



Telecommunications &  
Radiocommunications  
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## DECISION 01 OF 2018

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### The Telecommunications and Radiocommunications Regulator's Decision on the Planning for the 2100MHz Band in Vanuatu

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#### Background

The Office of the Telecommunications and Radiocommunications Regulator (TRR) released a consultation document on 6<sup>th</sup> April 2018 inviting public comment and input on the spectrum planning of the 2100MHz Band in Vanuatu. During the consultation period, The TRR received comments and feedback from service providers and interested persons, which had assisted the TRR in the making of its decision.

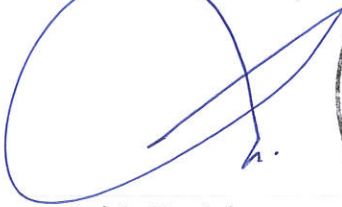
#### Decision

After assessing all the comments and feedback received from the service providers and in the exercise of the Regulator's powers and duties under the Telecommunications and Radiocommunications Regulation Act 2009 ("the Act"), I, the Telecommunications and Radiocommunications Regulator ("the Regulator") hereby make the following decisions.

1. The Regulator shall allocate the 2100 MHz band (1920-1980 MHz/2110 – 2170 MHz) for use by valid Licensees or service providers or potential service providers to provide international Mobile Telecommunications Services (IMT), mobile broadband services utilising 3G and/or 4G Long Term Evolution (LTE) technologies, or technologies that will be compatible with LTE services under the technical parameters and conditions as outlined in the Schedule hereto attached to this decision.

2. The Regulator may assign the 2100 MHz spectrum band to licensees, or service providers by means of direct assignment where supply exceeds demand or via a spectrum auction where demand exceeds supply.
3. The Regulator may set aside 2 x 15 MHz spectrum blocks in the 2100 MHz band for a new carrier (other than the current mobile service providers, namely Telecom Vanuatu Limited and Digicel (Vanuatu) Limited).
4. The Regulator may decide not to proceed in accordance with paragraph 3 above if it considers that there is sufficient spectrum in the band to provide for new entrant(s).
5. In the event where the Regulator decides to assign spectrum in the 2100 MHz band, the licensees, service providers or potential service providers will be subject to Radio Spectrum Fees as prescribed by the Regulator.

Made this 15<sup>th</sup> day of May 2018



**Dalsie Baniala**

**Telecommunications and Radiocommunications Regulator**



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## **SUMMARY OF REASONS RELATING TO THE DECISIONS ON PLANNING FOR THE 2100MHz BAND IN VANUATU**

1. Having considered the views of responders to its public consultation on Planning for the 2100 MHz Band in Vanuatu, the Regulator has concluded that it is in the public interest to proceed to allocate the 2100 MHz band for International Mobile Telecommunications (IMT) and mobile broadband services. It has also decided that the 2100 MHz band should be made available for services using 3G, 4G/LTE or technologies that will be compatible with 4G and/or LTE services under the technical parameters and conditions as set out in the Decision.

In reaching this decision, the Regulator has taken into account:

- a. The significant benefits that IMT and mobile broadband can bring to Vanuatu in terms of greater coverage and support for voice services, increased access to broadband services, greater productivity in the economy and better international roaming opportunities both for visitors to Vanuatu and for Vanuatu residents travelling to other countries;
  - b. The general level of support amongst respondents for the allocation of the 2100 MHz band;
  - c. The benefits for international roaming if Vanuatu adopts the same or similar technologies adopted in other countries in the region and elsewhere;
  - d. The widespread adoption of 3G and 4G technologies nationally and internationally;
  - e. The support amongst most responders for the technical conditions proposed in the Consultation Paper; and
  - f. The need to ensure that interference to, from and between services using the band is manageable.
2. The Regulator has concluded that the best way of assigning this spectrum is by direct assignment. In reaching this decision, the Regulator has taken into account:
    - a. The requirement under the Radio Apparatus Licence and Spectrum Licence (Fees) Regulation (Order No 153 of 2012) that the Regulator is to “charge the



- assignment of spectrum using the administrative incentive pricing or spectrum auctions whichever is appropriate under the circumstance”;
- b. The greater fairness and transparency of direct assignment compared to other assignment methods;
  - c. The prospect that there may be less demand for this spectrum than can be met by the available supply, based on requests to the Regulator for access to this spectrum;
3. The Regulator’s decision to set aside 2 x 15 MHz spectrum blocks for a third mobile operator is based on the advantages that would arise to consumers from an increase in competition in the Vanuatu markets for mobile and broadband services.
  4. The Regulator has decided that if it proceeds to assign spectrum in the 2100 MHz band, the licences will be subject to Radio Spectrum Fees to be determined by the Regulator. This is consistent with the requirements of the Radio Apparatus Licence and Spectrum Licence (Fees) Regulation (Order No 153 of 2012) that the Regulator is to “charge the assignment of spectrum using the administrative incentive pricing or spectrum auctions whichever is appropriate under the circumstance”. The administrative incentive price would be the Radio Spectrum Fee.

## **SCHEDULE:**

### **TECHNICAL PARAMETERS AND CONDITIONS**

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#### **1.1 BASIS OF PARAMETERS**

The limits for the technical framework for the terminal stations are based on 3GPP values for a 5 – 10 MHz E-UTRA (LTE) channel.

The limits for base stations are based on a combination of the European values which can also be used in other countries. In order to help preserve options for future planning of the frequencies above 2170 MHz, an additional requirement is for out-of-band emissions above 2173 MHz. Since there is not yet any decision on what will eventually occupy this spectrum, these values have been determined based on both the values given in 3GPP TS36.104 v10.3.0 and the European values.

Any system which meets the 3GPP standards for Band 1 (1920 – 1980 MHz/2110 – 2170 MHz) will be able to operate in Vanuatu.

The powers are expressed as radiated powers, these are the powers transmitted from the antenna of the system.

#### **1.2 Out of Band Limits**

The limits in this sub clause are intended for Europe and may be applied regionally and/or internationally for Base Station (BS) operating in band 1 (1920 – 1980 MHz/2110 – 2170 MHz).

For a BS operating in band 1 (1920 – 1980 MHz/2110 – 2170 MHz) emissions shall not exceed the maximum levels specified in Table 1 below for 5, 10, 15 and 20 MHz channel bandwidth:

Frequency offset of measurement filter -3dB point, $\Delta f$	Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Minimum requirement (Note 1, 2)	Measurement bandwidth (Note 8)
$0 \text{ MHz} \leq \Delta f < 0.2 \text{ MHz}$	$0.015 \text{ MHz} \leq f_{\text{offset}} < 0.215 \text{ MHz}$	-14 dBm	30 kHz
$0.2 \text{ MHz} \leq \Delta f < 1 \text{ MHz}$	$0.215 \text{ MHz} \leq f_{\text{offset}} < 1.015 \text{ MHz}$	$-14 \text{ dBm} - 15 \cdot \left( \frac{f_{\text{offset}}}{\text{MHz}} - 0.215 \right) \text{ dB}$	30 kHz
(Note 9)	$1.015 \text{ MHz} \leq f_{\text{offset}} < 1.5 \text{ MHz}$	-26 dBm	30 kHz
$1 \text{ MHz} \leq \Delta f \leq \min(10 \text{ MHz}, \Delta f_{\text{max}})$	$1.5 \text{ MHz} \leq f_{\text{offset}} < \min(10.5 \text{ MHz}, f_{\text{offset}_{\text{max}}})$	-13 dBm	1 MHz
$10 \text{ MHz} \leq \Delta f \leq \Delta f_{\text{max}}$	$10.5 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-15 dBm (Note 10)	1 MHz

NOTE 1: For a BS supporting non-contiguous spectrum operation within any operating band, the minimum requirement within sub-block gaps is calculated as a cumulative sum of contributions from adjacent sub blocks on each side of the sub block gap, where the contribution from the far-end sub-block shall be scaled according to the measurement bandwidth of the near-end sub-block. Exception is  $\Delta f \geq 10 \text{ MHz}$  from both adjacent sub blocks on each side of the sub-block gap, where the minimum requirement within sub-block gaps shall be -15dBm/1MHz.

NOTE 2: For BS supporting multi-band operation with Inter RF Bandwidth gap < 20MHz the minimum requirement within the Inter RF Bandwidth gaps is calculated as a cumulative sum of contributions from adjacent sub-blocks or RF Bandwidth on each side of the Inter RF Bandwidth gap, where the contribution from the far-end sub-block or RF Bandwidth shall be scaled according to the measurement bandwidth of the near-end sub-block or RF Bandwidth.

NOTE 8: As a general rule for the requirements in sub clause 1.2, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

NOTE 9: This frequency range ensures that the range of values of  $f_{\text{offset}}$  is continuous.

NOTE 10: The requirement is not applicable when  $\Delta f_{\text{max}} < 10 \text{ MHz}$

Table 1: Regional Wide Area BS operating band unwanted emission limits in band 1 (1920 – 1980 MHz/2110 – 2170 MHz) for 5, 10, 15 and 20 MHz channel bandwidth for Category B



In certain regions the following requirement may apply for the protection of systems operating in frequency bands adjacent to band 1 as defined in Table 2 below, in geographic areas in which both an adjacent band service E-UTRA are deployed.

These requirements may be applied for the protection of other systems operating inside or near each supported E-UTRA BS downlink operating band. The limits may apply as an optional protection of such systems that are deployed in the same geographical area as the E-UTRA BS, or they may be set by local or regional regulation as a mandatory requirement for an E-UTRA operating band.

The power of any spurious emission shall not exceed:

Operating Band	Frequency range	Maximum Level	Measurement Bandwidth
1	2100-2105 MHz	$-30 + 3.4 \cdot (f - 2100 \text{ MHz}) \text{ dBm}$	1 MHz
	2175-2180 MHz	$-30 + 3.4 \cdot (2180 \text{ MHz} - f) \text{ dBm}$	1 MHz

Table 2: Emissions limits for protection of adjacent band services

### 1.3 REFERENCE STANDARDS

The following references were used to determine the technical parameters described above.

Reference technology	Applicable standards and reports
UMTS (UTRA, WCDMA, HSPA, HSPA+)	ITU-R Report M.2039-2, 3GPP TS 25.101, 3GPP TS 25.104, 3GPP TS 24.942, ECC Report 82, ECC Report 96
LTE	ITU-R Report M.2039-2, 3GPP TS 36.101, 3GPP TS 36.104, 3GPP TS 36.942

Table 3 Reference Standards used in the 2100 MHz Band Plan