



**DECISION AND EXPLANATORY MEMORANDUM ISSUED BY INFOCOMM
DEVELOPMENT AUTHORITY OF SINGAPORE ON THE ALLOCATION OF AN
ADDITIONAL 2 X 5 MHz OF 1800 MHz SPECTRUM**

ISSUED ON 31 JANUARY 2011

PART I: INTRODUCTION

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1800 MHz FREQUENCY BAND**

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PART I: INTRODUCTION

1. The 900 MHz/EGSM and 1800 MHz bands have been allocated for the provision of public cellular mobile telecommunication services (“**PCMTS**”) during the spectrum assignment exercise in 2007/2008. In March 2008, a total of eighteen lots of 5 MHz paired spectrum in the above bands were assigned to SingTel Mobile, StarHub Mobile and M1 (“**PCMTS Spectrum Rights Auction**”). In February 2009, IDA assigned one more lot of 5 MHz paired spectrum in the GSM1800 band to SingTel Mobile through an auction (“**1800 MHz Spectrum Right Auction**”). The PCMTS Spectrum Rights and the 1800 MHz Spectrum Right will expire on 31 March 2017. There remain 2 lots of 5 MHz paired spectrum in the 1800 MHz band that have not been assigned under any spectrum right.
2. Arising from industry interest for IDA to release more 1800 MHz spectrum, IDA issued a public consultation on “The Allocation of an additional 2 x 5 MHz of 1800 MHz spectrum” (“**Consultation**”) on 3 December 2010. The Consultation closed on 29 December 2010.
3. At the close of the Consultation, IDA received comments from three respondents:
 - i. Qualcomm International;
 - ii. Singapore Telecom Mobile Pte Ltd; and
 - iii. StarHub Mobile Pte Ltd.
4. IDA thanks all respondents for their input. Two respondents were generally supportive of IDA’s proposal to allocate additional 1800 MHz spectrum, while one respondent did not support the proposed allocation. IDA has given careful and extensive consideration to the views received. The sections below discuss the key issues raised during the Consultation and IDA’s decision on the allocation of the additional 1800 MHz spectrum.

**PART II: IDA’S DECISION ON THE ALLOCATION OF SPECTRUM IN
THE 1800 MHZ FREQUENCY BAND**

5. IDA seeks to ensure that the remaining 1800 MHz spectrum available is managed in a way which makes the most efficient use of this scarce

resource to promote innovation in, and growth of a vibrant infocomm industry in Singapore.

Assignment of 1800 MHz Spectrum

6. Two respondents agreed with IDA's proposal to allocate additional 1800 MHz spectrum for PCMTS, while one respondent did not support the proposed allocation.
7. Of the two respondents which supported the allocation of 1800 MHz spectrum, one noted that the 1800 MHz band was one of the spectrum bands that could be used to deploy systems based on Long Term Evolution (LTE) technology and was of the view that IDA should release both remaining lots of 1800 MHz spectrum to achieve maximum utilisation of the spectrum. The other respondent was supportive of IDA's proposal to allocate one additional 5 MHz pair of 1800 MHz spectrum. Both respondents agreed with IDA's proposal to allocate the spectrum in 5 MHz pairs and to limit the participation in the auction to existing PCMTS operators.
8. The one respondent that did not support the proposed allocation of additional 1800 MHz spectrum was of the view that spectrum allocations should take place as part of a longer-term plan, with sufficient quantities of spectrum being made available at one time. It argued that allocating spectrum in small quantities on an ad-hoc basis creates confusion and artificial spectrum shortage, and may result in spectrum being allocated in a way that is inappropriate for new and emerging technologies. It proposed that any allocation of additional 1800 MHz spectrum should only take place as part of a wider spectrum allocation, which would include the remaining EGSM spectrum, and only after IDA had come to a decision on the allocation of 4G spectrum to allow operators to properly value the spectrum. This respondent also questioned why IDA was moving away from its stated position in its Explanatory Memorandum on the Framework for the Reallocation of Spectrum in the 900 MHz and 1800 MHz Frequency Bands issued on 18 January 2008, that *"to cater to future demand, IDA will reserve 3 lots of 1800 MHz spectrum, as well as the remaining 1 lot of EGSM spectrum, for allocation after this Auction if it deems necessary. The reserved spectrum may also be made available for other uses, such as technical or market trials, research and development, mobile equipment testing, etc."* It was of the view that it was necessary to reserve both the remaining lots of 1800 MHz spectrum for technical, trial and experimental use given the emergence of mobile data, applications and entertainment.

9. The Consultation has confirmed earlier indications to IDA that there is industry interest for more 1800 MHz spectrum to be allocated to industry players in the form of spectrum rights. Given the industry demand expressed, and the potential for operators to use the band to provide new and innovative services, IDA is of the view that issuing an additional 5 MHz pair of 1800 MHz spectrum would benefit Singapore's mobile market development.
10. **IDA has thus decided to make available one 5 MHz pair of 1800 MHz spectrum for allocation to existing PCMTS operators.** IDA sees this as an auxiliary spectrum allocation exercise to increase the capacity of existing PCMTS operators' networks, since the amount of spectrum would not be practically sufficient to support a new PCMTS operator.
11. This decision does not deviate from IDA's position in the Explanatory Memorandum on the Framework for the Reallocation of Spectrum in the 900 MHz and 1800 MHz Frequency Bands issued on 18 January 2008. In that Memorandum, IDA clearly stated that it could allocate the remaining 1800 MHz spectrum if it deems necessary. The 1800 MHz Spectrum Right Auction in 2009 was an example of such a situation. In this case, based on IDA's assessment above, IDA is of the view that there is benefit to make available an additional 5 MHz pair of 1800MHz spectrum at this time.
12. IDA notes the view that the allocation of additional 1800 MHz spectrum should only take place after IDA had come to a decision on the allocation of 4G spectrum. In this regard, operators may refer to IDA's interim decision on the "Spectrum Framework for 4G Mobile Communication Systems in Singapore" issued on 24 January 2011 ("**4G Interim Decision**").
13. With regard to the view that the allocation of additional 1800 MHz spectrum should be part of a wider spectrum allocation that includes the remaining EGSM spectrum, IDA notes that it is not feasible for IDA to assign the remaining EGSM spectrum at the moment as it is currently subject to spectrum coordination with our neighbouring countries. IDA is of the view that it is appropriate to make the 1800 MHz spectrum available now since there is some industry demand for it, rather than proceed with the allocation only after these issues are resolved. As stated above, this decision to make available just one of the remaining two 5 MHz pairs of 1800 MHz spectrum should be seen as an auxiliary spectrum allocation exercise, supplementing the PCMTS Spectrum Rights Auction and the 1800 MHz Spectrum Right Auction, to enhance the capacity of existing PCMTS operators' networks.

Spectrum for temporary, trial and experimental uses

14. While one respondent suggested that IDA release both unassigned lots of 1800 MHz spectrum for allocation at this juncture, IDA is mindful of the need to set aside some spectrum for temporary, trial and experimental uses in the near future. IDA notes that the demand for 1800 MHz spectrum for such uses has not increased in the last few years, and can generally be supported within one 5 MHz pair of spectrum. IDA will thus reserve the last lot of 1800 MHz spectrum for temporary, trial and experimental uses. For the avoidance of doubt, IDA reserves the right to allocate this last lot in the form of a spectrum right if it deems necessary. IDA will seek industry feedback before making any decision to allocate the final 1800 MHz spectrum lot under a long term spectrum right.
15. IDA will also impose a general duty on the spectrum grantee to cooperate and negotiate in good faith with third parties on the use of the frequencies for major events. IDA notes the view of one respondent that the onus should be on the third parties to ensure that their usage does not cause interference to the spectrum grantee, since the spectrum grantee has paid the market price to use the spectrum. While the third parties should take steps to minimise interference to the spectrum grantee, this may not always be possible. In such cases, the current practice is for the third parties to commercially negotiate with the spectrum grantee for use of the frequencies. It should be noted that a similar condition was included in the recent 3G Spectrum Rights Auction.

Use of the spectrum

16. Consistent with the existing PCMTS Spectrum Rights and 1800 MHz Spectrum Right, the new spectrum right to be allocated (the “**1800 MHz Spectrum Right (2011)**”) will allow the spectrum grantee to use the spectrum to provide PCMTS, using 2G or 3G technologies, and other technologies which share a similar platform and allow higher speed data services, such as GPRS, EDGE or HSPA. The spectrum grantee may also provide other services such as Wireless Broadband Access (“**WBA**”) using the spectrum as long as they have met the requirement to provide PCMTS.
17. One respondent sought clarification on how IDA would determine whether an operator has met the requirement to provide PCMTS. IDA clarifies that PCMTS operators must use their assigned spectrum in the 900 MHz/EGSM and/or 1800 MHz frequency bands (“**PCMTS Spectrum**”) to offer, as a minimum, a publicly available mobile voice telephony service which meets the requirements for level “8” and “9”

telephone numbers, within the service scope and obligations under their existing FBO licences. This includes the requirements to provide nationwide coverage¹, free access to emergency services, and uninterrupted, seamless call handover when moving from location to location at a speed of up to 100km/h. The operator must offer this service using all or part of its assigned PCMTS Spectrum. The operator may provide other forms of PCMTS (e.g. SMS services) in addition to this voice service.

18. As long as operators continue to maintain their publicly available mobile voice telephony service with any part of their PCMTS Spectrum, operators may use other parts of their PCMTS Spectrum (including spectrum granted under the 1800 MHz Spectrum Right (2011)) to provide non-PCMTS services, such as fixed wireless broadband. For example, if an operator holds 2 x 20 MHz of spectrum in the 1800 MHz band, 2 x 10 MHz could be used to provide a publicly available mobile voice telephony service while the remaining 2 x 10 MHz is used to deploy other telecom services (PCMTS or non-PCMTS). However, before an operator uses any part of its assigned spectrum to provide non-PCMTS services, it will need to seek IDA's approval to amend its spectrum right(s), and obtain IDA's approval for any licence amendments necessary.
19. As one of the respondents pointed out, there is growing interest globally in re-farming the 1800 MHz band for LTE. IDA notes that operators would not be able to use LTE to provide a publicly available mobile voice telephony service since the technology does not support voice telephony at the moment. However, in line with IDA's 4G Interim Decision, IDA will allow operators to use their PCMTS Spectrum to deploy LTE systems to provide other forms of PCMTS as long as they continue to provide publicly available mobile voice telephony services using part of their PCMTS Spectrum. In addition, the operator must ensure that there is no degradation of existing services such as in the Quality of Service standards for existing 2G services, when they implement their LTE systems and services over their PCMTS spectrum band. PCMTS operators will need to seek IDA's approval to amend their FBO licence and Radio-Communications Network Licence before deploying the new LTE systems.
20. Operators deploying LTE or any other non-2G system in their PCMTS Spectrum will be required to ensure that their systems do not interfere with the 2G networks of other PCMTS operators. The onus is on them to coordinate with the 2G operators and set aside additional guard

¹ The service coverage must extend to the whole island of Singapore (including 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.

bands if necessary. This is in line with IDA's existing position on the deployment of 3G systems in the PCMTS Spectrum.

Spectrum Lot and Spectrum Right Duration

21. There was no disagreement with IDA's proposal that the spectrum grantee be allowed to choose either one of the two available 1800 MHz lots. There was also no comment on IDA's proposal to require the spectrum grantee to provide a guard band of at least 200 KHz on the lower frequency boundary of the lot, unless it also holds the spectrum right for the spectrum lot on the other side of that boundary. IDA will thus proceed with these proposals.
22. There was no disagreement with the proposed 6 year duration of the spectrum right. IDA has thus decided that the spectrum right will commence on 1 April 2011 and expire on 31 March 2017, together with the other spectrum rights issued for spectrum in the PCMTS Spectrum.

Assignment mechanism

23. There were no comments on IDA's proposal to assign the spectrum via an ascending auction. IDA will thus proceed to auction the spectrum via an ascending auction if there is more than one initial offer for the spectrum. Further details of the auction framework will be given in the Information Memorandum to be published.

Reserve Price and Fees

24. One respondent proposed that the reserve price should be set at S\$300,000 or lower, to be on par with the reserve price for the 1800 MHz Spectrum Right Auction in 2009. It was of the view that the terms of the proposed auction should be no worse-off compared to those of the previous two auctions for PCMTS Spectrum. It noted that the reserve price for the 1800 MHz Spectrum Right Auction had been set to be equal to the reserve price for the earlier PCMTS Spectrum Rights Auction.
25. IDA's proposed reserve price of \$400,000 was calculated by pro-rating the final clearing price of the 1800 MHz Spectrum Right Auction by the duration of the spectrum right. Rather than trying to ensure that the terms of the proposed auction are no worse-off compared to those of the previous auctions, IDA's intention is to ensure that bidders will not be able to obtain spectrum on better terms than in the previous auction which took place only 2 years ago, to discourage operators from gaming in future auctions. IDA will thus proceed to set the reserve price at \$400,000.

26. IDA will also impose an annual spectrum management fee of \$140,000 for the spectrum lot, and an Application and Processing Fee of S\$22,500.
27. In addition to the above spectrum fees, operators will also be subject to licence fees, currently set at 1% Annual Gross Turnover ("AGTO"), for the provision of PCMTS under their FBO licences.

PART III: SPECTRUM ALLOCATION RULES AND PROCESSES

28. IDA intends to release the draft Information Memorandum containing information on the application process for the 1800 MHz Spectrum Right (2011) auction, as well as the draft auction rules and other relevant documents to the existing PCTMS operators for a closed consultation in February 2011. The final documents will be published on the IDA website at www.ida.gov.sg, under the "Policy and Regulation" section in March 2011.
29. The table below sets out the *indicative* dates for the key milestones leading up to the auction.

| Milestone | Date |
|---|-------------|
| Issue draft Information Memo and Auction Rules | 14 Feb 2011 |
| Submission of written queries | 21 Feb 2011 |
| Publish final Information Memo and Auction Rules | 3 Mar 2011 |
| Submission of Initial Offer and Bank Guarantee | 10 Mar 2011 |
| Announcement of whether Auction will proceed | 11 Mar 2011 |
| Information Session & Notification of Auction Details | 14 Mar 2011 |
| Auction Day | 21 Mar 2011 |