Kingdom of Saudi Arabia

Communications and Information Technology Commission

Radio spectrum issues related to the development of the National Frequency Plan

Public Consultation Document No 5/1426

Issued by the CITC in Riyadh, 30/12/1426H (30/01/2006G)

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1. Background

The Communications and Information Technology Commission (the "**CITC**") is the entity authorized to regulate the telecommunications sector in the Kingdom of Saudi Arabia ("the **Kingdom**"). The Telecommunications Act ("the **Act**"), enacted in June 2001, provides the legislative foundation for developing the telecommunications sector. The Act has a number of objectives including: to provide advanced and adequate telecommunications services at affordable prices; to promote and encourage fair competition in all fields of telecommunications; to ensure effective and interference-free usage of frequencies; to ensure transfer and migration of telecommunications technology to keep pace with its development; to ensure clarity, transparency, equality and non-discrimination; and to safeguard the public interest and the user interest. The CITC Ordinance ("the **Ordinance**"), effective in June, 2001, created the CITC and defines its functions, governance, and financing. The Telecommunications Bylaw ("the **Bylaw**") issued in July 2002, provides for the regulation of the telecommunications sector by the CITC in the Kingdom.

The Act, the Bylaw and the Ordinance include provisions with respect to National Frequency Plan ("the **NFP**" or "the **Plan**"). In particular, Article 11 of the Act states that the Frequency spectrum is a state-owned natural resource, and that the Council of Ministers is the approving authority of the National Frequency Plan for the purpose of achieving optimum utilization of this national resource, in accordance with International and Regional Agreements and approved regulations and standards.

Article 12 of the Act stipulates that the CITC should prepare the National Frequency Plan in coordination with the concerned parties, for submittal to the Council of Ministers for approval. In this respect, the CITC has initiated the process which will develop the National Frequency Plan. The NFP is essential for effective and efficient use of the spectrum and the prevention of radio frequency interferences between services.

This Public Consultation Document (the **Document**) seeks to establish the current and future demand for new services and technologies in the Kingdom that may be implemented within the whole frequency range from 9 kHz to 275 GHz.

2. Form of response and procedures

The CITC invites comments on all issues related to spectrum utilization, existing and future spectrum requirements, proposed spectrum management policy and strategies, technologies which might co-exist with licensed use and spectrum allocation policy.

The CITC specifically encourages parties and stakeholders to provide detailed answers to all questions raised in this Document and also invites to provide detailed comments, wherever possible, with relevant data, reasons, statistics, and benchmarks, analysis or experience to support their comments. These answers will be considered in the development of NFP, however, this Document and any responses to it are not binding to the CITC. All responses are the property of the CITC.

In providing the comments, parties are kindly requested to indicate the consultation question number in this Public Consultation Document to which their comment relates.

The parties are kindly requested to specify contact details including the name of the party (and all related parties if the respondent is part of a consortium) in addition to the address and phone number(s).

The CITC may consider publishing all or parts of the responses to this public consultation unless the respondent requests that it be kept confidential. Please indicate whether you wish to keep your identity and/or your comments on some or all questions confidential.

Responses to this Public Consultation Document must be submitted to the CITC (in electronic form) on or before **2:30pm local time Monday 13/2/1427H (13/03/2006G**) to either one of the following addresses:

1. E-mail to: **nfp@citc.gov.sa**
2. Delivery by hand or by courier:

   The Office of the Governor

   Communications and Information Technology Commission

   King Fahad Road

   Riyadh 11588, Saudi Arabia.

3. Introduction

One of the CITC's key statutory duties is to prepare the NFP for current, medium and long term ensuring the optimal use of the radio spectrum under its management. The NFP is a key requirement for an effective spectrum management. It provides a general plan for spectrum use ensuring that the spectrum is used effectively and efficiently while avoiding interferences between different services and applications.

The Table of Frequency Allocation presented in Article 5 of Radio Regulations (**RR**) issued by the International Telecommunications Union (**ITU**), forms the basis for national tables. It ensures effective integration of each country into the international radiocommunication community. This Table is based on a block allocation methodology with footnotes.

CITC has a detailed database which includes administrative and technical data such as data on all radiocommunication services and users operating in the Kingdom, current national frequency allocations and assignments, how heavily the spectrum is used in various frequency bands, where the different services are accommodated in the sub-bands along with the number of assignments and which bands are shared by the different users of the spectrum.

Based on an analysis of the current use of frequency spectrum and the projection of future spectrum use, which is a function of the spectrum needs and technology development, a NFP will be developed. A key element of CITC's spectrum strategy in developing NFP is to ensure as far as possible that sufficient spectrum is available to meet future demand.

Q1. In your views, how should the CITC deal with frequency bands that are overcrowded or have high demands?

Q2. Please provide your views regarding the best approaches to deal with spectrum scarcity especially with the advent of a variety of new wireless technologies and the increased demand on the newly emerging wireless services.

Q3. In your opinion, what is the best way to identify spectrum for new wireless technologies and services in order to encourage their introduction?

This consultation document covers the following main applications:

- Mobile
- Fixed
- Satellite (Fixed, Mobile and Broadcasting)
- Sound and TV Broadcasting

- Amateur and Citizen Band
- Science
- Short Range Devices.

4. Mobile applications

The land mobile service operation is defined as communications between a base and mobile station or between mobile stations**.** It is usually one-way or two-way communications. This definition includes systems such as GSM, 3G, trunking, etc.

Mobile service in the Kingdom has witnessed an outstanding increase in demand over the last decade due to the introduction of public mobile services and new technologies. It is estimated that there will be a continuing growth in demand for mobile spectrum, as users increasingly seek the additional functionality that higher bandwidth mobile applications can provide.

Q4. Please provide your views regarding the spectrum challenges and constraints experienced in all the mobile bands and the proposed recommendation to overcome them.

4.1 Public Mobile

Public Mobile comprises a wide range of technologies and frequency bands. It includes systems such as 2G, 3G, beyond 3G and trunking.

4.1.1 Second Generation (2G)

Second Generation Systems are digital systems that provide voice, fax, and limited data services as well as value added services. Current systems are evolving to increase data rates using new technologies. The 2G systems include GSM, TDMA, cdmaOne, PCS and other systems. GSM and other 2G systems, have limited data capabilities. However new enhanced technologies such as GPRS (General Packet for Radio Services) and EDGE (Enhanced Data rates for GSM Evolution) have been introduced to the basic GSM in order to offer higher data rates and allow the introduction of data services such as mobile email and mobile Internet access. These enhancements introduced to the basic GSM do not require new spectrum bands, but the higher data rates will use more radio channel resources therefore leading to a requirement for additional spectrum assignments.

The GSM-R is a special application dedicated to railway organizations. It is not used for commercial applications but only for internal service communications (voice, data and traffic control system).

The following bands are designated for the GSM in the Kingdom:

GSM 900

- 890 – 915 MHz paired with 935 – 960 MHz (Standard GSM 900)
- 880 –890 MHz paired with 925 –935 MHz (Extended GSM 900)

GSM-R

- 876 – 880 MHz paired with 921 – 925 MHz (GSM – R)

GSM 1800

- 1710 – 1785 MHz paired with 1805 – 1880 MHz.

Q5 In light of the frequency bands identified for GSM in the Kingdom, please provide your views regarding the spectrum bands for GSM.

Q6. Please provide your views regarding the spectrum requirement* for *the GSM-R applications.

4.1.2 Third Generation (3G)

In the mid-1980s, the ITU developed the concept of IMT-2000 (IMT stands for International Mobile Telecommunications) and in 2000 unanimous approval was given to the technical specifications for 3G systems under this brand name (i.e. IMT-2000). This approval resulted from the collaboration of many entities, both inside and outside the ITU.

This development of mobile communication resulted in combining high bandwidth multimedia performance with wide area mobility. There are several different 3G-technology standards such as UMTS, which is based on WCDMA and CDMA2000, which is an evolution of CDMA 2G technology. There are several types of CDMA2000, each offering different data rates and levels of compatibility with 2G CDMA.

The following bands are identified for 3G/IMT 2000:

- 1920 – 1980 MHz paired with 2110 – 2170 MHz
- 1900 – 1920 MHz
- 2010 – 2025 MHz
- 806 – 960 MHz
- 1710 – 1885 MHz
- 1885 – 2025 MHz
- 2110 – 2200 MHz
- 2500 – 2690 MHz.

Q7. Please provide your views on the preferred bands for the 3G.

Q8. Please provide your views on the necessary bandwidth that should be available for full national coverage.

Q9. Please provide your views with respect to the demand of the 3G services.

Q10. Please provide your views with respect to the minimum allocation of 3G spectrum and to what extent the above bands will satisfy the projected 3G coverage in the Kingdom.

4.1.3 Beyond 3G

The first version of the 3G air interface specifications enabled superior user data rates and system throughput capacities compared to any 2G systems. The High Speed Downlink Packet Access (HSDPA) (3.5G) in the UMTS Release 5, which promises data rates of up to 10 Mbps in the downlink, is being fielded by some Telecom Operators in different world markets. High Speed Uplink Packet Access (HSUPA) (3.75G) is a data access protocol for mobile networks, which provides a high upload speed of up to 5.8 Mbps. HSUPA specifications will be included in UMTS Release 6.

Q11. Please provide your views with respect to the new techniques such as HSDPA and HSUPA and how they will impact the spectrum of 3G systems.

Q12. Do you think there will be a need for additional spectrum band for beyond 3G systems? Please specify the suggested bands and distribution.

4.2 Trunking mobile

Trunking mobile system is a method of using relatively few communication paths to serve a large number of potential users.

Several types of trunking mobile systems are in use in different countries. The standard Terrestrial Enhanced Trunked Radio Access (TETRA) and the proprietary integrated Dispatch Enhanced Network (iDEN™), both digital are the most widely used trunking systems. They operate at the frequency bands shown below:

TETRA

- 385 –390 MHz paired with 395 –399.9 MHz
- 410 – 430 MHz
- 450 – 470 MHz
- 870 – 876 MHz paired with 915 – 921 MHz
- 380 – 383 MHz, 390 – 393 MHz (emergency use).

iDEN™

- 806 – 821 MHz paired with 851 – 866 MHz

- 821 – 825 MHz paired with 866 – 870 MHz
- 896 – 901 MHz paired with 935 – 940 MHz
- 1453 – 1465 MHz paired with 1501 – 1513 MHz.

A public digital trunking service (using iDEN™ technology) is currently being provided in the Kingdom in the 800 MHz band.

Q13. Please provide your views regarding likely future demand for digital trunked mobile radio applications in the Kingdom and the preferred frequency bands for them.

Q14. Please provide your views with respect to the approach on increasing spectral efficiency and capacity of land mobile service by migration to narrow channel spacing such as 12.5 / 6.25 kHz and on converting to digital multiple access technologies in order to satisfy increasing user demand.

4.3 Other mobile issues

Q15. Please provide your views regarding the requirement of spectrum to meet the future needs of emergency applications.

Q16. Please provide your views on whether there is a demand for emergency services provided by digital trunked radio in the 380-400 MHz band.

Q17. Please provide information of any other technology you foresee for commercial or private mobile systems and on minimum numbers of channels that would be sufficient for initial network roll out.

5. Fixed applications

5.1 Fixed links

The fixed service provides communications between two or more fixed locations. Terrestrial fixed-link services often referred to as point-to-point microwave links are used for a variety of network infrastructure purposes such as long-haul telecommunications wireless networks.

There has been a growing demand for fixed-links in recent years. The high level of demand for fixed links is partly linked to the growth in mobile services. Increasing numbers of fixed links will be needed to provide infrastructure support for mobile networks, including 3G networks. However, there are efficient transmission alternatives for high capacity point-to-point links such as fiber optical cables systems and Free Space Optics (FSO). It is believed that demand for fixed links will continue at a high level, and that demand for Fixed Wireless Access (FWA), including Broadband Fixed Wireless Access (BFWA) will also grow.

There are a variety of fixed service applications such as High Density Fixed Service (HDFS) and High Altitude Platform Station (HAPS).

HDFS offers a significant level of deployment of point-to-point and/or point-to-multipoint systems within a given area. The term HDFS does not refer to a particular application, sub service or band in the fixed service, but does describe the phenomenon of maximized density, spectral efficiency and frequency reuse in the fixed service that are realized through concentrated deployments.

The following bands are available for HDFS in the fixed service:

- 31.8 - 33.4 GHz
- 37 – 40 GHz
- 40.5 – 43.5 GHz
- 51.4 – 52.6 GHz
- 55.78 – 59 GHz
- 64 – 66 GHz.

Q18. Please provide your views regarding the approach that usage of frequencies for fixed service (fixed links) between 30MHz and 1 GHz band should be progressively reduced, to vacate spectrum for other services.

Q19. Please provide your views regarding the potential future demand for the fixed service (fixed links), in light of the availability of other transmission media such as fiber optics, Free Space Optics (FSO).

Q20. Please provide your views regarding the introduction of High Density Fixed Service (HDFS) in the Kingdom and specifically concerning the timeframe and mechanism of introduction.

5.2 Fixed Wireless Access

Fixed Wireless Access (FWA) is one of several delivery application technology that can provide Wireless Local Loop (WLL) for basic telephone services, as well as broadband connectivity or high-speed access to the Internet and other interactive services. As FWA is a radio-based technology, the cost and time associated with laying cable are dramatically reduced, thus resulting in cheaper and faster roll-out in rural and sparsely-populated areas or difficult terrain.

Due to the geography and demographics of the Kingdom, and the universal access/service requirements, it is anticipated that there will be a progressively increasing demand for the provision of point to multipoint FWA services, including Broadband Fixed Wireless Access (BFWA). While the use of mobile devices is expected to become ubiquitous for users on the move, those same users in the home or office will seek the extra functionality of very high bandwidth fixed services.

Consequently, there will also be a continuing growth demand for fixed links to provide infrastructure for mobile networks.

BFWA is one way of providing end users with links to broadband services. It offers a number of advantages over leased lines and fiber optic, notably flexibility in establishing connections to end users and scalability in developing networks as customers are signed up.

Worldwide interoperability for Microwave Access (WiMAX) is the common name associated to the IEEE 802.16a/REVd/e standards for Wireless Metropolitan Area Network (WMAN). These standards are issued by the IEEE 802.16 subgroup that originally covered the Wireless Local Loop (WLL) technologies. A similar standard is ETSI HiperMAN.

There are a number of frequency bands that can accommodate FWA and BFWA operations. The spectrum in each of these bands has its own characteristics and together the bands offer operators a range of service capacities, from narrowband through higher bandwidth to broadband. Frequencies below 900 MHz provide wider coverage. Bands below 6 GHz have the general characteristic of permitting transmission over radio paths that may be partially obscured from a direct line of sight. The ability of signals in these bands to perform without a direct line of sight makes short-range connections to portable terminals of nomadic users (a typical Wireless LAN deployment) a possible alternative scenario. Higher frequency allocations exhibit propagation characteristics that require a clear Line of Sight radio path and the need to account for rainfall attenuation in link budgets. However there tends to be greater bandwidth available compared to the more crowded lower frequency bands.

The table below shows the different bands used in different countries for FWA systems:

Frequency Band	**Application**
2.400 – 2.4835 GHz	Wireless Local Area Network (WLAN) (indoor and outdoor) • WiMAX • Radio Local Area Network (RLAN) • Bluetooth • Wireless Fidelity (Wi-Fi)
3.4 – 3.6 GHz	Point-to-Multipoint network • WiMAX
5.725 – 5.875 GHz	Wireless Local Area Network (WLAN) • Wi-Fi

	Metropolitan Area Network (MAN) • WiMAX
10 GHz 24.5 – 26.5 GHz 27.5 – 29.5 GHz	Bands identified in a few countries for FWA
40 GHz	Point-to-Multipoint network • Multimedia Wireless Systems (MWS)

Q21. In your views, which bands should be made available to Fixed Wireless Access (FWA)?

Q22. Do you have a view on the minimum band of radio frequency spectrum that should be made available for FWA, such as WiMAX, in the 2.4 GHz, 3.5 GHz, 5.8 GHz, 10 GHz, 26/28 and 40 GHz?

Q23. Given the geography and demographics of the Kingdom (vast area with dispersed population and remote location), please provide your comments regarding the suitability and demand of using 400/450 MHz band for Fixed Wireless Access applications (WLL).

6. Satellite communications

The satellite communications include mobile, fixed, broadcasting, radio-determination satellite services, etc.

The Mobile Satellite Service (MSS) is a radiocommunication service between mobile earth stations and one or more space stations, between space stations or between mobile earth stations by means of one or more space stations. MSS provides, through a range of regional and global mobile-satellite systems, voice, telemetry and data transmission for a wide range of applications in the land, maritime and aeronautical services.

Fixed Satellite Service (FSS) involves communication between fixed earth stations via satellite (downlinks and uplinks). The FSS can include communications to multiple specified fixed locations. Very Small Aperture Terminal (VSAT) is one of the key growth areas in FSS.

The market trends are towards more data and higher bit rate requirements. This results from the increasing use of PCs, IT and Internet, and terrestrial communications. There are growing requirements for mobility, hence, an increasing demand for mobile multimedia. It is likely that this demand will result in increased requirements for both terrestrial and satellite communications, as neither can separately satisfy all market segments.

Q24. Please comment on the foreseeable future of the various satellite services applications in the Kingdom and on relevant spectrum requirements.

7. Broadcasting

Broadcasting is one of the major users of radio frequency spectrum. Over half of the spectrum below 1 GHz is allocated to broadcasting (especially TV). In particular, most of the spectrum in the lower UHF band is currently allocated to UHF-TV (470-862 MHz).

Despite this huge allocation, it is only lightly used in the Kingdom. UHF TV is used for terrestrial coverage of different towns. Broadcasting (TV) satellite is reducing the demand for UHF TV. In addition VHF TV, which employs lower frequency, has better propagation and wider coverage (important for rural and scattered-population areas). There is limited flexibility, on the exclusive band, when close to borders. The band (790-862 MHz) could be restricted to fixed and mobile applications to meet demands for other public wireless access system (such as mobile or WLL, and new wireless access services).

Broadcasting is undergoing major technological changes. The major means of improving spectrum efficiency in the broadcasting sector will be to move from analogue transmission to a digital one. Digital transmission allows more information to be compressed into any given amount of spectrum, e.g. six or more digital TV channels can be housed in the spectrum used by one of its analogue equivalents. Potential spectrum released by digital switchover can be used to provide valuable new services.

Q25. Please provide your views on the potential usage for fixed (FWA) and mobile applications in the band 790-862 MHz.

Q26. Please provide your opinion regarding the timeframe and mechanisms of introduction of Digital Video Broadcasting (DVB) and Digital Audio Broadcasting (DAB) technologies in the Kingdom.

Q27. Please provide your views regarding the need to identify spectrum for ancillary broadcasting services. Please justify your comments.

Q28. Please provide your opinion regarding the appropriateness of video on demand service in the Kingdom and the necessary requirements.

8. Other applications

8.1. Radio Amateur

Generally, the trend for amateur radio has been experiencing a slight decline for some time now. This has been attributed to developments such as the widespread use of

mobile phones and, in particular, the Internet, which gives users a means of establishing worldwide communications without the need for specialized technical training or knowledge. The amateur application, however, can be used in disaster – relief operations.

The following bands are allocated to the amateur service in the Kingdom:

Frequency bands	Frequency bands
1810 – 1850 kHz	28- 29.7 MHz
7000 – 7200 kHz	144 – 146 MHz
14000 – 14350 kHz	24 – 24.05 GHz
18068 – 18168 kHz	47 – 47.2 GHz
21000 – 21450 kHz	142 – 144 GHz
24890 – 24990 kHz	248 – 250 GHz

Q29. Please provide your views on whether it is necessary to allow additional bands for Amateur application in the Kingdom.

8.2 Citizen Bands

Currently, the Citizen Band application is allocated in the Kingdom at 26.980 – 27.025 MHz and 27.220 – 27.245 MHz.

Q30. Please provide your views as to whether it is necessary to allow more Citizen Bands in the Kingdom.

8.3 Science applications

The Science applications comprise of the radio astronomy, space research, Earth Exploration-Satellite (EESS), space operations, meteorological aids, standard frequency and time services. The frequency allocations for Science applications include a number of bands within the range 19 kHz to over 100 GHz.

Q31. Please provide your views on whether there is a demand for science applications such as radio astronomy, meteorological aids, etc… in the Kingdom.

Q32. Please provide your views on whether there is a need for making frequency bands available for radio experiments.

9. Short range devices and other applications

9.1 Short Range Devices

The term "Short Range Devices" (SRD) is intended to cover the low-power radio transmitters, which provide either unidirectional or bi-directional communication over short distances as they have low capability of causing interference to other radio spectrum users. A wide range of SRD has been made exempt from individual licensing, because the power and propagation characteristics of these services are so localized that they do not materially interfere with other spectrum users. With advances in radio technology, there is growing commercial interest in developing products that utilize the spectrum set aside for short range devices, e.g: home/office local area wireless networks and wireless connectivity technology such as 'Bluetooth'.

Q33. Please provide your views regarding the introduction of the new Short Range Devices applications by making particular spectrum available whenever possible for such applications.

Q34. Please provide your views on whether, more spectrum should be made available for operating license exempt devices.

9.2 Cordless telephones

There are currently several technical standards and frequency bands used for cordless telephones around the world.

The following bands are used for the cordless telephones:

Type of Cordless Telephones	**Remarks**
914 – 915 MHz and 959 – 960 MHz	CT 1 (analogue)
885 – 887 MHz and 930 – 932 MHz	CT 1 +
46 and 49 MHz	FCC Type
864.1 – 868.1 MHz	CT 2 (early generation)
1895 – 1906.1 MHz	PHS
1880 – 1900 MHz	DECT
902 – 928 MHz	
2.400 – 2.4835 GHz	

However, some of the above bands have been phased out in some countries.

Q35. Please provide your views on whether, more spectrums should be allowed for operating cordless telephones.

Q36. In your views, which bands should be allowed for cordless telephones?

9.3 RLAN (WLAN or Wi-Fi)

Radio or Wireless Local Area Networks (RLAN or WLAN) are increasingly becoming popular substitute for wired data networking, both within organizations and public places. Wi-Fi is the short for "Wireless Fidelity", is such WLAN implementation, typically providing up to 50 Mbps using 2.4 GHz and 5 GHz bands and according to IEEE standards 802.11a, 802.11b and 802.11g:

Standard	**Frequency band (GHz)**	**Bit rates (Mbps)**
802.11a	5	22 – 54
802.11b	2.4	11
802.11g	2.4	54

The CITC allows WLAN in the following three frequency bands:

- 2.400 to 2.4835 GHz with max. power of 100 mW
- 5.150 to 5.350 GHz with max. power of 200 mW
- 5.725 to 5.825 GHz with max. power of 200 mW.

Q37. Do you recommend identifying certain bands for the use of Wi-Fi networks for commercial purposes (other than individual license exempt applications) to give the operators more flexibility in terms of signal power and coverage size?

9.4 Ultra Wide Band (UWB)

UWB is a new technology which provides the means of wirelessly conveying large amounts of data over very short distances using very low power signals that are spread over a very wide bandwidth. UWB devices typically have a bandwidth in the range 1 – 10 GHz. Relevant standards are currently under development by European and US technical standardization bodies. One of the main concerns relating to UWB is the need to protect other narrower bandwidth systems that use the same spectrum. To achieve this, various "spectrum masks" have been proposed, defining limits on the power that can be radiated by UWB devices in specific parts of the spectrum.

CITC recognizes the concerns expressed in relation to potential interference to 3G, BFWA, radio astronomy and other applications including fixed links, satellite

receivers and radar systems, however, such interference is unlikely to be significant and can be mitigated with relatively simple mechanisms.

Q38. Please provide views on the demand of Ultra Wide Band (UWB) technology applications and their implementation in the Kingdom.

9.5 Radio Frequency Identification (RFID)

Radio Frequency Identification (RFID) technology may be seen as a means of identifying a person or object using electromagnetic radiation. Frequencies currently used are 125 kHz, 13.56 MHz, or 800-960 MHz. RFID enables the automated collection of product, time, place, and transaction information.

An RFID system consists of two main components: a transponder to carry data (e.g. a tag), which is located on the object to be identified and an interrogator (or reader) to read the transmitted data.

Q39. Please provide your views regarding introduction of RFID and the bands that should be identified to this technology

9.6 Industrial, Scientific and Medical (ISM) applications

There are applications for RF energy that do not involve deliberate radiation outside the limits of the apparatus in which it is used. The most important of these involve industrial, scientific and medical (ISM) equipment. RR defines the ISM as "Operation of equipment or applications designed to generate and use locally radio frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of telecommunication"

Q40. Please provide your views on the potential demand of ISM applications in the Kingdom.

10. License exempt applications

Many countries have license exempt (or non-licensed) spectrum, however this application is allowed under special regulations. License exempt spectrum is currently not specifically allowed in the Kingdom. The CITC acknowledges the importance of the concept and wants to encourage growth of new applications. The CITC may adopt the licensing exempt approach (low cost or no cost, easy to get through an online registration).

License-exemption can offer significant advantages for users (and suppliers), especially in areas such as cost savings and convenience, therefore resulting in the

possible use of radio equipment without the need to apply for a license or a specific spectrum assignment.

Q41. Please provide your views and reasons for introducing a license exemption approach and the bands for applying this approach.

Q42. Please provide views on whether some kinds of permissible individual license exempt operations be extended.

11. National frequency policy and management

Spectrum is a scarce resource that needs to be managed effectively and efficiently in order to derive maximum economic and social benefit, including encouraging growth and rapid deployment of infrastructure and services for consumers. This requires innovative approaches to managing the spectrum therefore dynamically succeeding in making spectrum available for new services. A new set of spectrum management principles and practices, within regulators' respective mandate, will enable countries to harness the full potential of the new services including wireless broadband technologies. This, however, cannot be done in isolation.

The rapid convergence caused by the increasing use of digital technologies for example, between fixed and mobile services, and between mobile and broadcasting services, is putting pressure on spectrum management policies. For those platforms that use radio spectrum to deliver the new converged services to the consumer, it is important that spectrum regulation also converges and is coherent across all the affected frequency bands.

Q434. Please provide your views and reasons regarding the best approaches and the best practices guidelines for efficient national spectrum management, and issues that CITC should consider.

Q44. Please provide your views and reasons the frequency licensing awarding mechanisms such as first comes first serve, beauty contest or auction etc.

Q45. Please provide your views on the best methodology to evaluate the spectrum licensing applications and the eligibility criteria.

Q46. Please provide your views regarding the method of licensing, licensee rights, license duration and obligations that apply.

Q47. Are there any other significant technological or market developments that CITC should be aware of when developing the National Frequency Plan and management policies / strategies? What specific rules should be introduced or maintained to safeguard the delivery of services of national economic interest in the future?

Q48. In light of the Kingdom new membership to the WTO, please provide your views on how the available frequencies should be distributed to the new potential licensees.

12. Other related issues

In order to give the public larger space to contribute and add their comments regarding the NFP; the CITC welcomes the public to express their views regarding other issues related to NFP either those issues that affect the allocation of frequency bands or those that will affect the deployment of future technologies.

Q49. Interested parties are welcome to express their views regarding other related issues.

List of Abbreviations

2G	Second Generation Mobile Telephone
3G	Third Generation Mobile Telephone
BFWA	Broadband Fixed Wireless Access
cdmaOne	Code Division Multiple Access (IS-95 standard)
CITC	Communications and Information Technology Commission
CT	Cordless Telephone
DAB	Digital Audio Broadcasting
DECT	Digital Enhanced Cordless Telephony
DVB	Digital Video Broadcasting
EDGE	Enhanced Data rates for GSM Evolution
EESS	Earth Exploration Satellite Service
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission (United States)
FSO	Free Space Optics
FSS	Fixed Satellite Service
FWA	Fixed Wireless Access
GPRS	General Packet for Radio Services
GSM	Global System for Mobile Communications
GSM-R	Specialized GSM for railway services
HAPS	High Altitude Platform Station
HDFS	High Density Fixed Services
HiperMAN	Hi Performance Radio Metropolitan Area Network
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
iDEN™	integrated Dispatch Enhanced Network
IEEE	Institute for Electrical and Electronics Engineers
IMT-2000	International Mobile Telecommunications
ISM	Industrial, Scientific and Medical
IT	Information Technology
ITU	International Telecommunication Union

LAN	Local Area Network
MAN	Metropolitan Area Network
MSS	Mobile-Satellite Service
MWS	Multimedia Wireless Systems
NFP	National Frequency Plan
PCS	Personal Communication System
PHS	Personal Handy phone System
PMR	Private Mobile Radio
RF	Radio Frequency
RFID	Radio Frequency Identification
RLAN	Radio Local Area Network
RR	Radio Regulations
SRD	Short Range Device
TDMA	Time Division Multiple Access
TETRA	Terrestrial Enhanced Trunked Radio Access
TV	Television
UMTS	Universal Mobile Telecommunications System
UWB	Ultra Wide Band
VSAT	Very Small Aperture Terminal
WiMAX	Worldwide Interoperability for Microwave Access
Wi-Fi	Wireless Fidelity
WLAN	Wireless Local Area Network
WLL	Wireless Local Loop
WMAN	Wireless Metropolitan Area Network
WTO	World Trade Organization