



**AUCTION OF
700 MHZ SPECTRUM RIGHTS (2016),
900 MHZ SPECTRUM RIGHTS (2016),
2.3 GHZ SPECTRUM RIGHTS (2016) AND
2.5 GHZ SPECTRUM RIGHTS (2016)**

INFORMATION MEMORANDUM

29 APRIL 2016
(UPDATED ON 14 JULY 2016)

INFO-COMMUNICATIONS DEVELOPMENT AUTHORITY
REPUBLIC OF SINGAPORE

Important Notice

Terms and expressions used in this Important Notice are as defined in this Information Memorandum.

This Information Memorandum has been prepared in connection with the proposed grant of 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), and 2.5 GHz Spectrum Rights (2016) pursuant to the Telecommunications Act (Cap. 323) and Telecommunications (Radio-communication) Regulations. This Information Memorandum is for informational purposes only. It is made available on the express understanding that it will strictly not be used for any purpose other than to assist an interested party in deciding whether it wishes to proceed with a further investigation of possible participation in the allocation process.

This Information Memorandum shall not form any part of the basis of any investment decision or other evaluation of any decision to participate in the allocation process and should not be considered as a recommendation by IDA or IDA's advisers to participate in the allocation process. Each interested party must make its own independent assessment of the potential value of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), or 2.5 GHz Spectrum Rights (2016) after making such investigations, and seeking such independent professional advice, as it may deem necessary. All information contained in this Information Memorandum may be updated or amended by IDA at any time.

While the information contained in this Information Memorandum is accurate as at the time of posting on IDA's website, neither IDA nor any of IDA's advisers and/or any of their respective directors, officers or employees makes any representation or warranty (express or implied), and shall not have any responsibility or liability in relation to the accuracy or completeness of the information contained in this Information Memorandum or any other written or oral information made available to any interested party and/or its advisers. Any responsibility or liability in respect of any such information or any inaccuracy in this Information Memorandum or omission from this Information Memorandum is expressly disclaimed.

This Information Memorandum does not constitute an offer or invitation to participate in the allocation process.

Each recipient of this Information Memorandum shall consult its own professional advisers or other relevant government agencies on the financial, legal, tax and other implications or matters concerning any potential participation in the allocation process, any grant or any payments related to the grant of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), or 2.5 GHz Spectrum Rights (2016).

For the avoidance of doubt, this Information Memorandum shall form an integral part of the Auction Rules. The winning bidders of any spectrum rights issued pursuant to the Auction Rules shall comply with all applicable legal and regulatory obligations, including but not limited to the Telecommunications Act

(Cap. 323), Telecommunications (Radio-communication) Regulations, FBO licence conditions, and terms set out in the grants of the spectrum rights. Additionally, the proposed grant of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), or 2.5 GHz Spectrum Rights (2016) is without prejudice to IDA's right to amend, delete or add to any FBO Licence conditions, and/or the grant of the Spectrum Rights (2016) in accordance with Section 7 of the Telecommunications Act (Cap. 323) and Telecommunications (Radio-communication) Regulations respectively, as well as such other changes to the winning bidders' legal and/or regulatory obligations as IDA may be entitled to make, at any point of time.

TABLE OF CONTENTS

CONTENTS	PAGE
(A) GENERAL INFORMATION.....	6
1. INTRODUCTION	6
2. SPECTRUM LOTS TO BE ALLOCATED	7
3. EXISTING USE OF THE SPECTRUM.....	8
4. USE OF THE SPECTRUM LOTS	8
5. RATIONALE FOR AUCTION APPROACH.....	10
6. SPECTRUM CAPS	10
7. ALLOCATION FOR NEW ENTRANTS	14
8. GENERAL SPECTRUM AUCTION REGISTRATION AND INITIAL OFFERS.....	16
9. DETERMINATION AS TO WHETHER THE GENERAL SPECTRUM AUCTION WILL PROCEED	18
10. RESERVE PRICE FOR GENERAL SPECTRUM AUCTION.....	19
11. FEES AND CHARGES OTHER THAN SPECTRUM LOT FEE AND WINNING ASSIGNMENT BID PAYABLE FOR THE DURATION OF THE 700 MHz SPECTRUM RIGHTS (2016), 900 MHz SPECTRUM RIGHTS (2016), 2.3 GHz SPECTRUM RIGHTS (2016) AND 2.5 GHz SPECTRUM RIGHTS (2016).....	19
12. OUTCOME OF THE GENERAL SPECTRUM AUCTION.....	20
13. 700 MHz SPECTRUM RIGHTS (2016), 900 MHz SPECTRUM RIGHTS (2016), 2.3 GHz SPECTRUM RIGHTS (2016) AND 2.5 GHz SPECTRUM RIGHTS (2016), FBO LICENCES AND STATION/NETWORK LICENCES, AND ROLL-OUT REQUIREMENTS ..	21
14. DURATION OF 700 MHz SPECTRUM RIGHTS (2016), 900 MHz SPECTRUM RIGHTS (2016), 2.3 GHz SPECTRUM RIGHTS (2016) AND 2.5 GHz SPECTRUM RIGHTS (2016).....	23
15. SPECTRUM TRADING.....	24
16. NO MORATORIUM.....	25
17. RADIO FREQUENCY INTERFERENCE	25
18. CO-EXISTENCE WITH OTHER TELECOMMUNICATION SYSTEMS	25
19. HEALTH AND SAFETY ISSUES	25
(B) INTRODUCTION TO NEW ENTRANT SPECTRUM AUCTION FRAMEWORK.....	26
1. BINDING EXPRESSION OF INTEREST.....	26
2. THE NEW ENTRANT SPECTRUM AUCTION.....	28
3. FORFEITURE AND EXCLUSION	30
(C) INTRODUCTION TO THE GENERAL SPECTRUM AUCTION FRAMEWORK.....	32
1. PRE-AUCTION AND INITIAL OFFER STAGE	32
2. AUCTION PROCEDURE	33
3. RESULTS OF THE GENERAL SPECTRUM AUCTION	39
4. FORFEITURE AND EXCLUSION	40
(D) BANK GUARANTEE AND PAYMENT REQUIREMENTS FOR NEW ENTRANT SPECTRUM AUCTION AND GENERAL SPECTRUM AUCTION	41
1. BANK GUARANTEE REQUIREMENT FOR NEW ENTRANTS	41
2. PAYMENT REQUIREMENTS FOR NEW ENTRANT SPECTRUM AUCTION.....	41

3.	PAYMENT REQUIREMENTS FOR GENERAL SPECTRUM AUCTION.....	42
(E)	TIMETABLE.....	43
(F)	THE REGULATORY REGIME IN SINGAPORE	44
1.	THE REGULATORY AUTHORITY.....	44
2.	RELEVANT LEGISLATION	44
3.	THE IDA ACT	44
4.	THE TELECOMMUNICATIONS ACT	44
5.	THE TELECOMMUNICATIONS (RADIO-COMMUNICATION) REGULATIONS.....	45
6.	THE TELECOM COMPETITION CODE	45
7.	COPIF	45

(A) GENERAL INFORMATION

1. Introduction

1.1 The Info-communications Development Authority of Singapore and/or its lawful successor if applicable (“**IDA**”) is the authority in charge of regulating and promoting the information and communication technology industry in Singapore. Pursuant to the Telecommunications Act (Cap. 323) and the Telecommunications (Radio-communication) Regulations, IDA will offer to grant 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), and 2.5 GHz Spectrum Rights (2016) in respect of the 2 x 5 MHz lots of 700 MHz and 900 MHz spectrum (each lot to be known as a “**700 MHz Spectrum Lot**” and “**900 MHz Spectrum Lot**” respectively) or 5 MHz lots of 2.3 GHz and 2.5 GHz spectrum (each lot to be known as a “**2.3 GHz Spectrum Lot**” and “**2.5 GHz Spectrum Lot**” respectively) respectively, allocated by way of the process described in this Information Memorandum (“**Allocation Process**”). The spectrum rights granted pursuant to this Allocation Process will permit the use of the respective spectrum lots to operate telecommunication system(s) for the purposes of providing fourth-generation (“**4G**”) and/or International Mobile Telecommunications-Advanced (“**IMT-Advanced**”) services, provided that the party granted the relevant spectrum rights has the necessary Facilities-Based Operator Licence (“**FBO Licence**”) for such operations. This Information Memorandum contains important information that interested persons should read and understand for the purpose of the Allocation Process.

1.2 This Information Memorandum contains:

- (a) details of the 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and 2.5 GHz Spectrum Lots available for allocation, and the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), and 2.5 GHz Spectrum Rights (2016) that will be granted in respect thereof;
- (b) a review of associated policy issues;
- (c) a brief description of the Allocation Process;
- (d) clarification on the Bank Guarantee and payment requirements for the New Entrant Spectrum Auction and General Spectrum Auction;
- (e) an indicative timetable; and
- (f) an overview of the regulatory regime in Singapore.

Unless expressly specified otherwise, terms and expressions used in this Information Memorandum are defined in the Auction Rules, as issued by IDA on 29 April 2016 and updated on 14 July 2016.

2. Spectrum Lots to be Allocated

- 2.1 A total of nine (9) 700 MHz Spectrum Lots, six (6) 900 MHz Spectrum Lots, eight (8) 2.3 GHz Spectrum Lots and nine (9) 2.5 GHz Spectrum Lots are available for allocation, as shown in Table 1 and Table 2. The specific 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots to be allocated will be determined through the Allocation Process. This comprises a New Entrant Spectrum Auction followed by a General Spectrum Auction.

Table 1: Spectrum Lots Available From Sub-1 GHz Bands for Allocation

Lot	Lower Band (MHz)	Upper Band (MHz)
<u>700 MHz Spectrum Lots</u>		
1	703 – 708	758 – 763
2	708 – 713	763 – 768
3	713 – 718	768 – 773
4	718 – 723	773 – 778
5	723 – 728	778 – 783
6	728 – 733	783 – 788
7	733 – 738	788 – 793
8	738 – 743	793 – 798
9	743 – 748	798 – 803
<u>900 MHz Spectrum Lots</u>		
1 ¹	885 – 890	930 – 935
2	890 – 895	935 – 940
3	895 – 900	940 – 945
4	900 – 905	945 – 950
5	905 – 910	950 – 955
6	910 – 915	955 – 960

Table 2: Spectrum Lots Available From Above-1 GHz Bands for Allocation

Lot	Unpaired (MHz)
<u>2.3 GHz Spectrum Lots</u>	
1	2300 – 2305
2	2305 – 2310

¹ Should unforeseen circumstances delay the availability of this Lot or if part of this Lot is required for the Singapore-Malaysia High Speed Rail subsequently, the Winning Bidder of this Lot may be required to shift its operating frequencies within 880 – 890 MHz/925 – 935 MHz accordingly. If the Winning Bidder of this Lot is also the current spectrum right holder in the Extended GSM band (i.e., 882 – 887 MHz/927 – 932 MHz), the Winning Bidder may continue to operate in the same frequencies until the frequencies for the Singapore-Malaysia High Speed Rail are finalised. IDA will provide at least 6 months advance notice should there be a requirement for the said Winning Bidder to shift its operating frequencies.

3	2310 – 2315
4	2315 – 2320
5	2320 – 2325
6	2325 – 2330
7	2330 – 2335
8	2335 – 2340
<u>2.5 GHz Spectrum Lots</u>	
1	2570 – 2575
2	2575 – 2580
3	2580 – 2585
4	2585 – 2590
5	2590 – 2595
6	2595 – 2600
7	2600 – 2605
8	2605 – 2610
9	2610 – 2615

3. Existing Use of the Spectrum

- 3.1 The 700 MHz frequency band is currently used for analogue broadcasting services in Singapore. As Singapore is migrating to digital broadcasting and targets to switch off its analogue broadcasting network by end 2017, the 700 MHz band is expected to be made available for mobile services from 1 January 2018².
- 3.2 Spectrum in the 900 MHz frequency band has been designated for the provision of Public Cellular Mobile Telecommunication Services (“**PCMTS**”) in Singapore. This spectrum has been assigned to Singtel Mobile Singapore Pte Ltd, M1 Limited and StarHub Mobile Pte Ltd through their respective PCMTS Spectrum Rights, which will expire on 31 March 2017.
- 3.3 Spectrum in the 2.3 GHz and 2.5 GHz frequency bands are currently made available for allocation on a short-term basis through IDA’s Market Trial or Technical Trial Frameworks. This allows interested operators to assess the commercial feasibility of Time Division Long Term Evolution (“**TD-LTE**”) services or to trial heterogeneous networks in Singapore.

4. Use of the Spectrum Lots

- 4.1 Any operator granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), and/or 2.5 GHz Spectrum Rights (2016) will be required to deploy 4G and/or IMT-Advanced

² The timeline for the availability of the 700 MHz band is dependent on the switch off of the analogue broadcasting network. IDA has put in place measures to address the uncertainty in the commencement date for the 700 MHz Spectrum Rights (2016) as provided in Section A paragraph 4.2 below.

telecommunication systems and provide 4G and/or IMT-Advanced telecommunication services using all or part of its assigned spectrum in the respective frequency band(s). For the purpose of determining what a 4G and/or IMT-Advanced telecommunication system or service is with respect to this requirement, 4G and/or IMT-Advanced is defined as “a cellular mobile communications system capable of evolving to achieve the targeted peak data rates of 100 Mbps for high mobility and 1 Gbps for low mobility as defined by ITU-IMT-Advanced; meeting at the minimum the standards and specifications of either LTE (i.e., 3GPP Release 8 or beyond), or WiMax (i.e., IEEE 802.16-2009 or beyond) or standards/specifications recognised as ITU-IMT-Advanced by the ITU”.

- 4.2 Any operator granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), and/or 2.5 GHz Spectrum Rights (2016) (except for the New Entrant in which paragraph 4.3 of this Section applies) will also be required to use the allocated spectrum portfolio to augment their existing networks to provide 3G, or 4G and/or IMT-Advanced telecommunication services, as approved by IDA, by 31 December 2018 (i.e., 12 months after the expected availability of the 700 MHz Spectrum Rights (2016)). Should there be any delays to the availability of the 700 MHz band, IDA may, at its sole and absolute discretion, provide extension(s) to the aforementioned deadline to take into account the length of the delay.
- 4.3 The New Entrant granted the 900 MHz Spectrum Rights (2016) and 2.3 GHz Spectrum Rights (2016) in respect of the two (2) 900 MHz Spectrum Lots and eight (8) 2.3 GHz Spectrum Lots allocated via the New Entrant Spectrum Auction, as well as the 700 MHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) via the General Spectrum Auction, if any, will be required to comply with the following timelines for the deployment of nationwide 4G and/or IMT-Advanced telecommunication systems and services:

Table 3: Nationwide Service Coverage Timelines Applicable to New MNO

Coverage requirements	Timeline
Nationwide outdoor service coverage ³	By <u>30 September 2018</u> (i.e., 18 months after the commencement of the 900 MHz Spectrum Rights (2016) and 2.3 GHz Spectrum Rights (2016))
Road tunnels and in-building service coverage	By <u>30 September 2019</u>

³ The outdoor service coverage must extend to the whole island of Singapore (excluding MRT underground stations/lines and road tunnels), the offshore islands and the territorial waters up to 15km from the coast line of the island of Singapore, except where limitations in service coverage are due to technical requirements imposed by IDA, such as that to limit interference with neighbouring countries.

	(i.e., 30 months after the commencement of the 900 MHz Spectrum Rights (2016) and 2.3 GHz Spectrum Rights (2016))
Underground MRT stations/ lines service coverage	By <u>30 September 2021</u> (i.e., 54 months after the commencement of the 900 MHz Spectrum Rights (2016) and 2.3 GHz Spectrum Rights (2016))

- 4.4 Any operator granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), and/or 2.5 GHz Spectrum Rights (2016) will be required to negotiate in good faith to provide wholesale telecommunication services to mobile virtual network operators (“**MVNOs**”), upon receiving a request for such provision, for the provision of 4G and/or IMT-Advanced services.
- 4.5 Any operator granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), and/or 2.5 GHz Spectrum Rights (2016) will also be required to provide, at the minimum, a publicly available mobile voice telephony service and SMS service. The voice service shall include free access to emergency services at any time, and uninterrupted, seamless call handover when moving from location to location at a speed of up to 100km/h. The operator may satisfy this requirement using only a portion of the spectrum in its 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016), or 2.5 GHz Spectrum Rights (2016). It is also not required to satisfy this requirement through the use of 4G and/or IMT-Advanced technologies only. Service delivery using alternative technology platforms or through wholesale arrangement is acceptable so long as services meet IDA’s regulatory requirements.

5. Rationale for Auction Approach

- 5.1 The Allocation Process for the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and 2.5 GHz Spectrum Rights (2016) will rely on the auction mechanism. This takes into account that spectrum is a scarce and finite resource and that a market-based allocation approach, such as an auction, is more effective in ensuring spectrum optimisation by operators. An auction is generally a more efficient, objective and transparent approach for allocating scarce resources because it relies on market forces to allocate scarce resources to those who value them the most.

6. Spectrum Caps

- 6.1 The policy objective of introducing spectrum caps is to prevent the monopolisation of scarce spectrum resources and to facilitate an outcome where operators may reasonably obtain sufficient spectrum to deliver viable mobile services.

6.2 Following the publication of IDA’s decision on ‘Framework for the Allocation of Spectrum for IMT and IMT-Advanced services and for the Enhancement of Competition in the Mobile Market’ (“**Decision**”), IDA has received feedback from industry players about the preliminary spectrum caps. These included concerns that the preliminary spectrum caps were too high and may result in disproportionate acquisition of the spectrum by an operator. Conversely, IDA also received comments that the spectrum caps should be adjusted to take into account the market share of different players. IDA has thus reviewed the preliminary spectrum caps set out in paragraph 61 of the Decision after taking into consideration feedback from industry players and all relevant facts of the matter. The revised spectrum caps to be adopted for the General Spectrum Auction are as follows:

Table 4: Spectrum Caps

	700 MHz	900 MHz	2.3 GHz	2.5 GHz	Global
If there is a Winning New Entrant Bidder	2x20 MHz	2x10 MHz		-	75 MHz
If there is no Winning New Entrant Bidder	2x20 MHz	2x15 MHz		45 MHz	100 MHz

6.3 Arising from the issuance of the Information Memorandum and the Auction Rules for clarification on 29 April 2016, a few enquirers requested to increase the global spectrum cap to 80 MHz (if there is a Winning New Entrant Bidder). One argument was that it was common for an MNO to acquire 40% of the total spectrum share (including its existing spectrum holding), and IDA’s proposed spectrum cap would not allow this and was not consistent with international practices. It also argued that a majority of European countries with multi-band auction did not set global spectrum caps. Where they did, global spectrum caps were usually significantly higher, i.e., more than 50% of the spectrum to be allocated. Only the UK had set global spectrum caps at below 40% of the spectrum available. On the other hand, a few enquirers requested to implement a low-band sub-1 GHz spectrum sub-cap of 2 x 25 MHz (if there is a Winning New Entrant Bidder) and 2 x 30 MHz (if there is no Winning New Entrant Bidder). One enquirer requested IDA to set aside one (1) lot of 700 MHz for each of the Existing MNOs to meet the relevant quality of service standards at reserve price.

6.4 On balance, IDA is of the view that the band-specific spectrum caps remain relevant and reasonable to provide operators with the flexibility of acquiring the amount of spectrum that best meets their operational requirements. However, IDA has decided to reduce the global spectrum caps to address the concerns from industry players about disproportionate acquisition of spectrum.

Specifically, a global spectrum cap of 80 or 85 MHz, if there is a Winning New Entrant Bidder, may result in an outcome where three operators have to contend for 95 or 90 MHz of spectrum respectively once an operator maximises the amount of spectrum it can acquire under these spectrum caps. These could result in the operators having insufficient spectrum to provide viable mobile broadband services, contrary to IDA's policy objective.

- 6.5 IDA is also of the view that structuring the 2016 Spectrum Auction such that an operator may have 40% of the total allocated spectrum (comprising its existing spectrum holdings and the spectrum it may acquire in the 2016 Spectrum Auction) will lead to an untenable and unsustainable outcome. To elaborate, in order for an operator to achieve the foregoing, IDA will have to set the global spectrum caps for the 2016 Spectrum Auction at above 100 MHz (if there is a Winning New Entrant Bidder). In such a scenario, the remaining operators will have to contend with less than 65 MHz of spectrum should one of the operators maximise the spectrum it can acquire under the said global spectrum cap. However, this is likely to adversely affect the ability of the remaining operators to obtain a reasonable amount of spectrum to provide viable mobile services, contrary to IDA's policy objective of introducing spectrum caps.
- 6.6 IDA notes that in jurisdictions where there are four (4) operators, such as France, Hong Kong⁴, the Netherlands, Spain and the UK, the operator with the largest spectrum holding may hold between 29.2% and 36.1% of the total allocated spectrum for mobile services in those countries. With a global spectrum cap of 75 MHz (if there is a Winning New Entrant Bidder), the maximum spectrum holding an operator can obtain is 34.4% (including the operator's existing spectrum holding and the maximum spectrum it may acquire in the 2016 Spectrum Auction), which is in line with the above-mentioned international examples. Additionally, in countries where there are three (3) operators, such as Austria, Germany, Ireland, Portugal, South Korea and Switzerland, the operator with the largest spectrum holding may hold between 36.5% and 49.4% of the total allocated spectrum for mobile services. With a global spectrum cap of 100 MHz (if there is no Winning New Entrant Bidder), the maximum spectrum holding an operator can obtain is 38.4% (including the operator's existing spectrum holding and the maximum spectrum it may acquire in the 2016 Spectrum Auction), which is also in line with the international examples.
- 6.7 IDA will also not tighten the spectrum caps with the introduction of a sub-1 GHz spectrum cap as such a cap of 2 x 25 MHz (if there is a Winning New Entrant Bidder) will result in an operator who wishes to acquire two (2) 900 MHz lots to be restricted to a maximum of three (3) 700 MHz lots. Given that there is no

⁴ HKT Limited, the operator with the largest spectrum holding, has been directed by OFCA to divest half of its 3G spectrum as part of its merger with CSL New World Mobility Limited in 2014. This would reduce its spectrum holding from the current 41% to less than 36% of the total spectrum allocated after the upcoming 3G spectrum auction in October 2016.

carrier aggregation between the 700 MHz and 900 MHz bands commercially available and in the spectrum roadmap at the present juncture (which the industry acknowledges in their comments to IDA during the earlier public consultations), it would not be reasonable to design the auction in such a manner that administratively treats a combination of one (1) 900 MHz lot and three (3) 700 MHz lots as an effective substitute to a technically optimal four (4) lots of 700 MHz, and to require an operator to decide between the two spectrum portfolios. This is unlike the TDD bands which the industry has provided feedback that high frequency bands carrier aggregation combinations are commercially available. Hence, IDA will not further tighten the spectrum caps with the introduction of a sub-1 GHz spectrum cap, and will leave it to the operators to decide their network and technology needs and bid based on their commercial and operational considerations.

- 6.8 There are many ways in which regulators impose spectrum caps in an auction. While there are regulators who do not set global spectrum caps in an auction, IDA understands that band-specific caps would be imposed. There are also other regulators, such as those in Austria, Norway, and the UK, who may set spectrum caps with the operators' existing spectrum holding in mind. This means an operator with more existing spectrum holding may not be able to acquire as much spectrum in the auction as compared to another operator with less existing spectrum holding. For the 2016 Spectrum Auction, IDA is of the view that setting a global spectrum cap with the proposed band-specific spectrum caps, as opposed to setting additional/further band-specific spectrum caps (in lieu of a global spectrum cap) or spectrum caps that are based on an operator's existing spectrum holding, would provide operators with more flexibility to determine their spectrum holding that best suits their needs. Using the spectrum caps for the 2016 Spectrum Auction as an example, an operator can choose to maximise its spectrum holding allowed under the global spectrum cap in the TDD bands. Further, IDA's global spectrum cap of 75 MHz (if there is a Winning New Entrant Bidder) and 100 MHz (if there is no Winning New Entrant Bidder) would already allow an operator to acquire more than 40% of the spectrum to be allocated in the General Spectrum Auction, which is in line with international examples seen in Ireland's 2012 auction (up to 35.7% of the spectrum to be allocated in the auction if the operator does not have existing spectrum holding), and Norway's 2013 auction (up to 45% of the spectrum to be allocated in the auction if the operator does not have existing spectrum holding).
- 6.9 Therefore, having given full consideration to the submissions by the industry players and possible spectrum releases in the future, a more balanced and reasonable approach would be to reduce the global spectrum caps from 85 MHz to 75 MHz if there is a Winning New Entrant Bidder, and from 105 MHz to 100 MHz if there is no Winning New Entrant Bidder. This will provide the operators with a reasonable amount of spectrum should any operator acquire the maximum amount of spectrum allowed under the revised spectrum caps.

Such an approach would better meet IDA's policy objective of preventing the monopolisation of scarce spectrum resources while facilitating an outcome where operators may reasonably obtain sufficient spectrum to provide viable mobile services.

- 6.10 For the avoidance of doubt, the spectrum caps will similarly apply to the Winning New Entrant Bidder if it decides to participate in the General Spectrum Auction, and the spectrum that is provisionally allocated to it in the New Entrant Spectrum Auction will be counted towards the spectrum caps.
- 6.11 IDA will not be granting each Existing MNO one (1) lot of the 700 MHz at reserve price. IDA would reiterate that it is generally not inclined towards granting First Rights of Refusal in spectrum allocation exercises, as it strengthens incumbency and distorts the market mechanism which ensures that scarce spectrum resources are allocated to parties that are best able to utilise them efficiently. It is for any operator (particularly the Existing MNO) to put in place the necessary resources to secure the spectrum that it deems appropriate to meet its regulatory obligations and compete effectively in the market.

7. Allocation for New Entrants

- 7.1 In order to facilitate greater competition and innovation in the market for the provision of 4G and/or IMT-Advanced telecommunication services, IDA is prepared to grant 900 MHz Spectrum Rights (2016) and 2.3 GHz Spectrum Rights (2016) in respect of two (2) 900 MHz Spectrum Lots and eight (8) 2.3 GHz Spectrum Lots (collectively referred to as "**New Entrant Spectrum Lot**") to an operator that is a New Entrant. IDA considers a New Entrant to be any operator that does not currently provide nationwide mobile system and service coverage in Singapore, i.e., an operator that is not Singtel Mobile Singapore Pte Ltd, StarHub Mobile Pte Ltd or M1 Limited, and that is not an associate⁵ of an Existing MNO.

⁵ For the purpose of this definition, IDA will consider a person, A, to be an "**associate**" of another person, B, if:

- (a) A is a relative of B;
- (b) A is a related corporation of B;
- (c) A is a corporation whose directors are accustomed or under an obligation, whether formal or informal, to act in accordance with the directions, instructions or wishes of B or, where B is a corporation, of the directors of B;
- (d) B is a corporation whose directors are accustomed or under an obligation, whether formal or informal, to act in accordance with the directions, instructions or wishes of A or, where A is a corporation, of the directors of A;
- (e) A is a person who is accustomed or under an obligation, whether formal or informal, to act in accordance with the directions, instructions or wishes of B or, where B is a corporation, of the directors of B;
- (f) B is a person who is accustomed or under an obligation, whether formal or informal, to act in accordance with the directions, instructions or wishes of A or, where A is a corporation, of the directors of A;
- (g) A is a corporation in which B, alone or together with other associates of B as described in paragraphs (b) to (f), is in a position to control not less than 12% of the Voting Power in A;

7.2 The Reserve Price for the New Entrant Spectrum Lot shall be S\$35,000,000, exclusive of the applicable Goods and Services Tax (“**GST**”). The allocation of the New Entrant Spectrum Lot (“**New Entrant Spectrum Auction**”) will take place prior to the General Spectrum Auction in accordance with the procedures set out in the Auction Rules. Any New Entrant intending to take part in the New Entrant Spectrum Auction must submit a binding expression of interest (“**Expression of Interest Document**”) to participate in the New Entrant Spectrum Auction and other information in accordance with the requirements specified in Section 2.1.1 of the Auction Rules, as well as one or more Bank Guarantees that in total guarantee at least the Guaranteed Amount, which is the Reserve Price of the New Entrant Spectrum Lot of S\$35,000,000. Further, potential New Entrants bidding for spectrum in the New Entrant Spectrum Auction shall ensure that their bids shall be accompanied by one or more Bank Guarantees of amounts equal to or greater than the said bids. Should the New Entrant Spectrum Lot not be allocated in accordance with Section 7 of the Auction Rules, it will be made available for allocation in the General Spectrum Auction.

7.3 IDA, at its sole and absolute discretion, will determine: (a) whether the Expression of Interest Document and Bank Guarantee(s) are in compliance with the Auction Rules; and (b) whether a party submitting such documents is eligible and should be registered as a New Entrant Bidder and entitled to participate in the New Entrant Spectrum Auction. As specified in paragraph 48 of the Decision, IDA “*will also consider and review certain other relevant factors. On a non-exhaustive basis, these will include reviewing the prospective bidder’s business plans and planned service offerings (in particular, what are its planned innovative service offerings and how would it bring greater value to consumers), track record of operational performance and compliance with regulations, and subjecting it to a ‘fit and proper’ test, such as the background, reputation and standing of the prospective bidder, checking for any criminal records of the prospective bidder, whether the prospective bidder has been refused a licence, whether there are public interest concerns, etc*”. In relation to this, IDA has

-
- (h) *B* is a corporation in which *A*, alone or together with other associates of *A* as described in paragraphs (b) to (f), is in a position to control not less than 12% of the Voting Power in *B*;
 - (i) *A* is a person with whom *B* has an agreement or arrangement, whether oral or in writing and whether express or implied, to act together with respect to the acquisition, holding or disposal of shares, units or other equity interests in, or with respect to the exercise of their Voting Power in relation to, a designated telecommunication licensee, a designated business trust or a designated trust;
 - (j) *A* is a person with whom *B* has an agreement or arrangement, whether oral or in writing and whether express or implied, to act together with respect to the provision of telecommunication services;
 - (k) *A* is a person with whom *B* has an agreement or arrangement, whether oral or in writing and whether express or implied, to trade or lease or otherwise transfer the right to use spectrum; or
 - (l) *A* is related to *B* in such other manner as prescribed by any regulations made under section 74 of the Telecommunications Act,

provided always that, notwithstanding the existence of the circumstances stated in (a)-(l) above, IDA shall be entitled to determine that two persons are not associates of each other, based solely on the fact that both persons’ ultimate parent has a passive ownership interest in both persons.

therefore developed the Fit and Proper Person Criteria as set out in Appendix 13 of the Auction Rules. In making its assessment on whether a party should be registered as a New Entrant Bidder, IDA will take into account the Fit and Proper Person Criteria and such other factors it may consider relevant. Additionally, considering IDA's facilitation measures as set out in the Decision and the regulatory obligations that a new entrant is required to fulfil, as well as the importance of mobile services to consumers and the economy at large, it is reasonable for IDA to perform the aforementioned reviews of parties applying to participate in the New Entrant Spectrum Auction, to ensure that only capable and committed parties may do so.

- 7.4 Any party considering participation in the New Entrant Spectrum Auction should not assume that their application to participate in, their participation in, or the results of, the New Entrant Spectrum Auction will be kept confidential. IDA may publicly announce information relating to the New Entrant Spectrum Auction and/or the provisional award of the New Entrant Spectrum Lot, without consulting any interested party.
- 7.5 IDA, at its sole and absolute discretion, shall determine whether to proceed with the New Entrant Spectrum Auction in all situations.

8. General Spectrum Auction Registration and Initial Offers

- 8.1 The General Spectrum Auction will take place after the New Entrant Spectrum Auction. Any party intending to participate in the General Spectrum Auction must submit the Initial Offer Document and indicate its Initial Offer for the number of 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots (if applicable) and/or 2.5 GHz Spectrum Lots it wishes to obtain at the respective Reserve Prices, capped by the spectrum caps specified in the Auction Rules, taking into account any spectrum provisionally awarded in the New Entrant Spectrum Auction and any exercised First Right of Refusal to acquire a 2 x 5 MHz 900 MHz Spectrum Lot ("**FROR⁶ Lot**"), as the case may be, that is:
- (a) no more than four (4) 700 MHz Spectrum Lots in total;
 - (b) no more than two (2) 900 MHz Spectrum Lots in total if a New Entrant Bidder is provisionally awarded the New Entrant Spectrum Lot in the New Entrant Spectrum Auction prior to the General Spectrum Auction, and which shall include the FROR Lot;

⁶ FROR refers to the setting aside by IDA of one (1) 900 MHz Spectrum Lot in the General Spectrum Auction for each of the existing FBO Licensees currently providing nationwide 4G services. For the avoidance of doubt, a First Right of Refusal shall not confer any right, entitlement or expectation on any person to acquire, obtain or be awarded a 900 MHz Spectrum Right (2016) in respect of any specific range of frequencies, and the range of frequencies in respect of which IDA will award a 900 MHz Spectrum Right (2016) to a Winning Bidder shall be subject to the Assignment Stage of the General Spectrum Auction.

- (c) no more than three (3) 900 MHz Spectrum Lots in total if no New Entrant Bidder is provisionally awarded the New Entrant Spectrum Lot in the New Entrant Spectrum Auction prior to the General Spectrum Auction, and which shall include the FROR Lot;
 - (d) no more than nine (9) 2.3 GHz Spectrum Lots and 2.5 GHz Spectrum Lots in total, if no New Entrant Bidder is provisionally awarded the New Entrant Spectrum Lot in the New Entrant Spectrum Auction prior to the General Spectrum Auction;
 - (e) no more than 75 MHz of spectrum in total across the 700 MHz, 900 MHz, 2.3 GHz and 2.5 GHz bands, if a New Entrant Bidder is provisionally awarded the New Entrant Spectrum Lot in the New Entrant Spectrum Auction prior to the General Spectrum Auction; and
 - (f) no more than 100 MHz of spectrum in total across the 700 MHz, 900 MHz, 2.3 GHz and 2.5 GHz bands, if no New Entrant Bidder is provisionally awarded the New Entrant Spectrum Lot in the New Entrant Spectrum Auction prior to the General Spectrum Auction.
- 8.2 Existing MNOs will be provided with the option to exercise the FROR Lot at the Reserve Price of S\$20,000,000 in their Initial Offer. For the avoidance of doubt, all exercised FROR Lots will be removed from the Quantity Stage of the General Spectrum Auction and will be allocated at the Reserve Price of S\$20,000,000. The purpose of IDA setting aside the FROR Lot for each of the Existing MNOs in the General Spectrum Auction is to ensure their access to the 900 MHz band primarily for the continuing provision of 3G mobile services, and this should not be conflated with the additional spectrum in the 900 MHz band for the provision of 4G and/or IMT-Advanced telecommunication services which may be priced differently depending on the outcome of the General Spectrum Auction. Further, an Existing MNO would need to have certainty of the price of the FROR Lot in order to decide whether to exercise it. The price should not be determined by the outcome of the General Spectrum Auction for the 900 MHz or 700 MHz spectrum bands. The FROR Lot will thus be allocated at the Reserve Price of S\$20,000,000 if an Existing MNO decides to exercise it.
- 8.3 The interested party must also submit one or more Bank Guarantees that in total guarantee at least the Guaranteed Amount, which is calculated by multiplying the respective Reserve Prices by the number of 700 MHz Spectrum Lots, 900 MHz Spectrum lots (including the FROR Lot), 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots, for which it submits an Initial Offer. Copies of the Initial Offer Document and Bank Guarantee are set out in Appendices 3 and 4 to the Auction Rules respectively.
- 8.4 IDA will determine: (a) whether the Initial Offer Document and Bank Guarantee(s) are in compliance with the Auction Rules; and (b) whether a party

submitting such documents is eligible and should be registered as a Bidder and entitled to participate in the General Spectrum Auction.

- 8.5 Any party considering participation in the General Spectrum Auction should not assume that their application to participate in, their participation in, or the results of, the General Spectrum Auction will be kept confidential. IDA may publicly announce information relating to the General Spectrum Auction and/or the award of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) or 2.5 GHz Spectrum Rights (2016), without consulting any interested party.
- 8.6 For the avoidance of doubt, only a Winning New Entrant Bidder that has been provisionally allocated the New Entrant Spectrum Lot in the New Entrant Spectrum Auction and the Existing MNOs are allowed to participate in the General Spectrum Auction. In this regard, as spectrum is a necessary and important input for the Winning New Entrant Bidder to provide quality and competitive mobile services, the Winning New Entrant Bidder must clearly be given the opportunity to decide for itself how much spectrum it needs to be an effective and sustainable competitor in the market, based on its operational needs. Rather than foreclosing the Winning New Entrant Bidder's ability to acquire more spectrum in the General Spectrum Auction from the outset, IDA considers that it would be more equitable and reasonable to allow the Winning New Entrant Bidder to determine for itself whether it would require more spectrum for its mobile network, but importantly, to subject it to the same spectrum caps as the Existing MNOs if it participates in the General Spectrum Auction as well as the other requirements set out in the Auction Rules.

9. Determination as to whether the General Spectrum Auction will Proceed

- 9.1 There will be up to four (4) Categories in the Quantity Stage of the General Spectrum Auction grouped into two (2) Sections as follows:
- (a) the Paired Section, which includes the 700 MHz and 900 MHz Categories; and
 - (b) the Unpaired Section, which includes the 2.3 GHz (if available) and 2.5 GHz Categories.
- 9.2 The number of Spectrum Lots in each Category depends on the outcome of the New Entrant Spectrum Auction and the number of Bidders that exercise their First Right of Refusal for a 900 MHz Spectrum Lot pursuant to Section 9.4.2 of the Auction Rules:
- (a) the 700 MHz Category will contain nine (9) 700 MHz Spectrum Lots;
 - (b) the 900 MHz Category will contain six (6) 900 MHz Spectrum Lots:
 - i. less two (2) 900 MHz Spectrum Lots if there exists a provisional Winning New Entrant Bidder pursuant to Section 2.6 of the Auction Rules;

- ii. less one (1) 900 MHz Spectrum Lot for each registered Bidder exercising its First Right of Refusal for one (1) 900 MHz Spectrum Lot;
 - (c) in the case where there is no provisional Winning New Entrant Bidder, the 2.3 GHz Category will contain the eight (8) 2.3 GHz Spectrum Lots; and if there is a provisional Winning New Entrant Bidder, there will be no 2.3 GHz Category in the Quantity Stage of the General Spectrum Auction; and
 - (d) the 2.5 GHz Category will contain the nine (9) 2.5 GHz Spectrum Lots.
- 9.3 IDA shall determine, at its sole and absolute discretion, whether to proceed with the Quantity Stage of the General Spectrum Auction, in all situations. For example, if the Initial Offers received by IDA specify no more than the number of 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and 2.5 GHz Spectrum Lots available for allocation in the General Spectrum Auction, IDA will not proceed with the Quantity Stage of the General Spectrum Auction, and may provisionally award the 700 MHz Spectrum Lots and/or 900 MHz Spectrum Lots and/or 2.3 GHz Spectrum Lots (if applicable) and/or 2.5 GHz Spectrum Lots to Bidders in accordance with their Initial Offers. Each 700 MHz Spectrum Lot and/or 900 MHz Spectrum Lot and/or 2.3 GHz Spectrum Lot and/or 2.5 GHz Spectrum Lot so allocated will be priced at the respective Reserve Price. The General Spectrum Auction will proceed with the Assignment Stage in this case.
- 9.4 Please refer to the Auction Rules for details on the allocation of the 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots (if applicable) and 2.5 GHz Spectrum Lots should the General Spectrum Auction proceed.

10. Reserve Price for General Spectrum Auction

- 10.1 The Reserve Price for the respective spectrum lots to be allocated in the General Spectrum Auction, before the applicable GST, is provided in the following table.

Table 5: Reserve Prices

Spectrum Lot	Reserve Price (excluding GST)
700 MHz Spectrum Lot	S\$20,000,000
900 MHz Spectrum Lot (including the FROR lot)	
2.3 GHz Spectrum Lot (if applicable)	S\$3,000,000
2.5 GHz Spectrum Lot	

11. Fees and Charges Other than Spectrum Lot Fee and Winning Assignment Bid Payable for the Duration of the 700 MHz Spectrum Rights (2016), 900

MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and 2.5 GHz Spectrum Rights (2016)

- 11.1 A Bidder (including any Winning New Entrant Bidder) which is allocated any 700 MHz Spectrum Lot, 900 MHz Spectrum Lot, 2.3 GHz Spectrum Lot and/or 2.5 GHz Spectrum Lot ("**Winning Bidder**") and is granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or a 2.5 GHz Spectrum Rights (2016) shall be required to make the following payments in respect of each 700 MHz Spectrum Lot, 900 MHz Spectrum Lot, 2.3 GHz Spectrum Lot or 2.5 GHz Spectrum Lot allocated to it, in accordance with the First Schedule of the Telecommunications (Radio-communication) Regulations:
- (a) an Annual Frequency Management Fee of S\$15,400, exclusive of the applicable GST, in respect of the 700 MHz Spectrum Rights (2016) and/or 900 MHz Spectrum Rights (2016);
 - (b) an Annual Frequency Management Fee of S\$7,700, exclusive of the applicable GST, in respect of the 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016);
 - (c) a one-time Application and Processing Fee of S\$600, exclusive of the applicable GST, to be paid in the first year of the duration of the respective 700 MHz Spectrum Rights (2016) and/or 900 MHz Spectrum Rights (2016); and
 - (d) a one-time Application and Processing Fee of S\$300, exclusive of the applicable GST, to be paid in the first year of the duration of the respective 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016).

For the avoidance of doubt, the Winning Bidder shall also pay any applicable Forfeiture Amounts in accordance with the Auction Rules.

12. Outcome of the General Spectrum Auction

- 12.1 In the case where the General Spectrum Auction proceeds, the outcome of the General Spectrum Auction will determine:
- (a) the number of available Spectrum Lots to be allocated should the General Spectrum Auction commence at the Quantity Stage;
 - (b) the Winning Bidders arising from the General Spectrum Auction;
 - (c) the Winning Bids for the 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots (if applicable) and/or 2.5 GHz Spectrum Lots allocated under the General Spectrum Auction; and
 - (d) the Winning Assignment Bids for the 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots

allocated under the New Entrant Spectrum Auction and General Spectrum Auction.

13. 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and 2.5 GHz Spectrum Rights (2016), FBO Licences and Station/Network Licences, and Roll-out Requirements

- 13.1 The 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) will constitute the grant of a right to use the specified portions of the radio frequency spectrum to operate a 4G and/or IMT-Advanced telecommunication system for the purposes of providing 4G and/or IMT-Advanced telecommunication services, and other telecommunication services if approved by IDA, under that respective 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016).
- 13.2 A Winning Bidder is not required to apply for a new FBO Licence pursuant to the grant of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016), if it is already a holder of this licence. However, the Winning Bidder will need to have any existing FBO Licence amended in order to provide 4G and/or IMT-Advanced telecommunication services using the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016). The Winning Bidder will also need to obtain IDA's approval to amend any existing FBO Licence if it intends to provide other telecommunication services such as 3G services using the Spectrum Right(s), if it is not already licensed to do so. In both instances, the Winning Bidder will have to pay the applicable FBO Licence fees for the provision of the respective services under its existing FBO Licence using the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) or 2.5 GHz Spectrum Rights (2016). Where the Winning Bidder's existing FBO Licence is stated to expire before the expiry of the Spectrum Right(s), the Winning Bidder may apply to IDA to renew the existing FBO Licence.
- 13.3 A Winning Bidder that does not hold any FBO Licence at the time it is provisionally granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) shall apply for an FBO Licence within thirty (30) Business Days of being provisionally awarded the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) following the close of the Assignment Stage of the General Spectrum Auction. Details on the FBO Licensing Framework and Guidelines can be found on IDA's website at www.ida.gov.sg. The FBO Licence must be obtained before the Winning Bidder is allowed to deploy telecommunication systems in Singapore and provide telecommunication services using the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights

(2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) granted to such Bidder.

13.4 By participating in the New Entrant Spectrum Auction and/or the General Spectrum Auction, a Winning Bidder is deemed to have been notified of, have acceded to and have agreed to comply with, the specific conditions to be included in the FBO Licence, including the Schedule in relation to the provision of 4G and/or IMT-Advanced telecommunication systems and services pursuant to the grant of a 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) set out in Appendix 1 of the Information Memorandum. This shall include, among other things, the requirement to comply with the following timelines for the rollout of 4G and/or IMT-Advanced telecommunication systems and services:

(a) for a Winning New Entrant Bidder:

Table 6

Coverage requirements	Timeline
Nationwide outdoor service coverage ⁷	By <u>30 September 2018</u> (i.e., 18 months after the commencement of the 900 MHz Spectrum Right (2016) and 2.3 GHz Spectrum Right (2016))
Road tunnels and in-building service coverage	By <u>30 September 2019</u> (i.e., 30 months after the commencement of the 900 MHz Spectrum Right (2016) and 2.3 GHz Spectrum Right (2016))
Underground MRT stations/ lines service coverage	By <u>30 September 2021</u> (i.e., 54 months after the commencement of the 900 MHz Spectrum Right (2016) and 2.3 GHz Spectrum Right (2016))

(b) for a Winning Bidder that is not a Winning New Entrant Bidder:

Table 7

Requirement	Timeline
Augment existing networks to provide nationwide 4G	By <u>31 December 2018</u>

⁷ The outdoor service coverage must extend to the whole island of Singapore (excluding MRT underground stations/lines and road tunnels), the offshore islands and the territorial waters up to 15km from the coast line of the island of Singapore, except where limitations in service coverage are due to technical requirements imposed by IDA, such as that to limit interference with neighbouring countries.

and/or IMT-Advanced services	(i.e., 12 months from the commencement of the 700 MHz Spectrum Right (2016), or which may be extended as stated in paragraph 4.2 above)
------------------------------	---

- 13.5 All holders of FBO Licences will be required to pay the annual FBO Licence fees based on the provision of services specified in the FBO Licence Schedules. Please refer to IDA’s website for a template of an FBO Licence⁸.
- 13.6 In addition, a Winning Bidder granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) will be required to apply for, and obtain, the relevant Station/Network (Spectrum) Licence(s) before operating the radio-communication systems to provide 4G and/or IMT-Advanced telecommunication services using the 700 MHz Spectrum Lot(s), 900 MHz Spectrum Lot(s), 2.3 GHz Spectrum Lot(s) and/or 2.5 GHz Spectrum Lot(s). The fees payable for such Station/Network (Spectrum) Licences are prescribed in the First Schedule of the Telecommunications (Radio-communication) Regulations.
- 13.7 The 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) is granted by IDA pursuant to the powers granted to IDA under the Telecommunications Act (Cap. 323) and the Telecommunications (Radio-communication) Regulations. Templates of the respective Spectrum Rights (2016) are attached as Appendices 7 to 10 of the Auction Rules respectively. For the avoidance of doubt, IDA reserves the right to amend any of the conditions specified in the templates or to add or remove conditions as it considers appropriate.
- 14. Duration of 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and 2.5 GHz Spectrum Rights (2016)**
- 14.1 The 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) granted pursuant to this Allocation Process will have the commencement and expiry dates provided in Table 8, or such other date as IDA may determine in accordance with the Auction Rules. While IDA has indicated that the 700 MHz Spectrum Rights (2016) will commence from 1 January 2018, this may be further delayed by the progress of the switch off of the analogue broadcasting network (in short, analogue switch off or “**ASO**”). In this regard, IDA will adjust the commencement and end dates of the 700 MHz band spectrum rights accordingly to maintain the spectrum rights duration of 15 years regardless of the delay. There is no commitment by IDA that the duration of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum

⁸ <http://www.ida.gov.sg/Policies-and-Regulations/Industry-and-Licencees/Licensing/Framework-and-Guidelines/Guidelines-on-Licensing-Schemes.aspx#.UMvsCqzveCk>

Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) allocated under this Allocation Process will be extended for any period, if at all.

Table 8: Commencement and Expiry Date of Spectrum Rights

Spectrum Rights (2016)	Commencement Date	Expiry Date
700 MHz	1 January 2018	31 December 2032
900 MHz	1 April 2017	31 March 2033
2.3 GHz		
2.5 GHz		

14.2 If, at IDA’s sole and absolute discretion, there is any grant of an extension of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016), or if there is any new allocation exercise for spectrum in the 700 MHz, 900 MHz, 2.3 GHz and/or 2.5 GHz frequency bands, in which a Winning Bidder participates or is involved, there is no commitment by IDA that the same 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots will be re-allocated in that subsequent extension or allocation exercise to the Winning Bidder for the respective Spectrum Lots in the Allocation Process, or that the same applicable fees and charges will apply in respect of these Spectrum Lots.

15. Spectrum Trading

15.1 Spectrum trading of the whole or any part of rights and privileges granted under the spectrum rights allocated pursuant to the grant of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) is not permitted. In particular, any spectrum trading is subject to:

- (a) prior written approval from IDA;
- (b) any restriction, condition or such other requirements as may be generally or specifically imposed by IDA, including but not limited to the requirement that the holder of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) has provided the relevant telecommunication systems and services coverage in accordance with the timeline set out in the FBO Licence; and
- (c) the relevant provisions of the Telecommunications (Radio-communication) Regulations and Code of Practice for Competition in the Provision of Telecommunication Services (“**Telecom Competition Code**”).

15.2 For the avoidance of doubt, the Winning New Entrant Bidder shall not trade the whole or any part of the spectrum from the New Entrant Spectrum Lot and shall

return the spectrum to IDA should it become a party of any merger or acquisition (“M&A”), unless such M&A is approved by IDA in accordance with the procedures set out in the Telecom Competition Code and IDA approves the spectrum trading as part of such M&A, with or without conditions as IDA may determine in its sole and absolute discretion.

16. No Moratorium

- 16.1 IDA may allocate further spectrum in the 700 MHz, 900 MHz, 2.3 GHz and/or 2.5 GHz frequency bands (in the event that not all 700 MHz, 900 MHz, 2.3 GHz and/or 2.5 GHz Spectrum Lots are allocated in this Auction) at any time and in any manner, and does not commit to any moratorium period during which no such allocation will take place. However, IDA will give at least three (3) months’ notice prior to the commencement of any further allocation exercise.

17. Radio Frequency Interference

- 17.1 Each Winning Bidder granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) will be required to co-ordinate with other operators holding spectrum rights in the same frequency band, spectrum holders in adjacent frequency bands, and with neighbouring countries’ network operators to avoid frequency interference problems when using the 700 MHz Spectrum Lot(s), 900 MHz Spectrum Lot(s), 2.3 GHz Spectrum Lot(s) and/or 2.5 GHz Spectrum Lot(s). IDA will assist in cases where operators are unable to resolve these problems themselves.

18. Co-existence with Other Telecommunication Systems

- 18.1 Each Winning Bidder granted the 700 MHz Spectrum Rights (2016) shall not deploy mobile base stations operating in the 700 MHz band within a set of identified sites. IDA will provide further details about these sites to the Winning New Entrant Bidder and the Existing MNOs prior to the General Spectrum Auction.

19. Health and Safety Issues

- 19.1 This Information Memorandum does not express any view or opinion on matters relating to health hazards from exposure to electromagnetic fields. Each Winning Bidder is required to be apprised of and comply with any and all applicable guidelines, recommendations and other standards that may be issued by relevant ministries, statutory boards and/or internationally recognised experts in this field.

(B) INTRODUCTION TO NEW ENTRANT SPECTRUM AUCTION FRAMEWORK

This section is intended only to provide an overview of some of the major features of the New Entrant Spectrum Auction. Any party interested in participating in the New Entrant Spectrum Auction should refer to the Auction Rules for details about the auction mechanism. The party should also familiarise itself with the Auction Rules and should seek appropriate independent legal and other professional advice in respect of the Auction Rules.

1. Binding Expression of Interest

- 1.1 Any Prospective New Entrant Bidder interested in bidding for the New Entrant Spectrum Lot must submit to IDA its Expression of Interest Document (a copy of which is provided in Appendix 1 of the Auction Rules).
- 1.2 The submission must reach IDA by 5.00 pm on the New Entrant Application Date as defined in the Auction Rules.
- 1.3 A Prospective New Entrant Bidder shall, amongst other things, be an entity which:
 - (a) does not currently provide nationwide mobile telecommunication system and service coverage (including 4G and/or IMT-Advanced services) in Singapore; and
 - (b) is not an associate of any existing nationwide operator⁹.
- 1.4 The submission of an Expression of Interest Document will constitute a legally binding offer made by a prospective New Entrant Bidder at the Reserve Price for the New Entrant Spectrum Lot.
- 1.5 IDA will review each Expression of Interest Document, together with any accompanying documents, to determine whether any Prospective New Entrant Bidder which submitted such documents is pre-qualified to be registered to participate in the New Entrant Spectrum Auction. If such Prospective New Entrant Bidder is granted by IDA an in-principle pre-qualification to be registered to participate in the New Entrant Spectrum Auction in accordance with the Auction Rules, it shall submit a Bank Guarantee in accordance with Section 2.2.9 of the Auction Rules. In making its determination as to whether to grant such in-principle pre-qualification to the Prospective New Entrant Bidder, IDA may consider, among other things:
 - (a) whether the Prospective New Entrant Bidder is a New Entrant;
 - (b) whether, in the opinion of IDA, the Prospective New Entrant Bidder has demonstrated that it has the financial, technical and engineering capabilities, to acquire the New Entrant Spectrum Lot, and operate a telecommunication system for the purpose of providing 4G and/or IMT-

⁹ Refer to footnote 5.

Advanced services using the spectrum included in the New Entrant Spectrum Lot;

- (c) whether, in the opinion of IDA, the Prospective New Entrant Bidder has the relevant personnel, sufficient resources and/or adequate commitment to Singapore, including the composition of the board and management team and the shareholding, to be able to fulfil any of its regulatory and/or legal obligations;
 - (d) whether, in the opinion of IDA, the Prospective New Entrant Bidder has the requisite management skills, competencies, operational experience, and/or technical knowledge or ability pertaining to the Singapore telecommunication market, specifically in the running and provisioning of telecommunication systems and/or services, including the provisioning of retail telecommunication services to consumers in Singapore;
 - (e) whether, in the opinion of IDA, the Prospective New Entrant Bidder is an Associated Bidder in relation to any other Prospective New Entrant Bidder(s) which submitted an Expression of Interest Document;
 - (f) whether the Prospective New Entrant Bidder's shareholding, associates or affiliates (as defined in the Telecom Competition Code), whether in Singapore or elsewhere, would give rise to concerns of anti-competitive preferences set out in Section 8.3 of the Telecom Competition Code;
 - (g) whether there are any security or public interest concerns or whether it would be in the public interest for the Prospective New Entrant Bidder to be granted the spectrum included in the New Entrant Spectrum Lot;
 - (h) whether the Prospective New Entrant Bidder, and each of its key responsible persons and associates, is a fit and proper person in accordance with the Fit and Proper Person Criteria as set out in Appendix 13 of the Auction Rules;
 - (i) any other facts, circumstances or matters as set out in the Prospective New Entrant Bidder's Expression of Interest Document; and
 - (j) without being limited by the foregoing, any facts, circumstances or matters which IDA considers to be relevant.
- 1.6 IDA may request at any time such clarification, additional information and/or documents from any Prospective New Entrant Bidder which submitted the documents referred to in Section B paragraph 1.1, as may be reasonably required for the purpose of making a determination on whether a Prospective New Entrant Bidder should be registered as a New Entrant Bidder.
- 1.7 For the purposes of this section, a Group means, in relation to a Prospective New Entrant Bidder:
- (a) any holding company of the Prospective New Entrant Bidder;

- (b) any subsidiary of the Prospective New Entrant Bidder;
- (c) any subsidiary of any holding company of the Prospective New Entrant Bidder; and
- (d) any other company in which two or more of the shareholders or directors (directly or indirectly) own more than 50 per cent of or control more than 50 per cent of the voting rights attaching to, or shares of the Prospective New Entrant Bidder.

For purposes of this definition, the terms “holding company” and “subsidiary” have the meanings given in the Companies Act (Cap. 50).

- 1.8 If IDA determines: (a) that the documents submitted by a Prospective New Entrant Bidder in accordance with Section B paragraph 1.1 comply with IDA’s requirements; and (b) at IDA’s sole and absolute discretion, that such Prospective New Entrant Bidder may be registered as a New Entrant Bidder, IDA will notify that Prospective New Entrant Bidder within twenty (20) Business Days of the New Entrant Application Date (or such later date as is determined by IDA) that it is pre-qualified to participate in the New Entrant Spectrum Auction.
- 1.9 If IDA determines: (a) that the documents submitted by a Prospective New Entrant Bidder in accordance with Section B paragraph 1.1 do not comply with IDA’s requirements or (b) at IDA’s sole and absolute discretion, that such Prospective New Entrant Bidder should not be registered as a New Entrant Bidder, IDA will notify that Prospective New Entrant Bidder, within twenty (20) Business Days of the New Entrant Application Date (or such later date as is determined by IDA), that it is not pre-qualified and is not entitled to participate in the New Entrant Spectrum Auction. IDA has no obligation to give any reason for its decision in this respect.

2. The New Entrant Spectrum Auction

- 2.1 If there is no New Entrant Bidder, the two (2) 900 MHz Spectrum Lots and the eight (8) 2.3 GHz Spectrum Lots hitherto set aside for a New Entrant will be made available for allocation under the General Spectrum Auction framework. If there is only one New Entrant Bidder, IDA will provisionally allocate the New Entrant Spectrum Lot to the sole New Entrant Bidder. In this case, the Closing Price shall be equal to the Reserve Price of S\$35,000,000. If there are two or more New Entrant Bidders, IDA will proceed to allocate the New Entrant Spectrum Lot via the New Entrant Spectrum Auction, which will be a multiple-round auction format involving all the New Entrant Bidders.
- 2.2 If IDA determines that the New Entrant Spectrum Auction will proceed, IDA will notify each New Entrant Bidder of the details of the New Entrant Spectrum Auction, including the timetable and location for the Information Session, the Training Session (if relevant) and the bidding phase, as well as provide a list of all New Entrant Bidders. Such details will be provided to New Entrant Bidders

at least one (1) Business Day in advance of the Information Session, and at least five (5) Business Days before the New Entrant Spectrum Auction Start Date.

- 2.3 The New Entrant Spectrum Auction will comprise a multiple-round ascending auction conducted in accordance with the Auction Rules.
- 2.4 The New Entrant Spectrum Auction proceeds in a series of Rounds. In Round 1, a Valid Bid will be placed automatically on behalf of each New Entrant Bidder that corresponds to the binding commitment made in the Expression of Interest Document to acquire the New Entrant Spectrum Lot at the Reserve Price of S\$35,000,000. In subsequent Rounds, a New Entrant Bidder can place a Bid for the New Entrant Spectrum Lot at or below the current Round Price as long as the Bid is strictly higher than the Round Price of the previous Round. Only those New Entrant Bidders that submit a Bid equal to the current Round Price will be eligible to submit a Bid in the next Round. A Valid Bid below the current Round Price is referred to as an Exit Bid, and the Bidder is not eligible to make any further Bids in the New Entrant Spectrum Auction.
- 2.5 If more than one New Entrant Bidder submits a Bid at the current Round Price, there will be another Round and the Round Price will increase. The price increase in each round is set at the discretion of IDA, but shall not exceed 10% of the previous Round Price for the New Entrant Spectrum Lot.
- 2.6 A New Entrant Bidder shall, prior to any bidding in the New Entrant Spectrum Auction, submit to IDA one or more Bank Guarantees of an aggregate Guaranteed Amount sufficient to back up any of its Valid Bid(s) in accordance with Section 2.7 of the Auction Rules.
- 2.7 The New Entrant Spectrum Auction will close following a Round in which at most one New Entrant Bidder placed a Bid at the Round Price. The New Entrant Bidder with the highest Valid Bid (which may be an Exit Bid if there were no bids at the current Round Price) will win the New Entrant Spectrum Lot and the Closing Price for the new Entrant Spectrum Lot will be the amount of the highest Valid Bid. If there is more than one New Entrant Bidder who submitted the highest Valid Bid, such tied New Entrant Bidders will be given the opportunity to submit a Best Offer Bid that is at least as high as their Highest Valid Bid to break the tie. If there is still a tie, IDA will provide up to two (2) more opportunities for tied New Entrant Bidders to improve their Best Offer. If there is still a tie after these three (3) attempts, a method of random selection will be employed to select the Winning New Entrant Bidder from amongst the remaining tied New Entrant Bidders.
- 2.8 The New Entrant Bidder that is provisionally awarded the New Entrant Spectrum Lot shall pay the amount of its Winning Bid in the New Entrant Spectrum Auction and other associated fees within fifteen (15) Business Days of being issued the Provisional Award Notice.

- 2.9 The Winning New Entrant Bidder (whether the New Entrant Spectrum Auction proceeds or not), if any, shall take part in the Assignment Stage of the General Spectrum Auction to determine the assignment of the two (2) 900 MHz Spectrum Lots and eight (8) 2.3 GHz Spectrum Lots allocated to it and any additional Spectrum Lots it acquires in the General Spectrum Auction.
- 2.10 After the close of the Assignment Stage of the General Spectrum Auction, the Spectrum Rights provisionally awarded to the Winning New Entrant Bidder will be granted following payment in full of the relevant amount of the bidder's Winning Assignment Bid (if any) and any Forfeiture Amount imposed on the Bidder. If the Winning New Entrant Bidder does not make these payments by 5.00 pm fifteen (15) Business Days (or such later date as IDA may otherwise specify) from the issuance of the Final Provisional Award Notice in accordance with the Auction Rules, the Winning New Entrant Bidder will not be granted the relevant Spectrum Rights.
- 2.11 The Winning New Entrant Bidder will be granted the 900 MHz Spectrum Right (2016) and 2.3 GHz Spectrum Right (2016) following IDA's receipt of the required payments by the specified deadlines. A Winning New Entrant Bidder must also pay the Annual Frequency Management Fee in each year of the respective Spectrum Right (2016).

3. Forfeiture and Exclusion

- 3.1 IDA may, at its sole and absolute discretion, determine that a New Entrant Bidder shall forfeit up to the Guaranteed Amount of its Bank Guarantee(s) for any conduct that IDA considers to be acting in a manner that is prejudicial to the New Entrant Spectrum Auction, and/or failing to comply with one or more provisions in the Auction Rules and/or the procedures relating to the New Entrant Spectrum Auction. For the avoidance of doubt, the Forfeiture Amount shall be determined by IDA in its sole and absolute discretion. Where the Forfeiture Amount does not exceed the Bidder's aggregate Guaranteed Amount under all of its Bank Guarantee(s), IDA shall be entitled to draw down and retain all Forfeiture Amounts secured by that Bidder's Guaranteed Amount in its Bank Guarantee(s) as submitted to IDA. Where the Forfeiture Amount exceeds the Bidder's Guaranteed Amount under all of its Bank Guarantee(s), IDA shall also be entitled to draw down and retain the full Guaranteed Amount in the Bidder's Bank Guarantee(s) as submitted to IDA; and in addition to this, the Bidder shall be required to pay promptly to IDA the additional amount equivalent to the difference between the Forfeiture Amount and Guaranteed Amount, failing which IDA reserves the right to recover the said additional amount through such legal or regulatory means as are appropriate.
- 3.2 New Entrant Bidders can be excluded from the New Entrant Spectrum Auction by notice from IDA in certain circumstances, including if IDA identifies evidence of collusion between New Entrant Bidders, or any conduct that IDA considers to be acting in a manner that is prejudicial to the New Entrant Spectrum Auction,

and/or failing to comply with one or more provisions in the Auction Rules and/or the procedures relating to the New Entrant Spectrum Auction.

(C) INTRODUCTION TO THE GENERAL SPECTRUM AUCTION FRAMEWORK

This section is intended only to provide an overview of some of the major features of the General Spectrum Auction. Any party interested in participating in the General Spectrum Auction should refer to the Auction Rules for details about the auction mechanism. Such interested party should also familiarise itself with the Auction Rules and should seek appropriate independent legal and other professional advice in respect of the Auction Rules.

1. Pre-Auction and Initial Offer Stage

- 1.1 To be registered as a Bidder entitled to participate in the General Spectrum Auction, an interested party must, by 5.00 pm on the General Spectrum Auction Application Date in accordance with the Auction Rules submit to IDA an Initial Offer in respect of the number of 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots (if there is no Winning New Entrant Bidder) and/or the number of 2.5 GHz Spectrum Lots specified by the spectrum caps in the Auction Rules, using the Initial Offer Document provided in Appendix 3 of the Auction Rules. If the Bidder is an existing FBO licensee that currently holds a licence to provide services using spectrum in the 900 MHz Band, the Bidder is entitled to exercise its FROR Lot at the Reserve Price. Such a Bidder will have to include the FROR lot in its Initial Offer. It will not count towards the Bidder's Eligibility in the General Spectrum Auction, but will count towards the relevant spectrum caps.
- 1.2 Following the submission of the Initial Offer Document, IDA will make an assessment, in its sole and absolute discretion, as to whether a prospective Bidder is pre-qualified to be registered to participate in the Quantity Stage of the General Spectrum Auction. If such prospective Bidder is granted by IDA an in-principle pre-qualification to be registered to participate in the Quantity Stage of the General Spectrum Auction, that Bidder shall proceed to submit a Bank Guarantee in accordance with the requirements set out in Section 9.2.12 of the Auction Rules.
- 1.3 Only persons who have an existing FBO Licence with the obligation to provide nationwide 4G services, or that is provisionally awarded the New Entrant Spectrum Lot may be registered by IDA as a Bidder in the General Spectrum Auction.
- 1.4 IDA has sole and absolute discretion to decide whether to proceed with either the Quantity Stage or the Assignment Stage of the General Spectrum Auction. IDA may allocate the 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots (if there is no Winning New Entrant Bidder) and 2.5 GHz Spectrum Lots at the respective Reserve Prices if the Initial Offers received by IDA specify no more than the number of lots available for allocation in the General Spectrum Auction in each and every one of these spectrum bands. In such event, the Quantity Stage of the General Spectrum Auction will not

proceed, and the General Spectrum Auction will proceed to the Assignment Stage.

- 1.5 If IDA, at its sole and absolute discretion, determines that the Quantity Stage of the General Spectrum Auction will proceed, IDA will notify Bidders of the timetable for the General Spectrum Auction and a list of all participating Bidders. An Information Session and a Training Session will be held to allow Bidders to familiarise themselves with the procedures for the Quantity Stage. Representatives of each Bidder, in addition to the Bidder's Authorised Representatives, will be permitted to attend the Information Session and Training Session, provided that no more than ten (10) natural persons (including the Authorised Representatives) may attend on behalf of any Bidder.
- 1.6 An indicative timeline of the General Spectrum Auction and related matters is set out in Section E of this Information Memorandum. Details of the timing and location of the Information Session and Training Sessions will be provided to Bidders at least one (1) Business Day in advance.

2. Auction Procedure

- 2.1 The General Spectrum Auction will be divided into two (2) stages: a Quantity Stage and an Assignment Stage.

Quantity Stage

- 2.2 The Quantity Stage will be conducted using a Clock-Plus auction format in accordance with the Auction Rules. There will be up to four (4) Categories in the General Spectrum Auction, grouped into two (2) Sections as follows:
 - (a) the Paired Section, which includes the 700 MHz and 900 MHz Categories; and
 - (b) the Unpaired Section, which includes the 2.3 GHz (if available) and 2.5 GHz Categories.
- 2.3 The number of Spectrum Lots available in each Category depends on the outcome of the New Entrant Spectrum Auction and the number of Bidders exercising their First Right of Refusal for a 900 MHz Spectrum Lot. The Clock-Plus auction will be conducted simultaneously in respect of all available Categories.
- 2.4 A Winning New Entrant Bidder who is registered to participate in the Quantity Stage of the General Spectrum Auction shall, prior to any bidding in the General Spectrum Auction, submit to IDA one or more Bank Guarantees to back up all of its Valid Bid(s) during the Quantity Stage of the General Spectrum Auction.
- 2.5 The Clock-Plus auction proceeds in a series of Rounds. In Round 1, a Bid will be placed automatically on behalf of each Bidder that corresponds to the Bidder's Initial Offer. In subsequent Rounds, each Bidder may bid for quantities of Spectrum Lots at the Standing Price in each Category, subject to respecting

the eligibility-based activity rules and the spectrum caps. A Bidder's Bid in aggregate cannot exceed its eligibility, denominated in MHz, for that round. In Round 1 and Round 2, a Bidder's Eligibility is equal to the sum of the MHz associated with the Lots included in its Initial Offer (excluding the FROR Lot if applicable). In all subsequent Rounds, a Bidder's Eligibility is equal to its Eligibility in the previous Round less the MHz associated with the Spectrum Lots for which the Bidder submitted an Exit Bid in the previous Round.

- 2.6 As part of its Bid, a Bidder may request to switch all or part of its demand for Spectrum Lots in one or more Categories into one or more other Categories, or decrease the total quantity bid for as measured in MHz. In the case that it requests a reduction in the total quantity, the Bidder shall submit Exit Bids for the relevant number of Lots in the Categories in which it reduced its demand (and did not switch that demand to another Category). A Bidder is usually required to specify an Exit Price for each Exit Bid, at a bid amount that is less than the current Standing Price but not less than the previous Standing Price. Under certain limited circumstances, as described in the Auction Rules, the Bidder is exempted from specifying an Exit Price for its Exit Bid.
- 2.7 For the avoidance of doubt, no Bidder shall bid for or be awarded any 700 MHz Spectrum Lots and/or 900 MHz Spectrum Lots other than the FROR Lot in the General Spectrum Auction unless the Bidder has included at least one (1) 700 MHz Spectrum Lot and/or one (1) 900 MHz Spectrum Lot, other than FROR Lot, respectively in its Initial Offer.
- 2.8 A request from a Bidder to switch or drop demand in a Category will only be accepted if doing so would not cause aggregate demand (across all Bidders) for that Category to fall below supply (or further below supply, if demand was already below supply). If necessary, a request to switch or drop demand may be accepted in part, such that aggregate demand in a Category is reduced to but no lower than the level of supply:
- (a) In the case of a switch, this means that some portion of the Bidder's demand in this Category (or Categories) is retained at the previous Standing Price, and a corresponding quantity of the demand that the Bidder wanted to switch to another Category (or Categories) at the current Standing Price is denied. In a case where a Bidder is attempting to switch demand into more than one Category, the Auction Rules determine which switches are given priority. Bidders may specify a switch priority, which is used to determine a unique outcome in case there is more than one way of denying switches that respects the spectrum caps and maximises aggregate demand. In certain cases where there is a denied switch, it may not be possible to allocate all the Bidder's demand to Categories, in which case the Bidder will be allocated a corresponding quantity of 'Free Eligibility' which it can use to bid in the next Round.

- (b) In the case of a drop in demand, this means that some portion of the Bidder's demand in a Category at an Exit Price below the current Standing Price is retained. For the avoidance of doubt, even if a Bidder's demand at an Exit Price is retained, the Bidder loses Eligibility. An Exit Bid that has been retained will still be a Valid Bid.
- 2.9 In any Round in which there is no excess demand in a Category, IDA will designate the remaining Valid Bids in that Category as Standing High Bids. Standing High Bids cannot be changed: a Bidder may not switch out any Spectrum Lots bid or reduce the total number of Spectrum Lots bid in a Category if its demand in that Category has been designated as Standing High Bids. If, in a subsequent Round, there is new demand in a Category that causes aggregate demand to exceed supply, then all Valid Bids in that Category shall cease to be Standing High Bids, and Bidders may again request to switch or drop demand, as described in paragraph 2.6 of Section C.
- 2.10 If there is excess demand in a Category at the close of a Round, the Standing Price of the Category will be increased in the next Round. The price increase for each Category in each round is set at the sole and absolute discretion of IDA, but shall not exceed 10% of the previous Round Price for that Category.
- 2.11 The Rounds shall continue until there is a Round in which there is no excess demand in any Category and no Bidder has any Free Eligibility. Following the final Round, each Bidder shall be provisionally awarded the quantity of Spectrum Lots in each Category corresponding to the number of Standing High Bids in each Category associated with that Bidder in the final Round. As described in paragraph 3.2 of Section C, each Winning Bidder shall be required to pay a price per lot equal to the Closing Price for that Category. The Closing Price will be the lowest price associated with the Standing High Bids in that Category in the final Round.
- 2.12 A Bidder who wins a single 2.3 GHz or a single 2.5 GHz Spectrum Lot at the end of the Quantity Stage of the General Spectrum Auction and who never submitted a Bid for a single 2.3 GHz or a single 2.5 GHz Spectrum Lot at the Standing Price in any Round of the Quantity Stage, may provide notice to the IDA that it wishes to withdraw its Winning Bid for this Lot. Such an arrangement is to allow Winning Bidders who had wanted to switch their demand out of the Unpaired Section, but had some portion of their demand retained or denied, the flexibility of withdrawing the Winning Bid following the close of the Quantity Stage of the General Spectrum Auction. There is no penalty for withdrawing a winning Bid for these lots only under these limited circumstances.
- 2.13 For the avoidance of doubt, IDA reserves the right to determine, in its sole and absolute discretion, whether to reallocate the single 2.3 GHz or a single 2.5 GHz Spectrum Lot from the General Spectrum Auction as well as the method of any reallocation. IDA will announce any such reallocation of spectrum and the reallocation process, at the appropriate juncture.

Assignment Stage

- 2.14 The Assignment Stage will proceed following the close of the Quantity Stage¹⁰. All Bidders which have been provisionally awarded 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots from the New Entrant Spectrum Auction and/or the Quantity Stage¹¹ of the General Spectrum Auction shall participate in the Assignment Stage.
- 2.15 The Assignment Stage shall proceed in either one (1) or two (2) phases:
- (a) Phase 1: The submission of a joint proposal by all Winning Bidders indicating whether there is agreement by all Winning Bidders on the assignment of the allocated 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots; and
 - (b) Phase 2: The conduct of a single-round sealed-bid auction for the set of 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots whose assignment is contended. Phase 2 shall only take place if there is no agreement by all Winning Bidders on the assignment of all or part of the allocated 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots, or if IDA rejects all or part of the joint proposal.
- 2.16 In Phase 1, IDA will provide all Winning Bidders with a Form for Agreement or Non-Agreement of Spectrum Assignment, a copy of which can be found in Appendix 11 of the Auction Rules. If there are unsold lots, IDA will also inform all Winning Bidders of IDA's preference, if any, for the frequency assignments for the unsold lots. The Winning Bidders shall submit one (1) or more joint proposals for the assignment of the 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and 2.5 GHz Spectrum Lots respectively. The Winning Bidders shall jointly indicate in the relevant Annex to the Form for Agreement or Non-Agreement of Spectrum Assignment whether there is an assignment of all or some of the 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and 2.5 GHz Spectrum Lots to which all Winning Bidders agree. The Winning Bidders shall also jointly indicate:
- (a) if all Winning Bidders agree on one or more assignments of 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots, the specific frequency assignment(s) for which the Winning Bidders agree; and
 - (b) if all Winning Bidders agree on an assignment of only part of the 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots, or do not agree on any assignment of all the 700 MHz Spectrum

¹⁰ Or, if the Quantity Stage does not proceed after the Initial Offer Stage.

¹¹ Or the Initial Offer Stage, as the case may be.

Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots:

- (i) the specific non-contended segment(s), and the identity of the Winning Bidder(s) assigned the non-contended segment(s) (“**Non-Contending Winning Bidder(s)**”); and
- (ii) the specific contended segment(s), and the identity of the Winning Bidder(s) contending for the segment(s) (“**Contending Winning Bidder(s)**”).

2.17 The Winning Bidders shall jointly submit the Form for Agreement or Non-Agreement of Spectrum Assignment by the Assignment Stage Phase 1 deadline, which will be 5.00 pm on the date specified in the Assignment Stage schedule. IDA will determine whether the Assignment Stage will further proceed, and inform all Winning Bidders of the outcome within five (5) Business Days of the Assignment Stage Phase 1 deadline (or such later date as is determined by IDA). For each Category:

- (a) if only one (1) valid proposal is submitted, the IDA may, at its sole and absolute discretion, accept or reject the proposal; or
- (b) if more than one (1) valid proposal is submitted, the IDA may, at its sole and absolute discretion, accept one of the proposals or reject all proposals; or
- (c) if IDA does not accept any of the valid proposals under (a) or (b), or if IDA does not receive any duly submitted Form for Agreement or Non-Agreement of Spectrum Assignment, or if the Winning Bidders submit a Form for Agreement or Non-Agreement of Spectrum Assignment indicating that there is no agreement on any assignment, IDA will proceed to Phase 2 of the Assignment Stage for all Spectrum Lots in the Category; or
- (d) if IDA accepts a valid proposal under (a) or (b), but this proposal only indicates agreement on part of the assignment, IDA will proceed to Phase 2 of the Assignment Stage for the Spectrum Lots in the contended segment(s) of the Category.

2.18 For the avoidance of doubt, for Phase 1 of the Assignment Stage, Winning Bidders may not submit a proposal that spectrum lots to be assigned to any Winning Bidder are non-contiguous. In the case of the 900 MHz Band, a Winning New Entrant Bidder must be awarded contiguous spectrum.

2.19 Phase 2, if required, will consist of a single-round sealed-bid auction for the contended assignments for each respective Category. In Phase 2, IDA will identify an exhaustive list of Assignment Bid Options for each Contending Winning Bidder. Each Assignment Bid Option shall:

- (a) be a contiguous frequency assignment in the contended segment(s) of the Category;

- (b) consist of exactly the same number of Spectrum Lots that the Contending Winning Bidder was provisionally awarded in the New Entrant Spectrum Auction and/or General Spectrum Auction;
 - (c) not preclude any other Contending Winning Bidder from also winning contiguous frequencies within the Category; and
 - (d) be compatible with frequency assignments for any unallocated Spectrum Lots that IDA deems acceptable.
- 2.20 IDA will inform each Contending Winning Bidder of the date and time by which it must submit its Assignment Bid Form, a copy of which can be found in Appendix 12 of the Auction Rules, in accordance with the Assignment Stage schedule.
- 2.21 Each Contending Winning Bidder shall indicate its Bid for one or more Assignment Bid Options on its Assignment Bid Form, representing the price that the Contending Winning Bidder is willing to pay for that frequency assignment in the relevant Category. Each Contending Winning Bidder shall submit its Assignment Bid Form by the Assignment Stage Phase 2 deadline, which will be 5.00 pm on the date specified in the Assignment Stage schedule.
- 2.22 IDA will determine the Winning Assignment Bids for contended assignments in each Category in the following way:
- (a) IDA will identify the aggregate value of all feasible combinations of Valid Assignment Bids, taking exactly one Bid from each Contending Winning Bidder for that Category.
 - (b) From amongst these feasible combinations, IDA will identify the combination of Valid Assignment Bids that yields the highest total value.
 - (c) Where two (2) or more feasible combinations of Valid Assignment Bids yield the same highest total value, IDA shall determine the winning assignment by considering which of those contended assignments is most closely aligned to the assignment of existing spectrum rights. In the event that IDA is unable to, or at IDA's discretion decides not to, determine a contended assignment that is most closely aligned with the assignment of existing spectrum rights, IDA may employ a method of random selection from amongst these feasible combinations to make its determination.
 - (d) The Valid Assignment Bids in the combination identified in steps (a) through (c) are the Winning Assignment Bids.
- 2.23 Each Contending Winning Bidder will be required to pay an amount equal to the sum of their Winning Assignment Bids across all Categories, as identified using

the procedure described in paragraph 2.22 of Section C, in addition to any other payments due under the Auction Rules.

3. Results of the General Spectrum Auction

- 3.1 IDA will inform all Winning Bidders of the results of the Assignment Stage within five (5) Business Days of the close of this Stage (or such later date as is determined by IDA).
- 3.2 A 700 MHz Spectrum Right (2016), 900 MHz Spectrum Right (2016), 2.3 GHz Spectrum Right (2016) and/or a 2.5 GHz Spectrum Right (2016) will be granted following payment in full by the Winning Bidder of the relevant Winning Bids, Winning Assignment Bids (if any), Annual Frequency Management Fees, Application and Processing Fees, any Forfeiture Amount imposed on the Bidder and any applicable GST. If a Winning Bidder fails to pay such amount by 5.00 pm fifteen (15) Business Days after the issuance of the Final Provisional Award Notice, that Bidder will not be granted the relevant Spectrum Rights.
- 3.3 A Winning Bidder may apply to IDA to defer payment of its Winning Bid, Winning Assignment Bid (if any) and Application and Processing Fees in respect of a 700 MHz Spectrum Right (2016) provisionally granted to it, to a date no later than six (6) months before the commencement of the 700 MHz Spectrum Right (2016). A Winning Bidder shall submit its application using the Deferred Payment Form provided in Appendix 5 of the Auction Rules. The Deferred Payment Form shall be accompanied by one or more Bank Guarantees (a copy of which is set out in Appendix 6 of the Auction Rules) that in total guarantee an amount that is at least 75% of the sum of the Winning Bid, Winning Assignment Bid (if any), Annual Frequency Management Fee, Application and Processing Fees and any applicable GST due for the 700 MHz Spectrum Right (2016), which must be valid until a date no earlier than thirty (30) Business Days after the Deferred Payment Date. Such application must be submitted by 5.00 pm five (5) Business Days after the issuance of the Final Provisional Award Notice. Should IDA approve the deferment, IDA shall grant the relevant Spectrum Right to the Winning Bidder only after receiving all payments outstanding by the Deferred Payment Date. In the event of any delay to the commencement of the 700 MHz Spectrum Rights (2016), IDA will provide advance notice to the Winning Bidders of the 700 MHz Spectrum Lots on the revised commencement date of the 700 MHz Spectrum Rights (2016) and inform the Winning Bidders of what is to be done¹². For avoidance of doubt, payment of any Forfeiture Amount may not be deferred.
- 3.4 A Winning Bidder will be granted its 700 MHz Spectrum Right (2016), 900 MHz Spectrum Right (2016), 2.3 GHz Spectrum Right (2016) and/or 2.5 GHz

¹² To illustrate, the Winning Bidders may be required to make payment for the 700 MHz Spectrum Rights (2016) as per the original Deferred Payment Date or submit a new Bank Guarantee with a later Deferred Payment Date to IDA that caters for any such delay.

Spectrum Right (2016) following IDA's receipt of the required payments by the specified deadlines. A Winning Bidder shall also pay the Annual Frequency Management Fee in each year for the respective Spectrum Right (2016).

4. Forfeiture and Exclusion

- 4.1 IDA may determine that a Bidder will forfeit up to the Guaranteed Amount of its Bank Guarantee(s) for any failure to comply with one or more provisions in the Auction Rules and/or procedures relating to the General Spectrum Auction, and/or any conduct which IDA considers to be acting in a manner that is prejudicial to the General Spectrum Auction. For the avoidance of doubt, the Forfeiture Amount shall be determined by IDA in its sole and absolute discretion. Where the Forfeiture Amount does not exceed the Bidder's aggregate Guaranteed Amount under all of its Bank Guarantee(s), IDA shall be entitled to draw down and retain all Forfeiture Amounts secured by that Bidder's Guaranteed Amount in its Bank Guarantee(s) as submitted to IDA. Where the Forfeiture Amount exceeds the Bidder's Guaranteed Amount under all of its Bank Guarantee(s), IDA shall also be entitled to draw down and retain the full Guaranteed Amount in the Bidder's Bank Guarantee(s) as submitted to IDA; and in addition to this, the Bidder shall be required to pay promptly to IDA the additional amount equivalent to the difference between the Forfeiture Amount and Guaranteed Amount, failing which IDA reserves the right to recover the said additional amount through such legal or regulatory means as are appropriate.
- 4.2 Bidders can be excluded from the General Spectrum Auction by notice from IDA in certain circumstances, including if IDA identifies evidence of collusion between Bidders, or any conduct that IDA considers to be acting in a manner that is prejudicial to the General Spectrum Auction, and/or failing to comply with one or more provisions in the Auction Rules and/or the procedures relating to the General Spectrum Auction.

(D) BANK GUARANTEE AND PAYMENT REQUIREMENTS FOR NEW ENTRANT SPECTRUM AUCTION AND GENERAL SPECTRUM AUCTION

This section is intended only to highlight the Bank Guarantee and payment requirements for the New Entrant Spectrum Auction and General Spectrum Auction.

Any party interested in participating in the New Entrant Spectrum Auction and/or General Spectrum Auction should refer to the Auction Rules for details about the auction mechanism. The party should also familiarise itself with the Auction Rules and should seek appropriate independent legal and other professional advice in respect of the Auction Rules.

1. Bank Guarantee Requirement for New Entrants

- 1.1 In the Decision, it was specified that the Winning New Entrant Bidder will be required to submit an additional Bank Guarantee that, together with the submitted Bank Guarantee as part of the Winning New Entrant Bidder's expression of interest, guarantees at least 75% of the Winning Bid of the New Entrant Spectrum Auction.
- 1.2 IDA has reviewed the requirement and will now require each New Entrant Bidder to ensure that it submits additional Bank Guarantee(s) to back up the Valid Bid(s) submitted by it. In other words, bids by New Entrant Bidders which are not backed up by Bank Guarantee(s) of an equivalent or higher Guaranteed Amount will not be considered Valid Bids. This requirement applies to every New Entrant Bidder in the New Entrant Spectrum Auction and the Winning New Entrant Bidder in the General Spectrum Auction. While the onus remains fully on each New Entrant Bidder to comply with the foregoing, where appropriate IDA may choose to remind each New Entrant Bidder during the New Entrant Spectrum Auction if its submitted Valid Bid is close to reaching the amount that is backed up by Bank Guarantee(s).
- 1.3 While the revised Bank Guarantee requirement specified in Section D paragraph 1.2 is conceptually similar to IDA's initial requirement as set out in Section D paragraph 1.1, it is expressly incorporated into the bidding process. IDA is of the view that such a requirement is reasonable to safeguard against frivolous bidding by any of the New Entrant Bidders and to minimise any risk of the Winning New Entrant Bidder being financially incapable of acquiring the New Entrant Spectrum Lot after the close of the New Entrant Spectrum Auction, as well as any Spectrum Lots it may acquire in the Quantity Stage of the General Spectrum Auction.

2. Payment Requirements for New Entrant Spectrum Auction

- 2.1 The Winning New Entrant Bidder will be required to pay the Spectrum Lot Fee and the relevant fees specified in Section A paragraph 11.1 following the conclusion of the New Entrant Spectrum Auction, in accordance with the requirements and timeline set out in the Auction Rules. This includes, amongst

others, the requirement to pay the aforementioned fees regardless of whether it is participating in the Quantity Stage of the General Spectrum Auction.

3. Payment Requirements for General Spectrum Auction

- 3.1 Bidders issued a Provisional Award Notice following the close of the Quantity Stage of the General Spectrum Auction, excluding the Winning New Entrant Bidder if any, will be required to submit an additional Bank Guarantee or Bank Guarantees, which aggregate Guaranteed Amount covers at least 75% of the Winning Bidders' winning bids in the Quantity Stage of the General Spectrum Auction in accordance with the Auction Rules.
- 3.2 Bidders issued a Final Provisional Award Notice following the close of the Assignment Stage of the General Spectrum Auction, including the Winning New Entrant Bidder, will be required to pay the Spectrum Lot Fee, the relevant fees specified in Section A paragraph 11.1 and the assignment fees as the case may be, in accordance with the Auction Rules.

(E) TIMETABLE

- 1.1 The timetable set out below is an indicative timeline of certain key events prior to the start of the Allocation Process. The Auction Rules contain provisions relating to the notice which will be given of certain dates and events in relation to the Allocation Process.
- 1.2 While IDA will endeavour to follow any indicative timelines of activities, please note that IDA may at any time amend any of the times or dates and/or shorten or extend the time periods set out in the Auction Rules where warranted by the circumstances upon giving at least twenty-four (24) hours' notice, save in emergency situations where such changes may be made without notice. For the avoidance of doubt, this shall include the indicative dates specified in the table below.

Table 9

Milestones	Date
Publication of Information Memorandum and Auction Rules for Clarification	29 April 2016
Deadline for Submission of Queries	20 May 2016
Publication of Final Information Memorandum and Final Auction Rules	14 July 2016
Submission of New Entrant Expression of Interest Document (New Entrant Application Date)	1 September 2016
Announcement of whether New Entrant Auction will proceed	3Q/4Q 2016
Information Session and Notification of New Entrant Spectrum Auction Details (if applicable)	
New Entrant Spectrum Auction Start Date (if applicable)	
Submission of Initial Offer Document and Bank Guarantee(s) for General Spectrum Auction (Application Date)	4Q 2016
Announcement of whether General Spectrum Auction Quantity Stage will proceed	
Information Session and Notification of General Spectrum Auction Details (if applicable)	
General Spectrum Auction Start Date (if applicable)	

(F) THE REGULATORY REGIME IN SINGAPORE

1. The Regulatory Authority

- 1.1 IDA is the authority in charge of regulating the information and communication technology industry in Singapore. IDA is a statutory board under the purview of the Ministry of Communications and Information.
- 1.2 All parties participating in the Allocation Process and are interested in being granted the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016) shall ensure that they familiarise themselves with all relevant legislation, as well as all regulatory and licensing requirements, and seek independent legal and other appropriate advice in respect thereof.

2. Relevant Legislation

- 2.1 There are various pieces of legislation and subsidiary legislation that are relevant to the grant of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and 2.5 GHz Spectrum Rights (2016).
- 2.2 The relevant legislation includes (but is not limited to):
 - (a) The IDA Act;
 - (b) The Telecommunications Act; and
 - (c) The Telecommunications (Radio-communication) Regulations.
- 2.3 There are also various codes of practice governing the field of telecommunications, which include (but are not limited to):
 - (a) The Telecom Competition Code; and
 - (b) The Code of Practice for Info-Communications Facilities in Buildings (“**COPIF**”).

3. The IDA Act

- 3.1 The IDA Act sets out the functions and powers of IDA regarding the licensing and regulation of telecommunication systems and services in Singapore.

4. The Telecommunications Act

- 4.1 The Telecommunications Act is the primary legislation relating to telecommunications. The Telecommunications Act empowers IDA to grant licences for the provision of telecommunication services and to regulate the telecommunication industry in Singapore. It also authorises IDA to make regulations governing the classes of licences to be granted by IDA and the conditions for their grant, as well as the control and regulation of interference by radiowaves, electrical and other telecommunication means in Singapore.

Offences and penalties relating to the unlawful operation of telecommunication systems or services are also stipulated in the Telecommunications Act.

5. The Telecommunications (Radio-communication) Regulations

- 5.1 The Telecommunications (Radio-communication) Regulations was gazetted on 2 March 2001 and came into force on that date in place of the repealed Radio-Communication Regulations (which was gazetted in August 1994). The current Telecommunications (Radio-communication) Regulations came into effect on 1 April 2016.
- 5.2 The Telecommunications (Radio-communication) Regulations set out the regulatory framework by which IDA exercises licensing and regulatory functions in respect of the allocation, management and use of radio frequency spectrum in Singapore.

6. The Telecom Competition Code

- 6.1 The Telecom Competition Code first came into force on 29 September 2000. On 9 April 2012, IDA issued a revised Telecom Competition Code. The Telecom Competition Code sets out a comprehensive regulatory framework for the development of fair and effective competition in the telecommunication industry in Singapore.
- 6.2 The licensing framework adopted by IDA under the Telecommunications Act, for providing telecommunication services, is divided into the following categories of licensees:
 - (a) Facilities-based licensees;
 - (b) Services-based licensees;
 - (c) Telecommunication equipment dealer licensees; and
 - (d) Self-provisioning licensees.
- 6.3 The Telecom Competition Code applies to the categories of licensees listed in (a), (b), and (c) above, albeit to varying degrees, in recognition that certain licensees are obliged to comply with more stringent obligations by virtue of the extent of their control over the market.

7. COPIF

- 7.1 The COPIF was introduced in 2000 to ensure that developers and/or owners of buildings and developments provide adequate space and facilities, and access thereto, for the deployment and operation of installation, plant and systems which are used for providing info-communication services to the buildings. The COPIF also specifies the duties to be observed by developers and/or owners of buildings and developments, and telecommunication licensees in relation to the provision, maintenance and utilisation of the relevant space and facilities

provided, as required under COPIF. The current COPIF came into effect on 1 May 2013.

7.2 The Telecom Competition Code and COPIF are available on the IDA website.