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Ministry of Business, Innovation & Employment

700 MHz Auction

Consultation on Auction Design and Implementation Requirements, and Execution

Radio Spectrum Policy and Planning
Resources, Energy and Communications Branch
Infrastructure and Resource Markets Group
15 May 2013

MBIE-MAKO-1867806

Contents

Government decisions

1. The Minister for Communications and Information Technology recently announced key Government decisions on the allocation of the digital dividend 700 MHz radio spectrum. This spectrum is freed up by the switchover to digital television, and is highly prized internationally for the deployment of next generation mobile broadband services.

2. The Government has made the following decisions on the allocation of the 700 MHz band:

    a. The 700 MHz band will be configured according to what is commonly known as the 'APT Band Plan'. The band plan consists of two 45 MHz paired blocks, separated by a 10 MHz centre band gap

    b. The spectrum will be allocated in 5 MHz blocks as long term management rights expiring in 2031

    c. An initial acquisition limit of 2x15 MHz will be applied, but this may be relaxed to 2x20 MHz during the auction if bids above the reserve price are not received for all spectrum blocks

    d. Spectrum rights will be subject to implementation requirements ensuring that services are deployed across New Zealand in a timely manner

    e. Spectrum rights will be allocated for commercial use by contestable auction, the specifics of which are to be confirmed following this consultation.

3. These decisions are not open for consultation.

4. The Ministry of Business, Innovation and Employment ('the Ministry') is now consulting on final allocation design specifics to give effect to these decisions, including:

    a. auction design

    b. design of the implementation requirements

    c. draft Deeds to give effect to the acquisition limits and implementation requirements

    d. draft Management Rights.

5. This consultation is split into four parts:

    a. this consultation document, which includes background information, outlines the proposed choice of auction and rationale, discusses implementation requirements and presents options to extend mobile coverage beyond current levels

    b. the draft Deeds, which successful bidders will be required to sign with the Crown, giving effect to the Government's policy decisions

    c. the draft Management Rights, which include technical emission limits

    d. an outline of the issues that will need to be included in detailed auction rules which would govern the auction process, including association and activity rules, for example.

    In addition, the Ministry has provided a technical report on the coexistence of existing fixed services in the KK band (immediately above the 700 MHz band) and the potential deployment of Long Term Evolution (LTE) cellular mobile services in the 700 MHz band.

Consultation process and timeframe

Purpose

6. This discussion document outlines the issues relating to the auctioning of the 700 MHz spectrum. The document seeks the opinions of interested parties on the analysis and options presented.

Workshop

7. This discussion document will be supplemented by a workshop to be held on 29 May 2013. The workshop will provide an opportunity for interested parties to clarify the proposals or assumptions within this document. Please note that attendance at the workshop will not replace a written submission, and only written submissions will be taken into account in the final analysis.

8. To confirm your attendance at the workshop, please email radiospectrum@med.govt.nz (Subject line: "700 MHz Auction Workshop") no later than Friday 24 May.

Making a submission

9. Comments should be submitted in writing, no later than 5pm on 21 June 2013, as follows:

Email (preferred)

radiospectrum@med.govt.nz (Subject line: "700 MHz Auction Submission")

Post

700 MHz Auction Submission
Radio Spectrum Policy and Planning
Ministry of Business, Innovation and Employment
PO Box 1473
WELLINGTON

Publication and public release of submissions

10. Our intention is to publish all submissions on the Ministry website www.rsm.govt.nz. Submitters will be considered to have consented to publication unless clearly specified otherwise in the submission. If parties wish to make points which are commercially sensitive, these should be clearly identified in the document, and a 'public' version of the submission should also be provided for inclusion on the Ministry website.

11. Submitters should also be aware that the content of submissions provided may become subject to public release under the Official Information Act 1982. Please advise if you have any objection to the release of any information contained in a submission, and in particular, which part(s) you consider should be withheld, together with the reason(s) for withholding the information. Confidential information should be clearly marked. The Ministry will take into account all such objections when responding to requests for information on submissions to this document under the Official Information Act 1982.

12. The Privacy Act 1993 establishes certain principles with respect to the collection, use, and disclosure of information about individuals by various agencies including the Ministry. It also governs access by individuals to information about themselves held by agencies. Any personal information you supply to the Ministry in the course of making a submission will be used by the Ministry only in conjunction with consideration of matters covered by this document. Please clearly indicate in your submission if you do not wish your name to be included in any summary of submissions that the Ministry may publish.

Auction timeframe

13. Following receipt of submissions, the Ministry will consider the issues raised and finalise its advice to the subcommittee of Ministers who have been delegated decision-making authority for the auction.

14. No exact timeframe is available for the lead-up to the auction, as a specific date has not yet been set.

15. The exact date for the auction will be a decision for Ministers. Once taken, it will be publicised by media release and through the Ministry's business update service. We aim to announce the auction date, along with reserve prices, at least two calendar months prior to the auction.

16. The provisional reverse timetable is set out below:

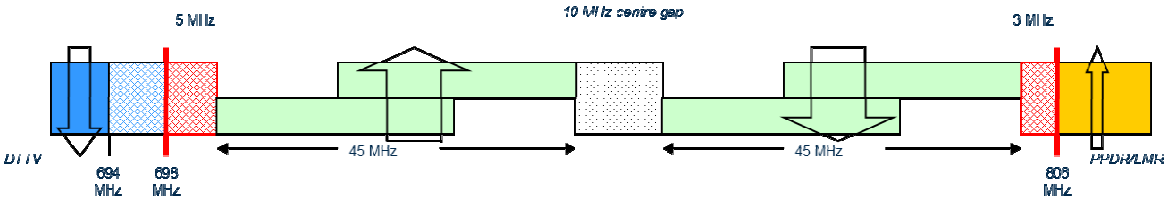
Event	Date prior to auction
Auction	Date to be announced
Bidder Workshop	- 2 weeks prior
Bidder Registration Closes	- 3 weeks prior
Auction Date and Reserve Prices Announced	- 6-8 weeks prior

Band and lot configuration

17. The Government has decided to configure the 700 MHz band according a plan commonly known as the 'APT Band Plan'. This consists of two paired blocks of spectrum, each 45 MHz wide, and separated by a 10 MHz centre band gap. The band plan has been adopted by the International Telecommunications Union (ITU), and 3GPP standards have been developed.

18. 3GPP specifications for the band (Band 28) were confirmed at RAN4 level in June 2012. The band is configured in "conventional duplex," with two 45 MHz blocks (703 MHz-748 MHz; 758-803 MHz). The standards provide for guard bands from 698-703 MHz[1], and 803-806 MHz, with a centre-band gap spanning 748-758 MHz.

19. Devices are likely to require two duplexers to cover the band, each expected to span 30 MHz with a 15 MHz overlap.



20. Within this band plan, the Government has also agreed that the spectrum be packaged in 5 MHz blocks. The Ministry therefore proposes dividing the available spectrum into 9 lots, each consisting of management rights for 2x5 MHz. (5 MHz in the lower block, and the corresponding pair in the upper block).

21. The guard bands (red) and centre band gap are to be retained by the Crown, and are not intended to be allocated to the market at this time. The Government may provide general user access to some or all of these frequencies on a non-interfering basis in the future, in compliance with the Radiocommunications Act.

[1] In New Zealand, the 700 MHz band commences at 694 MHz, compared to 698 MHz in many other jurisdictions. This provides additional protection to ensure compatibility with adjacent television services.

Management rights

22. The Management Rights will be made available to Successful Bidders for use from 1 January 2014 and will expire 28 November 2031.

23. The commencement date was selected to provide a transition period following the cessation of analogue broadcasting. Successful Bidders, following Settlement, may be provided access to spectrum prior to the commencement of the Management Rights at the discretion of the Ministry. The expiry date aligns with the expiry of current management rights in the 850/900 MHz bands, also used for the provision of mobile broadband services.

24. The existing Management Rights, used for UHF television until 31 November 2013, do not expire until 11 March 2020. These will be modified so they are suitable for cellular mobile.

25. The proposed Management Rights are provided for comment. They have been developed on the basis of 2x5 MHz blocks. Bidders seeking to purchase multiple lots will be able to aggregate the blocks and management rights following the transfer of rights.

26. The 'adjacent frequency emission limits' have been developed based upon 3GPP standards. Limits have also been applied to ensure compatibility with existing services in adjacent bands. Prospective bidders are encouraged to ensure they understand how these limits are applied.

27. Later in this document is a section addressing the use of Deeds for the application of competition controls, including implementation requirements. The Deeds provide that two types of Management Rights will be available to Successful Bidders. These are:

    a. Early Management Rights

       These Management Rights will be available from 1 January 2014 and expire on 11 March 2020. If a Successful Bidder does not meet the implementation requirements outlined in the Deed, they will not be renewed.

    b. Conditional Management Rights

       These Management Rights will be available from 12 March 2020 and expire on 28 November 2031. Where implementation requirements have been met as required in the Deed, these will be created and transferred to the Successful Bidder.

Potential encumbrances

28. The Ministry wishes to advise of potential licences which may be included as part of the management rights for allocation.

    a. Chatham Islands

       The Ministry may include a spectrum licence in the Crown's name in the Chatham Islands, in each of the nine management right lots.

    b. Corrections

       The Ministry may include geographically specific spectrum licences for the Department of Corrections, for the purposes of disrupting and jamming future cellular communications within their buildings and associated land. These licences will not permit disruption or degradation to cellular communications outside of boundary of the land owned by the Department and used for correctional institutions.

    c. Radio Microphones

A general user licence spanning the 700 MHz band is currently in operation allowing the use of low powered devices such as radio microphones, on the condition that the devices do not cause any interference. The licence expires in 2015.

Acquisition limits

29. The Government has agreed that an initial acquisition limit be set at 2x15 MHz. This would correspond to a limit of three lots, each consisting of 2x5 MHz.

30. Under this limit, a minimum of three bidders will be able to successfully acquire spectrum at an auction, provided the reserve price is met.

31. The Government also agreed that, in the event that not all lots receive bids meeting the reserve price, the limit could be relaxed to 2x20 MHz during the auction. This is to avoid spectrum remaining unsold if there is a willing purchaser.

32. A mechanism to provide for the potential change in limit is set out as part of the proposed auction methodology. The limit would only change if not all lots receive bids above the reserve price during the auction.

Application

33. Acquisition Limits will be applied initially during the auction, both through the design of the auction and participation rules.

    a. The design will specify the maximum number of lots any party may bid on during the auction, and the circumstances under which this number may be relaxed.

    b. The rules also include association rules, to prevent collusive bidding to exceed the acquisition limit. Under these rules, no party may have a controlling interest in more than the final acquisition limit. Registered bidders will be required to declare any associations prior to the auction.

34. Following the auction, the acquisition limits will be set out in deeds to be signed by the winning parties as a condition of the transfer of management rights.

Duration

35. The acquisition limit will apply for a minimum of three years. This period was selected to provide sufficient time for investment to commence.

36. After the initial three years, the limits may be extended for a further period of time, relaxed, or allowed to expire, based on a Government assessment of the competitive needs of the marketplace.

Application of the Commerce Act

37. Regardless of the use of acquisition limits, provisions of the Commerce Act will still apply. Under section 138 of the Radiocommunications Act 1989, management rights are deemed to be business assets under the Commerce Act.

38. Section 47 of the Commerce Act states that no party may acquire business assets if that acquisition may have the effect of substantially lessening competition in the market. For the avoidance of doubt, bidders may wish to consider seeking clearance from the Commerce Commission regarding the potential acquisition of spectrum through this auction.

Implementation requirements

39. The Government has agreed that implementation requirements be applied to spectrum sold in the 700 MHz band, to ensure that the spectrum is used and services are rapidly deployed across the country.

Ensuring spectrum is used

40. The Ministry had originally proposed, in its 2011 discussion document, applying a requirement to provide services to at least 50% of the population within five years. The Ministry considered that this would ensure that services are deployed, while enabling operators to deploy services based on economic realities. In addition, implementation requirements should be simple to understand and easy to measure, to avoid costly and complicated monitoring and reporting.

41. Submissions were varied, with arguments for both less and more stringent requirements. While the 50% proposal could be achieved by covering only Auckland, Wellington and Christchurch, the Government has expressed its intent to ensure services are deployed more widely.

42. The proposal has therefore been refined to require deployment in each region. The Ministry proposes requiring services using the 700 MHz band offering at least:

    a. 50% population coverage nationwide within 5 years, including

    b. 30% population coverage within any given region, based on Regional Council boundaries as at 2012.

43. The intention is that while 50% population coverage is required within five years, this must comprise at least 30% of the population of any given Regional Council area. This option would ensure that services are deployed across the country, while still being an achievable target which does not overly distort investment incentives.

44. A list of the Regional Councils, with key cities and 2011 population estimates sourced from Statistics New Zealand, is set out below. We propose that the final population percentages be based on the outcomes of the 2013 census. Maps demonstrating the boundaries and key cities are available on the Local Government New Zealand website (http://www.lgnz.co.nz).

Region	Population	Key Cities	Population
Northland	158,300	Whangarei	52,200
Auckland	1,486,000	Auckland	1,377,200
Waikato	413,000	Hamilton	206,400
Bay of Plenty	277,100	Tauranga	121,500
Gisborne	46,600	Gisborne	34,300
Hawke's Bay	155,300	Napier/Hastings	124,800
Taranaki	109,700	New Plymouth	52,500
Manawatu-Wanganui	232,400	Palmerston North Whanganui	82,500 39,700
Wellington	487,700	Wellington	393,400
Tasman	48,100		

Nelson	46,200	Nelson[2]	60,800
Marlborough	45,600	Blenheim	30,300
West Coast	32,900	Greymouth	10,100
Canterbury	560,700	Christchurch	380,900
Otago	209,900	Dunedin	117,700
Southland	94,900	Invercargill	49,200

45. For the purposes of this implementation requirement, the Ministry proposes combining the Tasman and Nelson regions, due to the lack of sizeable towns in the Tasman region.

Improving cellular mobile coverage

46. The Government is also seeking to improve cellular mobile coverage and is open to suggestions from industry on the best way to achieve the goal.

47. This would be *in addition to* the general implementation requirement to deploy services using the 700 MHz band.

48. To achieve these objectives, we have proposed a requirement for parties owning a significant portion of the 700 MHz band to deploy a minimum number of new cell towers every year. A starting point for consideration would be five cell towers each per year for five years.

49. To meet the obligation, parties would need to either construct a new cell site, or co-locate on a cellsite in an area in which they did not already offer services, or in which they were not contracted to provide services in the coming years. These new cell towers would need to be 'macro' sites, providing coverage in areas which previously did not have substantial coverage. New capacity improvement or infill sites would not meet the obligation, nor would sites being built under the Rural Broadband Initiative contract.

50. This obligation is to improve general mobile coverage. It is not 4G-specific. As such, it may be achieved utilising spectrum holdings other than the 700 MHz band.

51. This approach would enable operators to deploy new towers where it was deemed most appropriate, be it in currently underserved townships, on key transport routes, or in tourist destinations that lack mobile coverage.

Colocation of new towers

52. The Ministry notes that colocation of new cell towers remains desirable. As such, colocating on a tower will be an acceptable approach to meeting this obligation.

53. The Ministry envisages a system in which operators are required to provide annual plans setting out the new towers that they intend to deploy for approval, and inviting applications for colocation. These will be followed with reports confirming the towers deployed, new coverage achieved, and details of any colocation arrangements, including applications received.

[2] City population is based on the Nelson 'Urban Zone', which has greater population than the Nelson unitary authority.

54. The Ministry seeks feedback on the proposal and also invites suggestions on other mechanisms to achieve its objective of improving mobile coverage.

Proposed application of both requirements

55. The Ministry notes that the two proposed requirements ('Ensuring Spectrum is Used' and 'Improving Cellular Mobile Coverage') may be onerous for smaller operators seeking to participate in the auction. Imposing such requirements on all auction participants may have the perverse outcome of limiting the auction to simply the three incumbent operators.

56. The Ministry therefore proposes staged requirements, with the extent of the requirement dependant on the quantity of spectrum purchased.

Quantity of spectrum purchased	Implementation requirement[3]	Additional coverage obligation[4]
2x5 MHz	50% national population coverage within five years.	N/A
2x10 MHz	50% national population coverage, including at least 30% population coverage within any given region, within five years.	N/A
2x15 MHz	50% national population coverage, including at least 30% population coverage within any given region, within five years.	5 new coverage cell sites per year, for first five years.
2x20 MHz[5]	75% national population coverage, including at least 50% population coverage within any given region, within five years.	10 new coverage cell sites per year, for first five years.

57. The Ministry notes that the potential acquisition of 2x20 MHz of spectrum may be highly desirable to some parties. As such, the Ministry is particularly interested in feedback on the level of requirement that may be placed on such a block.

[3] Services using the 700 MHz band.
[4] Services using any spectrum holdings.
[5] If this becomes available as per the auction rules.

Deeds and the application of competition controls

58. Acquisition limits and implementation requirements will be implemented through deeds between successful bidders and the Ministry. Draft deeds are available to download alongside this consultation document for feedback.

Ongoing application of the acquisition limits

59. The deeds will be used to enforce the limits for an initial three years from the commencement of the management rights.

60. The deeds also provide the Crown with the ability to extend the expiry date of the limits, if deemed necessary. The process for this would be similar to the process applied in the 2.1 GHz band, following an assessment of competition.

61. To prevent gaming of the limits, the deeds also define associations, so that associated companies may not exceed the limits.

Successive management rights

62. Successful bidders will be provided with an initial 'early' management right during which the implementation requirements must be met. A 'conditional' management right will also be created, for the remaining period.

63. The conditional right will only be transferred to the successful bidders once the implementation requirement has been achieved, and a statutory declaration made, to the satisfaction of the Chief Executive of the Ministry.

64. In previous allocations, the Ministry established a "buy-out right" period of two years, in which right holders could purchase an additional two years to meet the implementation requirement by paying an additional 15% of the original purchase price.

65. In the event that the implementation requirements for the 700 MHz band are not met in the required timeframe, no option has been included to extend. The remaining 13 years of the Management Right will not be transferred to the operator, and the Ministry will consider options for reallocation to market.

Choice of auction methodology

Background

66. The Government has used auctions to allocate highly-valued radio spectrum in New Zealand for a number of years. While New Zealand was originally a front-runner in this regard, allocating spectrum by auction is now considered international best practice, and is the standard allocation method adopted by most of our OECD partners, including the United States, United Kingdom, Europe, and Australia.

67. The Ministry originally recommended in its 2011 consultation document that the 700 MHz band be allocated by auction. Some submitters in that process preferred direct or administered allocations. However, the Ministry considered that such options lacked transparency, were administratively cumbersome and fraught with the risk of regulatory failure.

68. The Government has agreed that the 700 MHz band should be allocated by auction, as long term management rights.

Objectives

69. We have identified a number of objectives which will indicate the appropriate choice of auction design. These are objectives relating to the auction, not to the policy decisions for the 700 MHz allocation in general.

Allocative efficiency
The key goal of any auction is to guide goods to those who value them the most. Spectrum auctions, by commoditising spectrum rights, help identify the highest value use and users of specific parts of the radio spectrum. Included in this is identifying whether certain portions of spectrum within the band plan are valued more highly by certain players.

Technical efficiency
It is also important to ensure that the auction outcome results in technically efficient allocation. Ideally, final allocations to different parties should be contiguous (not fragmented) for maximum technical utility, and allocations should not impede adjacent users. In addition, it is important that allocations should be compatible with international standards.

Transparency
Auctions should invite open and honest bidding by parties. Some auction designs facilitate gaming or encourage non-competitive bidding strategies. An ideal auction design will limit opportunities for gaming (including free-riding, communicative bidding) and encourage honest bids by parties reflecting the value of the spectrum.

Fair return
Radio spectrum is a Crown administered resource. Auctioning provides rights to private companies. To minimise private windfall gains, it is important to ensure that an appropriate price is paid by the private companies in exchange for use of highly contested spectrum.

Deployment
The Ministry wishes to see all available spectrum allocated to market for rapid deployment, if there is a willing buyer.

International approaches to auctioning the digital dividend

70. A number of auction formats have been used internationally, including sealed first-price tenders, second price tenders, and combinatorial tenders.

71. The most common forms are the Simultaneous Ascending Auction and the Combinatorial Clock Auction, set out below. These two forms were also briefly outlined in the Digital Dividend consultation document released in 2011, as the most likely auction forms for use in allocating the 700 MHz band.

Simultaneous ascending auction

72. The Simultaneous Ascending Auction (SAA) has been used in New Zealand and in other jurisdictions since the mid-1990s. It essentially consists of a number of independent lots auctioned simultaneously by English ascending 'outcry'.

73. Bidding is held over multiple rounds where all lots are auctioned at the same time. Bidding on lots is simultaneously closed when no new valid bids are received on any lot, typically for two sequential rounds. Bidding rules (including activity rules, the ability to withdraw bids to move to alternative lots, and constraints on the number of lots any party may bid on at a given time) aim to prevent participants from colluding, to decrease competition, and to ensure the auction is not drawn out over an unreasonable length of time.

74. By auctioning the lots at the same time over multiple rounds, additional information is provided to participants in the form of other bidders' valuations. This form of price discovery also limits the 'winner's curse' as the highest bids are announced at the end of each round.

75. The mechanics of the SAA coupled with an auction rule allowing the withdrawal of bids enable bidders who see the licences as substitutable to move from lot to lot (or between groups of lots), based on their relative price. Similarly, as bidders are able to assess their ability to obtain a group of lots they see as complementary, they can modify their bidding strategy or withdraw from the auction as the situation dictates.

Combinatorial clock auction

76. Following the major allocations for 3G spectrum held in the early 2000s, several jurisdictions have sought to implement a new form of auction designed to address many of the shortcomings of the SAA.

77. Known as the Combinatorial Clock Auction (CCA), this type of auction has gained the support of many regulators internationally, as it offers significant benefits over SAA to support allocative and technical efficiency. It has been used by the United Kingdom, Denmark, the Netherlands, Ireland, Switzerland, and Australia.

78. It has been seen as particularly beneficial for when complementary or substitutable goods are being auctioned - for example, in jurisdictions where multiple spectrum bands are being auctioned at the same time. The auction is typically designed in such a way to allow bidders to move between different types of lots in response to demand and increasing price (for example, reducing demand in a lower frequency band and increasing demand in a higher frequency band).

79. CCA combines two key features – clock-based pricing and combinatorial bidding. The first identifies the price and number of lots each bidder wins, and the second identifies their preferred way of packaging those lots (in the case of spectrum auctions, the specific frequency ranges).

Clock-based pricing

80. In a clock auction, participants indicate their demand at the stated price and the seller increases the price, until demand equals supply. A clock auction is commonly used where one product has been divided into some number of identical units, or multiple products have been divided into some number of identical units.

81. Controlling the price limits the ability of participants to signal to each other, thereby reducing the possibility of collusion.

82. During the clock phase, bidders indicate the number of generic lots they are willing to purchase for a stated price. The auctioneer raises the price each round, until the demand from the bidders equals the number of lots the auctioneer has to sell.

Combinatorial bidding

83. Package or combinatorial bidding methods can be incorporated into auction design. Package bidding allows participants to place a bid on a group of lots rather than having to bid on each lot in that group. Where there are strong complementarities among the lots and these complementarities vary by bidder, this form of bidding is attractive to both participants and the government because:

- Package bidding helps ensure the contiguity of lots, for maximum flexibility and technical efficiency
- participants minimise exposure risk due to not being able to back out of failed aggregations
- the government avoids potentially inefficient allocations due to failed aggregations.

84. A combination phase is held to allow bidders to indicate the price they are willing to pay for a specific location of those lots within the spectrum band. This may be a single round combinatorial tender, or held over several rounds.

Proposal – simplified combinatorial clock auction

85. After weighing the two preferred auction methodologies against its objectives, the Ministry considers that the preferred auction format for the allocation of the 700 MHz band would be the Combinatorial Clock Auction.

86. The Simultaneous Ascending Auction would enable price discovery across the band, with price differentiation for different blocks. In addition, it is a format already familiar to both the Ministry and market participants.

87. However, the Ministry considered that SAA was not well suited to achieving the objectives of technical efficiency and transparency. It contains risks of gaming, including through forcing non-contiguous allocations on weaker bidders, as well as opportunities for price signalling and collusion.

88. While these downfalls can be mitigated by the development of additional rules, such as contiguity requirements, the ability to withdraw (constrained by a limit), and minimum bid increments, such amendments complicate the auction and are likely to predetermine a certain outcome.

89. CCA would be a departure from previous auction formats used in New Zealand. However, the Ministry notes that auction design helps mitigate the concerns raised about SAA:

- It supports technical efficiency by ensuring contiguity and more easily ensuring packages adhere to international standards

- It supports allocative efficiency as bidders pay prices reflecting their actual valuation of specific combinations and frequencies

- It minimises the opportunity for gaming (through bid signalling or forcing non-contiguous allocations).

90. The key drawback of CCA is that versions implemented internationally are relatively complicated, particularly those used in the UK and Australia. In addition, the combinatorial phase requires the identification of all possible combinations, which can be a large number depending on the number of successful bidders.

91. As New Zealand is auctioning only one spectrum band, the auction design may be simplified, and the number of possible combinations will likely be relatively low, thereby allowing the benefits of the CCA auction without the complicating costs.

Simplified aspects

92. While similar to the method adopted by the United Kingdom and Australia, a few aspects have been simplified to reflect that New Zealand is only auctioning a single band. The simplifications include:

    a. Activity Rules

       As bidders do not need to shift between different products (spectrum bands) during the allocation phase, the Ministry does not consider that complicated activity/eligibility rules are required. Instead, we propose that eligibility be a simple descent.

       All bidders would start with eligibility equal to the acquisition limit. Following the first round, eligibility would be determined by the bid in the preceding round. This would mean that bidders can only reduce, and not increase, their demand as the clock price increases. This is designed to minimise gaming, and to encourage honest bidding by auction participants.

    b. Supplementary Bids

       The ACMA has proposed a supplementary round that allows bidders to make their best and final offers for all the different combinations of spectrum they want, before the assignment round. This is designed to address an outcome where a bidder may have a preference for alternative combinations of spectrum across the multiple bands being auctioned.

       As New Zealand is only auctioning a single spectrum band, divided into nine blocks, this approach is not required.

    c. 'Vickrey-Nearest Minimum Revenue Core' Pricing

       An evolution of second-price auctions, this is designed to find the efficient price point for all spectrum, meaning that the final price paid in the allocation round (following the supplementary bid round) is based on all others' bids.

       As we do not propose a supplementary round in which bidders can make open-ended bids for generic lots, we do not consider that this pricing mechanism is needed.

Outline of proposed auction format

93. We propose auctioning nine lots, each consisting of 2x5 MHz. The auction would be split into three potential phases.

Clock Allocation Phase

94. This phase identifies the number of lots to be purchased by each successful bidder. No party can bid for more than three lots (allowing a maximum of 2x15 MHz), and bid eligibility is descending (that is, parties cannot bid for more than the number of lots they bid for in the previous round). Bidding occurs in rounds, with the price set by the Auction Manager increasing each round until the total number of lots sought by bidders is equal to nine.

95. Phase overview:

    a. Bidding takes place over successive rounds. The auction manager sets the 'round price'. The initial round price is equal to the reserve price.

    b. Bidders place package bids for the number of generic lots sought at the round price. Generic lots consist of 2x5 MHz, with no specific frequency assigned.

    c. Bids will be subject to an Acquisition Limit of three lots, or 2x15 MHz.

    d. The round price increases each round that the total number of lots sought by bidders exceeds the number of lots available.

    e. Bidders have descending eligibility. Initially, it is equal to the Acquisition Limit, and in subsequent rounds will be equal to the bid in the previous round.

    f. Rounds continue until the number of lots sought by all bidders is equal to or fewer than the number of lots available.

    g. If the number of lots sought by all bidders is fewer than the number of lots available, a Supplementary Allocation Phase will be held.

Supplementary Allocation Phase

96. The Supplementary Allocation Phase is triggered only if fewer than nine lots are allocated at the end of the Clock Allocation Phase. Remaining lots will be allocated by a second clock auction, with bidders competing only for remaining generic lots. The acquisition limit in this phase will be relaxed to four lots total, or 2x20 MHz (including the number of lots bought in the Clock Allocation Phase).

97. For example, if only eight lots are sold in the Clock Allocation Phase, the single remaining Generic Lot will be auctioned by Clock Auction in the Supplementary Allocation Phase.

98. Bidding will commence at the price achieved at the end of the Clock Allocation Phase.

99. All registered bidders may bid for the remaining lot or lots in this phase.

Combinatorial Assignment Phase

100. The Combinatorial Assignment Phase determines the specific lots or frequencies each winner will be assigned. It is designed to ensure that all successful bids are contiguous to allow maximum technical efficiency, and also provides flexibility for bidders to differentiate the amount that they are willing to pay for different frequencies within the band. Any bids in this phase will be in addition to the prices determined in the previous Allocation Phases.

101. The Auction Manager will provide each successful bidder with a list of possible locations in the band. The bidder will then have the opportunity to offer additional bids on as many (or as few) of the specific locations as desired.

102. The Auction Manager will determine the winning bids by maximising value to the Crown. In the event of a tie, a tiebreaker will be held with the winner determined at random.

103. Phase overview:

    a. The Auction Manager will release possible frequency assignments for each bidder based on the results of the two allocation phases.
    b. The possible frequency assignments will ensure each bidder receives contiguous spectrum.
    c. Bidders may place bids on as many of their possible frequency assignments as desired, provided all spectrum assignments are contiguous.
    d. Bids may be any non-negative value. Any bid is *in addition to* the already committed Allocation Price.
    e. A single round will be held.
    f. The Auction Manager will assign frequencies by maximising price based on the bids received.

Prices

Reserve price

104. Reserve prices will be applied during the Clock Allocation Phase. The Ministry is not consulting on the reserve price as part of this consultation document. Reserve price setting will be a decision for Ministers. Final reserve prices will be released not later than two calendar months before the auction.

105. Bidding will commence at the reserve price.

Clock price

106. Before each round during the Clock Allocation Phase, the Auction Manager will increase the price of each lot by an increment.

107. The final price at the end of the Clock Allocation Phase is known as the “Final Clock Price”. All bidders pay the same Final Clock Price for each lot that they win.

Supplementary assignment phase price

108. The remaining lots (if any) auctioned during the Supplementary Assignment Phase may be sold at a price different from the Final Clock Price. The price achieved in the Supplementary Assignment Phase will only apply to the lots auctioned during this phase.

Final price

109. The final price to be paid by any bidder is the combination of

    a. the Final Clock Price for the lot(s) won in that phase,
    b. the Supplementary Allocation Price for the lot(s) won in that phase, and
    c. any successful bid made in the Combinatorial Assignment Phase.

Publication of bids

110. Following the successful completion of the auction, all bids from each round will be published on the Radio Spectrum website.

111. During the auction, specific bid information will not be made public.

112. Bidders will be informed of the outcome of the bidding at three points:

    a. After each clock round, bidders will be informed whether demand exceeded supply, and whether another round will be held.
    b. Once all clock bidding has been completed, bidders will be informed of the number of blocks won by them, and by other registered bidders. In the event that a Supplementary Allocation Phase is held, information relating to bids made by other registered bidders will not be communicated until after the completion of that Supplementary Allocation Phase.
    c. Bidders will be informed of the outcome of Combinatorial Assignment Phase, following the successful conclusion of that phase.

Settlement (Payment)

113. Settlement will be subject to GST. Bids are made excluding GST.

114. Management Rights are typically only transferred following the full and final settlement of bids. Settlement is generally required soon after the completion of the auction, invoiced by the Ministry.

Deferred payments

115. Given the expected value of the 700 MHz band, requiring full and final settlement immediately following the auction may be onerous to successful bidders. The prospect of significant capital expenditure may be a disincentive for firms to bid truthfully, or to reveal the true value of the spectrum.

116. As such, Ministers have indicated that they are prepared to consider options for deferred payment, in which successful bidders may pay for the spectrum over a number of payments.

117. A deferred payment scheme was established for the renewal of AM/FM licences in 2009. The scheme was optional. Parties who opted to take up the scheme were able to pay the renewal prices in five equal payments over four years. Renewal prices were subject to interest, comprising the Crown's cost of capital and a risk premium.

118. The Ministry seeks views on establishing such an approach for the 700 MHz Auction.