, 2000.

49 It should be noted that in order for "free-to-view" channels to be available to the Malaysian public, the set-top box or the television sets (the CPE) would have to be configured to allow this.

> ***Question I.*** Should existing television stations be available as free service in the digital environment? In order to provide this "free" service, should the government mandate that an "open" set top box (whereby a consumer can purchase the set top box and be able to view the "free" channels without having have to subscribe to a service, very much like purchasing a radio or television set) to be made available?

DTTB – Making Malaysia as the Global Hub

50 In carrying out its role as the catalyst for the development of communications and multimedia industry in Malaysia, the MCMC is guided by the Ten National Policy Objectives as outlined in the CMA.

51 One of the challenges in the Policy Objectives is "to establish Malaysia as a major global center and hub for communications and multimedia information and content services". MCMC's Framework for Industry Development 2002-2006 states that among the attributes of a communications and multimedia hub include the availability of high quality services at reasonable prices, the ability to attract international and regional communications and multimedia traffic to compete at home and abroad; and offering a wide array of content and applications service.

52 Considering the potentials of DTTB, as well as the various possible business models, it is clear that the introduction of DTTB could assist Malaysia in achieving the goal of becoming a global hub as described briefly above. For example, new and innovative ***local*** content could be transmitted over DTTB as there is much more efficient use of the spectrum resources.

> ***Question J.*** Would there need to be other considerations for the government to take with respect to digital television, particularly in relation to it being able to provide more channels?. How would the availability of these channels promote the development of local content whilst taking into consideration the need to preserve Malaysian cultural heritage in terms of content development, content marketing and content distribution?

DTTB – An alternative means of delivering broadband

53 The bandwidth-hungry nature of analogue television would have made it the most pervasive "broadband" services available to the nation at the moment. However, it would have been difficult to gauge the capability of this analogue broadband service to be the interactive and digital broadband that is currently being pursued after by the consumer, businesses and government alike.

54 The technology surrounding DTTB should enable the introduction of an alternative means to broadband access. Together with an efficient return channel, DTTB could be very well used to provide digital broadband capability to many areas.

Improving Service Quality and Choice

55 Considering the advantages and disadvantages of the migration from analogue to digital broadcast transmission, there are also other considerations that have to be taken into account. As indicated in the earlier paragraphs, digital terrestrial television offer a number of benefits to the consumer, industry and the regulator:

(a) Better reception quality (no ghosting or snowing) whereby industry players would have more control on the quality of transmission;

(b) More program channels thereby providing greater choice to consumers and more revenue streams to the industry players,

(c) Mobile reception whereby it promotes new lifestyle to complement other broadband technologies.

56 While the benefits may be manifold, providing a nationwide digital terrestrial service is an enormous and challenging task. This would include efforts such as acquiring digital set top box initially to enable digital reception, and installing digital transmitters to ensure sufficient coverage, which require a lot of investment and time.

Question K. Considering that satellite could provide instant coverage, how important would coverage be in the introduction of DTTB in Malaysia? Would satellite television service be substitutable to that of DTTB in providing the coverage needed? Would a decision of not introducing DTTB limit and hinder the development of the content industry **in general** and freedom of choice to services at affordable prices to the Malaysian public specifically?

Question L. How would the transition to DTTB be managed so that the quality of service (transmission and reception) of analogue television is not compromised, while allowing improvements to quality of service of digital transmission? In this case, how would the existing broadcasters be prepared to allow for this transition?

Cost Implications

57 The investment cost to implement DTTB, in particular the provision of transmission systems will be similar to the analogue system. New system and equipment for DTTB can largely be considered as replacement or upgrading cost.

58 Furthermore, DTTB enables the efficient utilisation of spectrum, resulting in the use of lower transmission power for similar coverage as analogue. In Europe[6] the estimated cost of transmission per household is US$20 –US$50, assuming 80% coverage or 20 million TV households.

59 The cost of implementing digital transmission in Malaysia could be reduced and physical rollout would to be minimal if existing transmitters' locations are used. However, additional sites may be required for pocket fillings as well as for extending the coverage areas throughout the nation.

60 Assuming that the industry is required to replicate existing coverage, (there are about 80 analogue locations throughout Malaysia currently), and that the cost of installing digital equipment in each location is RM500,000, it will cost a minimum of RM40 million to enable digital transmission nationwide. Further, the industry will require new digital infrastructure, "multiplexer", studio upgrades and/or feed distribution equipment to fully maximize the benefits of digital television.

Question M. The MCMC invites feedback on the above assumptions. For respondents' information, a detailed and informed response on the costs are important for MCMC's assessment as it may influence decisions to be taken in relation to determining the least disruptive analogue shut-down date or whether the simulcast period should be extended.

61 Additionally, viewers will have to acquire either a set-top box to decode digital transmission to enable viewing or purchase a fully integrated television set with a built in decoder. There are currently a number of set-top boxes and integrated television (iTV) sets being manufactured by established manufacturers. These

[6] Digital Television in Europe, 1997 – Convergent Decisions Group

set-top boxes and iTV sets will be in great demand worldwide as more and more countries implement digital terrestrial television broadcast.

62 Based on experience in other countries, it is expected that the minimum price of a set-top box will be similar to that of an existing analogue 14" television sets, or even less. In the United Kingdom, for example, the cost of digital terrestrial set-top boxes ranges from £75 to £134 (RM450 to RM800).

> ***Question N.*** Are Malaysian manufacturers ready to design and manufacture affordable set-top boxes and integrated television sets? What incentives that should be considered in facilitating the production of set-top boxes and integrated television sets locally? What is considered affordable set-top boxes and integrated television sets?

MANAGING DIGITAL TRANSITION

Standards Development

63 In the absence of a Technical Forum as required under CMA, the MCMC has tasked various Working Groups to ensure development of standards and other technical matters pertinent to the industry and the consumer. Members of the Working Groups comprise the players in the industry, as well as academicians and those who represent the consumer.

Standards Development - Transmission

64 In this regard, Working Group 7 (WG7), was formed in 1999 to recommend Digital Terrestrial Television Broadcast standards to be adopted by Malaysia. The MCMC, with the assistance of WG7, is currently preparing the necessary documents and process for the adoption of DBV-T as the transmission standard for DTTB in Malaysia.

65 However, it is not within the scope of this Discussion Paper to elaborate the advantages and disadvantages of a specific standard for Digital Terrestrial Television Broadcast.

Standards Development – Consumer Equipment

66 In addition to determining uniform transmission standards, it is also viewed that it is necessary to determine a uniform set-top box standards to promote early take-up and minimize costs.

67 Further, it is imperative that viewers are not unnecessarily burdened with the complexities of installing the equipments to receive digital transmission. Some of the solutions would include development of "plug-and-play" set-top boxes and information on relevant aerial types.

68 The introduction of digital television would also set the stage for competition on service basis. In this case, the Electronic Program Guide ("EPG") will be the platform for service providers to provide their program information. Thus, it is necessary for access to the EPG and basic requirements be set to further promote competition, service differentiation and viewers' choice.

> ***Question O.*** In addition to the above, what are other issues regarding standards and access that should be considered by the MCMC?

Simulcast

69 The approach to DTTB implementation will depend largely on the consumer uptake in receiving digital transmission, availability of digital transmission in the area, as well as other industry and consumer factors.

70 In order to minimize disruption to existing service and to ensure that the viewers are prepared for the new service, existing broadcasters are expected simulcast their programs both in analogue and digital. Simulcasting will commence as soon as digital broadcasting is launched and will continue, depending on the analogue shutdown date. This phasing out period will have to take into consideration the roll-out of digital TV network across the nation and the propensity of viewers to acquire set top boxes or new digital TV sets.

71 Taking into consideration that existing broadcasters have invested into providing sufficient coverage and are improving the quality of their transmission, it will be more economical to the broadcasters and less disruptive to the viewers for the simulcast to be done in phases. However, in identified areas where existing analogue transmission quality is below expectation, the industry could consider transmitting in digital.

Analogue Switch off

72 **It is important to note that viewers should be able to receive analogue signals should they choose not to migrate to digital television**. However, the MCMC is aware of the costs associated in maintaining analogue transmission.

73 From spectrum planning perspective, analogue TV transmission will be **phased out starting 2009**, five (5) years after digital transmission is introduced. The process of shutting down analogue transmission is expected to be gradual, and will be completed on December 31, 2014, or until at least 90% of the population has switched over to digital television, whichever is earlier.

74 The phasing out of analogue transmission can also be done according to region. It is most likely that analogue transmission will cease its transmission in identified urban areas, for example, Kuala Lumpur and Penang, followed by other areas. This "ripple effect" could make the transition less disruptive to both the industry and the consumer.

75 In order to facilitate this, the MCMC is of the opinion that no further investment in analogue transmission should be allowed once the spectrum is assigned. This would mean that all new investment for transmission of broadcasting service should be for digital transmission devices.

Question P. Do you agree with the statements in Paragraphs 72, 73, 74, and 75 above, and why?

Question Q. Will the setting of the date of analogue shut down facilitate, or even accelerate digital television take up? Should the MCMC take the position that providing digital coverage is more important than setting the analogue switch off? Other than the above, as well as the availability and affordability of set-top boxes and the success of simulcast, what are other important factors that the MCMC should take into consideration in determining the appropriate measures to ensure a smooth transition and uptake of digital television?

Consumer Education

76 In ensuring the success of the implementation of DTTB in Malaysia, there should be greater co-operation between the industry players and the viewers. As the initiative involves a significant number of the population, it is necessary that this transition is managed efficiently. One of the important tasks is to educate the consumers or viewers on the technology, the choices available as well as the benefits of digital television.

77 Among the factors that will affect the success of DTTB are

(a) Cost of equipment and service
    (i) Affordable set-top boxes and iTV sets.
    (ii) Availability of suitable antenna
    (iii) Consumers' willingness to pay for the currently free television services;
    (iv) How much more would the consumer prepare to spend for a basic service, as well as other services?

(b) Quality and availability of Service
    (i) Ensuring acceptable level of service and picture quality
    (ii) Ensuring sufficient information and availability of service

78 The above factors will guide the MCMC, as well as other players in the industry in preparing their action plans toward implementing DTTB in Malaysia.

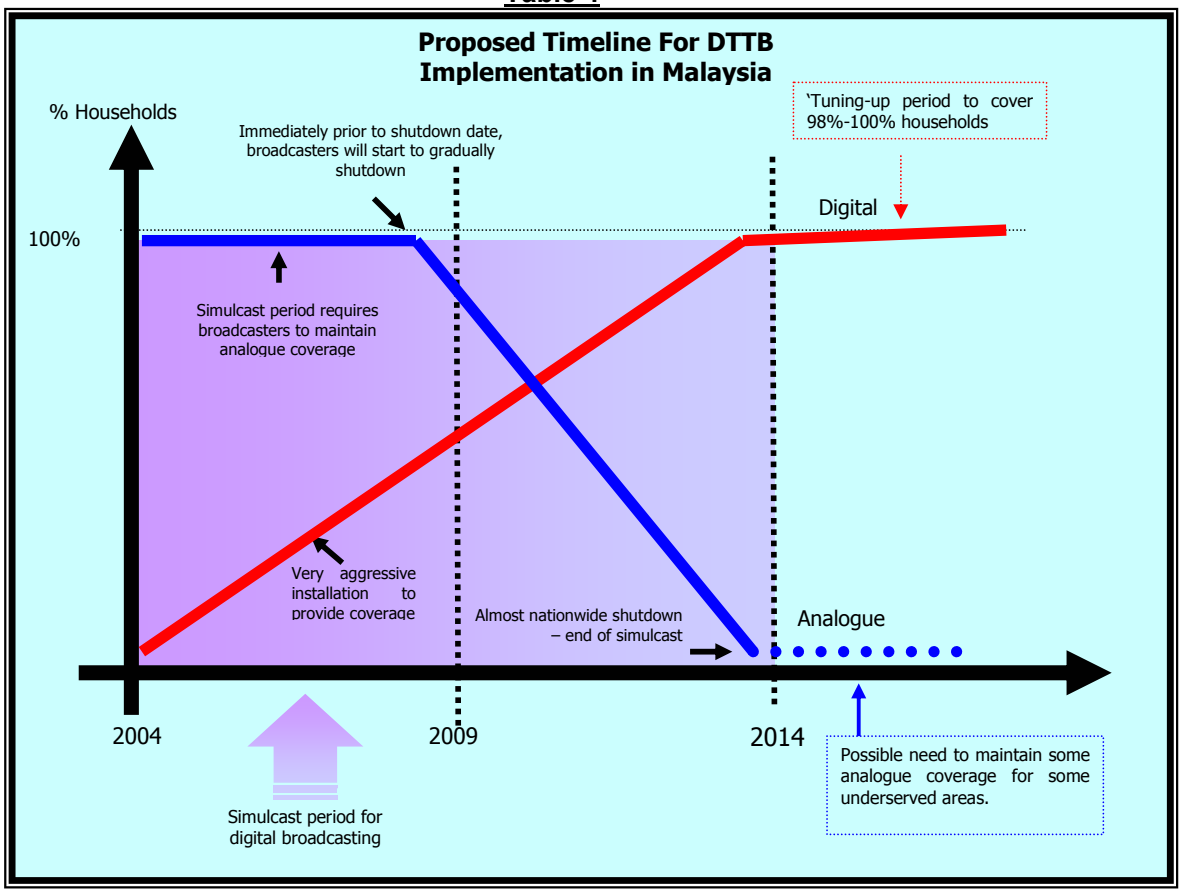
Question R. What are specific action points that could be taken in making sure that the consumers are well informed, and well-educated in migrating to the digital platform?

Question S. What are other areas that should be given priority in addition to the above?

PROPOSED TIME LINE FOR DTTB IMPLEMENTATION

79 This Discussion Paper serves to gauge the level of readiness of the industry and the public, as well as to assess the relevant factors in determining the policy approach and the principles in implementing DTTB in Malaysia. The following table summarizes the proposed timeline for DTTB implementation:

Table 4



80 The above timeline strives to balance the needs to provide a comprehensive digital broadcasting network while allowing for a calculated approach toward reducing analogue coverage. Building an extensive coverage does not necessarily guarantee take-up. However, it allows for the industry to experiment, as well as relieves the "chicken-and-egg" situation.

81 The MCMC also envisages a period of simulcasting, whereby existing analogue transmission will be required to be simulcasted together with digital transmission. As the MCMC is aware of the costs associated with simulcasting, as well as taking into consideration of the need to encourage take up, it is of the opinion that this requirement should not be necessarily prolonged than envisaged. Thus, it is expected that all analogue transmission will cease by the end of 2014.

Question T. The MCMC seeks comment on the above-proposed timeline for the implementation of Digital Terrestrial Television Broadcast in Malaysia.

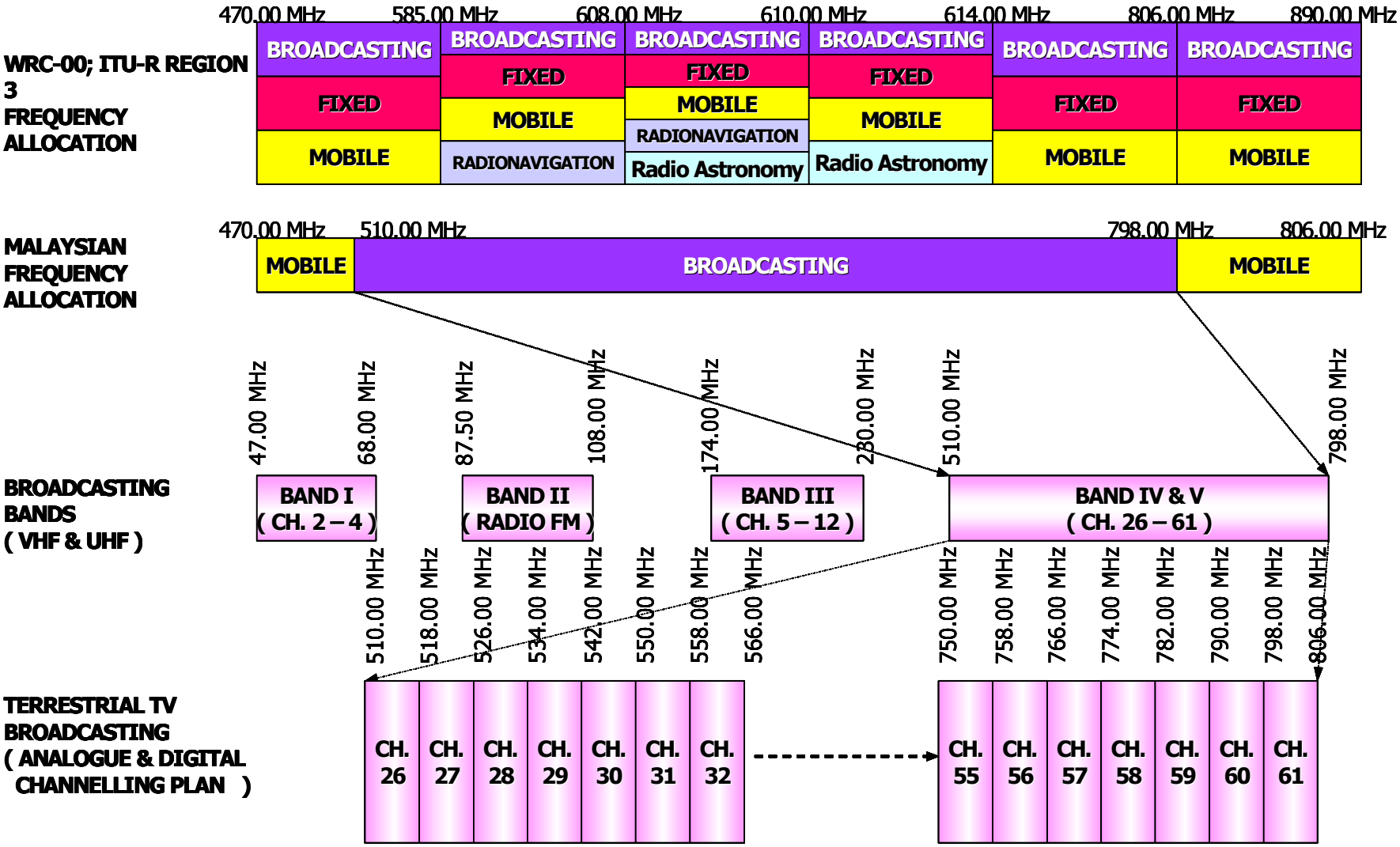
/end

ATTACHMENT A – SECTION 3 OF THE COMMUNICATIONS AND MULTIMEDIA ACT 1998

NATIONAL POLICY OBJECTIVES
FOR THE COMMUNICATIONS AND MULTIMEDIA INDUSTRY

1. to establish Malaysia as a major global centre and hub for communications and multimedia information and content services;
2. to promote a civil society where information-based services will provide the basis of continuing enhancements to quality of work and life;
3. to grow and nurture local information resources and cultural representation that facilitate the national identity and global diversity;
4. to regulate for the long-term benefit of the end user;
5. to promote a high level of consumer confidence in service delivery from the industry;
6. to ensure an equitable provision of affordable services over ubiquitous national infrastructure;
7. to create a robust applications environment for end users;
8. to facilitate the efficient allocation of resources such as skilled labour, capital, knowledge and national assets;
9. to promote the development of capabilities and skills within Malaysia's convergence industries; and
10. To ensure information security and network reliability and integrity.

ATTACHMENT B – FREQUENCY ALLOCATION 470.00MHz – 890.00MHz



ATTACHMENT C – DRAFT MALAYSIAN SPECTRUM PLAN – CHAPTER III PART 3.4

UHF Channels

Channel Number	Frequency Range (MHz)	UHF Band	Channel Number	Frequency Range (MHz)	UHF Band
26	510 - 518	IV	44	654 – 662	V
27	518 – 526	IV	45	662 – 670	V
28	526 – 534	IV	46	670 – 678	V
29	534 – 542	IV	47	678 – 686	V
30	542 – 550	IV	48	686 – 694	V
31	550 – 558	IV	49	694 – 702	V
32	558 – 566	IV	50	702 – 710	V
33	566 – 574	IV	51	710 – 718	V
34	574 – 582	IV	52	718 – 726	V
35	582 - 590	V	53	726 – 734	V
36	590 – 598	V	54	734 – 742	V
37	598 – 606	V	55	742 – 750	V
38	606 – 614	V	56	750 – 758	V
39	614 – 622	V	57	758 – 766	V
40	622 – 630	V	58	766 – 774	V
41	630 – 638	V	59	774 – 782	V
42	638 – 646	V	60	782 – 790	V
43	646 – 654	V	61	790 – 798	V

mra