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## **INFORMATION MEMORANDUM**

**SPECTRUM AUCTION OF NEXT GENERATION  
MOBILE SERVICES (NGMS) IN AZAD JAMMU AND  
KASHMIR (AJ&K) AND GILGIT BALTISTAN (GB) –  
2021**

**17<sup>th</sup> August, 2021**

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# 1 Executive Summary

## 1.1 Preamble and Purpose

- 1.1.1 Pakistan Telecommunication Authority (**PTA**), established under section 3 of the Pakistan Telecommunication (Reorganization) Act, 1996 with the mandate to regulate the establishment, operation and maintenance of telecommunication system and provision of telecommunication services in Azad Jammu and Kashmir (AJ&K) by virtue of the Azad Jammu and Kashmir Council Adaptation of Pakistan Telecommunication (Re- Organization) Act, 2005 (including all amendments made from time to time) and in Gilgit Baltistan (GB) by virtue of Gilgit Baltistan Council Adaptation of Laws Act, 2012 (including all amendments made from time to time), in compliance with the Policy Directive No. 1-2/2020-DT dated 11<sup>th</sup> August 2021 (the **Policy Directive**), is proceeding to award Licenses for use of radio frequency spectrum in the 1800 MHz and 2100 MHz bands through an Auction in AJ&K and GB.
- 1.1.2 The process of the award is titled as the “**Spectrum Auction of Next Generation Mobile Services (NGMS) in Azad Jammu and Kashmir (AJ&K) and Gilgit Baltistan (GB) - 2021**”.
- 1.1.3 This Information Memorandum (**IM**) sets out the rules, process, planned timelines and other background information for prospective Applicants to participate in the Spectrum Auction of NGMS in AJ&K and GB. An overview of the AJ&K and GB’s telecommunications sector is given in **Annex A**.
- 1.1.4 Prospective Applicants are advised to seek their own expert advice on whether or not to participate in the Spectrum Auction of NGMS in AJ&K and GB and on any other matters concerning financial, legal, technical or other implications of the Spectrum Auction of NGMS in AJ&K and GB and associated policies.
- 1.1.5 PTA may also conduct an information session for prospective Applicants to explain the process and rules of the Spectrum Auction of NGMS in AJ&K and GB and to respond to all Applicants’ questions to clarify any questions that prospective Applicants may have about the Spectrum Auction of NGMS in AJ&K and GB.
- 1.1.6 Furthermore, PTA will conduct a mock Auction of the Electronic Auction Stage with relevant Qualified Applicants so that all relevant Qualified Applicants are familiar with the Electronic Auction Stage and Auction Management System.
- 1.1.7 While every effort has been made to ensure the information contained in this IM is accurate as at the time of publishing on PTA’s website. Neither PTA, Frequency Allocation Board (**FAB**), the Government of Pakistan (**GoP**), the AJ&K Council and GB Council (the **Councils**), nor any of their respective officers, employees, consultants or advisers make any representation or warranty or have any liability in relation to the accuracy or completeness of the information contained in this IM or any other written or oral information made available to any interested party or its advisors, whether prior to or after the date of this IM. PTA, FAB, GoP and the Councils expressly disclaim any responsibility or liability in respect of any such information or any inaccuracy in this IM or omission from this IM.

**Note:** Specialist terms used in this IM are defined in Section 7.

## 1.2 Legal Framework

1.2.1 The legal framework applicable to all Applicants is:

- a) The Azad Jammu and Kashmir Council Adaptation of Pakistan Telecommunication (Re- Organization) Act, 2005 (*including amendment made from time to time*);
- b) Gilgit Baltistan Council Adaptation of Laws Act, 2012 (including amendment made from time to time);
- c) All relevant applicable rules, regulations, policies / directives; and
- d) All PTA determinations / directives / decision / guidelines / Standard Operating Procedures (SOPs) issued from time to time including relevant decisions of the FAB.

1.2.2 For information, the key organizations of the institutional framework, in addition to PTA and FAB, are the Ministry of Information Technology and Telecommunication (**MoIT&T**) and AJ&K and GB Councils. Relevant websites are provided below:

- a) MoIT&T: <http://www.moitt.gov.pk> ;
- b) PTA: <http://www.pta.gov.pk> ;
- c) FAB: <http://www.fab.gov.pk/>;
- d) AJ&K Government: <https://www.ajk.gov.pk/> ;and
- e) GB Government: <https://gba.gov.pk/>.

1.2.3 Documents relevant to the legal frameworks are available on above mentioned websites.

## 1.3 Overview of the Spectrum

1.3.1 The Spectrum Auction of NGMS in AJ&K and GB is for use of spectrum from the internationally harmonised 1800 MHz and 2100 MHz bands within AJ&K and GB. The spectrum included in the Spectrum Auction of NGMS in AJ&K and GB comprises:

- a) 2 x 16 MHz in the 1800 MHz band; and
- b) 2 x 30 MHz (1930-1950 MHz / 2120–2140 MHz and 1960-1970 MHz / 2150-2160 MHz) in the 2100 MHz band.

### **1800 MHz**

1.3.2 The 2x16 MHz of spectrum will be packaged as two blocks of 2x5 MHz and five blocks of 2x1.2MHz.

### **2100 MHz**

1.3.3 The 2x30 MHz in the 2100 MHz band will be packaged as six specific blocks of 2x5 MHz:

- a) 2x5 MHz (1930-1935 MHz / 2120-2125 MHz);
- b) 2x5 MHz (1935-1940 MHz / 2125-2130 MHz);
- c) 2x5 MHz (1940-1945 MHz / 2130-2135 MHz);
- d) 2x5 MHz (1945-1950 MHz/ 2135-2140 MHz);
- e) 2x5 MHz (1960-1965 MHz/ 2150-2155 MHz);and
- f) 2x5 MHz (1965-1970 MHz/2155-2160 MHz).

1.3.4 The current allocation of spectrum bands is defined in the Pakistan Table of Frequency Allocations which is consistent with the International Telecommunications Union (**ITU**) allocations for Region 3. The Table of Frequency Allocations provides the 1800 MHz

and 2100 MHz bands to be allocated to mobile services on a primary basis in AJ&K and GB.

#### 1.4 Spectrum Auction Process

- 1.4.1 Licenses to use the spectrum will be awarded, *for a duration of fifteen years*, by means of a two stage process. Section 3 of this IM describes this process in detail while Section 4 of this IM explains the bidding process and rules in more detail for the Electronic Auction Stage, if so required. The draft License template applicable to spectrum in the 1800 MHz and 2100 MHz bands is attached as Annex F to this IM.

##### **Stage 1 of Spectrum Auction (Application Form, Sealed-Bid Form and Pre-bid Deposit)**

- 1.4.2 In this stage, all Applicants will be required to provide information as per the **Application Form** given in Annex B. All Applicants will also be required to submit, along with their application, an irrevocable **Sealed-Bid Form**, as per Annex E.
- 1.4.3 In the Sealed-Bid Form and subject to the rules set out in this IM, each Applicant will be required to state their interest in the following spectrum at the Base Price:
- a) Product 1: Up to 2 blocks of 2x5 MHz in 1800 MHz;
  - b) Product 2: Up to 5 blocks of 2x1.2MHz in 1800 MHz;
  - c) Product 3: Between 1 and 6 blocks of 2x5 MHz in 2100 MHz:
    - i.) Block 1: (1930-1935 MHz / 2120-2125 MHz);
    - ii.) Block 2: (1935-1940 MHz / 2125-2130 MHz);
    - iii.) Block 3: (1940-1945 MHz / 2130-2135 MHz);
    - iv.) Block 4: (1945-1950 MHz / 2135-2140 MHz);
    - v.) Block 5: (1960-1965 MHz / 2150-2155 MHz); and
    - vi.) Block 6: (1965-1970 MHz /2155-2160 MHz).
- 1.4.4 Applicants will also be required to submit a Pre-Bid Deposit at this stage for 20% of the cumulative Base Price for those blocks on which they have expressed their interest, as per **Annex E**.
- 1.4.5 The information submitted by Applicants will be assessed by PTA and only those considered suitable for participation and who have submitted the correct Pre-bid Deposit, as per the timelines set, will be informed that they are **Qualified Applicants**.
- 1.4.6 For all remaining Applicants (i.e. those that are not Qualified Applicants), PTA will return the Pre-Bid Deposit and submitted information within 30 days of concluding the Spectrum Auction process.
- 1.4.7 PTA will then assess the demand for spectrum across the Products in the Sealed-Bid Forms from all Qualified Applicants. This is to determine whether total demand for any Category in the Sealed-Bid Form exceeds the total spectrum available in that Category, as this determines the need to move to the Electronic Auction Stage for these categories. When determining demand for 2100 MHz spectrum PTA will include any demand resulting from the Eligibility Adjustment in that band. The Eligibility Adjustment is discussed in Section 3.4:
- a) If total demand for spectrum in any Product in the Sealed-Bid Forms matches or is less than the total spectrum available in that Product, PTA will provisionally assign the spectrum in those Products based on the Sealed-Bids of each Qualified Applicant at the Base Price (i.e. no Electronic Auction Stage is required).

- b) If total expressed demand in the Sealed-Bid Forms from all Qualified Applicants for any Product exceeds the available supply of spectrum in that Product, PTA will then proceed to the **Electronic Auction Stage** for that Product or Products. In that case, PTA will notify the Qualified Applicants within three days about the upcoming Electronic Auction Stage.
- i.) If there is excess demand for the 1800 MHz spectrum, but no excess demand for Blocks 1 to 6 of 2100 MHz (after the Eligibility Adjustment, discussed below), Blocks 1 to 6 will be provisionally assigned at the Base Price, while the 1800 MHz spectrum will be allocated using the Electronic Auction Stage (see Section 4.1 for more details on the Electronic Auction Stage for 1800 MHz Auction). Equally, if there is excess demand for just one product in the 1800 MHz band (either Product 1 or Product 2), only the product with excess demand will be allocated using the Electronic Auction Stage, while the other product (with no excess demand) will be provisionally assigned at the Base Price;
  - ii.) Similarly, if there is no excess demand for Product 1 and Product 2, but there is excess demand for at least one Block in the 2100 MHz band (Blocks 1 to 6), PTA will proceed to provisionally assign the 1800 MHz spectrum at the Base Price and allocate the 2100 MHz spectrum using the Electronic Auction Stage (see Section 4.2 for more details on the Electronic Auction Stage for 2100 MHz Auction); and
  - iii.) Finally, if there is excess demand for both the 1800 MHz and 2100 MHz spectrum, then the 1800 MHz and the 2100 MHz spectrum will be allocated using the Electronic Auction Stage (i.e. in separate and sequential electronic auctions, as set out further below).

#### **Stage 2 of the Spectrum Auction (Electronic Auction Stage )**

1.4.8 The Electronic Auction Stage will be conducted sequentially:

- a) First - A **Clock Auction** for the 1800 MHz spectrum; and
- b) Second - A Simultaneous Multi-Round Ascending Auction (**SMRA**) for the 2100 MHz spectrum.

1.4.9 For the avoidance of doubt, a Qualified Applicant does not need to participate in the Clock Auction of 1800 MHz spectrum in order to participate in the SMRA for the 2100 MHz spectrum, and *vice versa*.

### **1.5 Rationalisation of 1800 MHz Spectrum**

1.5.1 Pursuant to the Policy Directive, PTA/FAB shall undertake a process for the rationalisation of spectrum in the 1800 MHz band to achieve contiguity where feasible (the **Rationalisation Process**). PTA, however, notes that its ability to ensure contiguous spectrum holdings in this band will depend on the outcome of the Auction.

1.5.2 The Rationalisation Process will involve the entire spectrum in 1800 MHz band and all CMOs, irrespective of their participation in the Auction. The Rationalisation Process will be conducted in accordance with the timeline set out in Section 1.7 of this IM.

- 1.5.3 Under the Rationalisation Process, PTA will endeavour to group together, in the 1800 MHz band, each CMO's existing spectrum and the auctioned spectrum.
- 1.5.4 This may involve a CMO's existing spectrum changing from its current position, either up or down in the band.

**EXAMPLE**

Suppose one CMO has 2x8.8 MHz of existing spectrum and that it acquires 2x1.2 MHz in the Auction. In that case, PTA will endeavour to group its 2x8.8 MHz of existing spectrum adjacent to its 1.2 MHz of auction spectrum, to make a contiguous block of 2x10 MHz.

- 1.5.5 PTA in consultation with FAB shall publish a Rationalisation Plan (which takes into account to achieve contiguity) as per timelines mentioned in Table 1.
- 1.5.6 In that Rationalisation Plan, PTA will specify the date for each CMO to implement the reassignment or change of the spectrum within its network, with a view to minimise disruption to each CMO, *where practicable*, in achieving this reassignment or change. CMOs will be required to implement the re-assignment or change in accordance with the Rationalisation Plan within thirty (30) days as per the undertaking provided as part of the Application Form in Annex B of the IM.
- 1.5.7 Although the Rationalisation Process will involve a CMO changing its position in the 1800 MHz band, and re-assignment of previously occupied spectrum to another CMO, with a view to ensuring the optimal utilization of contiguous and standard spectrum holdings, there will be no reduction in any CMO's Existing Spectrum.
- 1.5.8 Any re-assignment/change as contemplated by the Rationalisation Process will not require the payment of compensation by PTA. Furthermore, no CMO will claim for any sort of compensation for readjustment.

**1.6 Spectrum Cap**

- 1.6.1 No spectrum cap has been imposed in this Auction.

**1.7 Timelines for the Spectrum Auction**

- 1.7.1 PTA reserves the right to determine and amend the overall timelines of the Spectrum Auction of NGMS in AJ&K and GB, taking into account of all the circumstances prevailing at the specific time. However, in order to assist prospective Applicants in the preparation of their applications, Table 1 below provides an indication of the intended timeline:

**Table 1: Timeline for the process of the Spectrum Auction of NGMS in AJ&K and GB**

No.	Process step	Timeline (T0*/T1 + No. of days)
1.	Publication of Information Memorandum	T0
2.	Consultation period on the Spectrum Auction rules and procedures as set out in the Information Memorandum	T0 + [21]

No.	Process step	Timeline (T0*/T1 + No. of days)
3.	Notification of changes to the Spectrum Auction of NGMS in AJ&K and GB rules and procedures, if any, and publication of any changes to the IM	T0 + [26]
4.	Information session for prospective Applicants (last opportunity for prospective Applicants to ask questions and get clarification on specifics of the Spectrum Auction), if required	T0 + [30]
5.	Deadline for prospective Applicants to submit Application Form and Sealed-Bid Form with Pre-Bid Deposits (Annex B and Annex E)	T1 = T0 + [35] (till 4 pm Pakistan Standard Time)
6.	PTA notifies Qualified Applicant(s) and informs all Qualified Applicants whether the Auction shall move to the Electronic Auction Stage or PTA declares Qualified Applicants as Provisional Winners.	T1 + [1]
7.	If PTA proceeds with the Electronic Auction Stage, an information package containing confidential information and instructions to participate in the Electronic Auction Stage is provided to Qualified Applicants eligible to participate in the stage.	T1 + [2]
8.	Mock Auction (1800 MHz and 2100 MHz), if required, for eligible Qualified Applicants	T1 + [5]
9.	Clock Auction bidding starts, if required	T1 + [6]
10.	SMRA Auction bidding starts, if required, for eligible Qualified Applicants	T1 + [7]
11.	Provisional Winners announced for both spectrum bands	No more than [1] day after completion of the Electronic Auction Stage, if required
12.	Initial Spectrum Fees due from Provisional Winners for all Spectrum Blocks acquired in the Spectrum Auction (i.e. 50% or 100% payment of the Initial Spectrum Fee).	According to the schedule in Section 2.5 of this IM
13.	PTA in consultation with FAB to issue Rationalisation Plan for the 1800MHz band and, if necessary, proposed band plan for 2100 MHz band.	After receipt of all relevant Initial Spectrum Fee
14.	Deadline for CMOs to implement Rationalisation Plan for the 1800MHz band;	Within 30 days of PTA having published the Rationalisation Plan
15.	Grant of Licenses/Assignment of right to use of spectrum	After having received the 50% or 100% of the Initial Spectrum Fee and implementation of Rationalization Plan
*T0 (17 <sup>th</sup> August 2021) is the date of publication of the IM. These dates/timelines are subject to change as deemed necessary by the PTA.		

## **1.8 Measures to Promote Market Entry, Innovation and Competition**

1.8.1 The Spectrum Auction of NGMS in AJ&K and GB will enable market entry, innovation and competition through a number of Council/GoP policies and directives. These include, but are not limited to:

### **a) Market Entry**

- i.) All the existing CMOs and potential **New Entrant(s)** may apply to participate in the Auction process; and
- ii.) A potential New Entrant in the Cellular Mobile Market gaining spectrum in the Spectrum Auction of NGMS in AJ&K and GB is encouraged to negotiate national roaming with existing CMOs.

### **b) Significant Market Power (SMP)**

If PTA determines that a Licensee possesses SMP in a relevant geographical market, the Licensee shall comply with orders/decisions of PTA that are intended to prohibit abuse of its SMP position through anti-competitive conduct or to promote competition in respect of that relevant market or markets ancillary thereto. These include certain remedies specified in the License.

### **c) National Roaming**

A Licensee is encouraged to negotiate a commercial arrangement with one or more Operators for national roaming so that the Licensee can provide seamless Voice, Data and other services, if any. If no such agreement can be reached after negotiation in good faith by the Licensee and the Operator, then the parties will resolve the matter as per applicable framework.

### **d) International Roaming**

CMOs shall use their best efforts to enter into the necessary agreements with foreign operators in order to enable and provide international roaming to their subscribers. CMOs must follow PTA guidelines / direction(s) on international roaming which may be issued from time to time.

### **e) Infrastructure Sharing and Spectrum Trading**

- i.) CMOs are required to share their existing and future infrastructure with other operators, on request by that other operator. As a minimum, the infrastructure to be shared shall be site sharing and mast sharing; and
- ii.) CMOs may enter into commercial arrangements with each other for active sharing. However, such arrangement shall not take effect until such time as the relevant guidelines are in place and subject to the formal approval and comprehensive framework of PTA. CMOs may enter into commercial arrangement with each other for Spectrum Sharing and Trading, however such arrangement shall not take effect until it is approved by PTA as per applicable framework.

### **f) Mobile Virtual Network Operators (MVNOs)**

CMOs are encouraged to support MVNO Services, as required under the framework prepared and published by PTA from time to time.

**g) Numbering**

Numbering resources already allocated to CMOs may also be used for spectrum awarded in the Spectrum Auction. A New Entrant can request numbering series as per the procedure and regulations devised by PTA. New Entrant in the Cellular Mobile Market shall be provided a unique network identity code.

**h) Mobile Number Portability (MNP)**

The CMOs shall implement MNP according to the regulations/ guidelines issued by PTA from time to time.

**i) Quality of Service (QoS)**

A Winner of the spectrum shall provide services with QoS standards defined in Section 2.3 of this IM and as set out in the License.

**1.9 Structure of the Information Memorandum**

1.9.1 The remainder of this IM is structured as follows:

**Section 2** – Description of spectrum available and the License template;

**Section 3** – Description of the Spectrum Auction process;

**Section 4** - Overview of the bidding procedures and rules for the Electronic Auction Stage;

**Section 5** - Terms and Conditions, including payment terms, relating to the Spectrum Auction of NGMS in AJ&K and GB;

**Section 6** - Detailed application instructions; and

**Section 7** - Definition of Terms.

## 2 License Description

### 2.1 License Structure

#### 2.1.1 Overview:

A License for spectrum awarded in the Spectrum Auction of AJ&K and GB provides non-exclusive right for use of the frequencies assigned to that successful Applicant. The services permitted will be governed by each specific License. The territorial extent of each License is Azad Jammu & Kashmir (**AJ&K**) and Gilgit Baltistan (**GB**).

#### 2.1.2 License Duration

The duration of the License shall be fifteen (15) years from the License Effective Date, which may be renewable on terms and conditions as per policy at the time of renewal. In order to align the expiry dates of Licenses of existing CMOs with the Licenses/ right to use spectrum awarded in this Auction, para (k) of Policy Directive dated 11<sup>th</sup> August 2021 will be followed in consultation with CMOs.

#### 2.1.3 License

License Template is attached at Annex F. If there are any differences between the Licensee's<sup>1</sup> rights and obligations described in this IM and the License template at Annex F, then the License (Annex F) shall prevail.

### 2.2 Definition of Spectrum being Offered

2.2.1 The current assignment of frequencies to CMOs and other stakeholders in AJ&K and GB is available to view on the FAB website ([www.fab.gov.pk](http://www.fab.gov.pk)). The spectrum offered in the Spectrum Auction of NGMS in AJ&K and GB is described in Section 1.3 of this IM.

#### a) Limitations on Use

- i.) The successful Applicant for the spectrum will be granted a non-exclusive License on a technology neutral basis for the establishment, maintenance and operation of the Licensed System to provide licensed services in AJ&K and GB.
- ii.) The Licensee shall ensure compliance with ETSI, ANSI, ITU, IEC standards etc and will have to take all possible measures while installing, maintaining and operating its network to ensure that the out-of-band emissions are under the permissible limits defined by 3GPP Technical Specifications. The Licensee will also have to take all possible measures while installing, maintaining and operating its network to ensure that there is no interference to other Licensees' networks and to ensure that any unwanted signals from other spectrum users are sufficiently mitigated. In case there is any intermittent receiver blocking phenomenon experienced by other Licensees or the Licensee is experiencing intermittent receiver blocking phenomenon from wireless local loop (**WLL**) operators operating in the band adjacent to the 2100 MHz band, the Licensee will have to make adjustments to its network to eliminate interference as per the above referred standards. The

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<sup>1</sup> In this IM, the PTA refers to CMOs and New Entrants that have acquired a License in the NGMS Spectrum Auction in AJ&K and GB - 2021 as Licensees.

Licensee will also be required to make all reasonable efforts to coordinate use of the spectrum with operators using adjacent frequencies as identified by the FAB.

- iii.) The License shall be personal to the Licensee and shall not be assigned, sub-licensed to, or held on trust for another person, without the prior written approval of PTA.

**b) The Spectrum Blocks offered in this Auction**

Spectrum will be assigned as specific Spectrum Blocks, structured on the following basis:

**Table 2: Spectrum Block included in the Spectrum Auction of NGMS in AJ&K and GB**

Spectrum Band	Spectrum Quantity	Blocks
1800 MHz	2x16 MHz	Packaged as: Product 1 (two blocks of 2x5 MHz) Product 2 (five blocks of 2x1.2 MHz)
2100 MHz	2x30 MHz	Packaged as six blocks of 2x5 MHz: i.) 1930-1935 MHz / 2120-2125 MHz; ii.) 1935-1940 MHz / 2125-2130 MHz; iii.) 1940-1945 MHz / 2130-2135 MHz; iv.) 1945-1950 MHz/ 2135-2140 MHz; v.) 1960-1965 MHz/ 2150-2155 MHz; vi.) 1965-1970 MHz/2155-2160 MHz.

**c) Technical Requirements**

- i.) The Auctioned spectrum will be assigned on a technology neutral basis. However, Licensees must meet certain procedural requirements for spectrum management to minimise interference and to enhance QoS, etc:
  - (1) Technologies implemented shall use the Frequency Division Duplex (**FDD**) access method and be compliant with the out-of-block (**OOB**) emission limits stipulated in the relevant 3GPP Technical Specifications. The Licensee shall be solely responsible for meeting all regulatory obligations;
  - (2) The Licensee shall operate radio communication apparatus and devices in compliance with all requirements of PTA and FAB pertaining to emissions, frequencies for operation, site clearance, technical characteristics, power and aerial characteristics etc.; and
  - (3) The Licensee shall allow inspection of any premises by a representative of PTA at any time and shall furnish to the representative such information as may be required by PTA.

**2.3 Coverage and Quality of Service Obligations**

- 2.3.1 PTA encourages the provision of mobile communications services throughout AJ&K and GB by all CMOs. PTA envisions maximum population of AJ&K and GB to be served with high quality Voice and Mobile Broadband Services. A Licensee will be

obliged to roll out its network as defined in the License Template attached at Annex F (which provides the necessary details).

2.3.2 The Licensee shall maintain the QoS as defined in the License. This will include Key Performance Indicators (**KPIs**) to ensure that voice and data performance levels achieve the desired standards. KPI thresholds regarding user data throughput and signal strength must be achieved as provided in license template.

2.3.3 A full list of performance requirements is defined in Appendix 3 of the License template in Annex F. PTA may revise the QoS standards and above-mentioned targets at any time. In addition, any QoS KPIs revised in future and regulations made thereto by the PTA for licensed services shall be strictly followed by the Licensee.

## 2.4 Other license Terms and Conditions

2.4.1 The service obligations defined in the License templates are summarised in Table 4. These are presented in detail in the License template in Annex F. Capitalised terms included in Table 4 are defined in the License Template.

**Table 4: Other service obligations**

<b>Obligations</b>	<b>Requirements</b>
<b>Emergency services</b>	Provision of mandatory emergency services as determined by PTA.
<b>Lawful interception</b>	Cooperation with Law Enforcement and Security Agencies. The Licensee shall also comply with Critical Telecom Data and Infrastructure Security Regulations, 2020 and its amendments (if any) issued from time to time.
<b>Non-discrimination</b>	The services shall not discriminate between end-users, in particular with regard but not limited to, quality, availability and reliability of the service
<b>Tariffs</b>	Tariffs must be offered in accordance with Telecom Consumer Protection Regulations 2009 and other related regulations/determinations/orders available or issued from time to time. The Tariffs shall not be unfair, burdensome or anti-competitive. If PTA determines that the Licensee possesses SMP in a relevant market, PTA may regulate Licensee's prices, terms and conditions for those Licensed Services in the SMP market and any Licensed Services incidental thereto. The method of regulation shall be determined by PTA and may include a requirement for prior approval of PTA for any price or non-price term or condition, or the maximum or minimum price, or both, for the Licensed Services.
<b>Billing</b>	Provision of detailed and precise billing to end-users upon request
<b>Data protection</b>	Compliance with laws regarding privacy and data protection
<b>Provision of information</b>	The Licensee shall provide technical details for the deployed network equipment upon request. The Licensee shall provide up to date information in the manner as and when required by PTA
<b>Interconnection</b>	On request of another Licensee, the Licensee shall enter into an agreement to connect and keep connected the Licensee's Licensed System to the Telecommunications Network run by the requesting operator at specified points of interconnection

Obligations	Requirements
	and to provide such other mobile communications services as are reasonably requested in order for the requesting operator to provide mobile communications services to its customers. If the Authority determines that the Licensee has SMP in the relevant telecommunications market under the Rules issued from time to time then termination charges shall be offered at cost based rates as determined by the Authority or in line with the methodology set by the Authority, with reasonable margin or in line with the methodology set by PTA through industry consultation.
<b>Site clearance</b>	Obligations with regard to clearance of cell sites as per Standard Operating Procedure of PTA/FAB. In addition to SOP for BTS site clearance, the Licensee shall follow "Protection from Health Related Effects of Radio Base Station Antennas Regulation 2008" including amendments, while installing and operating radio base station antennas.
<b>Access for Inspection</b>	The Licensee shall provide access to all radio equipment for inspection upon request.
<b>National Security</b>	Obligations with regard to National Security including but not limited to provision of Lawful Interception System, CDRs and IPDRs etc.
<b>Relations with Customers</b>	Requirements for the Licensee to submit standard service contracts and Code of Commercial Practice to PTA for approval and establishment of complaint system
<b>Performance Bond</b>	The Licensee will provide the performance bond as described in section 4.4, as security against its network coverage obligations
<b>Quality of service</b>	The Licensee shall at all times meet or exceed the Quality of Service standards described in Appendix-3 of the License template. In addition, any QoS KPIs devised in future and regulations made thereto by PTA for the Licensed Services shall be strictly followed by the Licensee

## 2.5 Fees

2.5.1 Table 5 below describes the relevant fees associated with the License. In addition to Table 5 all relevant taxes, fees, levies imposed by Councils or GoP shall be applicable.

**Table 5: Fee structure**

Fee/charges	Amount due
Initial Spectrum Fees (ISF)	<p>The ISF shall be the Auction Winning Price in the process of the Spectrum Auction of NGMS in AJ&amp;K and GB that shall be determined in US Dollars. The ISF shall be paid in US Dollars or its equivalent in Pakistan Rupees to be converted at the National Bank of Pakistan (NBP) Telegraphic Transfer (TT) selling rate prevailing on the day preceding the date of payment.</p> <p>The Provisional Winner shall pay 50% of the total ISF amount within one month of the auction date, taking into account the Pre-Bid Deposit. The remaining 50% of the total ISF shall be payable in ten (10) equal annual instalments.</p>

Fee/charges	Amount due
	<p>The Licensee may pay the remaining balance of the ISF at any time before the end of 10 years, without any pre-payment penalties.</p> <p>If any payment of the ISF, including any instalment, becomes overdue, PTA may serve upon the Licensee a show cause notice stating the default and seeking explanation, allowing it not less than seven days, as to why its License shall not be suspended or revoked. On considering the Licensee's explanation, PTA may suspend or revoke the License as deemed appropriate. PTA and the Licensee have agreed to this term in the light of the spirit of Section 28 of the Contract Act, 1872 and despite Section 23 of the Act read with Rule 9 of the Pakistan Telecom Rules, 2000.</p>
Annual License Fee (ALF)	<p>The Licensee shall pay the ALF to PTA, an amount equivalent to 0.5% of the Licensee's annual gross revenue from Licensed Services for the relevant financial year, minus inter-operator costs and related PTA / FAB mandated payments. In the case of PTA / FAB mandated payments including contributions, this deduction will be allowed if these amounts have actually been paid and not on accrual basis.</p> <p>However, ISF/ILF instalments, any amount paid/payable to foreign carriers, leased line charges, collection charges, late payment additional fee, penalties, and other expenses imposed by PTA, if any, shall not be deducted from the gross revenue.</p>
Universal Service Fund (USF) Contribution	<p>The Licensee shall pay an annual USF contribution to PTA, an amount equivalent to 2% of the Licensee's annual gross revenue from Licensed Services for the relevant financial year, minus inter operator payments and related PTA / FAB mandated payments. In the case of PTA / FAB mandated payments including contributions, this deduction will be allowed if these amounts have actually been paid and not on accrual basis. However, ISF/ILF instalments, any amount paid/payable to foreign carriers, leased line charges, collection charges, late payment additional fee, penalties and other expenses imposed by PTA, if any, shall not be deducted from the gross revenue.</p>
Annual Radio Spectrum Administration Fee (ARFSF)	<p>The Licensee shall pay ARFSF within 120 days of close of its financial year to PTA on the basis of Rs 120,000 per MHz per annum or as determined by the Authority from time to time.</p> <p>For first year, ARFSF will be billed on time (period) proportionate basis pursuant to additional spectrum assigned to CMOs during the auction.</p>
Annual Numbering Charges	<p>For each number allocated to the Licensee, annual number charges are payable in advance to PTA by the due date on 30th June each year in accordance with the Numbering Allocation &amp; Administration Regulations, 2018 including amendment made from time to time.</p>
Late Payment Additional Fee (LPAF)	<p>In case of delay in any payment of any fees, charges, contributions, the Licensee shall pay LPAF at the rate of 2% per month or part thereof from the due date until the date of payment.</p>

## 2.6 Base Price

- 2.6.1 The Base Price for the Spectrum included in the Auction is detailed in Tables 6 and 7. This Base Price will be used to determine the Starting Price for each Spectrum Block offered in the Auction as specified below. These are based on the per MHz Base Price (Paired Spectrum) set out in the Policy Directive. For the avoidance of doubt, bids in the Sealed Bid Stage shall be placed at the Base Price:

**Table 6: Base price expressed on a Per MHz basis (Paired Spectrum)**

Spectrum band	Spectrum quantity	Base Price
1800 MHz	2x1 MHz	USD 0.87 million
2100 MHz	2x1 MHz	USD 0.87 million

- 2.6.2 Overall, this means that the Spectrum Blocks that are available for Auction and outlined in Section 1.3 have the following Base Prices:

**Table 7: Base price**

Spectrum band	Size	Base Price
1800 MHz – Product 1	2x5 MHz	USD 4.35 million
1800 MHz – Product 2	2x1.2 MHz	USD 1.04 million
2100 MHz	2x5.0 MHz	USD 4.35 million

- 2.6.3 Spectrum Blocks will not be sold at a price lower than the Base Price shown in Tables 6 and 7.

## 2.7 Future harmonisation of Licenses

- 2.7.1 PTA envisages that, *in due course*, it is likely to be efficient to harmonise the terms and conditions of all existing mobile service Licenses with the form of the License in Appendix F. To this end, it notes that the form of the License in Appendix F is substantially the same as the License awarded to those CMOs whose existing spectrum assignments were renewed during 2021. The PTA shall, therefore, in effect, include any spectrum assigned to those CMOs in this Auction to the Licenses awarded to those CMOs in the License renewal process 2021. The existing License of one CMO (Zong) is not due for renewal until 2022. Upon renewal of that License, the PTA will seek to harmonise the tenure of the relevant spectrum assignments in line with the Policy Directive. It is expected that this consultation would take place at some point after the Auction process is complete.

### 3 Overview of the Spectrum Auction

The Auction will consist of the following steps:

#### 3.1 Consultation period

- 3.1.1 The consultation period will start with the publication of this IM as indicated in the award timetable of Section 1.7. During this consultation period, prospective Applicants will be allowed to submit clarification questions to PTA. PTA may respond to questions and publish the same on the website without providing the identity of the party making the question or comment. No prospective Applicant will receive preferential treatment or receive special information from PTA in this process.
- 3.1.2 PTA reserves the right to determine what comments are relevant and require modification of the Spectrum Auction and hence require it to publish amendments to this IM. All questions and comments can be submitted by email to the below provided email address: [\[ajkqb-lic@pta.gov.pk\]](mailto:ajkqb-lic@pta.gov.pk)
- 3.1.3 The PTA will publish on its website, responses to those queries it considers relevant and which it receives no less than 24 hours before the end of the consultation period.

#### 3.2 Information Session for Prospective Applicants

- 3.2.1 Following the consultation period, there may be an information session for prospective Applicants so that they can better understand the Spectrum Auction. This session would be the last opportunity for prospective Applicants to ask questions and get clarification on specifics of the Auction process and rules.
- 3.2.2 Applicants must register with PTA prior to attending this session by sending an email to: [\[ajkqb-lic@pta.gov.pk\]](mailto:ajkqb-lic@pta.gov.pk).
- 3.2.3 During this session, PTA will only respond to clarification questions related to the Auction itself and only those Applicants who successfully registered in advance will be allowed to participate.

#### 3.3 Application Process

- 3.3.1 The application process will start on the date indicated in Section 1.7. This should allow sufficient time for prospective Applicants to evaluate the business opportunity and to prepare the required documentation to participate in the Spectrum Auction.
- 3.3.2 The Spectrum Auction will comprise two stages. During the first Stage, Applicants must submit, by the date indicated in the timetable of Section 1.7, both Annex B (**Application Form**), and Annex E (**Sealed-Bid Form**) of this IM, along with all the required supporting documentation. Applicants are also required to submit a Pre-Bid Deposit at this stage. PTA will review the Application Form and Sealed-bid Forms, and will qualify those Applicants that are deemed to be suitable and who paid the correct Pre-Bid Deposit. PTA will then determine whether the Auction (including the Eligibility Adjustments) will proceed to the second stage, based on the demand in the Auction as expressed in the Sealed-Bid Forms submitted by Qualified Applicants.

#### 3.4 Stage 1: Sealed-Bid Stage

- 3.4.1 In this stage, all Applicants will be required to complete the Application Form given in Annex B and provide the information required by the Application Form. An applicant

will also be required to submit, along with its application, an irrevocable Sealed-Bid Form, given in Annex E. Applicants will also be required to submit a Pre-Bid Deposit at this stage for 20% of the cumulative amount of the Base Price for those Spectrum Blocks in which they have expressed interest, as per the Sealed-Bid Form

- 3.4.2 On their Application Form, Applicants will be asked to provide contact details for an Authorised Representative for the purposes of, among others, that representative receiving all information related to the Spectrum Auction, including the Bidder Information Package, if the Applicant is qualified to participate in the second stage. Please note that this representative needs to be fully available during the entire Auction.
- 3.4.3 Upon receipt of the Application Forms, PTA will review whether or not each Applicant complies with all the requirements. Where an application is deficient, PTA may, but is not required to, ask the Applicant to provide any missing information or additional documentation but the Applicant will not be asked to, nor can he/she change, any of the information already provided in Annex E.
- 3.4.4 The information submitted by Applicants will be assessed by PTA. Those who are considered suitable for participation and have submitted the correct Pre-bid Deposit in the prescribed form and manner; will be informed, as per the timelines, that they are Qualified Applicants. The Pre-Bid Deposit for any Applicant who does not become a Qualified Applicant will be returned by PTA in due course, subject to that Applicant having complied with the rules of the Spectrum Auction process.
- 3.4.5 In the Sealed-Bid Form, each Applicant will be required to state their interest in the following spectrum at the Base Price:
  - a) Product 1: Up to 2 blocks of 2x5 MHz of 1800 MHz;
  - b) Product 2: Up to 5 blocks of 2x1.2MHz of 1800 MHz; and
  - c) Product 3: Up to 6 blocks of 2x5 MHz of 2100 MHz.

#### **Eligibility Points**

- 3.4.6 The number of Spectrum Blocks stated in the Sealed-bid Form and supported by a corresponding Pre-bid Deposit, in the prescribed form and manner, will constitute a Qualified Applicant's Initial Eligibility for the 1800 MHz and 2100 MHz spectrum Auction.
- 3.4.7 Each Spectrum Block will be associated with a certain number of Eligibility Points:
  - a) 25 Eligibility Points for a 2x5 MHz block within 1800 MHz (Product 1);
  - b) 5 Eligibility Points for a 2x1.2 MHz block within 1800 MHz (Product 2); and
  - c) 25 Eligibility Points for each of the 2x5 MHz blocks within 2100 MHz (Blocks 1-6).
- 3.4.8 The minimum Initial Eligibility a Qualified Applicant can have is 5 points. It will allow this Qualified Applicant to bid on 1 Spectrum Block in Product 1 in the Electronic Auction Stage, if required, for that Product.

### EXAMPLE

- (1) If a Qualified Applicant bids on one Block in Product 1, one Block in Product 2 and Block 1 in the 2100 MHz in Stage 1 of the Auction, this Qualified Applicant will have 55 eligibility points; and
- (2) If a Qualified Applicant bids on 1 Block in Product 1, one Block in Product 2, and blocks 1 and 2 in the 2100 MHz band, it will have 80 points, etc.

### **Eligibility Adjustment**

- 3.4.9 Applicants who expressed demand for Product 1 (1 or 2 Blocks 2x5 MHz of 1800 MHz spectrum) at the Base Price will be able to benefit from an Eligibility Adjustment, if they wish to do so. The Eligibility Adjustment will allow Bidders in the Electronic Auction Stage to carry over their Eligibility Points from 1800 MHz spectrum to 2100 MHz spectrum if they are not successful in winning Product 1.
- 3.4.10 In order to facilitate the Eligibility Adjustment, eligible Applicants (i.e. those who bid on Product 1) will be asked in their Sealed-Bid Form whether they want to carry over their Initial Eligibility from 1800 MHz to 2100 MHz. This Eligibility Adjustment would only apply if the Qualified Applicant is then not successful in winning Product 1. In the Sealed-Bid Form, eligible Applicants would need to specify whether they want to use the Eligibility Adjustment and, if so, which specific blocks of 2100 MHz spectrum they would want to transfer that eligibility to.
- 3.4.11 The Eligibility Adjustment will not be applied if Qualified Applicants do not state clearly in the Sealed-Bid Form that they want to use it.

### **3.5 Determining the outcome of the Sealed Bid Stage**

- 3.5.1 The information submitted by Applicants will be assessed by PTA and those that are considered suitable for participation and have submitted the correct Pre-bid Deposit will be informed as per the timelines set, that they have qualified for the next Stage<sup>2</sup> (i.e., that they are Qualified Applicants).
- 3.5.2 The Pre-Bid Deposit for any Applicant who does not become a Qualified Applicant will be returned, on request, after conclusion of Spectrum Auction process, subject to that Applicant having complied with the rules of this process. This is set out further in Section 5.3 of this IM.
- 3.5.3 Once Qualified Applicants have been determined, PTA will assess the demand for spectrum across the 1800 MHz band and 2100 MHz bands (including the Eligibility Adjustments) as expressed in the Sealed-Bid Forms from all Qualified Applicants. This is to determine whether total demand for any Product in the Sealed-Bid Forms exceeds the total spectrum available for that Product, and therefore, whether still there is a need to proceed to the Electronic Auction Stage. This assessment includes any demand resulting from the Eligibility Adjustment in that band (see previous section):
  - a) If total demand in the Sealed-Bid Forms in any Category (Product 1, Product 2, Block 1, Block 2, Block 3, Block 4, Block 5 or Block 6) from all Qualified Applicants

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<sup>2</sup> PTA's will conduct a more thorough review of potential New Entrants based on their suitability to participate in the auction. PTA will however only conduct a completeness and accuracy check for existing CMOs. This is because, by definition, existing CMOs have already been deemed to be suitable Licensees.

exceeds supply of spectrum in that particular Category, PTA will then proceed to the Electronic Auction Stage for those Categories. In that case, PTA will notify the Qualified Applicants three days after the receipt of applications about the upcoming Electronic Auction Stage; and

- b) If total demand for spectrum in each Category<sup>3</sup> matches or is less than total spectrum available in that Category, PTA will provisionally assign the 1800 MHz and 2100 MHz spectrum based on the Sealed-Bid Forms to each Qualified Applicant at the Base Price:
  - i.) If there is no excess demand for Product 1 and Product 2, but there is excess demand for at least one block in the 2100 MHz band (blocks 1, 2, 3, 4, 5 or 6), PTA will proceed to provisionally assign 1800 MHz spectrum for which there is demand at the Base Price and move to the Electronic Auction Stage for the 2100 MHz spectrum (see Section 4.2 for more details on the Electronic Auction Stage for 2100 MHz spectrum);
  - ii.) Similarly, if there is excess demand for one product in the 1800 MHz band but no excess demand for blocks 1, 2, 3, 4, 5 or 6 (after the Eligibility Adjustment discussed above), blocks 1, 2, 3, 4, 5 and 6 will be provisionally assigned at the Base Price (assuming there is demand for those blocks at the Base Price), while the 1800MHz product for which there is excess demand will be allocated using the Electronic Auction Stage (see Section 4.1 for more details on the Electronic Auction Stage for 1800 MHz spectrum); and
  - iii.) Finally, if there is excess demand for just one product in the 1800 MHz band (either Product 1 or Product 2), only the product with excess demand will be sold using the Electronic Auction Stage, while the other product (with no excess demand) will be provisionally assigned at the Base Price.

### **3.6 Mock Auction**

3.6.1 Should the Spectrum Auction be required to proceed to the Electronic Auction Stage, Qualified Applicants who placed bids, in their Sealed-Bid Forms, for those Products going forward to the Electronic Auction Stage, will be invited to participate in a mock Auction Bidder training session. This will cover one or both of the Electronic Auctions for 1800 MHz and 2100 MHz spectrum, depending on which bands proceed to the Electronic Auction Stage<sup>4</sup>. PTA will provide instructions to participate in the mock Auction as part of the Bidder Information Package. It is recommended that all Qualified Applicants who will be taking part in the Electronic Auction Stage for the relevant band or bands, take part in the mock Auction in order to familiarise themselves with the Auction Management System.

### **3.7 Stage 2: Electronic Auction Stage for the 1800MHz and 2100MHz spectrum bands**

- 3.7.1 The Electronic Auction Stage will be conducted sequentially:
- a) First - A Clock Auction for the 1800 MHz spectrum; and

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<sup>3</sup> Including demand resulting from the Eligibility Adjustment in the 2100 MHz band.

<sup>4</sup> A Qualified Applicant who takes part in the Electronic Auction Stage is known as a Bidder.

- b) Second - A SMRA (Simultaneous Multi-Round Ascending Auction) for the 2100 MHz spectrum.
- 3.7.2 These two different approaches are needed because:
- a) There are 5 generic blocks of 2x1.2 MHz spectrum, and two blocks of 2x5 MHz in the 1800 MHz band; and
  - b) There are 6 specific 2x5 MHz blocks (blocks 1 - 6) in the 2100 MHz band. Specific blocks are best allocated using a SMRA.
- 3.7.3 The PTA will first conduct the Clock Auction for the 1800 MHz spectrum, followed by the SMRA Auction for the 2100 MHz spectrum. For the avoidance of doubt, a Qualified Applicant need not participate in the Clock Auction for 1800 MHz spectrum in order to participate in the SMRA Auction for 2100 MHz spectrum.
- 3.7.4 The Electronic Auction Stage will be conducted through an electronic Auction Management System. The Auction Management System will:
- a) Provide all the information which will be made available to the Bidder (i.e., a Qualified Applicant taking part in the Electronic Auction Stage) on the progress of the Auction as set out in this IM;
  - b) Provide the electronic forms necessary for Bidders to make bids during the Clock and SMRA Auctions;
  - c) Enable Bidders to receive announcements from PTA following the System Live date; and
  - d) Enable Bidders to communicate with PTA using the secure messaging tool.
- 3.7.5 The Auction Management System will be hosted on servers operated by the Auction Software Provider. Bidders will be provided in advance with a login ID and password in order to access the Auction Management System. They will also be provided with an Electronic Certificate that must be installed on the machine from which they intend to participate in the Electronic Auction Stage. Details of the machine to be shared with PTA, accordingly.
- 3.7.6 Only Bidders will be able to log into the electronic Auction Management System at the date and time indicated by PTA. In order to do so, Bidders will require the login ID, password and electronic certificate provided to them in advance. Bidders will be prompted to change the password given to them on the first successful login attempt. To access and use the Auction Management System, Bidders will need a minimum specification of broadband Internet connection and PC. Bidders are directed to the detailed instructions that will be set out in the User Manual for the Auction Management System for full details of the specifications required.
- 3.7.7 All Applicants should note that the Auction Management System incorporates Secure Socket Layer (SSL) encryption and all transactions are encrypted across the communication channels. The data stored is secure and access to data is restricted. Appropriate security measures are in place for the data storage along with physical and electronic security enforcement. High performance hardware, network and software support will be provided by the Auction Management System to ensure

secure and reliable communication to and from PTA and the Auction Software Provider.

3.7.8 If a Bidder faces communication difficulties during the Electronic Auction Stage, PTA will accept emergency bidding either through submitting bids physically or through faxed bids, duly signed and stamped by the Bidder's Authorised Representative (already communicated to PTA). Details of the **Emergency Bidding Procedure** will be provided to Qualified Applicants.

3.7.9 Section 4.1 and Section 4.2 describe the process for the Clock Auction and SMRA in more detail.

### **3.8 Announcement of Provisional Winners**

3.8.1 The Spectrum Auction will end once demand is less than or equal to supply in each Category. At this point, which may either be at the end of Stage 1 or Stage 2 (Electronic Auction Stage), the Provisional Winners will be announced by the PTA, in line with the timelines set out in Section 1.7 of this IM.

3.8.2 The PTA shall also notify the Provisional Winners in writing, of the quantity of spectrum they have provisionally won in each band and the price payable as per section 1.7 of the IM.

3.8.3 The relevant Government, however, reserves the right to withhold the spectrum for a future Auction or award it as deemed appropriate.

### **3.9 Rationalisation phase**

3.9.1 As discussed in Section 1.5, PTA in consultation with FAB, shall undertake a post-Auction process for the rationalisation of spectrum in the 1800 MHz band to achieve contiguity. As part of this post-Auction Rationalisation Process, PTA in consultation with FAB, will endeavour to minimise any movement of CMOs' spectrum holdings. The Rationalisation Process shall be applicable on all CMOs regardless of whether or not they participate in the Spectrum Auction and shall be implemented by all CMOs within 30 days of publication of the Rationalisation Plan.

### **3.10 License Fees**

3.10.1 Fees will be according to the schedule established in Section 2.5 of this IM.

### **3.11 Grant of License**

3.11.1 The License will be offered in accordance with section 1.7 of the IM.

## 4 The Electronic Auction Stage

- a) This section explains in detail the bidding procedure during the Electronic Auction Stage.
- b) As stated in Section 3.5 above, should the Auction proceed to the Electronic Auction Stage, the PTA will use different mechanisms to allocate spectrum in the 1800 MHz and 2100 MHz bands - a Clock Auction to allocate the 1800MHz spectrum and a SMRA to allocate the 2100MHz spectrum. These two different approaches are needed because:
  - i.) There are 5 generic blocks of 2x1.2 MHz spectrum, and two blocks of 2x5 MHz in the 1800 MHz band; and
  - ii.) There are 6 specific 2x5 MHz blocks (Blocks 1 – 6) in the 2100 MHz band. Specific blocks are best allocated using an SMRA.
- c) The PTA will first conduct the Clock Auction for the 1800 MHz spectrum, followed by the SMRA Auction for the 2100 MHz spectrum. For the avoidance of doubt, a Bidder need not participate in the Electronic Auction Stage for the award of 1800 MHz spectrum in order to participate in the Electronic Auction Stage for 2100 MHz award, or vice versa.

### 4.1 Electronic Auction Stage for 1800 MHz Spectrum: Ascending Clock Auction

- 4.1.1 As set out in Section 3.5 above, there will be two Products in the 1800 MHz Spectrum:
  - a) Product 1: two blocks of 2x5 MHz; and
  - b) Product 2: five blocks of 2x1.2 MHz.
- 4.1.2 At a high level and assuming that there is excess demand for both Product 1 and Product 2, the bidding in the Clock Auction will proceed as follows:
  - a) Bidding will take place in series of rounds;
  - b) In each round, Bidders (i.e. Qualified Applicants who participate in the Electronic Auction Stage) place bids at the announced prices for a number of Spectrum Blocks in Product 1 and / or 2. As the Auction progresses, Bidders can maintain or reduce demand for each Product, but they cannot increase demand. For example, if in its Sealed-Bid Form, a Bidder bids for two Spectrum Blocks on Product 1 and one Spectrum Block of Product 2, this Bidder can continue bidding on two Spectrum Blocks of Product 1 and one Spectrum Block of Product 2, or it can reduce demand for either or both Products, with a corresponding reduction in its Eligibility Points. However, it cannot bid on two (or more) Spectrum Blocks of Product 2;
  - c) The price for each Product will increase from round to round as long as there is excess demand for that Product;
  - d) Total demand for each Product will be made available to Bidders after each round;

- e) If, in a given round, aggregate demand for each Product is equal to supply, the Auction will close and the Spectrum Blocks will be provisionally allocated to Bidders according to their bids in that round;
- f) If, in a given round, a single Bidder drops demand causing aggregate demand for one of the two Products to fall below supply, the auction for that Product will end and the Product will be allocated at the price in the previous round. All Bidders who did not drop demand will be allocated the quantity that they demand in the final round, and the single Bidder who dropped demand will be allocated the remaining quantity of the Product;
- g) If, in a given round, multiple Bidders drop demand causing aggregate demand for any of the two Products to fall below supply, the Auction will proceed to the refinement stage for that Product, with Bidders who reduced demand in the final round being required to submit additional bids to ensure that all spectrum is sold. Examples of the refinement stage are set out in Annex H.

4.1.3 Below, the Clock Auction rules are set out in more detail.

**a) Information provided to Bidders before the Clock Auction**

- i.) Prior to the start of the Clock Auction, Bidders will receive the following information:
  - (1) The schedule for the first day of bidding;
  - (2) Information on the identities of all Bidders;
  - (3) Information on their individual eligibilities and required 100% activity for round 1 of the Clock Auction; (i.e. Bidders are not allowed to reduce demand in round 1); and
  - (4) The Base Price for Product 1 and Product 2 as set out in Section 2.6.

**b) A Bidding Round**

- i.) Bidding rounds will have a fixed start time and end time. Bidders should have sufficient time until the end time of a round to submit a bid. Bidders can modify their bids any time during the Bidding Period. However, the last bid recorded by the Auction Management System will be deemed the Valid Bid;<sup>5</sup>
- ii.) If a Bidder faces communication difficulties during the Clock Auction, PTA will accept emergency bidding over the phone with fax bids, signed and stamped verification and confirmation received within the Bidding Period. Details of the Emergency Bidding Procedure will be provided to Bidders.

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<sup>5</sup> While Bidders can submit their bids at any point during the bidding round, it is recommended that the Bidders should try to make their bidding decisions as early in the round as possible to make sure their bids are registered before the close of the round as well as have time to resolve any issues in the bid submission process (if any issues arise).

- iii.) A Bidding Period will be followed by a Reporting Period. During the Reporting Period, Bidders will receive information on the previous round (See Section h) below).

**c) Considered bids**

- i.) A bid is an offer to purchase one or more generic Spectrum Blocks of Product 1 and / or Product 2 at the announced prices. In every round, Bidders will select the number of Spectrum Blocks they are willing to purchase at the announced price and for which they have sufficient Eligibility Points to bid on;
- ii.) A bid is a binding offer that cannot be rescinded;
- iii.) All bids placed in the latest bidding round are considered; and
- iv.) An absent or null bid means that a Bidder does not place any bid in a round. In practice, an absent bid on a Product, on which a Bidder has positive demand in the previous round, will be considered as a bid for zero Spectrum Blocks at the current clock price, with a corresponding reduction in Eligibility Points for that Bidder in the next round. This means, in practice, that the Bidder will no longer be able to place bids for any Blocks in that Product.

**d) Prices and Bid Increments**

- i.) If, in any given round, demand for Product 1 is greater than two blocks, the price for that Product will increase in the next round. Similarly, if demand for Product 2 is greater than five blocks, the price for Product 2 will increase in the next round. The price increment rules will be determined for each round by PTA. During the Reporting Period, PTA will inform Bidders via the Auction Management System of the bid increment that will be applied to Spectrum Blocks for the next round; and
- ii.) By placing a new Valid Bid, the Bidder indicates that it is willing to purchase those Spectrum Blocks at the current price for that round, i.e. the price announced by PTA for each Spectrum Block via the Auction Management System at the start of the Bidding Round.

**e) Round 1 Minimum Bids**

In the first round, the price of Product 1 and Product 2 will be set at the Base Price and Bidders' demand from the Sealed-Bid Form will be used to pre-fill the bid automatically. In other words, Bidders will be required to submit this bid, which is equal to their Initial Eligibility. If a Bidder fails to submit a Valid Bid in round 1 of the Clock Auction, PTA reserves the right to submit the bid on the Bidder's behalf.

**f) Bids after Round 1**

After the first round and subsequent rounds, Bidders could maintain their Initial Eligibility or choose to lower their eligibility by reducing, on one or both Products, the number of blocks on which they place a bid. A Bidder's eligibility in subsequent rounds can never increase; it can remain the same or decrease as the Clock Auction progresses.

### **g) Activity Requirements**

Bidders will be required to maintain 100% activity in each round on each Product or lose eligibility. A Bidder's eligibility in one round on a given Product will be equal to its activity in the previous round on that Product. To maintain its eligibility, a Bidder must bid on the same number of Spectrum Blocks as in the previous round. Otherwise, its eligibility will be reduced for the next round. For example, if a Bidder has 50 Eligibility Points and is bidding on two Spectrum Blocks of Product 1, it can continue bidding on two Spectrum Blocks of Product 1. Alternatively, it can reduce its demand to one or zero Spectrum Blocks of Product 1. However, in that case, the Bidders' Eligibility Points will be reduced to 25 or zero. If the Bidder reduced demand to one Spectrum Block of Product 1, in future rounds the Bidder can bid on no more than one Spectrum Block of Product 1.

### **h) Information provided to Bidders at the start of Each Round**

- i.) At the start of each Bidding Period, Bidders will receive the following information:
  - (1) Aggregate demand for Product 1 and Product 2;
  - (2) Bidder's current eligibility;
  - (3) Each Product's clock prices; from the previous round; and
  - (4) Current clock prices.

### **i) Closing Rules for Clock Auction**

- i.) The Clock Auction will close when there is no excess demand for the Product(s) in the Clock Auction. If, in a given round, aggregate demand for both Products is equal to supply, the Clock Auction closes and all Bidders in this final round are provisionally assigned the quantity demanded at the final round prices. This final price is referred to as the Auction Winning Price, and the amount of spectrum provisionally assigned to each Bidder as the Winning Allocation.
- ii.) However, if there is a drop in aggregate demand below supply for one or both Products, Bidders who reduced demand for that Product, causing aggregate demand to fall below supply, will be required to participate in a refinement round.

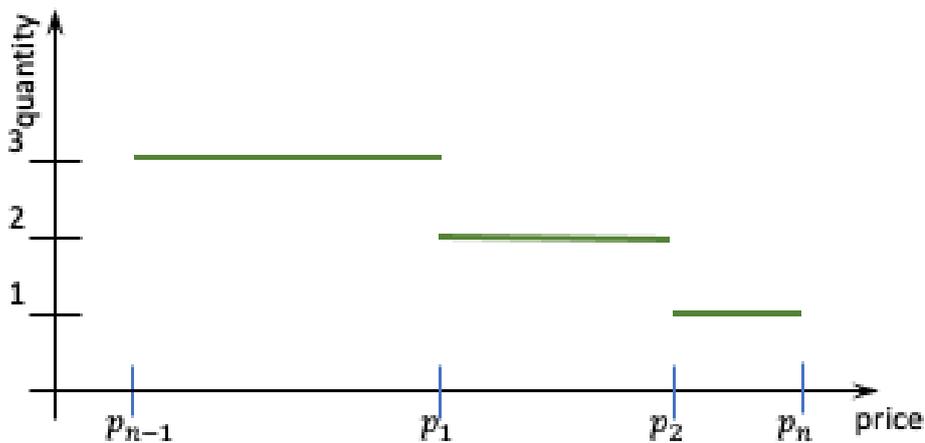
### **j) Refinement Round**

- i.) A refinement round will only be conducted if multiple Bidders drop demand causing aggregate demand for Product 1 or Product 2 to fall below supply. The objective of the refinement round is to ensure that all spectrum, for which there was demand at the Base Price, is sold; and
- ii.) If multiple Bidders drop demand causing aggregate demand to fall below supply, Bidders who dropped demand in the final round will be required to state the price at which their demand falls, including potentially stating multiple

prices if the Bidder dropped demand by more than one Spectrum Block. However, the Bidder could choose to indicate that it would drop its demand for multiple blocks all at the same price.

**EXAMPLE**

In this example, Bidders drops demand such that aggregate demand falls below supply. One of the Bidders drops demand from 3 Blocks of Product 2 at price  $p_{n-1}$  to 1 Block at  $p_n$ . As multiple Bidders dropped demand, the auction will enter a refinement round and the Bidder will be required to provide the maximum price (between  $p_{n-1}$  and  $p_n$ ) at which it is still willing to buy 3 Blocks and the maximum price at which it is willing to buy 2 Blocks (see the diagram below).



Let us assume that at price  $p_2$  aggregate demand for Product 2 is equal to supply. In this case price  $p_2$  per Block is the market clearing price.

However, if after the refinement round, there is no price identified at which demand is equal to supply, the prices with the lowest excess supply and the lowest excess demand will be identified. For instance, call the price with the lowest excess supply  $P_S$  and the price with the lowest excess demand is  $P_D$ .

- All Product 2 Blocks will be allocated at the price  $P_D$  – the auction clearing price for Product 2.
- The allocation will be as follows:
  - o all bidders who placed bids at price  $P_S$  or at a higher price will be allocated their quantities demanded -  $Q_S$ .
  - o any unallocated blocks of the spectrum will then be allocated using the tie-breaking method (described below).

iii.) If a single Bidder drops demand causing aggregate demand to fall below supply, the Product will be allocated at the price in the previous round the auction without a refinement round. All Bidders who did not drop demand will be allocated the quantity that they demand in the final round, and the single

Bidder who dropped demand will be allocated the remaining quantity of the Product.<sup>6</sup>

- iv.) If a Bidder who is required to submit Valid Bids in the refinement round fails to do so, the PTA reserves the right to place bids on behalf of the Bidder at the final clock price minus US\$1. If a Bidder experiences technical issues during the refinement round and requires more time to submit its Valid Bids, it should communicate this to the PTA and the refinement round will be extended, as will be described further in the Bidder Information Package.

**Note:** Each Bidder is allowed only a single extension. Thereafter any Bidder who is facing such a challenge shall use the Emergency Bidding Procedure.

- v.) Further examples of the Clock Auction and the refinement stage are set out in Annex H.

#### **k) Breaking ties**

In order to break ties, random numbers will be assigned automatically in the Auction Management System to all considered bids and ties will be broken using the highest random number.

#### **l) Final Allocations**

- i.) Provisional Winners will be announced for the 1800 MHz spectrum based on the results of the final round and the refinement round (if applicable), in line with the process set out in Section 1.7 of this IM. Each Provisional Winner will be required to pay its Initial Spectrum Fees (calculated and defined as set out above), based on the Auction Winning price (as defined above) multiplied by the number of Spectrum Blocks of Product 1 and Product 2 provisionally allocated to this Provisional Winner in the Winning Allocation; and
- ii.) Once the PTA has received payment of the ISF from a Provisional Winner and confirmed it has been made correctly in accordance with Section 2.5, that Provisional Winner shall be declared a Winner of spectrum in the Spectrum Auction.

### **4.2 Electronic Auction Stage for 2100 MHz spectrum: SMRA**

4.2.1 During this stage, the Blocks 1 – 6 (inclusive) will be allocated using a SMRA. At a high level, the bidding rounds in an SMRA Auction are as follows:

- a) Bidding takes place in series of rounds;
- b) Bidders start the Auction with a number of points, known as Eligibility Points. The number of Eligibility Points will be determined based on the Sealed-Bid Form, including the Eligibility Adjustment, if applicable;
- c) In each round, Bidders place bids at the announced prices for the specific Spectrum Blocks they wish to acquire based on their Eligibility Points;

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<sup>6</sup> In cases where the total quantity demanded by Bidders who did not reduce their demand is equal to aggregate supply, the remaining quantity of the Product will be equal to 0 and the Bidder that dropped its demand will not be allocated any of the Product.

- d) A bid is an offer to purchase a given Spectrum Block at the announced price. If a Bidder wants to buy two or three Spectrum Blocks, it will have to place two or three bids respectively;
- e) Bidders can only bid up to their eligibility, less the Eligibility Points associated with their Standing High Bids. Bidders can also increase the bid on the Spectrum Block on which they are the Standing High Bidder (SHB), if they wish to do so. If there is only one new bid on a Spectrum Block, the Bidder placing that bid will be the SHB for that Spectrum Block going into the next round. If there is more than one bid for a particular Spectrum Block, the SHB will be determined randomly. The SHB will remain as such until another higher bid is placed on that same Spectrum Block in a subsequent round;
- f) The price for Spectrum Blocks with new Standing High Bids will increase from round to round;
- g) PTA will determine the price increments from round to round;
- h) Information on total eligibility in the Auction (i.e. the sum of all Bidders' Eligibility Points) will be made available at the end of each round. The SHB will also be notified that they are SHB on a given Spectrum Block. However, the identity of the SHB will not be disclosed to other Bidders;
- i) The Auction will have an activity rule, to penalise Bidders who are inactive by reducing their Eligibility Points; and
- j) The rounds continue until there is a round in which there is no activity (no new bids or waivers are submitted). The SHBs on each Spectrum Block at the close of bidding will be deemed the Provisional Winners of those Spectrum Blocks.

4.2.2 More detailed rules are set out below:

**a) Information provided to Bidders before the Auction**

- i.) Prior to the SMRA Auction, Bidders will receive the following information:
  - (1) The schedule for the first day of bidding;
  - (2) Information on the identities of all Bidders;
  - (3) Each Bidder will receive information on their individual eligibilities (including the Eligibility Adjustment if applicable);and
  - (4) The Base Price for each Spectrum Block available as set out in Section 2.6.

**b) Bidder's Eligibility**

- i.) The number of Spectrum Blocks stated in the Sealed-Bid Form (including the Eligibility Adjustment, taking into account the provisional results of the Auction

of 1800 MHz spectrum) and supported by a Pre-bid Deposit will constitute that Bidder's Initial Eligibility for the 2100 MHz SMRA Auction.

**EXAMPLE**

If, in the Sealed-Bid Form, a Qualified Applicant (now Bidder) expressed demand for Block 1 and also opted for the Eligibility Adjustment, expressing demand for Block 2 in the 2100 MHz, its Initial Eligibility in the 2100 MHz SMRA will be as follows:

- if the Bidder was not successful in winning Product 1, its Initial Eligibility in the 2100MHz SMRA Auction will be 50 points and it will be able to bid on Blocks 1 and 2 in Round 1 of the SMRA;
- if, on the other hand, the Bidder was successful in winning Product 1, its Initial Eligibility in the 2100 MHz award will be 25 points and it will only be able to bid on Block 1 in Round 1 of the SMRA.

**c) A Bidding Round**

- i.) Bidding rounds will have a fixed start time and end time. Bidders will have until the end time of a round to submit a bid. Bidders can modify their bids during the Bidding Period. However, the last bid recorded by the Auction Management System will be deemed the Valid Bid<sup>7</sup>;
- ii.) If a Bidder faces communication difficulties during the Auction, PTA will accept emergency bidding over the phone with fax bids, signed and stamped verification and confirmation. Details of the Emergency Bidding Procedure will be provided to Bidders; and
- iii.) A Bidding Period will be followed by a Reporting Period. During the Reporting Period, participating Bidders will receive information on the previous round.

**d) Bids and Standing High Bids**

- i.) A bid is an offer to purchase a specific Spectrum Block at the announced price. If a Bidder wants to acquire multiple Spectrum Blocks, the Bidder will need to submit multiple bids. In every round, Bidders will select the Spectrum Blocks they wish to purchase at the announced price and for which they have sufficient Eligibility Points to bid on;
- ii.) If a Spectrum Block receives a bid at the announced price for that round, the Bidder submitting the bid will become the SHB of that Spectrum Block. In case there are several bids on the same Spectrum Block, one of the Bidders placing a new bid will be determined to be the SHB by the Auction Management System (using random numbers to determine the SHB);

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<sup>7</sup> While Bidders can submit their bids at any point during the bidding round, it is recommended that the Bidders should try to make their bidding decisions as early in the round as possible to make sure their bids are registered before the close of the round as well as have time to resolve any issues in the bid submission process (if any issues arise).

- iii.) At the end of the Bidding Period, the SHB will be informed that it is SHB in its individual Bidder's report. Non-SHBs will only know there is an SHB on that Spectrum Block but will not know the identity of the SHB; and
- iv.) If a Bidder is a holder of Standing High Bid, that Bidder will only be allowed to make bids equivalent to its Eligibility Points, minus those that are committed in a standing high bid.

**EXAMPLE**

If a Bidder has 50 Eligibility Points and is currently SHB on Block 1, it will need to bid on Block 2, 3, 4, 5 or 6 to maintain its 50 point eligibility. If the Bidder does not bid on any of Blocks 2 – 5, its eligibility will be reduced to 25 points. Note that the Bidder is not required to bid on Block 1 if it is currently the SHB on Block 1.

**e) Bids and Bid Increments**

- i.) If a Spectrum Block receives a bid in a round, the Bidder or one of the Bidders making that bid will become the SHB and the price for that Spectrum Block will increase by a fixed increment in the next round. The price increment percentages will be determined for each round by PTA. PTA will inform Bidders via the Auction Management System, prior to the next round, of the bid increment that will be applied to Spectrum Blocks that receive new bids on a round;
- ii.) By placing a new bid, the Bidder indicates that it is willing to purchase a given Spectrum Block at the current price for that round, i.e. the price announced by PTA for each Spectrum Block via the Auction Management System at the start of the bidding round; and
- iii.) A bid is a binding offer that cannot be rescinded.

**f) Round 1 Minimum Bids**

- i.) In round 1, a Bidder will be required to bid on the same blocks as stated in the Sealed-Bid Form, including the Eligibility Adjustment; and
- ii.) The Auction Management System will not allow a Bidder to submit a bid in round 1 of the SMRA Auction which is below its demand expressed in the Sealed Bid Form, including, if relevant, the Eligibility Adjustment. If a Bidder fails to submit a Valid Bid in round 1 of the Auction, PTA reserves the right to submit the bid on the Bidder's behalf.

**g) Activity Requirements**

- i.) After the first round and subsequent rounds, Bidders should maintain activity or their eligibility will be reduced. A Bidder's eligibility can never increase; it can remain the same or decrease as the Auction progresses.
- ii.) Bidders will be required to maintain 100% activity in each round or lose eligibility. A Bidder's eligibility in one round will be equal to its activity in the

previous round. As a Bidder can never bid on more points than for which it has eligibility, the Bidder's eligibility for one round is therefore the minimum of its Initial Eligibility and activity from the previous round.

- iii.) If a Bidder is not a SHB on any Spectrum Block, this Bidder must bid on the number of Spectrum Blocks equal to their current Eligibility Points or their eligibility will be reduced for the next round. Eligibility Points lost cannot be recovered.

**EXAMPLE**

If a Bidder is eligible to bid for 3 Spectrum Blocks of 2x5 MHz (75 Eligibility Points) and bids on 2 Spectrum Blocks of 2x5 MHz in a round (50 Eligibility Points) without also being the SHB on the third block, that Bidder will only be able to bid for no more than 2 Spectrum Blocks of 2x5 MHz in any subsequent round of the SMRA Auction.

**h) Activity**

- i.) A Bidder is considered to be active on a Spectrum Block in a round if either it has a Standing High Bid from the previous round or places a new bid in the current round. Bidders are allowed to bid on any Spectrum Block by using their free Eligibility Points or they will reduce points from round to round. Free Eligibility Points are those that are not tied to a Spectrum Block where a Bidder is the SHB. The points associated with the Standing High Bid are already committed and cannot be bid on other Spectrum Blocks.

**EXAMPLE**

If a Bidder has eligibility of 75 points and there are 3 Lots of 2x5 MHz, that Bidder may:

- (1) Have a Standing High Bid on two Lots of 2x5 MHz and therefore must bid 25 points on another 2x5 MHz Lot or its eligibility for the next round will be reduced by 25 points.
- (2) Have a Standing High Bid on one Lot of 2x5 MHz and therefore can bid 50 points on 2 Lots of 2x5 MHz, or bid for fewer Lots with reduced eligibility for the next round.
- (3) Have no Standing High Bids and therefore can bid 75 points on 3 Lots of 2x5 MHz, or bid on fewer Lots with reduced eligibility for the next round.

**i) Information provided to Bidders at the start of each round**

- i.) At the start of each Bidding Period, Bidders will receive the following information:
  - (1) Previous round prices for each block;

- (2) Current price for each block;
  - (3) Total Eligibility Points in the Auction, which is the sum of all Bidders' Eligibility Points at the end of each round; and
  - (4) Total number of waivers the Bidder has and how many are left across all Bidders (see Section 4.1j).
- ii.) Each Bidder will also be notified whether they are the SHB on any given Spectrum Block. However, the SHB's identity will not be disclosed to other Bidders.

**j) Waiver**

- i.) If a Bidder is considering reducing demand (reducing eligibility) and needs more time to make this decision, it can proactively submit a waiver (below referred to as "proactive waiver") using the Auction Management System. Therefore, a proactive waiver is an action taken by the Bidder to express their decision not to place any bids in a round, but without losing their Eligibility Points. Waivers can thus act as a "time-out," allowing a Bidder to not bid in a round;
- ii.) Bidders will be granted one waiver in this Auction;
- iii.) A waiver cannot be submitted in the first round of the Auction. If a Bidder does not enter a bid in a subsequent round, then a waiver will be submitted automatically; and
- iv.) If a Bidder's activity in a round is positive but below the Bidder's eligibility and the Bidder has waiver remaining in the Auction, the Bidder's eligibility will be reduced and an automatic waiver will not be used to maintain the Bidder's eligibility.

**k) Close of the SMRA Auction**

- i.) The SMRA Auction shall close when a round concludes with:
  - (1) no Valid Bids being submitted; and
  - (2) no proactive waivers having been submitted or unused waivers being left.
- ii.) The SHB on each Spectrum Block upon the close of the SMRA Auction will be declared the Provisional Winner of that Spectrum Block.

**l) Final Allocations**

The Provisional Winners will be provisionally assigned the 2100 MHz Spectrum Blocks for which they had a SHB at the end of the SMRA Auction. Each Provisional Winner will be required to pay an Initial Spectrum Fee determined from the Auction Winning Price, i.e., the highest submitted bid that the Bidder offered during the SMRA for those Spectrum Blocks.

### **4.3 Auction Payments**

- 4.3.1 Following written notification from the PTA, Provisional Winners shall, within one month of the Auction date, deposit the ISF as per clause 2.5 above in the PTA designated bank account, after adjustment for the Pre-Bid Deposit, failing which the Pre-bid deposit of the Provisional Winner shall stand forfeited. After making the payment, the Provisional Winner shall submit evidence of the payment deposit to PTA's Director General (Licensing) or his designate.
- 4.3.2 If the Provisional Winner fails to make the payment within the stipulated time as referred to above, the next highest Bidder(s), in order of the bid(s), will be offered the Spectrum on the same Auction Winning Price and same terms and conditions. If none of the Bidders offers to match the Auction Winning Price, the License/ spectrum will not be awarded or assigned and the Government will be informed accordingly for further directions.
- 4.3.3 The License/spectrum shall only be awarded or assigned after payment of 100% or 50% of the Initial Spectrum Fee, whichever is applicable, within the stipulated timelines in clause 2.5 above and, where relevant, upon the Winner conforming with the Rationalisation Plan for the 1800 MHz band.

## **5 Legal Terms and Conditions**

### **5.1 Important Notice**

- 5.1.1 This IM is for information purposes only. It does not form part of any contract, whether explicit or implied. Terms and conditions in a License will prevail if there is a discrepancy between the License and this IM. Prospective and Qualified Applicants are advised to seek their own expert advice on whether or not to participate in the Spectrum Auction and on any other matters concerning financial, legal, technical or other implications of the Spectrum Auction and associated policies and the Auction Management Software.
- 5.1.2 PTA does not warrant the accuracy of the information herein, and PTA reserves the right to update, amend or modify or add or omit any information in this IM. Any such change, alteration, modification, amendment, addition, omission, supplemental or replacement or any deletion will be communicated to the prospective Applicants via PTA website or any other mode of communication and shall become an integral part of the IM and the Auction process.
- 5.1.3 PTA reserves the right, in its sole discretion, to take any action, including amendment of this IM, which it considers necessary to ensure that the Auction is carried out in a fair, open and transparent manner, in accordance with law and in a manner that discourages and strongly penalises any attempted collusion or predatory bidding that may inhibit an efficient outcome.
- 5.1.4 PTA reserves the right to add, modify, amend, supplement, cancel, annul or replace any or all of the Auction process at any stage without incurring any liability to the affected Bidders or any obligations thereunder. PTA further reserves the right to modify or terminate the Auction process at any time in its sole discretion and, in such an event, a Pre-Bid Deposit defined in Section 5.3 below would be returned to the Applicant within thirty (30) days without bearing any liability, unless the amount is otherwise required to be forfeited.
- 5.1.5 This IM and any License or spectrum issued pursuant to the Auction process described in the IM shall be exclusively subject to, and interpreted in accordance with, the provisions of the Act, and the Rules and Regulations and Policies.
- 5.1.6 Any dispute, controversy or claim arising out of, or in connection with, this IM, or the breach, termination or invalidity thereof, shall be settled by PTA and its decision shall be final and binding. The process for the Spectrum Auction of NGMS in AJ&K and GB, the accompanying documents, and all correspondence relating to the Auction process announced in this IM shall be submitted in the English language.
- 5.1.7 No suit, prosecution or any other legal proceedings shall lie against PTA or any member or employee or consultant or contractor of PTA/FAB or any other Council or Government functionary in respect of anything done or intended to be done in good faith in connection with this IM.

### **5.2 Conditions of Participation in the Auction**

- 5.2.1 Company Registration: Each Applicant must be a company registered with SECP in Pakistan and enlisted in AJ&K and GB.

- 5.2.2 Ownership Disclosure Requirements: All Applicants must disclose their complete ownership information with details of shareholding on the Application Form.
- 5.2.3 Changes in Composition of Applicants: No change in the composition of an Applicant is allowed following submission of the Application Form and at least up to the date that the License is awarded.
- 5.2.4 Collusion: All Applicants (whereby this term also, for the avoidance of doubt, includes Qualified Applicants and Bidders) are warned not to indulge in collusion. In case there is any evidence of collusion, PTA reserves the right to disqualify that Applicant from the Spectrum Auction process. If PTA confirms evidence of collusive bidding before or during the Spectrum Auction, PTA has the right to cancel the Auction and for all colluding Applicants to forfeit their Pre-Bid Deposits, and claim damages from them.
- 5.2.5 Confidential Information: Confidential Information means any information which, if known to other Applicants, would be likely to affect the price that other Applicants would be prepared to bid in the Auction. Such information would include, but not necessarily be limited to, the Applicant's business case, Auction strategy and the highest price it is willing to bid for the Spectrum. Any party to whom Confidential Information in relation to an Applicant is disclosed is deemed to be an "Insider" in relation to that Applicant. Applicants and Insiders must not convey Confidential Information to any other Applicant or Insider. In case of such evidence, PTA reserves the right to exclude these Applicants from the Auction and to retain their Pre-Bid Deposits.
- 5.2.6 Disqualification: Without prejudice to any other remedy that may be available to it, PTA reserves the right to disqualify any Applicant and forfeit its Pre-Bid Deposit for any of the reasons set out below:
- a) If a Provisional Winner abandons the bid or fails to pay Initial Spectrum Fee as per Section 2.5;
  - b) Inaccuracy or misrepresentation of any facts in any part of the Application Form;
  - c) Illegal conduct, disruption during the Auction, or indulgence in improper attempts to influence the outcome, or delay the process, or collusion;
  - d) Any "corrupt practice", meaning undue influence, personating, aiding, abetting, counselling or the offering, giving, receiving or soliciting of anything of value to influence a public official in relation to Auction process;
  - e) Any fraudulent practice or misrepresentation of facts in order to influence the results of the Auction process established by the IM; and
  - f) In the event of an Applicant being disqualified from the process, PTA reserves the right to impose a penalty on the Applicant which will result in forfeiture of its full Pre-Bid Deposit and damages.

### **5.3 Payment Terms**

#### **Pre-Bid Deposit**

- 5.3.1 Pre-Bid Deposit to PTA should be made only through wire transfer or through RTGS in PTA's Account Titled "PTA AJ&K DEREGULATION ACCOUNT", Account Number

3000942231 (IBAN: PK87NBPA2221003000942231) maintained with Corporate Branch, National Bank of Pakistan, G-5/1 Branch Code 2221, Islamabad, Pakistan. In case of Pre-Bid Deposit to PTA from abroad in foreign currency, it should be remitted through SWIFT Telegraphic Transfer in above referred PTA Account Number 3000942231, Swift code NBPAPKKASMB routed through any of the following Correspondent Banks under intimation to DG Licencing, PTA, having clearly mentioned reference "Spectrum Auction of NGMS in AJ&K and GB":

- a) Standard Chartered Bank New York, SWIFT Code: SCBUS33;
- b) The Chase Manhattan Bank, SWIFT Code: CHASUS33;
- c) National of Pakistan New York, SWIFT Code: NBPAUS33; and
- d) Citi Bank New York, SWIFT Code: CITIUS33.

Pre-Bid Deposit shall be made/credited in PTA's bank account by the date indicated in Section 1.7 of this IM.

- 5.3.2 PTA, after verification of applications and Pre-Bid Deposit, will inform the Applicants whether there has been acceptance of the same as per the schedule provided in Table 1 of this IM.
- 5.3.3 The Pre-Bid Deposit of a Provisional Winner will be adjusted against the Auction Winning Price (Initial Spectrum Fee) without bearing any liability towards exchange rate, interest, indexation, inflation or deflation, while the Pre-Bid Deposit of the unsuccessful Applicants will be returned in local currency, on request, after conclusion of Spectrum Auction process without bearing any liability towards exchange rate, interest, indexation, inflation or deflation.
- 5.3.4 Any delays in transfer of funds should be taken up by the Applicants and enough time should be allowed to ensure that all (full) amounts are received in PTA's bank account by the given deadline.
- 5.3.5 The applicant shall ensure that full amount of irrevocable Pre-Bid Deposit has been credited/transferred in above referred bank accounts by the due date as mentioned in Section 1.7 of this IM.

#### **Final Payments**

- 5.3.6 The Initial Spectrum Fee (ISF) shall be the Auction Winning Price for the spectrum blocks provisionally assigned to the Provisional Winner. It shall be determined in US Dollars. ISF shall be paid in US Dollars or its equivalent in Pak Rupees converted at the National Bank of Pakistan (NBP) Telegraphic Transfer (TT) selling rate prevailing on the day preceding the date of payment. ISF shall be payable within one month of auction date the PTA written intimation to Provisional Winners of the same as per the payment plan stipulated in clause 4.1.1 of the License (Annex F).
- 5.3.7 The Provisional Winner shall pay 50% of the total ISF amount within one month of the auction date, taking into account the Pre-Bid Deposit. The remaining 50% of the total ISF shall be payable in in ten (10) equal annual instalments.
- 5.3.8 If any payment of the Initial Spectrum Fee, including any instalment, becomes overdue, PTA may serve upon the Licensee a show cause notice stating the default and seeking explanation, allowing it not less than seven days, as to why its License shall not be

suspended or revoked. On considering the Licensee's explanation, PTA may suspend or revoke the License as deemed appropriate.

#### **5.4 Performance Bond**

- 5.4.1 As a guarantee for the performance of a Licensee's network rollout obligations as mentioned above in Section 2.3, any Provisional Winner who does not already, through an existing license has a valid Performance Bond of equivalent value lodged with the PTA, shall deliver to PTA unconditional, irrevocable and continuing Performance Bonds in the shape of Bank Guarantees from a local bank in Pakistan with credit rating of AA+ and above, or a foreign bank having credit rating of A1 and above, acceptable to PTA for the amount of US\$1,000,000 (US Dollars One Million only) or its equivalent in Pakistan Rupees of the value prior to Effective Date.
- 5.4.2 A draft template for performance bank guarantee is attached as Annex-G.
- 5.4.3 In case any phased roll-out obligation is not fulfilled, the Performance Bond proportionate to the roll-out obligation not met shall be encashed by PTA, in line with the Performance Bond Release Schedule set out in Appendix-1 A2 of the License. The performance bond (or parts of it) Each Performance Bond shall remain in force until six months after the associated phase of the network rollout is completed.

## 6 Application Instructions

- 6.1 An Applicant must complete the Application Form in Annex B and must submit all the required information and supporting company documentation, the completed Sealed-Bid Form and a Pre-Bid Deposit. As part of this process, an Applicant must declare it is willing to buy offered spectrum at the Base Price. This declaration will be irrevocably binding on the Applicant. After submission, the application will not be modified. However, PTA reserves the right to request additional information and/or clarification from an Applicant.
- 6.2 The Applicant shall bear all its costs associated with the preparation and submission of its Application and PTA shall in no case be responsible for these or any other costs, regardless of the conduct or outcome of the application process.
- 6.3 PTA reserves the right to accept or reject all or any Application without assigning any reason and incurring any liability whatsoever. However, in case of rejection of an Application, the Pre-Bid Deposit will be returned, unless the amount is otherwise required to be forfeited.
- 6.4 Applicants may raise questions and queries in writing through email to PTA concerning this IM, by the date mentioned in Section 1.7. PTA may not respond to questions and queries received after the end date for submission of queries as given in Section 1.7. Furthermore, PTA reserves the right not to reply to questions. However, to the extent that it does, it will publish and reply to the question at the PTA website without disclosing the name of the Applicant.
- 6.5 PTA will notify the Applicants by courier or letter or fax or e-mail as per the timeline mentioned in Section 1.7 whether the Applicant is entitled to participate in the Auction (i.e. whether it is a Qualified Applicant). Any of the above will be considered sufficient for the purpose of notice.

### 6.6 Contact Details for Questions

- 6.6.1 All deliveries, notices or other communications made to Applicants in connection with the Application process shall be sent by designated fax or email or letter (courier) to the contact office of the Applicant(s), as specified by the Applicant to PTA in its Application Form.
- 6.6.2 All correspondence relating to this IM, information session (if required), submission of Application documents, Auction procedure and issuance of License should be duly marked "Spectrum Auction of NGMS in AJ&K and GB" and addressed to:

Director (Wireless)  
Pakistan Telecommunication Authority  
H/Qs F-5/1, Islamabad 44,000  
Pakistan

Phone: (+92 51) 2878111  
Fax: (+92 51) 2878129  
E-mail: [ajkqb-lic@pta.gov.pk](mailto:ajkqb-lic@pta.gov.pk)

- 6.6.3 PTA will review and consider comments and correspondence on this IM submitted by the date given in Section 1.7 of the IM.

6.6.4 PTA may also conduct an information session for prospective Applicants to explain the Auction process, rules, and respond to all questions and concerns. This information session will take place after the final IM is published and its only purpose will be to clarify any questions that prospective Applicants may have about the Auction.

## 7 Definition of Terms

7.1 Terms used in this document shall have the meanings defined in Table 8.

**Table 8: Definition of terms**

<b>Term</b>	<b>Definition</b>
<b>3GPP</b>	3 <sup>rd</sup> Generation Partnership Project – responsible for development of GSM, EDGE, UMTS and LTE standards
<b>Act</b>	The Pakistan Telecommunication (Reorganization) Act, 1996
<b>Applicant</b>	A company that submits an Application for the Spectrum Auction. For the avoidance of doubt, a Qualified Applicant and a Bidder is also an Applicant.
<b>Application Form</b>	Form to be completed by all Applicants in order to participate in the Spectrum Auction. A template of this form is set out in Annex B of this IM.
<b>Auction</b>	Auction is a process that includes all the steps from submission of application till the announcement of (provisional) winner(s). Even if a single Bidder participates in the Auction process, it will also be treated as an Auction.
<b>Auction Management Software</b>	The software system that will, if required, be used to conduct the Electronic Auction Stage and which is described in Section 4 of this IM.
<b>Auction Spectrum</b>	Spectrum on which an Applicant places a bid in this Auction.
<b>Auction Winning Price</b>	The price as determined at the conclusion of the Auction Spectrum. The price for a given Product at which the Auction clears, whereby demand is equal to supply in the Electronic Auction Stage, or where, in the Sealed-Bid Stage, demand is equal to or less than supply, in which case the Auction Winning Price is the Base Price for that Product, and which shall be used to determine the Initial Spectrum Fee.
<b>Authorised Representative</b>	An Applicant's Authorised Contact Representative, as set out in its Application Form.
<b>Base Price</b>	The minimum price for each Spectrum Block available in the Spectrum Auction, as shown in Tables 6 and 7 of the IM.
<b>Bidder</b>	A Qualified Applicant who participates in the Auction.
<b>Information Package</b>	The information package that will be provided to Qualified Applicants eligible to participate in the Electronic Auction Stage, setting out the details of that Stage, including the User Manual for the Auction Management System and details of the Emergency Bidding Procedure.
<b>Bidding Period</b>	Time period during which Bidders can submit a Valid Bid within each bidding round in the Electronic Auction Stage.
<b>Clock Auction</b>	Auction format used to assign the generic Spectrum Blocks in the 1800 MHz band within the Electronic Auction Stage.
<b>CMO</b>	Cellular Mobile Operator; an operator that has an existing License to provide mobile communications services in AJ&K and GB.
<b>Day</b>	Calendar day, unless specified otherwise. If a specific deadline falls onto a weekend or a national public holiday in Pakistan, that specific deadline is automatically extended to the next working day thereafter.

<b>Term</b>	<b>Definition</b>
<b>Category</b>	This refers to any product (Product 1, Product 2) within 1800 MHz and any blocks (block 1-6) within 2100 MHz
<b>Electronic Auction Stage</b>	Second stage of the Spectrum Auction process, if required, as described in Section 4.
<b>Eligibility Adjustment</b>	Adjustment that allows Bidders to carry over their Eligibility Points from Product 1 in the 1800 MHz band to Product 3 in the 2100 MHz band, if they are not declared a Provisional Winner of Product 1.
<b>Eligibility Points</b>	Points associated with each Spectrum Block, as described in Section 3.4 of this IM.
<b>Emergency Bidding Procedure</b>	The process a Bidder may follow if it is unable to submit a bid in any Bidding Period via the Auction Management System, details of which will be included in the Information Package.
<b>GoP</b>	Government of Pakistan
<b>IM</b>	This Information Memorandum, setting out the rules, process, planned timelines and other background information for prospective Applicants to participate in the Spectrum Auction of NGMS in AJ&K and GB in 2021.
<b>IMT</b>	International Mobile Telecommunications. A term used by the ITU to describe the collection of approved standards used for delivery of mobile services
<b>Initial Eligibility</b>	The number of Eligibility Points a Bidder has at the start of the Clock Auction or SMRA Auction, as appropriate.
<b>Initial Spectrum Fee (ISF)</b>	The payment due for the License as detailed in Section 2.5 of the IM and Paragraph 4.1.1 of the License.
<b>ITU</b>	International Telecommunications Union.
<b>License</b>	The License awarded to a CMO or new Entrant in the Spectrum Auction
<b>LTE</b>	Long-Term Evolution means an international 3GPP standard for high-speed mobile communications services
<b>Market Entrant/New Entrant/Potential Market Entrant</b>	A new investor from within or outside Pakistan, which may or may not be from the Telecom Sector, not currently holding Spectrum in the 900 MHz, 2100MHz or 1800 MHz bands, that obtains a License in the Spectrum Auction of NGMS in AJ&K and GB.
<b>Pakistan Table of Frequency Allocations</b>	A document that defines the Spectrum Allocation for each frequency band in Pakistan and is available at FAB website.
<b>Pre-Bid Deposit</b>	Financial deposit required to be made by Applicants as part of their Application for the Spectrum Auction, based on the template set out in Annex E of this document.
<b>Policy Directive</b>	The Policy Directive dated 11 <sup>th</sup> August 2021 issued under section 8 of the Act by the Federal Government
<b>Provisional Winner</b>	A Qualified Applicant who, following the completion of Stage 1 and / or Stage 2 of the Auction, as applicable, is provisionally declared a winning Bidder.
<b>PTA</b>	Pakistan Telecommunication Authority
<b>Qualified Applicant</b>	An Applicant who has been deemed qualified by PTA after assessment of its application for further processing
<b>Rationalisation Process</b>	PTA / FAB led process for the rationalisation of existing and auctioned spectrum in the 1800 MHz band to achieve

<b>Term</b>	<b>Definition</b>
	contiguity, where feasible, as further set out in Section 1.5 of this IM.
<b>Rationalisation Plan</b>	Proposed rationalisation of 1800 MHz spectrum shared by PTA/FAB with CMOs after the Provisional Winners have been announced.
<b>Reporting Period</b>	Time period during which the auction administrator evaluates all bids placed by Bidders to determine the Standing High Bids, etc. for the next bidding round in the Electronic Auction Stage.
<b>Sealed-Bid Form</b>	A form required by Applicants to be submitted as part of their application for the Spectrum Auction of NGMS in AJ&K and GB, setting out their interest in each Spectrum Block at the Base Price. The Sealed-Bid Form template is set out in Annex E of this document.
<b>SMRA</b>	Simultaneous Multi-Round Ascending Auction format.
<b>Spectrum Auction</b>	The award of 1800 MHz and 2100 MHz spectrum in AJ&K and GB in 2021 as contemplated by this IM
<b>Spectrum Block / Block</b>	A quantity of spectrum which is auctioned as a non-divisible unit
<b>Starting Price</b>	Same as Base Price
<b>Standing High Bid</b>	Highest Valid Bid placed by Bidders on a given Block in the SMRA.
<b>Standing High Bidder (SHB)</b>	The Bidder in the SMRA Auction that has placed the Standing High Bid. In situations where multiple Bidders have placed the Standing High Bid, this will be randomly allocated to an individual Bidder.
<b>System Live Date</b>	The date on which the Auction Management System will be accessible to Bidders
<b>Valid Bid</b>	A bid placed by a Bidder in the Spectrum Auction that conforms with all auction rules.

## **Annexes**

- Annex A - AJ&K and GB's Telecommunication Sector
- Annex B- Application Form to participate in the Spectrum Auction of NGMS in AJ&K and GB
- Annex C - Company Resolution
- Annex D - Power of Attorney
- Annex E - Sealed-Bid Form
- Annex F - License Template
- Annex G - Performance Bank Guarantee
- Annex H - Refinement Stage Examples

# Annex A – AJ&K and GB’s Telecommunication Sector

## 1. Overview of the Telecom Sector

1.1 The telecom sector in AJ&K and GB has grown rapidly in the past decade and offers significant opportunities to new entrants and existing operators. In recognition of the catalytic effect of telecommunications services on economic growth, the Government has granted high priority to fostering the provisioning of telecommunications services across all Pakistan (including AJ&K and GB) to achieve sustainable growth in all sectors of the economy. The regulatory framework of AJ&K and GB’s telecoms sector provides a conducive environment for domestic and international investment and provision of advanced telecom services.

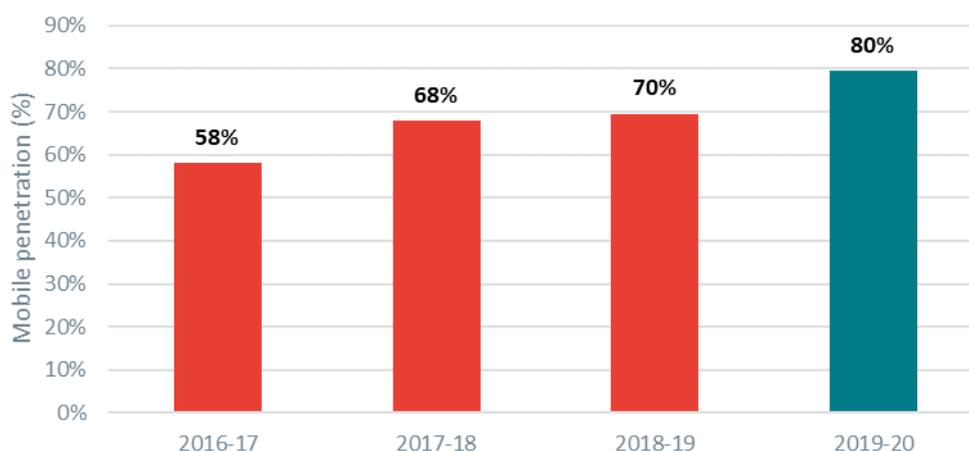
1.2 In line with global and regional trends, the cellular mobile market has experienced significant growth in recent years and now represents the vast majority of telecommunications service connections and associated revenues within AJ&K and GB. For example, total mobile connections (5.1 million) accounted for 99% of all telecom connections in 2019-20.

## 2. Mobile Communication Services

2.1 The telecom sector in AJ&K and GB was deregulated in 2006 and this resulted in the introduction of telecom services by private service providers in addition to the incumbent operator Special Communications Organisation (SCO).

2.2 The cellular mobile sector in AJ&K and GB has shown significant growth in recent years and this can be observed in the figure below. However, despite the recent growth, AJ&K and GB’s mobile penetration (number of mobile subscribers per 100 inhabitants) and internet usage is still low in comparison to many countries. Since there is a substantial population that is devoid of telecommunication services, there exists potential for growth of cellular services in AJ&K and GB.

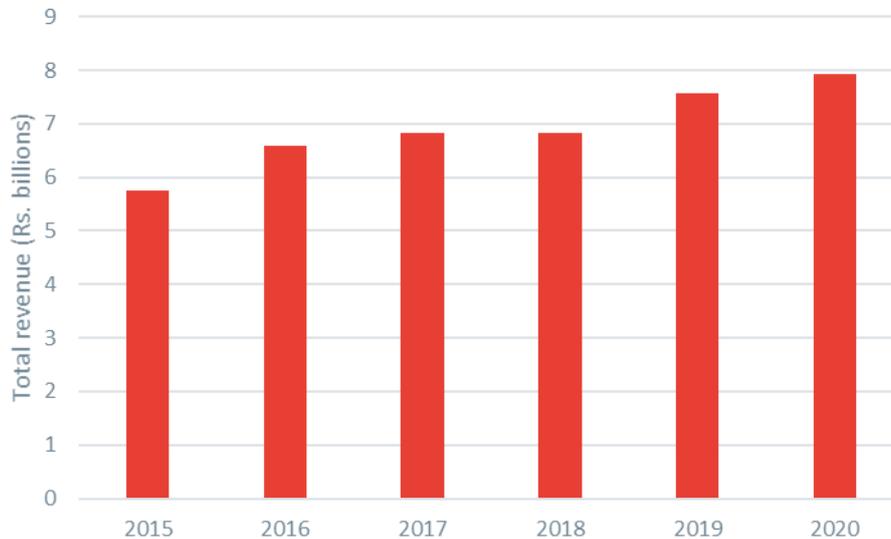
**Figure 1: Cellular tele-density or penetration, 2016-2020**



2.3 The take-up of NGMS services has also grown in recent years where mobile broadband connections have increased to more than 1.6 million in 2019-20 (compared with 0.4 million in 2017-18). This shows that, on average, more than fifty thousand additional mobile broadband connections have materialised each month during that period.

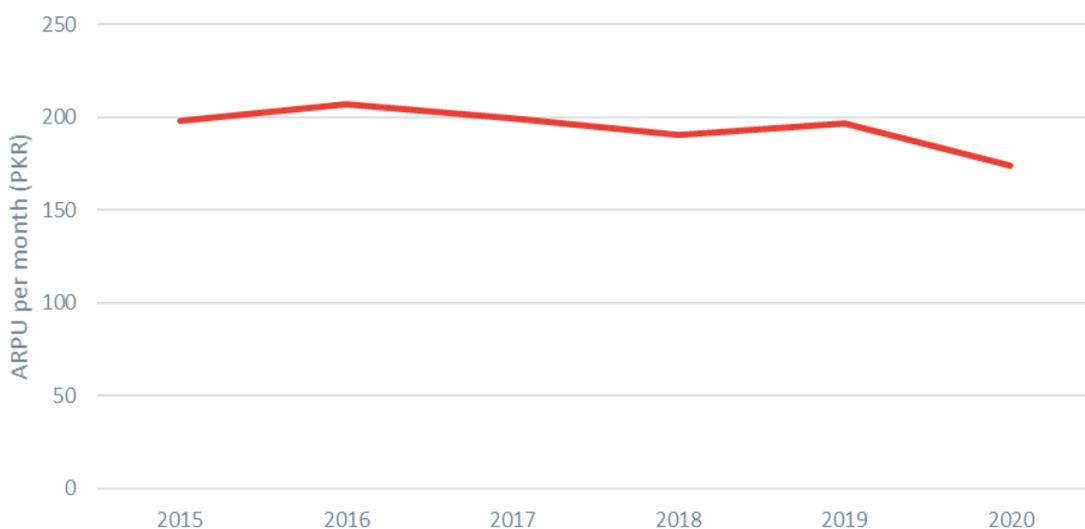
2.4 The increase in total mobile connections in AJ&K and GB has largely corresponded with an increase in total market revenues where total cellular mobile revenue exceeded Rs. 7.9 billion in 2020.

**Figure 2: Total cellular mobile revenue (Rs. billions), 2015-2020**



2.5 ARPU is the average revenue being generated by cellular mobile operators from a user on their network in a given month. The average ARPU per SIM of the cellular segment has remained relatively stable with an average of Rs. 198 between 2015 and 2019 although this has declined recently in 2020. However, the increase in cellular penetration means that total market revenue has increased from Rs. 5.8 billion in 2015 to Rs. 7.9 billion in 2020.

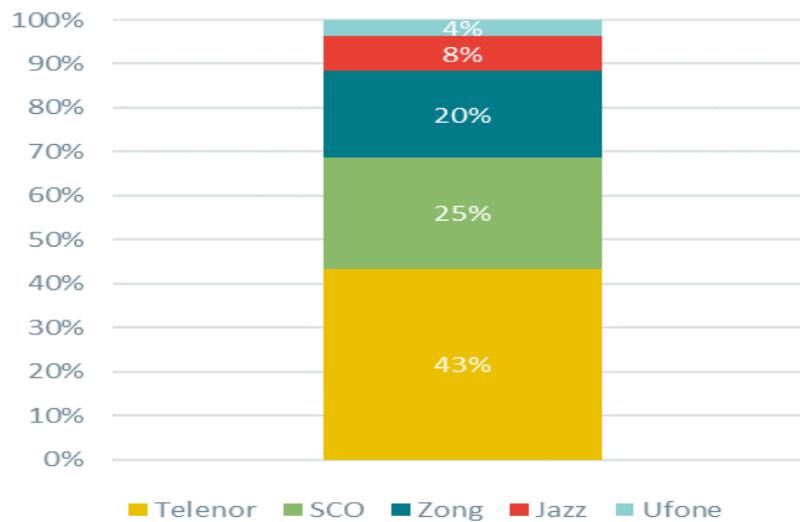
**Figure 3: Average cellular ARPU over time, 2015-2020**



## 2.6 Cellular Mobile Services Provider Profiles

2.6.1 There are currently five CMOs in AJ&K and GB and the figure below shows that Telenor is the market leader followed by SCO, Zong, Jazz and Ufone. The following paragraphs provide a brief description of each of the five existing CMOs.

**Figure 4: Market share of subscribers in 2019-2020**



### **2.6.2 Telenor**

Telenor launched mobile services in AJ&K and GB after obtaining spectrum in 900 MHz and 1800 MHz in 2006. It currently has the largest mobile network and subscriber base within AJ&K and GB. Telenor Pakistan is wholly owned by Telenor Norway.

### **2.6.3 Pakistan Mobile Communication Limited -PMCL (JAZZ)**

PMCL launched mobile services in AJ&K and GB after obtaining spectrum in 900 MHz and 1800 MHz in 2006. It is currently 100% owned by Netherlands registered VEON.

### **2.6.4 CMPak Limited (ZONG)**

Zong entered the AJ&K and GB market later than other CMOs as Zong obtained its 900 MHz and 1800 MHz spectrum in 2007.

### **2.6.5 Pakistan Telecommunication Mobile Limited - PTML (UFONE)**

Ufone launched mobile services in AJ&K and GB after obtaining spectrum in 900 MHz and 1800 MHz in 2006. It is currently 26% owned by Etisalat and 62% owned by the GoP.

### **2.6.6 Special Communications Organisation (SCO)**

Special Communications Organisation (SCO) was established as Public Sector Organization in 1976 to develop communication services in AJ&K and GB regions. It began offering commercial GSM services in 2003.

## Annex B – Application Form

### APPLICATION FORM TO PARTICIPATE IN SPECTRUM AUCTION OF NEXT GENERATION MOBILE SERVICES (NGMS) IN AZAD JAMMU AND KASHMIR (AJ&K) AND GILGIT BALTISTAN (GB) - 2021

#### APPLICATION SUBMISSION INSTRUCTIONS:

The Application Form must be in English language and one (1) original signed by the Applicant's authorized representative plus (2) two copies must be submitted to the following address of PTA by 4pm Pakistan Standard Time as per the timeline in Section 1.7:

Director (Wireless)  
Pakistan Telecommunication Authority  
H/Qs F-5/1, Islamabad 44,000  
Pakistan

Phone: (+92 51) 2878111  
Fax: (+92 51) 2878129  
Email: [ajkqb-lic@pta.gov.pk](mailto:ajkqb-lic@pta.gov.pk)

Applications shall be submitted in sealed envelopes and the envelopes shall be clearly marked "ORIGINAL" or "COPY". If there are any discrepancies between the original and the copies of the proposal, the original application will be taken as the correct one. The envelope shall be titled as Application for **Spectrum Auction of Next Generation Mobile Services (NGMS) in Azad Jammu and Kashmir (AJ&K) and Gilgit Baltistan (GB) – 2021** and include (i) the submission address and date, (ii) the name of the Applicant.

#### APPLICATION FORM:

[Letterhead of Applicant]

Director (Wireless)  
Pakistan Telecommunication Authority  
H/Qs F-5/1, Islamabad 44,000  
Pakistan

Phone: (+92 51) 2878111  
Fax: (+92 51) 2878129  
Email: [ajkqb-lic@pta.gov.pk](mailto:ajkqb-lic@pta.gov.pk)

Dear Pakistan Telecommunication Authority

This is our Application Form for the **Spectrum Auction of Next Generation Mobile Services (NGMS) in Azad Jammu and Kashmir (AJ&K) and Gilgit Baltistan (GB) - 2021**.

We attach the following documents as part of the Application Form in support of our application:

\*Please check mark with "yes" if provided or explain why a document is not provided. Please note that, for information marked with (#), where there are no changes to the information provided by a CMO in respect of the previous NGMS Auction process, please indicate "previously provided". For information marked with (#), if there are any changes to that information, please note the changes only. Please provide a cover letter along with each requested document including title and number of pages. Information marked with (\*) is only required to be provided by New Entrants into the mobile market in AJK and GB.

Description	Provided (yes/no)	If no, please explain
1. Applicant information		
a) The name of the Applicant		
b) The name, title, capacity and signature of at least one person legally authorized to fully represent the Applicant by virtue of the law.		
c) Certificate of Incorporation/registration duly attested/certified by SECP / relevant authorities in AJ&K and GB (#)		
d) List of Directors with details of their shareholdings, and relation to other CMOs and Applicants for a License (#)		
d) Shareholders with details of their shareholdings (#)		
e) Ownership. A clear, comprehensive and detailed view of the Applicant's ownership structure (#)		
f) National Identity Card (for Pakistan National)/ Passport (for foreign nationals) and other antecedents like contact details of the Directors and authorized representatives of the company (#)		
2. Proof or a statement on word of honour by the Applicant:		
a) That the Company or its Directors have never been declared insolvent by a court of law or government organization.		
b) That the Directors of the company have never been convicted by a court of law for major offences or unethical/ immoral turpitude (other than minor offences).		
c) That neither the Applicant Company nor its group/consortium members are defaulter(s) of PTA and to other PTA Licensees/transactions		
3. National Income Tax Number (#)		
4. Certificate on original letterhead from the Group /Joint venture/Consortium members that they are the authorized participants for Spectrum Auction of NGMS in AJ&K and GB through the Applicant (Annex B).		
5. Resolution of the Board of Directors of the Applicant authorizing: a) the person who submits and signs the Application; b) legally authorized to fully represent the Applicant by virtue of the law.		
6. Special Power of Attorney granted to the person who submits and signs the Letter of Application		
7. Company Resolution Format (Annex C)		
8. Authorized Contact Representatives nominated and duly authorized by the Applicant		
9. Brief Description of Telecommunications Qualifications and Experience of the Applicant, its key management personnel and its shareholders (*)		

Description	Provided (yes/no)	If no, please explain
10. Capital Cost of service/ project for the first year and the sources of finance in the form of equity and long term debt (*).		
11. Source of funds in the form of equity and debt for Auction Winning Price (*).		
12. Brief Description of the project and forecast balance sheets and profit loss accounts/ income statements and cash flow statements for the first 5 years of operation (*).		
13. Brief description of committed financial resources to meet Capex of the project for the 1st year in the form of bank statement of the company's account duly signed and stamped by bank manager, confirmed commitments, letter of intent, MOU signed by the bank and CFO/ Authorized officer of the company for any long term debt (*).		
14. Technical Plan (*).		
15. Bank account details for any reimbursement after the Auction.		
16. Annex D – Power of Attorney.		
17. Annex E – Pre-bid Deposit Form.		
18. Pre-Bid Deposit paid to PTA with:  Pay order-demand draft number: _____  Dated: _____ OR SWIFT code number: _____ Dated: _____ OR Direct deposit Receipt Number: _____ Dated: _____ as per Annex-E		
19. Processing Fee 500 USD or equivalent PKR		

## AUTHORIZED CONTACT REPRESENTATIVES

We confirm the following persons as our Principal Authorized Contact Representative and a Backup Authorized Contact Representative, together the Authorized Contact Representatives, for purposes of receiving all Auction-related documentation and for communications with PTA on matters relating to the Spectrum allocation process.

We will ensure that an Authorized Contact Representative is available for all matters related to the licensing process and this is the person who will receive all official communications and confidential information. These Representatives will be the only people allowed to submit official communications on our behalf to the PTA during the process.

The Authorized Contact Representatives have been duly authorized by the Applicant's Board of Directors.

The contact details are as follows:

### PRINCIPAL AUTHORIZED CONTACT REPRESENTATIVE

[insert]

[FIRST, LAST NAME]  
PHYSICAL ADDRESS  
LANDLINE TELEPHONE  
CELL PHONE NUMBER  
FAX NUMBER  
EMAIL ADDRESS

BACKUP AUTHORIZED CONTACT REPRESENTATIVE

[insert]

[FIRST, LAST NAME]  
PHYSICAL ADDRESS  
LANDLINE TELEPHONE  
CELL PHONE NUMBER  
FAX NUMBER  
EMAIL ADDRESS

**UNDERTAKING**

We hereby undertake that we accept and agree to be bound by all provisions of the PTA's Information Memorandum, including the rules and requirements related to the Spectrum Auction, and that we agree to be bound by, and to undertake to implement the re-assignment or change of spectrum in the 1800 MHz band in accordance with, the Rationalisation Plan published by the PTA in consultation with FAB and referred to in the Information Memorandum.

For and on behalf of:

[Name of Applicant]

Seal of the Company

WITNESSES:

1. \_\_\_\_\_

National ID/NICOP/CNIC NO. \_\_\_\_\_

Passport Number (in case of foreign national). \_\_\_\_\_

2. \_\_\_\_\_

National ID/NICOP/CNIC NO. \_\_\_\_\_

Passport Number (in case of foreign national). \_\_\_\_\_

## Annex C – Company Resolution

[Letterhead of the Company]

I, \_\_\_\_\_, Company Secretary of [HERE GIVE FULL NAME AND ADDRESS OF THE APPLICANT ENTITY] (the "Company"), do hereby certify that the following is a true and correct copy of a Resolution duly adopted at a meeting of the Board of Directors of the Company duly convened and held on \_\_\_\_\_, and at this resolution has not been modified, rescinded or revoked, and is at present in full force and effect:

RESOLVED THAT the Company be and is hereby authorized to apply for the award of [here describe the nature of the Spectrum being applied for], ("the Spectrum") and to comply with all requirements of its application process and the terms of the License, if any, granted as a consequence;

FURTHER RESOLVED THAT Mr/Ms. \_\_\_\_\_, son/daughter of Mr. \_\_\_\_\_, bearing CNIC/Passport No. \_\_\_\_\_ resident of \_\_\_\_\_ [here give designation of the appointee] be and is hereby appointed as an authorized representative of the Company (the "Authorized Representative"), for and on its behalf, to execute all documents and take all actions as may be required, necessary or incidental in connection with submission and grant of the application of the License, including submission of the Power of Attorney in the form and manner prescribed at Annex D of the Information Memorandum issued by the Pakistan Telecommunication Authority for which all necessary instructions and information has been provided to him;

FURTHER RESOLVED THAT Mr/Ms \_\_\_\_\_, son/daughter of Mr. \_\_\_\_\_, bearing CNIC/Passport No \_\_\_\_\_, director/secretary of the Company be and is hereby authorized on behalf of the Company to execute a Power of Attorney in favour of the Authorized Representative on such terms as may be deemed expedient and in the form prescribed by the Pakistan Telecommunication Authority.

Certified to be a true copy:  
Company Secretary

Company Seal and Stamp

## Annex D – Power of Attorney

### POWER OF ATTORNEY

[To be submitted on a stamp paper of Rs.100]

KNOW ALL MEN BY THESE PRESENTS THAT WE \_\_\_\_\_,  
("Company Name")

Incorporated in \_\_\_\_\_ (country) having our registered office at \_\_\_\_\_ (hereinafter called the "Applicant") on approval by the [Board of Directors] and after meeting all necessary requirements for appointing a Special Attorney do hereby nominate, constitute, appoint and execute \_\_\_\_\_ [here give name, parentage identity document number and address of the Special Attorney] (hereinafter to be called as "Attorney") to be and to act as our lawful attorney, for us, in our name and on our behalf to exercise any and all of the powers herein contained and ancillary thereto, that is to say:

- a) to sign, execute and/or authenticate all applications or other correspondence, statements and documents required to be submitted to Pakistan Telecommunication Authority (hereinafter the "Authority") and to act for and on our behalf in all matters including negotiating the terms and conditions of the award and signing any and all documents relating to award of the spectrum for provision of mobile communications services in Azad Jammu & Kashmir and Gilgit-Baltistan;
- b) to fulfil all the requirements and formalities as may be required to be fulfilled for the award of Spectrum for provision of mobile communications services and grant of the License applied for and on behalf of the Applicant in this regard;
- c) to attend all meetings with and hearings before the Authority or any other governmental officer or entity and to provide any and all necessary documents and material information or assistance as may be required by the Authority for its satisfaction to issue the License for mobile communications services applied for by the Applicant;
- d) to execute any and all such documents and undertake all such acts as may be necessary in order to comply with the directions, decisions and orders of the Authority relating to award of spectrum for mobile communications services and issuance of License (*including all fees and other dues etc. provided in the License*) applied for by the Applicant; and
- e) generally to do any and all such acts as may be necessary or incidental for the award of spectrum for mobile communications services and grant of the License applied for by the Applicant.

We hereby agree and undertake to bind ourselves irrevocably to all commitments made, acts done, agreements made and arrangements entered into by the Attorney and hereby anticipatorily and irrevocably confirm and ratify all acts, deeds and things which the said Attorney shall lawfully do or cause to be done in express and implied exercise of any of the powers contained herein.

This Power of Attorney shall not be revoked without prior written notice reasonably in advance to the Authority and such revocation shall not invalidate any and all action taken by the

Attorney before the revocation in exercise of the powers vested hereby. In witness whereof we have signed this power of attorney at this day\_\_\_\_\_ of \_\_\_\_\_, 2021

EXECUTANT

Seal of the Company

WITNESSES:

1. \_\_\_\_\_

National ID/NICOP/CNIC NO. \_\_\_\_\_

Passport Number (in case of foreign national). \_\_\_\_\_

2. \_\_\_\_\_

National ID/NICOP/CNIC NO. \_\_\_\_\_

Passport Number (in case of foreign national). \_\_\_\_\_

## Annex E – Sealed-Bid Form

Name of Applicant:

---

STATEMENT OF SPECTRUM THE APPLICANT IS INTERESTED IN BUYING AT THE BASE PRICE FOR THE SPECTRUM AUCTION OF NGMS IN AJ&K AND GB 2021.

Please state in Tables 1, 2, 3 and 4 below the total quantity of spectrum that you are interested in acquiring in the 1800 MHz and 2100 MHz bands. Please further fill out Table 5 below with your total Pre-Bid Deposit amount and proof of payment.

### 1800 MHz

#### Product 1

State, in Column D of Table 1 below, whether you are interested in acquiring and pay the Pre-Bid Deposit for one or two 2x5 MHz blocks. Note that you can only enter a number between 1 and 2 in column D. Please then fill out the total Base Price in Column E (multiply Column B by Column D) and total Pre-Bid Deposit in Column F (multiply Column C by Column D). If you are not interested in this Product, please leave columns D, E and F blank in Table 1.

Table 1

Radio frequency blocks	A	B	C	D	E	F
	Base Price for 2x1 MHz (USD)*	Base Price per 2x5 MHz block (USD)* (A x 5)	Pre-Bid Deposit per 2x5 MHz (USD)* (B x 20%)	Number of blocks (1 – 2)	Base Price based on total demand (USD)* (B x D)	Pre-Bid Deposit based on total demand (USD)* (C x D)
2x5 MHz blocks	870,000	4,350,000	870,000			

#### Product 2

Please state, in Column D of Table 2 below, the total number of 2x1.2 MHz blocks for which you are interested in buying usage rights and pay the Pre-Bid Deposit. Note that you can only enter a number between 1 and 5 in column D. Please then fill out the total Base Price in Column E (multiply Column B by Column D) and total Pre-Bid Deposit in Column F (multiply Column C by Column D). If you are not interested in this Product, please leave columns D, E and F blank in Table 2.

Table 2

Radio frequency blocks	A	B	C	D	E	F
	Base Price for 2x1 MHz (USD)*	Base Price per 2x1.2 MHz block (USD)* (A x 1.2)	Pre-Bid Deposit per 2x1.2 MHz (USD)* (B x 20%)	Number of blocks (1 – 5)	Base Price based on total demand (USD)* (B x D)	Pre-Bid Deposit based on total demand (USD)* (C x D)
2x1.2 MHz blocks	870,000	1,044,000	208,800			

Please note that your choices above in Tables 1 and 2 are irrevocably binding.

## 2100 MHz

### Product 3

Please state, in Column E of Table 3 below, whether you are interested to buy usage rights and pay the Pre-Bid Deposit for specific blocks of 2x5 MHz within 2100 MHz. You can only enter “Yes” or “No” in Column E. **Please only state your interest in a specific block in**

**Table 3 below if you have not already expressed your interest in that block as part of the Eligibility Adjustment in Table 4.**

Radio frequency blocks	A	B	C	D	E
	Frequency (MHz)	Base Price for 2x1 MHz (USD)*	Base Price for 2x5 MHz (USD)* (B x 5)	Total pre-bid deposit for 2x5 MHz (USD)* (C x 20%)	Interest (Yes/No)
Block 1	1930-1935 / 2120-2125	870,000	4,350,000	870,000	
Block 2	1935-1940 / 2125-2130	870,000	4,350,000	870,000	
Block 3	1940-1945 / 2130-2135	870,000	4,350,000	870,000	
Block 4	1945-1950 / 2135-2140	870,000	4,350,000	870,000	
Block 5	1960-1965 / 2150-2155	870,000	4,350,000	870,000	
Block 6	1965-1970 / 2155-2160	870,000	4,350,000	870,000	

Note that your choices above in Table 3 are irrevocably binding on the Applicant.

### Only for Bidders that stated their interest in Product 1 of 1800 MHz in Table 1

Please specify whether you would like to use the Eligibility Adjustment (if applicable) in Column A. That is, if you are not successful in winning the quantity of Product 1 set out in Table 1 of this Form as part of the 1800 MHz Auction, please specify whether you would like to transfer your eligibility for one or two blocks from Product 1 to the same number of blocks in Product 3. Note that you can only enter “Yes” or “No” in Column A. If so, please specify which Block(s) you want to use the eligibility for in Column B. Note that you can only enter Block 1 to Block 6 in Column B. Please ensure that you specify a Block or Blocks which are different from those included in Table 3 above.

Please note that if you are successful in winning the quantity of Product 1 set out in Table 1 of this Form, you will not be able to use the Eligibility Adjustment in Table 4.

Table 4

Radio frequency blocks	A	B
	Interest in using the Eligibility Adjustment (Yes/No)	If interested in using the Eligibility Adjustment, please state the specific block(s) in 2100 MHz (Block 1/ Block 2 / Block 3 / Block 4 / Block 5 / Block 6) <sup>8</sup>

<sup>8</sup> Please note the number of Blocks stated in Column B Table 4 cannot exceed your stated demand for Product 1, the number in Column D Table 1.

<b>Eligibility Adjustment</b>		
-------------------------------	--	--

Please note that your choices above in Table 4 is irrevocably binding on the Applicant.

**Summary**

Please add up your total Pre-Bid Deposits from Tables 1, 2 and 3 above and fill out Column A in Table 5 below. This is the total amount of Pre-Bid Deposit you must submit with your application. Please also enter the date and number of instruments used for payment of Pre-Bid Deposit in Column B.

Table 5

	A	B
	Total Pre-Bid Deposit for 1800 MHz and 2100 MHz spectrum (USD)*	Proof of Payment - Financial Instrument(s) Details
Total		

\* Pre-Bid Deposit Amount shall be paid in US Dollars or its equivalent in Pak Rupees to be converted at the National Bank of Pakistan (NBP) Telegraphic Transfer (TT) selling rate prevailing on the day preceding the date of payment.

I declare and irrevocably commit that the Applicant Company will pay for the blocks set out in Tables 1, 2, 3 and 4 above, at the Base Price, if awarded such spectrum in the case where demand for spectrum does not exceed the supply of spectrum.

In addition to the above declaration and commitment, I declare and irrevocably commit that the Applicant Company shall pay for the spectrum blocks subject to payment options at the end of the Auction for which it is declared Provisional Winner.

I solemnly declare that the number of stated spectrum blocks in this Application binds the Applicant Company to pay for this amount of spectrum at the Base Price for each spectrum block stated in the above tables if awarded such spectrum in this Spectrum Auction.

Date: \_\_\_\_\_

Name and Signature of Authorized Representative \_\_\_\_\_

**Warning**

Applicants will note that the application must be complete when it is submitted, with the correct amount of copies, with neither mistakes nor omissions. The application shall also be submitted during the hours indicated, and at the latest by the date specified by PTA. PTA will provide a receipt of application with checkmarks on the submitted documentation. If these requirements are not met, the application can be turned down and PTA may only provide 24 hours to complete.

## **Annex F – License Template**

Template of the License is part of this IM and is attached as a separate document at (Annex F).

Note: The License Template also includes Appendix 2(a) for the existing licensees whose license are renewed by PTA in June 2021.

## Annex G – Performance Bank Guarantee (PBG)

**Guarantor:** [Name of local bank in Pakistan with credit rating of AA+ and above, or a foreign bank having credit rating of A1 and above, acceptable to the Authority] (the “**Guarantor**”), [Bank’s address]

**Beneficiary:** Pakistan Telecommunication Authority (PTA), PTA Headquarters Building F-5/1 Islamabad, Pakistan, (the “**Beneficiary**”).

**Principal:** Licensee Name \_\_\_\_\_, a company incorporated under the laws of Pakistan with its registered offices at \_\_\_\_\_ (the “**Principal**”).

**Guarantee Amount:** USD 1,000,000 (US Dollars One Million) or equivalent Pakistan Rupees at the T.T Selling rate of National Bank of Pakistan on the preceding working day of the conversion date (the “**Guarantee Amount**”).

**PBG Date:** License Effective Date

**License:** The License granted to the Principal dated \_\_\_\_\_.

**Rollout Obligations:** The roll out obligations in Appendix-1 A1 of the License, being rollout obligations to be fulfilled within the first eight years of the license term.

**Expiry Date:** Expiry date shall be set in accordance with the Roll out Obligations, in each case with an additional grace period of 6 months, at the counters of the Guarantor

WHEREAS:

- a) The Principal has committed to furnish an unconditional, irrevocable and continuing Performance Bond in the form of Bank Guarantee (the “Guarantee”) of (Name of Bank) \_\_\_\_\_ for the Guarantee Amount as security for compliance with the Rollout Obligations; and
- b) The Guarantor has executed this unconditional, without recourse to the Beneficiary, irrevocable and continuing Performance Bond in the shape of Bank Guarantee at the request of the Principal for the performance of Principal’s Rollout Obligations.

NOW THEREFORE the parties agree as follows:

- a) Subject to the terms of this Guarantee, the Guarantor hereby un-conditionally, irrevocably and continuingly guarantee without recourse to the Beneficiary, i.e. PTA, as primary obligor and as a guarantor of payment, the due, complete and punctual payment within 3 working days upon receipt of written notice of claim from the Beneficiary (in the form attached hereto as Annex A);
- b) The maximum aggregate liability of the Guarantor under or in connection with this Guarantee shall be limited to the Guarantee Amount, together with interest thereon at the prevailing one (1) month Karachi Interbank Offer Rate (KIBOR) from the date from which payment is due to the Beneficiary until receipt of payment by the Beneficiary or collection thereof against the Principal and the Guarantor;
- c) This Guarantee is un-conditional, irrevocable and continuing, and
  - i.) the Principal shall be entitled to have a proportion of this Guarantee (being one quarter) released on its request upon successful completion of the Year 2, Year

4, Year 6 and Year 8 Rollout Obligations met by the Principal/Licensee and duly approved by Beneficiary/PTA (in all other respects, this Guarantee remains in effect); and

- ii.) the Principal shall be entitled to have this Guarantee returned on its request upon successful completion of all of the Rollout Obligations under the License met by the Principal/Licensee and duly approved by Beneficiary/PTA.
- d) In case any phased network Rollout Obligations is not fulfilled, the Performance Bond against the defined network Rollout Obligations not met shall be encashed by the Authority. This Performance Bond shall remain in force and valid until six months after the associated phase of the network Rollout Obligations.
- e) If any payment by the Principal or any discharge given by the Beneficiary is avoided or reduced as a result of insolvency or any similar event:
  - i.) the liability of the Guarantor shall continue as if the payment, discharge, avoidance or reduction had not occurred; and
  - ii.) the Beneficiary shall be entitled to recover the value or payment from the Guarantor, as if the payment discharge, avoidance or reduction had not occurred.
- f) Subject to clause 3 above, this Guarantee is valid until the Expiry Date for the relevant Rollout Obligation, by which date notice of claims in respect of that Rollout Obligation, if any, must have been given to the Guarantor, and failing such notice of claim by close of business on the Expiry Date this guarantee shall be null and void in respect of that Rollout Obligation.
- g) Any claim or notice made or given by the Beneficiary to the Guarantor under this Guarantee shall be deemed to be sufficiently made and given if in writing in the form attached in Annex A and delivered at the counters of the Guarantor at the following address:  
  
Bank Name: \_\_\_\_\_  
Address: \_\_\_\_\_
- h) This Guarantee shall be governed by and construed in accordance with the Uniform Customs and Practice for Documentary Credits, 2007 Revision, ICC Publication No. 600 (UCP) and/or Uniform Rules for Demand Guarantees, 2010 Revision, ICC Publication No.758 (URDG) and their updated versions, whichever is applicable, to the extent that such provisions are not inconsistent with this Guarantee and the laws of Pakistan, and engages us in accordance with the terms thereof. No recourse is permissible upon the occurrence of events listed in Article 17 (UCP) or Article 26 (URDG), to any other branch, subsidiary or affiliate of .....(Bank Name).

For matters not covered by the Publication, the laws of Pakistan shall be applicable and the Guarantee related matters will be governed, accordingly. We hereby unconditionally and irrevocably understand and accept the exclusive jurisdiction of the Courts of Pakistan at Islamabad.

Notwithstanding anything contained herein above, the Guarantor's liability under this Guarantee is limited to the Guarantee Amount , together with interest thereon at the prevailing one (1) month Karachi Interbank Offer Rate (KIBOR) from the date the payment is due to the Beneficiary until receipt of payment by the Beneficiary and reasonable expenses not

exceeding in the aggregate 2% of the Guarantee Amount incurred by the Beneficiary in collection thereof against the Principal and the Guarantor. Claims under this Guarantee will be payable and must be lodged and received (accompanied by the original instrument of Bank Guarantee) solely at the counters of  [Bank's name] \_\_\_\_\_ [Bank Address] on or before the Expiry Date for the relevant Rollout Obligation and will be payable solely by  \_\_\_\_\_ [Bank's name] at Islamabad, Pakistan. Except for any claims duly received at the Guarantor's counters in Islamabad before close of business on the Expiry Date for the relevant Rollout Obligation, the Guarantor shall stand discharged and released of all its obligations under this Guarantee in respect of that Rollout Obligation at close of business on the Expiry Date and shall not be liable for any claims lodged thereafter, notwithstanding that Beneficiary may have failed to return the original instrument of Bank Guarantee to the Guarantor duly cancelled at expiry hereof.

Bank Guarantee No. \_\_\_\_\_ duly issued on the \_\_\_\_\_ (PBG Date)  
for and on behalf of \_\_\_\_\_ (Licensee Name) as Guarantor.

By

Name (Bank's Representative):

Title: In the presence of:

Witnesses:

1- Name: \_\_\_\_\_

Address:

Occupation:

CNIC No.:

2- Name: \_\_\_\_\_

Address:

Occupation:

CNIC No.:

**ANNEX-A**

Beneficiary's Demand under Unconditional, Irrevocable & Continuing Bank Guarantee / Letter of Credit No. \_\_\_\_\_

Issued by \_\_\_\_\_ (Bank Name) at Islamabad Branch

Drawn under Letter of Credit No. \_\_\_\_\_  
(Insert Bank Guarantee/Letter of Credit Number and Date)

To \_\_\_\_\_ (Name and Address of Issuing Bank)

The undersigned hereby demands that [name of issuing bank] \_\_\_\_\_ pay to the order of the undersigned (Beneficiary/PTA) before close of the 3rd business day after receipt of the notice a sum of USD 1,000,000 (US Dollar One Million) or equivalent Pakistan Rupees at the T.T Selling rate of National Bank of Pakistan on the preceding working day of the payment/encashment, together with interest thereon at the prevailing one (1) month Karachi Interbank Offer Rate (KIBOR) from the date the payment is due to the Beneficiary until receipt of payment by the Beneficiary and reasonable expenses not exceeding in the aggregate 2% of the Guarantee Amount incurred by the Beneficiary in collection thereof against the Principal and the Guarantor. The Bank Guarantee / Letter of credit is enclosed for endorsement by \_\_\_\_\_ (Bank Name) at Islamabad Branch of the amount drawn for cancellation/encashment.

Dated:- -----

Pakistan Telecommunication Authority

Chairman \_\_\_\_\_

## Annex H – Refinement Stage Examples

This Annex sets out illustrative examples of how a Clock Auction determines market clearing prices. It considers four (4) examples:

- a) A Clock Auction where an equilibrium is achieved without a refinement round;
- b) A Clock Auction where one Bidder reduces demand leading to a refinement round;
- c) A Clock Auction where multiple Bidders reduce demand leading to a refinement round where an equilibrium is reached without a tiebreaker; and
- d) A Clock Auction where multiple Bidders reduce demand leading to a refinement round where an equilibrium is reached through a tiebreaker.

All examples are highly stylised and are designed to show how the auction will determine market clearing price in the simplest possible way.

### Example 1 - A Clock Auction where an equilibrium is achieved without a refinement round

This stylised example has the following characteristics:

- a) There are three Bidders<sup>9</sup> bidding for a product with total supply of 10 units;
- b) In round  $n$  the three bidders express their demand for the product at a price of \$50. At \$50, aggregate demand across the three Bidders is greater than supply; and
- c) In round  $n+1$ , the three Bidders express their demand for the product at a price of \$60. As the price has increased from \$50, the Bidders have decreased their demand. Now aggregate demand across the three Bidders is equal to 10 units. As supply now equals demand, the market clearing price is found to be \$60.

Table H1: Example 1 - A Clock Auction where an equilibrium is achieved without a refinement round

	Round $n$	Round $n + 1$
<b>Clock Price</b>	<b>\$50</b>	<b>\$60</b>
Bidder One	3	3
Bidder Two	5	3
Bidder Three	8	4
<b>Aggregate Demand</b>	<b>16</b>	<b>10</b>
	<b>Demand &gt; Supply</b>	<b>Demand = Supply</b>

<sup>9</sup> For simplicity, all examples in this Annex use three bidders, however the results and conclusions from each example could easily be extended to examples with four or more bidders.

In this scenario there is no need for a refinement round as the nature of the bidders' decrease in demand means that an allocation is found where supply equals demand.

**Example 2 - A Clock Auction where one Bidder reduces demand leading to aggregate demand falling below supply**

This stylised example has the following characteristics:

- a) As above, there are three Bidders bidding for a product with supply of 10 units. In round n+1, the three Bidders express their demand for the product at a price of \$60.
- b) In this example, Bidder Three has decreased its demand to 0 while the other two Bidders have not changed their demand. The nature of the decrease in Bidder Three's demand means that at a price of \$60 the demand for the product is less than the supply.<sup>10</sup>

Table H2: Example 2 - A Clock Auction where one Bidder drops demand leading to aggregate demand falling below supply

	Round n	Round n + 1
<b>Clock Price</b>	<b>\$50</b>	<b>\$60</b>
Bidder One	3	3
Bidder Two	5	5
Bidder Three	3	0
<b>Aggregate Demand</b>	<b>11</b>	<b>8</b>
<b>Demand &lt; Supply</b>		

In this example, as a single Bidder has caused demand to fall below supply, the Product will be allocated at the price in the previous round (i.e. \$50). All Bidders who did not drop demand will be allocated the quantity that they demanded in the final round, and the single Bidder who dropped demand will be allocated the remaining quantity of the Product. Therefore, Bidder One and Two receive 3 and 5 units respectively, and Bidder Three receives the remaining two units. This is set out in the Table below.

Table H3: Example 2 - Final allocation

<b>Clearing price: \$50</b>	<b>Quantity</b>
Bidder One	3

<sup>10</sup> Note that if Bidder Three had decreased its demand to 2 (instead of 0) an equilibrium would be found in the clock round. If Bidder Three had decreased its demand to an amount greater than 2 the auction would continue as demand would remain greater than supply.

Clearing price: \$50	Quantity
Bidder Two	5
Bidder Three	2

### Example 3 - A Clock Auction where multiple Bidders reduce demand leading to a refinement round

This stylised example has the following characteristics:

- As above, there are three Bidders bidding for a product with supply of 10 units. In round  $n$  the three Bidders express their demand for the product at a price of \$50. At \$50, aggregate demand across the three Bidders is greater than aggregate supply; and
- In round  $n+1$ , the three Bidders express their demand for the product at a price of \$60. In this example, two Bidders have decreased their demand while the other Bidder has not changed its demand. The nature of the decrease in Bidder Two and Three's demand means that at a price of \$60 the aggregate demand for the product is less than the supply and so a refinement round is needed to ensure that the entirety of the product is allocated.<sup>11</sup>

Table H4: Example 3 - A Clock Auction where multiple Bidders drop demand leading to a refinement round where an equilibrium is reached without a tiebreaker

	Round $n$	Round $n + 1$
<b>Clock Price</b>	<b>\$50</b>	<b>\$60</b>
Bidder One	3	3
Bidder Two	5	3
Bidder Three	3	0
<b>Aggregate Demand</b>	<b>11</b>	<b>6</b>
	<b>Demand &gt; Supply</b>	<b>Demand &lt; Supply</b>

As multiple Bidders have dropped demand, this auction now enters a refinement round. In this example:

- Bidder One does not participate in the refinement round as it did not change its demand between the penultimate and the final round; and

<sup>11</sup> Note that if Bidder Two and Three had decreased their demand such that they demanded a total of 7 units between them, a refinement round would not be necessary as the market clearing price would have been found. If Bidder Two and Three decreased their demand such that they demanded more than 7 units between them the auction would continue as demand would remain greater than supply.

- b) Bidder Two and Three enter their valuations for each lot where they dropped demand. This is shown in the tables below.

Table H5: Example 3 – Bidder 2's valuation in the refinement round

Requested quantity	Requested price	Bid
4	\$52	\$208
3	\$54	\$162

Table H6: Example 3 – Bidder 3's valuation in the refinement round

Requested quantity	Requested price	Bid
2	\$54	\$108
1	\$56	\$56
0	\$58	\$0

In this example, Bidder Two indicates that:

- a) At prices between \$50 and \$51.99, it is still willing to buy 5 units;
- b) At \$52, its demand drops to 4 units;
- c) At prices between \$52 and \$53.99 it is willing to buy 4 units;
- d) At \$54, its demand drops to 3 units; and
- e) At prices between \$54 and \$60, it is willing to buy 3 units.

And Bidder Three indicates that:

- a) At prices between \$50 and \$53.99, it is still willing to buy 3 units;
- b) At \$54, its demand drops to 2 units;
- c) At prices between \$54 and \$55.99 it is willing to buy 2 units;
- d) At \$56, its demand drops to 1 units;
- e) At prices between \$56 and \$57.99 it is willing to buy 1 units;
- f) At \$58, its demand drops to 0 units; and
- g) At prices between \$58 and \$60, it is not willing to buy any units.

The Table below combines Bidder Two and Three's valuations with Bidder One's valuation to calculate a market clearing price.

Table H7: Example 3 - A refinement round where multiple Bidders drop demand

Price	\$50	\$52	\$54	\$56	\$58	\$60
Bidder One	3	3	3	3	3	3
Bidder Two	5	4	3	3	3	3
Bidder Three	3	3	2	1	0	0
<b>Demand</b>	<b>11</b>	<b>10</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>6</b>
	D > S	D = S	D < S	D < S	D < S	D < S

The Bidders' valuations mean that \$52 is the market clearing price. Bidder One is allocated 3 units, Bidder Two is allocated 4 units and Bidder Three is allocated 3 units.

**Example 4 - A Clock Auction where multiple Bidders reduce demand leading to a refinement round where an equilibrium is reached through a tiebreaker**

This stylised example has the following characteristics:

- a) As with all examples above, there are three Bidders bidding for a product with supply of 10 units. In round  $n$  the three Bidders express their demand for the product at a price of \$50. At \$50, aggregate demand across the three Bidders is greater than supply; and
- b) In round  $n+1$ , the three Bidders express their demand for the product at a price of \$60. In this example, all three Bidders have decreased their demand. As with example 3, the nature of the decrease in bidders' demand means that at a price of \$60 the demand for the product is less than the supply and so a refinement round is needed to ensure that the entirety of the product is allocated.

Table H8: Example 4 - A Clock Auction where multiple Bidders reduce demand leading to a refinement round where an equilibrium is reached through a tiebreaker

	Round n	Round n + 1
<b>Clock Price</b>	<b>\$50</b>	<b>\$60</b>
Bidder One	3	2
Bidder Two	4	3
Bidder Three	4	3

<b>Aggregate Demand</b>	<b>11</b>	<b>8</b>
	<b>Demand &gt; Supply</b>	<b>Demand &lt; Supply</b>

As with Example 3, this auction now enters a refinement round. In this example, all three Bidders enter their valuations for Lots where they dropped demand. In this case,

- Bidder One indicates it reduces its demand from 3 to 2 units at \$54<sup>12</sup>;
- Bidder Two indicates it reduces its demand from 4 to 3 units at \$54<sup>13</sup>; and
- Bidder Three also indicates it reduces its demand from 4 to 3 units at \$54<sup>14</sup>.

This leads to the valuations set out in the table below:

Table H9: Example 4 - A refinement round where multiple Bidders drop demand

<b>Price</b>	<b>\$50</b>	<b>\$54</b>	<b>\$60</b>
Bidder One	3	2	2
Bidder Two	4	3	3
Bidder Three	4	3	3
<b>Demand</b>	<b>11</b>	<b>8</b>	<b>8</b>
	<b>D &gt; S</b>	<b>D &lt; S</b>	<b>D &lt; S</b>

In this example a tie-break round is needed because:

- Multiple Bidders (in this case all three Bidders) have indicated that their demand falls at exactly the same price point. At this point supply exceeds aggregate demand; and
- The nature of the Bidders' decrease in demand at this price point means that aggregate demand is less than aggregate supply.<sup>15</sup>

<sup>12</sup> This means that Bidder One is willing to buy 3 units between \$50 and \$53.99.

<sup>13</sup> This means that Bidder Two is willing to buy 4 units between \$50 and \$53.99, and 3 units at any price between \$54 and \$60.

<sup>14</sup> This means that Bidder Two is willing to buy 4 units between \$50 and \$53.99, and 3 units between \$54 and \$60.

<sup>15</sup> In a scenario where demand dropped by an amount greater than the number of bidders that reduced demand, bidders who reduced their demand would be assigned the excess units up until a point where a tie-breaker was needed. For example, in a scenario where three Bidders dropped demand at the same price point leading to an excess demand of 4 units, each Bidder will be assigned 1 unit and the remaining unit will be assigned in a tie-breaker round.

In the tie-breaker round the Auction Management Software assigns all three bidders random numbers, for example as in the table below.

Table H10: Example 4 - Tie-breaker round

	<b>Bidder selection number</b>
Bidder One	0.10052
Bidder Two	0.43303
Bidder Three	0.49537

As Bidder Three is assigned the highest random number, it receives one additional unit. Bidder Two is assigned the second highest number. Hence, Bidder Two receives the second unallocated unit.

In this example, \$54 is the market clearing price as it is the price at which the auction switched from excess supply to excess demand. Bidder One is allocated the 2 units it demanded at this price. Bidder Two and Three are each allocated 4 units (the 3 they demanded at \$54 plus 1 assigned through the tiebreaker).

Table H11: Example 4 - Final allocation

<b>Clearing price: \$54</b>	<b>Quantity</b>
Bidder One	2
Bidder Two	4
Bidder Three	4