



Australian Government

**Department of Broadband,
Communications and the Digital Economy**

**Competition limits on the sale of
digital dividend (700 megahertz)
and 2.5 gigahertz spectrum**

Regulation Impact Statement

Introduction

On 24 June 2010, the Minister for Broadband, Communications and the Digital Economy announced the Australian Government's decision to release 126 megahertz of broadcasting spectrum as a digital dividend. During the 2010 election campaign the government committed to auctioning the 2.5 GHz band in 2012–13.

An auction is being planned to sell spectrum from the digital dividend (700 MHz) band and 2.5 GHz bands through a single process at the end of 2012.

On 1 November 2011, the Minister for Broadband, Communications and the Digital Economy formally initiated the process for reallocating spectrum in the 700 MHz and 2.5 GHz bands away from broadcasting use and auctioning the spectrum by making Spectrum Reallocation Declarations. These instruments declare the spectrum subject to reallocation by issuing spectrum licences.

Under section 60(10) of the *Radiocommunications Act 1992* the Minister for Broadband, Communications and the Digital Economy has a discretionary power to direct the Australian Communications and Media Authority (ACMA) to develop procedures to impose competition limits on the sale of spectrum licences. Limits may be imposed on the amount of spectrum that participants can purchase and apply to specified bands, geographic areas or areas of population reach. Competition limits are intended to prevent a single participant from monopolising the spectrum at the expense of competition and outcomes for consumers.

This Regulation Impact Statement sets out the impacts of a proposal to impose competition limits on the sale of spectrum from the 700 MHz and 2.5 GHz bands.

1. Problem

Spectrum is a vital input to wireless broadband

Spectrum is a scarce resource and an essential input to the provision of wireless broadband services. In this auction a total of 230 MHz of spectrum (2x45 MHz in the 700 MHz band and 2x70 MHz in the 2.5 GHz band) will be on offer. Such a large amount of spectrum comes to market rarely. The ACMA in its research paper *Towards 2020—Future spectrum requirements for mobile broadband* noted the challenges involved in identifying additional spectrum and making it available to meet the demand for mobile data. This allocation of mobile broadband spectrum is likely to be the largest for the foreseeable future.

Importance of the bands for the evolution of mobile communications

The spectrum bands on offer through the auction are important for the future evolution of the mobile communications market in Australia. The 700 MHz and 2.5 GHz bands are harmonised internationally for use for Long Term Evolution (LTE) technology—the next generation of mobile communications services. The 700 MHz band is the LTE band in the Asia–Pacific and the Americas. The 2.5 GHz band (sometimes called the 2.6 GHz band) is harmonised globally for LTE and is likely to be the band that supports international roaming. These technologies, combined with larger blocks of spectrum, offer greater efficiencies and cost savings for operators. The optimal channel bandwidth for these technologies is 2x20 MHz.

Demand for mobile data—more spectrum needed

Demand for mobile broadband is growing exponentially. In the *Towards 2020* paper, the ACMA estimated that data demand would grow 30-fold between 2007 and 2015 and be 500 times greater than 2007 levels by 2020. To meet this demand an additional 130–150 MHz of spectrum (on top of what is already being made available through this and other processes) would be required for mobile broadband by 2015, and a further 150 MHz by 2020. This demand growth is already placing pressure on existing mobile networks and will necessitate continued network deployments in the foreseeable future.

Complementarity of the bands—a combination needed for LTE

The 700 MHz and 2.5 GHz bands are technologically complementary. Higher frequency spectrum like the 2.5 GHz spectrum is useful for carrying large amounts of data but does not travel over great distances, while lower frequencies like 700 MHz are useful for covering larger areas and penetrating buildings and other obstacles between base stations and customers. Participants in the auction are likely to want a mix of both bands in order to best design their future networks, with the 700 MHz band likely to be used for coverage and the 2.5 GHz band as an overlay to provide additional capacity and international roaming. LTE networks being deployed internationally are using a combination of higher and lower band spectrum. For example, Deutsche Telekom in Germany has deployed LTE in 800 MHz (the European digital dividend band), 1.8 GHz and 2.6 GHz.

Maturity of the Australian mobile communications market

The Australian mobile communications market is a mature market with three existing mobile network operators—Telstra, Optus and Vodafone Hutchison Australia (VHA). Most major markets internationally have three to four mobile network operators. This is attributed to the limited availability of spectrum to support a greater number of infrastructure competitors (network costs and capacity are tied to the amount of spectrum available to a network) and the level of investment required to deploy national networks.

This is particularly applicable to the Australian market given its low population base relative to geographic size. Australia had four network operators until 2009 when Hutchison 3G Australia merged with Vodafone Australia to form VHA. There is a high level of mobile ownership in Australia and therefore no new mobile user groups for a new entrant to access. Customers tend to shift from one provider to another. These shifts are based on differences in service cost and quality and the availability of new devices and technologies. As a consequence, the three incumbents are the entities most likely to participate in the 700 MHz and 2.5 GHz auction.

Interaction with existing spectrum holdings

The existing mobile network operators have spectrum holdings that could potentially be used to roll out LTE; these include 1800 MHz (held by Telstra, Optus and VHA), 850 MHz (held by Telstra and VHA), 900 MHz (held by Telstra, Optus and VHA) and 2 GHz (held by Telstra, Optus and VHA). However, these are in most cases fully utilised providing 2G and 3G mobile services.

Without new spectrum allocations the existing network operators would have to re-farm existing spectrum to provide the new services. To do this, 2G and 3G services would have to be provided using less spectrum at the expense of service quality and the customer experience, or these networks shut down completely. Rolling out a network in re-farmed spectrum is likely to be more costly for a network operator as it is not able to rely as much on the revenues of existing services to fund the rollout of the new network. It is also likely to take longer as customers need time to migrate, delaying the commercial return to the operator from the new services.

Strong incentive for monopolisation

If no competition limits are imposed on this auction, there is a strong incentive for participants to seek to purchase more spectrum than they need—that is, to monopolise the spectrum, in order to gain a competitive advantage. The size of the potential return to carriers from investing in additional spectrum creates a strong financial incentive to seek to monopolise the spectrum. The current financial strength of the prospective bidders also presents a risk of monopolisation.

The scarcity of spectrum and the importance of this spectrum to the telecommunications industry in terms of meeting the demand for mobile broadband and future evolution of networks creates a strong incentive for monopolisation in order to limit the ability of competitors to migrate their networks and provide improved services to customers. The current market structure of only three mobile carriers also adds to the risk of monopolistic behaviour.

Monopolisation could occur where an operator providing wireless broadband services acquires a sufficient proportion of the available spectrum such that its retail prices are not constrained by the other acquirers of the spectrum—that is, it is able to charge monopoly prices for its services. Similarly, monopolisation could occur where a provider was to acquire a significant proportion of the spectrum with the intention of hoarding this spectrum—that is, acquiring it solely to prevent other operators using the spectrum to provide competing services.

Impact of monopolisation on existing mobile network operators

In the absence of competition limits, there is a considerable risk that one of the existing mobile network operators could obtain all, or a large majority, of the spectrum on offer at the auction, resulting in the monopoly outcomes described above.

The other operators' existing spectrum holdings would not be sufficient to compete effectively, over the long term, with an entity with such significant spectrum holdings in key bands. This is because carriers' current holdings do not offer the large contiguous blocks of paired spectrum (2x20 MHz) that are optimal to efficiently run LTE. No existing operator has 2x20 MHz of contiguous spectrum nationally through existing holdings. There is also a balancing act in terms of achieving network capacity, between building more infrastructure or obtaining more spectrum. In a monopoly situation, the limited bandwidth available through existing spectrum holdings would therefore likely increase costs of deployment, with competitors unable to substitute spectrum for base stations as readily as the monopoliser would be able to do. Consumers could be faced with paying monopoly prices for higher quality services from the monopoliser, or increased prices for poorer quality services from the competitors.

Another possibility if no competition limits are applied is a duopoly outcome, whereby two of the current market players obtain the majority of the spectrum at the expense of the third player. Due to the factors outlined above the third player would be at a significant commercial disadvantage and may even be forced out of the market to the detriment of service choice and pricing for consumers.

Impact of monopolisation on new entrants

For a potential new entrant without access to existing spectrum, monopolisation of the spectrum could mean the difference between entering the market or being denied entry. Monopolisation of the spectrum could prevent a new entrant obtaining sufficient spectrum at auction to compete on equal terms with the existing network operators.

Addressing monopolisation post-auction

While it may be possible to address monopolisation issues post-auction, this is likely to take some time and the strong likelihood of legal challenges could delay resolution for many years. In the meantime the auction outcome would remain uncertain and network rollouts and service delivery suspended or significantly delayed. It is therefore preferable to address potential competition issues in advance of the auction where possible.

Competition limits necessary to prevent monopolisation

The Australian Competition and Consumer Commission (ACCC) considers that competition in downstream markets will be promoted if competition limits are imposed on the auction. The principle reason for imposing competition limits is to prevent monopolisation. Competition limits are necessary in this auction due to the risk of monopolisation of the spectrum, which is a scarce resource.

Competition limits proposed for both bands

Competition limits are proposed for both bands in order to prevent monopolisation of either band and any resultant inefficient network architecture and subsequent negative impact on consumers in terms of service availability, quality and pricing.

Form of competition limits dependent on local circumstances

Whether and in what form competition limits may be imposed depends on a range of factors including the institutional arrangements of the country concerned, the history of telecommunications development, government policy goals, technology characteristics, economic conditions and the level of competition in that market.

While competition limits have been applied to auctions in the past in Australia, each auction has a temporal component and limits applied previously are unlikely to apply today. This is because markets and technologies change over time. For example, in some previous auctions the priority was on encouraging new entrants in order to address concerns of a lack of competition in the market. Today, with a mature market structure of three relatively strong competitors, this is less of a concern. The focus in this auction is to avert a situation where any of the existing mobile network operators could monopolise the spectrum at the expense of the others or a potential (though unlikely) new entrant. The focus is also on ensuring that the limits align with the capabilities of the technology likely to be deployed.

Internationally, the majority of digital dividend and 2.5/2.6 GHz auctions that have taken place to date have included some form of competition limit or spectrum cap.

The form these limits take varies from country to country and reflects the unique market circumstances in each country at the time of the auction, and is therefore not readily translatable to the context of this auction.

2. Objectives

The government's primary policy objective in relation to the digital dividend is to maximise the benefit that use of the spectrum will bring to the Australian community and economy over time.

The *Telecommunications Act 1997* is concerned with promoting the long-term interests of end users of communications services. The *Radiocommunications Act 1992* is concerned with maximising the overall public benefit derived from use of the spectrum by ensuring the efficient allocation and use of the spectrum.

Imposing competition limits in order to ensure that no one player is able to monopolise the spectrum to the detriment of competition in the market and the availability, quality and pricing of services to consumers is consistent with these objectives.

Due to the strength of competition in the wireless broadband market, the ACCC considers that competition limits should be structured to ensure a level playing field for the three bidders most likely to participate in the auction. The options discussed below meet this objective.

3. Options

Option 1 (preferred option): Impose limits of 2x20 MHz for the 700 MHz band and 2x40 MHz for the 2.5 GHz band

These are the limits recommended by the ACCC. The ACCC believes that these limits will enable mobile network operators to deploy networks using varying combinations of high and low-frequency bands, but not preclude any one operator from taking advantage of the most technically-efficient network design.

Under the LTE technical standards 20 MHz is the maximum channel size supported. Any spectrum allocated over and above 20 MHz would need to be aggregated (that is, joined together) with the 20 MHz block to enable a greater amount of data to be carried. Aggregation into channels greater than 20 MHz is proposed in future technical standards but is not possible under the current LTE standard. While the first standards enabling aggregation are expected to be available by the end of 2011 and deployment of networks internationally could potentially have begun by the time the digital dividend and 2.5 GHz spectrum is made available (around 2014/2015), implementation of aggregation is expected to be limited, challenging and costly in practice. Only a limited number of aggregation scenarios will be supported by the standards and the cost of consumer devices capable of aggregation will be significantly higher than the cost of devices that are not¹.

Spectrum blocks of 20 MHz are also optimal for technical efficiency. Larger blocks of spectrum provide operators with the ability to organise networks for greater efficiency enabling greater peak data rates and data traffic-carrying capacity. If spectrum can be used to increase capacity rather than additional base stations, costs can be reduced.

A fourfold increase in capacity may be possible when utilising a 20 MHz block compared to a 15 MHz block, depending on subscriber numbers.

700 MHz

A limit of 2x20 MHz provides all bidders with the opportunity to bid for the technically-optimal amount of spectrum for LTE. If a 2x20 MHz limit is set, the spectrum could, assuming three bidders, be allocated as follows.

¹ This is due to the need to include to duplicate (or triplicate) functionality and circuitry within devices to support aggregation.

Bidder A	Bidder B	Bidder C
20 MHz	20 MHz	5 MHz
20 MHz	15 MHz	10 MHz
15 MHz	15 MHz	15 MHz

2x15 MHz and 2x10 MHz spectrum blocks are sufficient to run a voice and data network. LTE services are able to be deployed over a variety of bandwidths, such as 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz and 20 MHz.

A hypothetical new entrant would ideally seek a 2x20 MHz allocation to compete on an equal footing with the existing mobile network operators. Should a potential new entrant emerge, setting competition limits at 2x20 MHz would provide that entity with an opportunity to bid for the technically-optimal amount of spectrum.

The ACCC has a preference for setting limits at 50–60 per cent of the available spectrum in the band in order to prevent monopolisation where there are three active bidders in the auction. A limit of 50–60 per cent would leave sufficient spectrum remaining which, if purchased by two additional bidders, would enable those bidders to deploy networks of sufficient quality and cost effectiveness to enable them to constrain the retail prices of the bidder with the largest spectrum holding (that is, to prevent it charging monopoly prices). A competition limit of 2x20 MHz is consistent with this approach.

2.5 GHz

A limit of 2x40 MHz is consistent with the technical parameters of the likely technologies. Should a single bidder obtain a full 2x40 MHz, there would be sufficient spectrum remaining (2x30 MHz) to maintain market competition to the benefit of consumers. If limits are set at 2x40 MHz and all the spectrum is allocated, potential allocations could, assuming there are three bidders, be as follows.

Bidder A	Bidder B	Bidder C
40 MHz	20 MHz	10 MHz
40 MHz	15 MHz	15 MHz
40 MHz	25 MHz	5 MHz
40 MHz	30 MHz	-
35 MHz	35 MHz	-
30 MHz	30 MHz	10 MHz
30 MHz	20 MHz	20 MHz
25 MHz	25 MHz	20 MHz

2x20 MHz is the optimal block size for implementing LTE. 2x15 MHz and 2x10 MHz allocations would enable competitors to run voice and LTE data networks.

An operator acquiring allocations above 20 MHz paired and up to 40 MHz paired would have the choice of implementing two concurrent networks in any one geographic area or implementing spectrum aggregation, once technology evolves.

Should a new entrant emerge, the new entrant along with the existing mobile network operators would have the opportunity to bid up to the 2x40 MHz limit. 2x40 MHz of spectrum is more than sufficient to enable a new entrant to compete effectively in the mobile broadband market with the incumbents.

A competition limit of 40 MHz paired fits within the ACCC's preferred 50–60 per cent zone for preventing monopolisation of the spectrum where there are expected to be three active bidders in the auction.

Option 2: Impose limits of less than 2x20 MHz for the 700 MHz band and less than 2x40 MHz for the 2.5 GHz band

700 MHz

It could be argued that a limit of 2x15 MHz would result in a fair market outcome, maintaining the current level of competition in the market and allowing some improvement to services and pricing. However, a competition limit set below 2x20 MHz prevents any party bidding on the technically-optimal amount of spectrum to the detriment of technical efficiency, network cost structures and service speeds and prices for consumers.

A limit of 2x10 MHz, for example, may also appear desirable to enable a new market entrant. However, there is limited evidence to date to indicate that a new entrant is likely to emerge. Any new entrant is likely to seek to obtain the technically-optimal allocation of spectrum (2x20 MHz) to compete effectively with the existing mobile network operators.

A limit below 2x20 MHz falls outside the ACCC's preferred 50–60 per cent range for preventing monopolisation and could significantly reduce competitive tension and/or result in spectrum remaining unsold.

2.5 GHz

A limit of 2x35 MHz would satisfy the ACCC's preferred 50–60 per cent range to prevent monopolisation of the spectrum. The trade-off with a 2x35 MHz limit is between technical efficiency on the one hand versus a potentially marginal improvement in competition on the other. Technically, a limit of 2x35 MHz is less desirable than a limit of 2x40 MHz (an increment of 2x20 MHz). According to the ACCC, a limit set lower than 2x40 MHz would unnecessarily constrain bidders in their network planning.

A limit lower than 2x35 MHz falls outside the 50–60 per cent range generally preferred by the ACCC and, assuming three active bidders, could significantly reduce competitive tension and/or result in spectrum remaining unsold.

Option 3: Impose limits of more than 2x20 MHz for the 700 MHz band more than 2x40 MHz for the 2.5 GHz band imposed

700 MHz

A limit of 2x25 MHz could be contemplated within the ACCC's preferred competition limit range of 50–60 per cent of the spectrum on offer. However, it is less desirable from a technical perspective. The utility of a 2x25 MHz allocation depends on the ability to aggregate the extra 2x5 MHz with the 2x20 MHz block—something which is subject to future standards development and the willingness of a bidder to incur extra cost. There is a risk that a 2x25 MHz competition limit would lead to 2x20 MHz being used and 2x5 MHz lying dormant.

2x5 MHz taken out of the market could make the difference between a bidder obtaining 2x10 MHz of spectrum rather than 2x15 MHz or 2x5 MHz rather than 2x10 MHz. Hoarding the spectrum in this way would be at the expense of competition in the market and service availability, quality and pricing for consumers.

A competition limit higher than 2x25 MHz falls outside the ACCC's preferred 50–60 per cent range and presents an unacceptable risk of monopolisation of the spectrum and spectrum hoarding.

2.5 GHz

From a technical perspective there is little advantage in a higher competition limit as it would require greater aggregation of spectrum, resulting in higher costs to operators and to consumers if these costs are passed on. For the same reasons, a higher limit is unlikely to benefit a hypothetical new entrant.

A competition limit higher than 2x40 MHz falls outside the ACCC's preferred 50–60 per cent range and presents an unacceptable risk of monopolisation of the spectrum.

4. Impact analysis

There are four key groups impacted by the proposal—the existing mobile network operators, potential new entrants, consumers, and government.

The existing mobile network operators

The ACCC considers that the mobile broadband market is competitive. This was its view when it decided to allow the merger of Vodafone Australia and Hutchison 3G Australia in 2009. The limits proposed by Option 1 operate to maintain competition by ensuring that no one competitor is able to dominate at the expense of the others. All bidders have the opportunity to bid for the maximum amount of spectrum on offer up to the level of the competition limit (which also corresponds to the technically-optimal amount of spectrum for next-generation mobile broadband).

Should one bidder obtain a full 2x20 MHz block in the 700 MHz band, there is sufficient spectrum remaining (2x25 MHz) to support the provision of next-generation mobile broadband services by two additional bidders.

There may be some potential costs to the mobile network operators should the competition limits proposed in Option 1 constrain them from purchasing the full amount of spectrum they want to implement their business plans.

Any administrative costs associated with complying with the competition limits set out in Option 1 are likely to be minor in the context of the broader costs of participating in the auction.

Potential new entrants

No potential new entrants have identified themselves to the Department of Broadband, Communications and the Digital Economy, the ACCC or the ACMA to date.

The process of realising the digital dividend has been underway for a number of years and there have been many opportunities for an interested participant to make themselves known, including through multiple public consultation processes.

The ACCC considers that the high fixed costs of establishing a new wireless network mean that the likelihood of a new entrant is low. A possible exception is the emergence of an arbitrage player (a bidder hoping to purchase spectrum to resell it to others for a capital gain).

The maturity of the Australian mobile communications market is likely to act as a disincentive for new entrants to seek to enter the market by acquiring spectrum in this auction. The trend in the sector in recent years has been towards consolidation rather than expansion, with the 2009 merger of Vodafone Australia and Hutchison 3G Australia. A key motivation for the merger was to create a stronger player able to compete more effectively with Optus and Telstra.

There is a small number of mobile virtual network operators and resellers of the mobile network operators' wholesale services participating in the mobile broadband retail market. It is unlikely that these operators will want to incur the costs of building their own networks, and they would therefore be unlikely to participate in the auction.

The capital-constrained environment post global financial crisis and the strength of the mobile network operators in the Australian market reduce the likelihood of an international entrant.

As the auction is still 12 months away and the ACMA's official call for applications will not be made until September 2012, the emergence of a new entrant cannot be ruled out. The limits set out in Option 1 assume three active bidders in the auction as this is the most likely scenario, while still enabling a hypothetical new entrant to participate.

In the event that a new entrant or entrants were to emerge, they would benefit from the opportunity to acquire sufficient spectrum to compete on equal footing with the existing mobile broadband operators. Under Option 1 all potential bidders, including new entrants, will have the opportunity to bid for the maximum amount of spectrum on offer up to the level of the competition limit. 2x20 MHz of 700 MHz spectrum and 2x40 MHz of 2.5 GHz spectrum is ample spectrum to enable a new entrant to establish its own competing network.

New entrants may potentially incur costs if the competition limits proposed in Option 1 constrain them from purchasing the full amount of spectrum they want to implement their business plans.

Any administrative costs associated with complying with the competition limits set out in Option 1 are likely to be minor in the context of the broader costs of participating in the auction.

Consumers

Option 1 is expected to benefit consumers. The competition limits proposed are expected to prevent monopolisation of the spectrum and promote competition in the mobile broadband market.

Competitive pressure encourages the deployment of services earlier than could be expected under monopolistic conditions. Competitive pressure should also result in improved service offerings for consumers as competitors attempt to differentiate themselves based on service quality, speed, data allowances and price.

The limits proposed are also consistent with the technical characteristics of the technologies likely to be deployed. Setting the limits as proposed provides all bidders with the opportunity to bid for sufficient spectrum to support the provision of next-generation mobile broadband services. The efficiencies that are expected to accrue to network operators from new mobile broadband technologies and larger spectrum blocks mean lower costs for network operators, which can then be passed on to customers. It may also mean that services can be provided to areas where it may not have been economical to provide them previously.

There may be some indirect costs to consumers if the competition limits constrain network operators from purchasing the full amount of spectrum they want to implement their business plans and they pass costs associated with this on to consumers.

Government

The government is seeking to achieve its policy objectives for the allocation of the spectrum. Option 1 is most likely to maximise the public benefit derived from the use of spectrum (including ensuring efficient allocation and use of the spectrum) and promote competition and the long-term interests of consumers.

Option 1 should also result in an acceptable revenue outcome for government. In general, competition limits tend to lower revenue because the possibility of a bidder paying a premium to monopolise the spectrum is excluded—the lower the competition limit, the greater the potential for a reduction in revenue. On this analysis, Option 2 is likely to result in greater revenues for the government. However, the potentially higher revenues to be derived would most likely be the result of a bidder paying a premium to monopolise the spectrum to the detriment of competition and outcomes for consumers.

The administrative costs to government of imposing competition limits as proposed would be the same for any of the options identified.

5. Consultation

As part of its day-to-day work, the department is in dialogue with the three mobile carriers on a range of matters. The carriers have expressed varying views in regards to the imposition of competition limits on this auction, ranging from no limits to approaches factoring in existing spectrum holdings.

The ACCC was consulted as the independent competition regulator. The ACCC is the body tasked with promoting competition in the marketplace and ensuring compliance with competition laws to benefit consumers, businesses and the community. As such, it has the expertise and knowledge base to provide objective advice on competition limits.

The ACCC was asked to undertake a comprehensive analysis of the need for, and impact of, imposing competition limits on both the 700 MHz and 2.5 GHz spectrum or on one or other of the bands. It was asked to consider the impact on competition in downstream markets and across geographic areas, the capacity of potential auction participants to fund spectrum purchases, the relative substitutability of the 700 MHz and 2.5 GHz spectrum; and any other matters the ACCC considered relevant.

The analysis in this RIS is based on the ACCC advice and Option 1 reflects the ACCC's recommended competition limits. When developing its advice the ACCC consulted with officers of the ACMA.

6. Conclusions and recommended options

Although the proposal restricts competition in the auction itself, it promotes competition in the market more broadly and is consistent with wider competition policy because of the considerable net benefits to be gained.

The importance of the 700 MHz and 2.5 GHz bands for the future of the existing mobile network operators and the growing demand for data and the scarcity of spectrum converge to create a strong incentive for participants in the digital dividend auction to seek to purchase more spectrum than they need in order to gain a competitive advantage.

Without competition limits, an existing market player could dominate purchase of this key spectrum, lessening competition in the market to the detriment of service availability, quality and pricing for consumers. This would flow through to the economy and society more broadly in terms of productivity and connectivity benefits foregone. This can only be addressed through regulation. For these reasons, the imposition of competition limits on the auction is necessary. Only Option 1 is likely to:

- provide all bidders with the opportunity to bid on the technically-optimal amount of spectrum (2x20 MHz or increments thereof) in both bands, reducing network costs and improving services for consumers
- provide a potential new entrant with the opportunity to bid for sufficient spectrum to enable it to compete on equal footing with the existing mobile network operators
- prevent monopolisation of the spectrum and therefore provide the best competitive outcome for the market and consumers
- provide an acceptable revenue outcome (although not the highest possible revenue outcome, which could be achieved by permitting a bidder to pay a premium to monopolise the spectrum).

It is therefore recommended that Option 1 be adopted. Option 1 would impose the following competition limits as recommended by the ACCC:

- no person or specified group of persons be allocated more than 2x20 MHz of the 2x45 MHz of spectrum available in the 700 MHz frequency band (703–748 MHz and 758–803 MHz); and
- no person or specified group of persons be allocated more than 2x40 MHz of the 2x70 MHz of spectrum available in the 2.5 GHz frequency band (2500–2570 MHz and 2620–2690 MHz).

7. Implementation and review

Should the Minister for Broadband, Communications and the Digital Economy accept the recommendation on competition limits, the Minister will issue a Direction to the ACMA to develop procedures to impose the competition limits as recommended.

Should a Direction be issued, the ACMA will consult on the procedures it develops to impose competition limits when it undertakes its consultation on the Section 60(1) determination, expected to take place in early 2012.

The Determination, made under section 60(1) of the *Radiocommunications Act 1992* sets out the procedures for allocating spectrum licences, in this case, by auction.

Once the auction is completed the Direction will be spent and the *Competition and Consumer Act 2010* will apply to companies' spectrum holdings.