



Australian Government

Department of Communications

Spectrum Review

Potential Reform Directions

Consultation Paper
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Introduction and Context

On 23 May 2014 the Minister for Communications, the Hon Malcolm Turnbull MP, announced a review of spectrum policy arrangements. The review is an opportunity to boost innovation and productivity with resulting benefits to the broader community. It is also part of the Government's commitment to streamlining regulation and cutting red tape.

The Department of Communications (the Department) is undertaking the review in conjunction with the Australian Communications and Media Authority (ACMA). Terms of Reference for the review were released with the Minister's announcement along with an issues paper seeking stakeholder feedback.¹ The review will report to the Minister in early 2015. Implementation of reforms will likely commence in 2015 but the Department is seeking feedback from stakeholders on sequencing and timing.

This paper provides context and suggests some reform principles and options for discussion. These have been prepared after consideration of stakeholder feedback on the issues paper.

The proposals are not intended to cover the full range of possible reforms and feedback as to amendments or additional proposals is welcome. The proposals do not represent the final views of the Department or the views of the Australian Government.

Economics of spectrum

Spectrum is a major contributor to economic and social wellbeing. For example, the ACMA's April 2014 *Economic impacts of mobile broadband* report² estimated that mobile broadband increased Australia's economic growth rate by 0.28 per cent each year from 2007-2013. This equates to an economic contribution of \$33.8 billion by mobile broadband over this period, primarily through productivity improvements. Mobile broadband is only one of a large number of uses that the radiofrequency spectrum supports.

Internationally, there are similar examples of the importance of spectrum. A 2012 study³ on the economic value of radiofrequency spectrum in the United Kingdom (UK), found that spectrum added £52 billion (AUD\$90 billion) to UK gross domestic product in 2011.

Spectrum is a finite natural resource with relatively unique characteristics: it is a 'commons' good where the actions of one user can impact the experience of others (for example, by degrading the use by others through congestion and interference), and users cannot be excluded from use except through allocation and licensing arrangements. Spectrum is very responsive to changes in technologies and innovations, and can support many different uses and applications as different bands have different characteristics (for example, propagation).

¹ www.communications.gov.au/consultation_and_submissions/spectrum_review

² www.acma.gov.au/theACMA/Library/researchacma/Research-reports/economic-impacts-of-mobile-broadband-1

³ www.analysismason.com/About-Us/News/Insight/Economic-value-of-spectrum-Jan2013/

To maximise the economic and social return from spectrum, and thereby promote national wellbeing, arrangements should support efficient allocation and use. Economic efficiency – allocative, dynamic and productive (or spectral) efficiency – means allocating spectrum to its highest value use (both economic and social), on price and access terms that reflect its ongoing opportunity cost and incentivises efficient use and reallocation to more productive uses.

In general, this is best supported by an active and deep trading market with transparent and accessible information. There should be flexible, light-touch regulation to manage interference and other potential market failures (for example, anti-competitive conduct).

The spectrum management framework in Australia is a ‘mix’ of approaches between centralised planning, allocation and interference management; ‘marketisation’ through tradable licences and conditions of access and reuse; and open-access arrangements for more flexible and localised services.

The capacity to achieve economic efficiency with existing arrangements is constrained by several factors:

- parts of the framework are administratively burdensome and display limited flexibility;
- current market mechanisms (for example, pricing and allocation processes) do not adequately reflect the changing value of spectrum over licence timeframes or are not flexible enough to accommodate emerging uses and technologies; and
- there is a lack of strong incentives for maximising the use of allocated spectrum.

International context

Spectrum management also has an international dimension. Spectrum is planned through the International Telecommunication Union (ITU), with the Australian Radiofrequency Spectrum Plan reflecting these frequency allocations, with a number of Australia-specific variations.

Making internationally harmonised allocations limits the potential for interference between services and across international borders, and supports the efficient operation of international activities such as air and sea travel. International harmonisation also provides access to economies of scale and scope in technology manufacturing and interoperability of equipment, and exposure to key international innovations in technology and spectrum management. The rapid global adoption of advanced mobile communications technologies such as LTE exemplifies the benefits of international harmonisation.

Australia’s relative remoteness provides some discretion on international harmonisation and coordination decisions (there are exceptions, such as satellite frequency coordination), but the benefits of this flexibility still need to be assessed against the costs of moving away from international harmonisation.

Stakeholder Feedback and Principles for Reform

Feedback to the Department indicates that spectrum users want a simpler framework and greater efficiency and flexibility of spectrum use to enable technology and service innovation. Stakeholders also sought improved certainty in arrangements to support investment decisions, particularly certainty in respect to the terms and conditions of spectrum access (for example, renewal arrangements and interference protection).

Users want allocation decisions to be based on overall public benefit – including the less easily quantifiable social benefits as well as economic benefit.

The need to engage internationally to influence international spectrum planning processes and a greater focus on interference protection and compliance and enforcement were also key themes. Stakeholders also sought greater clarity around the different roles of industry, the ACMA and the Minister.

The following principles were developed after taking into account stakeholder feedback and considering the terms of reference. These principles have been used to guide development of proposals in this paper.

Reforms should:

- provide a clear and transparent policy framework and direction, within the bounds of which the ACMA should have broad discretion over the options available to it to manage the spectrum and enable a greater role for users (**transparency**);
- promote efficient allocation and use of spectrum – by making use of market principles and mechanisms as the preferred approach and providing licensees with the freedom and incentives to make optimal choices about their spectrum use (**efficiency**);
- ensure arrangements are as flexible as possible to promote choice and innovation (**flexibility**);
- provide confidence about regulatory arrangements and spectrum access terms and conditions and promote international harmonisation in Australia's interests (**certainty**); and
- create a framework that is simpler, easier to understand and uses the least cost regulation required to achieve the objective (**simplicity**).

The reforms as a whole should seek to maximise public benefit by improving overall efficiency and effectiveness of spectrum policy and management in line with these principles.

Potential Reform Proposals

The proposals in this paper seek to support a more efficient, responsive and sustainable spectrum market. This should be one that enables spectrum to move to its highest value use, with cost-reflective pricing (incorporating opportunity cost), opportunities for active secondary markets and targeted 'fit-for-purpose' regulation.

It will be important to maintain certainty for incumbent spectrum users throughout the review process and beyond. Where changes are proposed, techniques such as transition plans, grandfathering of existing licences and early reviews of new arrangements will be used.

Policy framework

Proposal 1: Implement a clear and simplified framework of policy accountability

- *Minister to publicly issue over-arching policy statements, against which the ACMA must act consistently.*
- *Minister to have direction powers in the Radiocommunications Act to enable Ministerial intervention for specific purposes such as to reserve spectrum in a plan, allocate or reallocate spectrum.*
- *The ACMA to be required to notify the Minister of certain decisions and provide an annual work program and key priorities over a three-five year timeframe.*

The intention is to establish a clear, transparent and future looking policy decision-making framework with clear roles and responsibilities for the Minister and the ACMA in spectrum management. Decisions with significant public policy implications (for example, those involving major government policy initiatives and major spectrum allocations) would remain in the Minister's control and day to day management of the spectrum consistent with government policy would be the responsibility of the ACMA.

Ministerial policy statements could be broad or specific, for example, set out the government's policy goals for spectrum management, or focus on a particular issue or policy initiative. Policy statements would be published, may be of limited or no set duration and could be updated or withdrawn at any time. Statements initially would provide guidance on implementing key elements of the new framework, for example, implementation of a single licensing framework, and establish a whole of government and economy spectrum policy similar to the UK spectrum strategy.

It is anticipated that, having set the policy direction, Ministerial intervention using the specific direction powers would be on an exception basis. If the Minister were to intervene, this would be undertaken in a transparent manner and directions would be made public. Direction powers would continue to remain available to the Minister to direct the ACMA on the exercise of its spectrum management powers and functions.

The ACMA annual work program would clearly set out the ACMA's priorities and how these will be implemented. When preparing its annual work program the ACMA would consult with stakeholders on its contents before providing it to the Minister. The Minister would have the ability to require amendments to the work program, request additional information and indicate issues of interest or where Ministerial intervention may be required.

Single licensing framework

Proposal 2: Establish a single licensing framework

- *Establish a single licensing framework by consolidating the three licence categories (apparatus, class and spectrum) and provide the ACMA with flexibility to set licence parameters, for example, to include band frequency, payment, sharing and trading arrangements.*
- *Tenure of licences to be a parameter, with a maximum term of 15 years to be specified in the legislation.*
- *Renewal of licences to also be a parameter. If the licence provides for a presumption of renewal, the legislation would specify the circumstances under which the ACMA is not required to renew.*

Under this proposal a single licensing framework would replace the current three licence categories (being class, apparatus and spectrum licences). The legislation would not specify licence categories. Instead, it would provide the ACMA with maximum flexibility to design licences around a set of prescribed parameters which would be specified in legislation – such as frequency and geographic location, licence term, renewal presumptions, power limits and other factors that describe how the device or service can be operated, spectrum sharing or exclusivity and pricing.

This approach is intended to break down the ‘hard’ legislative barriers between licence categories (especially apparatus and spectrum licences) and provide the ACMA with the tools to respond more effectively to challenges as technologies continue to develop and demand for spectrum increases. Breaking down these barriers increases flexibility including to standardise some spectrum access rights and therefore facilitating secondary trading of licences. There will also be reduction of red tape associated with managing the licensing and allocation of three licence categories.

Implementation of the proposed new licensing framework would be progressive and consultative, and where required guided through Government policy statements. The ACMA would report on progress through its annual work program. It is anticipated that the ACMA would specify ‘standard’ licensing conditions to provide guidance to spectrum users and consistency of treatment. The ACMA would also have the capacity to develop bespoke solutions where necessary. The intention is to ensure the licensing framework is simplified and the number of required legislative instruments is kept to a minimum.

A maximum licence term, proposed as 15 years, would be specified in the legislation. This is equivalent to the current maximum term for spectrum licences. This period is proposed to strike a balance between providing investment confidence and flexibility to enable spectrum to be replanned so that it moves to the most beneficial use (internationally maximum licence terms range between 10 and 25 years). Within the constraint of policy directions / guidance the ACMA would have the discretion to select licence terms up to the maximum that are appropriate to the licence purpose, suit technology and investment cycles and allow for planning changes. Changes of use and replanning of spectrum would primarily be managed through appropriate use of licence terms.

It is proposed that renewal of licences would also be a parameter. The legislation would specify circumstances where the ACMA is not required to renew a licence in the event the licence provides for a presumption of renewal. Grounds not to renew could include that replanning is required, the licensee is unable to demonstrate effective use of the spectrum, there has been a breach of licence conditions or renewal is otherwise not in the public interest. Specified grounds could be complemented by a general Ministerial power to determine additional grounds. Specifying grounds in the legislation would provide transparency and certainty for users, as well as flexibility to enable replanning. No compensation would be payable if the ACMA decides not to renew a licence.

Allocation and reallocation

Proposal 3: More flexible allocation and reallocation processes

- *Provide the ACMA with greater flexibility to determine the most appropriate allocation process and method.*
- *The ACMA's annual work program to specify timing of allocation processes and the ACMA to report against these.*
- *Allow the ACMA to reallocate spectrum without the need for a Ministerial determination.*
- *Manage changes of use by setting appropriate licence terms that allow for replanning.*
- *Authorise the ACMA to allocate encumbered spectrum enabling incumbent users to continue operating in the band following reallocation.*

The move to a single licensing framework would substantially assist with streamlining the allocation and reallocation processes that are currently specific to the particular licence category. For example, this would remove the need for the existing detailed legislative process required to convert an apparatus licence into a spectrum licence. Instead, replanning and reallocation would be facilitated through the appropriate use of licence terms.

The allocation process would be further improved by the proposal to give the ACMA the discretion to determine the allocation mechanism and process it deems appropriate. Whilst the ACMA already has some flexibility in respect to the spectrum licence allocation process (for example, by auction, tender or administrative allocation), with the single licensing framework this would extend to all licences. Providing the ACMA with greater flexibility to determine the allocation process would also enable it to select other alternatives, such as incentive auctions.

Rather than specifying an allocation period in legislation, the ACMA would be required to specify allocation timing in the procedures it develops for particular allocations, and to set a target for the timing of proposed allocations and reallocations in its annual work program against which it would report. The latter arrangement would provide guidance to spectrum users and government on how long these processes are expected to take and accountability if timing diverges from estimates.

The ACMA would have the authority to reallocate spectrum without Ministerial involvement, although the Minister would have the ability to direct the ACMA on this issue if considered appropriate.

The ACMA would also have the authority to allocate licences that are encumbered that is, sell licences with incumbent users and devices in place. This approach is not intended to alter incumbents' existing rights (that is, licensees would not have their licensing arrangements changed during the licence term) but rather provide flexibility for both existing and future spectrum users to encourage higher value use of the spectrum. This would also provide for the emergence of private band managers (see Case Study 2).

Pricing and market information

Proposal 4: Establish a more transparent and flexible approach for spectrum pricing to promote efficient use and re-use of spectrum

- *Prices for spectrum to be market-based, with the ability for Ministerial intervention to determine otherwise on an exception basis.*
- *Pricing for administrative allocations of spectrum to be reviewed, simplified and made consistent and transparent.*

Market-determined or market-equivalent prices play a key role in determining spectrum value and driving efficient use and reuse of spectrum. Prices for spectrum should in general be market-based to incentivise efficient use and encourage spectrum to move to its highest value use. Incentivising greater movement of spectrum in this way has the potential to increase secondary trading of spectrum. However, a reformed framework should provide for exceptions to the market-based approach on a case by case basis where there is a sound public interest rationale.

Under a reformed framework, and subject to issued Government policy statements, decisions on pricing would be the responsibility of the ACMA. The Minister would have the ability to set prices (as is the case under the current spectrum licensing framework), with the expectation that this would be on an exception basis.

It is also proposed that a review of pricing for administrative allocations be undertaken with the objective of putting in place a methodology that is simple, transparent, cost-reflective and provides appropriate incentives for spectrum to move to its highest value use.

This review should explore costing options and valuation approaches (for example, opportunity cost pricing or other forms of administered incentive pricing), how the costs of spectrum management (including any relevant taxes) should be recouped, and mechanisms for enabling the changing 'market value' of that spectrum allocation to be progressively reflected in charges for access and use. An output of this process would be a pricing policy for administrative allocations that provides greater transparency for spectrum users.

Proposal 5: Structuring payment schedules for licences

- *Provide flexibility in the timing and approach for payment of licence fees.*

Fee payment structures and timing currently differ between licence categories, with class licences not generally subject to fees and apparatus licences usually paid for annually, although some licensees do choose to pay for longer periods in advance for security of tenure. The majority of spectrum licence fees are paid in advance for the full term, with a small annual licence tax collecting indirect costs.

It is proposed that under a reformed framework the ACMA would have the flexibility to determine payment structures and timing where licence fees are paid. This would be a parameter or condition of the licence. The Minister would also have the ability to provide policy guidance to the ACMA on structuring of payments, for example, by indicating that particular licences would be subject to upfront or annualised payments.

There are advantages to both upfront and annual payments. Annual payments have the benefit of providing a lower barrier to market entry and a yearly incentive to consider whether the licence remains valuable. Upfront payments provide greater cost certainty for licensees, less market disruption, less risk to the Commonwealth and the possibility of avoiding scarcity-based price rises during the term of the licence. Retaining flexibility allows the most appropriate approach to be adopted to fit the circumstances.

Proposal 6: The ACMA to take an open data approach to substantially improve the range, availability and quality of information provided to support an efficient spectrum market

- *The ACMA to report to the Minister through its annual work program on its efforts to improve and maintain the range, availability and quality of information to support the spectrum market.*
- *Provide the ACMA with authority to collect information from industry relevant to the performance of its functions and exercise of its powers.*

Efficient markets rely on timely information being readily available on prices, preferences, market structures and conditions of access and use. For a market as dynamic and technology-driven as spectrum, improved information availability and quality will encourage more efficient and effective market operations and spectrum management by supporting improved planning, increased spectrum sharing and secondary trading and new market entry.

It is proposed that the ACMA identify, in consultation with the Government and spectrum users, the information needed to support the spectrum market under a reformed spectrum management framework and work to improve the availability and quality of this information over time. This would include the quality, accuracy and usability of licensing information and conditions of use, pricing and allocation data, spectrum availability and user preference trends and statistics. This would be in the spirit of 'open data' where information is readily accessible to all, up-to-date and as interactive as possible.

Initially this would involve assessing what information is available and required by users and the market, what options are available to enable that information to be disseminated and accessed, and recommendations for action and pathways for implementation. The Department welcomes stakeholder suggestions for improving the information provided by the ACMA.

The ACMA would be supported with a general information gathering power in order to access relevant data. Currently there is no provision in the *Radiocommunications Act* (other than to obtain information by search warrant) which would enable the ACMA to acquire information from licensees/suppliers and other persons relevant to the performance or exercise of the ACMA's radiocommunications functions or powers. In contrast, Part 27 of the *Telecommunications Act 1997* applies such a provision in respect to carriers and service providers (and other persons).

It is therefore proposed to include such a provision in the *Radiocommunications Act*. This would assist in providing information for market participants but would also be of relevance to the ACMA's regulation of radiocommunications devices. The complexity of the supply chain with multiple parties involved in importing devices, makes it increasingly challenging for the ACMA to identify each person involved in the process in the absence of, or ability to ask for, information when it is required.

Compensation

Proposal 7: Payment of compensation for resuming all or part of a licence

- *Provide for common compensation provisions for resumption of licences.*
- *Whether compensation is payable in event of resumption to be a licence parameter.*

The ability to resume part or all of a spectrum band during a licence term allows the spectrum to be returned to the ACMA to enable it to replan and/or reallocate the spectrum depending on the need. The requirement to provide compensation recognises and reimburses incumbents for the loss when licenses are resumed.

It is proposed that the new framework include the right to compensation in the event of resumption similar to that applying to spectrum licences under the current framework. As is the case now, all or part of a licence may be resumed and resumption may be by agreement or a compulsory process. Compensation would be for the market value of the licence and any loss, injury or damage suffered or expense reasonably incurred as a consequence of resumption.

Under a single licensing framework, the right to compensation on resumption could potentially apply to a wider range of licensees than currently have a right to compensation. However, it is proposed that whether or not compensation is payable would depend on the parameters of the particular licence, for example, the right to compensation may not apply to licences with terms of less than five years or instances where no licence fees are payable.

It is anticipated under the single licensing framework that changes of use would primarily be managed through the setting of appropriate licence terms both on initial allocation and on renewal where applicable. As a result, the expectation is that there would be a limited need to resume licences and therefore for compensation to be paid.

User involvement in spectrum management

Proposal 8: Facilitate greater user involvement in spectrum management

- *Allow the ACMA to delegate spectrum management functions to other entities.*

This proposal would allow the ACMA to delegate its spectrum management functions with the intention of enabling greater involvement of spectrum users and other entities in spectrum management and so improved flexibility and efficiency. This process may be used to support private band management or involvement of other entities in other parts of the framework.

Currently the ACMA can make instruments to, for example, accredit persons for frequency assignment purposes. This arrangement would continue under the new framework. The concept/model would be extended for the purposes of allowing some of the ACMA's functions to be performed by others such as private band managers. Functions to be devolved could include planning, licensing, pricing, fee collection, interference management and dispute resolution.

To put this into effect the ACMA would designate what roles or functions were to be delegated and any conditions that would apply. The ACMA would be responsible for monitoring and overseeing these arrangements to ensure the delegated functions were performed effectively. The ACMA would be able to withdraw delegations for certain reasons, for example, breaches of conditions or requirements.

Technical regulation

Proposal 9: Develop more principles-based device supply regulation

- *Provide the ACMA with increased flexibility to construct device supply schemes appropriate to specific circumstances.*
- *Increase incentives for users and suppliers to manage risk and resolve interference and disputes in the market.*
- *ACMA to develop and publish guidelines as to its dispute management process.*
- *Minimise to the extent appropriate existing record-keeping and labelling requirements having regard to risk factors.*
- *Reform the definitions relating to supply to oblige all persons in the supply chain to take reasonable steps to ensure that compliant devices are supplied to the Australian market.*

Device supply regulation has two primary objectives. First, it provides an important strategy for managing interference (and provides users with confidence that products are fit for purpose). Second, it manages health and safety risks associated with radiocommunications devices. It is the area of the radiocommunications framework of widest application as the vast majority of electrical and electronic products must comply whether they are mains or battery powered, or for consumer or commercial use. Currently the ACMA utilises a substantial amount of resources to monitor and resolve technical issues / disputes. These resources to a large extent flow through to industry and therefore consumer costs.

Whilst the current regulatory scheme provides the ACMA with some flexibility, the *Radiocommunications Act* remains relatively prescriptive. The proposal is to move to a more principles-based approach involving the replacement of standards, labelling and record-keeping requirement provisions with the ability for the ACMA to construct device supply schemes appropriate to specific circumstances. The legislation would specify the scope of the ACMA's powers (for example, provide for technical standards, operating requirements, labelling and record-keeping) and identify the objectives to be taken into consideration by the ACMA in applying the specific device supply schemes.

The intention of this approach is to increase the ACMA's flexibility to enable it to devise schemes appropriate to the level of risk for the equipment and the type of supply chains. This would enable the labelling requirements to be more consumer-focused, give the ACMA greater flexibility to exempt low-risk devices from compliance and target particular (rather than generic) supply chains.

In order to reduce costs associated with disputes it is also proposed to incentivise users and suppliers to resolve disputes between themselves. This could be facilitated by providing the ACMA with the option to recover the costs of an investigation into interference/technical disputes from an offending party. The ACMA would develop and publish guidelines setting out its dispute handling process. It is also proposed, as part of the move to a single licensing framework, that the existing rights to commence civil action currently conferred on spectrum licensees (section 50 of the Act) to protect against interference would become a licence parameter and so could be extended to potentially all licensees where appropriate.

The last recommendation in respect to this proposal is to ensure all persons in the supply chain are responsible for compliance. The *Radiocommunications Act* was introduced at a time when it was more readily able to identify the responsible persons in a supply chain in that a device was ordinarily either manufactured in Australia or imported into the country by a single entity. Less equipment is now manufactured in Australia and often multiple parties are involved in the importation process. It is proposed to amend the definitions relating to supply and therefore provide greater flexibility to impose obligations on parties in the supply chain.

Compliance and enforcement

Proposal 10: Improve regulation by extending the suite of enforcement measures available to the ACMA

- *Substitute civil penalties for the existing criminal offences, where appropriate.*
- *Enable the ACMA to impose civil penalties, issue remedial directions and formal warnings for the purposes of managing and controlling interference or a breach of licence conditions.*
- *Apply strict liability provisions and infringement notices to a broader range of offences where appropriate, for example, operation of prohibited devices and interference endangering safety.*
- *Provide the ACMA with powers to issue recalls, interim bans formal warnings and public warnings to manage the supply of non-compliant devices.*

The *Radiocommunications Act* has a range of compliance and enforcement measures available but there are limits as to when these tools may apply. For example, the Act is heavily reliant on criminal sanctions. Substituting civil penalties for criminal offences (where appropriate) would enable the ACMA to initiate legal action (rather than the Director of Public Prosecutions) and rely instead on the civil standard of proof.

Remedial directions and formal warnings would provide the ACMA with a more graduated and flexible approach to enforcement. Greater use of strict liability provisions and infringement notices would enable the relatively minor offences to be responded to and resolved more immediately. This would reduce costs associated with the evidentiary burden of regulation.

With spectrum licences, in the event of a breach of a licence condition, the ACMA is currently limited to either suspending or cancelling the licence. Authorising the ACMA to use penalties such as remedial directions and/or formal warnings would provide the ACMA with increased flexibility. For example, in seeking to maximise the efficient use of spectrum, a licence condition regarding use/rollout/coverage may be more effective if the options available to the ACMA to enforce are not limited to licence suspension or cancellation. It may also be appropriate for some rules to be contained in legislation rather than in licence conditions.

Similarly, providing the ACMA with the power to order a recall, cease supply, issue a public warning or apply consumer warning labels would give it greater flexibility in terms of technical regulation, for example, when a product poses an interference risk and the supplier is not prepared to recall the goods voluntarily or a supplier cannot be found. Electromagnetic compatibility non-compliance is commonly managed through recalls in Norway and Sweden and bans in the UK. In Australia they are used for consumer product safety and can be initiated by a supplier or ordered by a Minister.

Moving spectrum to its highest value use

Proposal 11: The ACMA to continually review options for allocating spectrum to alternative / higher value uses and to ensure that barriers to achieving this are reviewed and removed where appropriate

Under this proposal the ACMA would, as part of its annual workplan, be required to indicate options for alternative / higher value use of spectrum and propose options for change.

Consistent with this approach are the proposals announced by the Minister for Communications on 10 September 2014 for the future management of the broadcasting television spectrum, including that used by community television. The intent of these proposals is to provide greater flexibility for the commercial and national broadcasters in their spectrum use, improve efficiency of spectrum use by encouraging their migration to more spectrally efficient technologies and encourage highest value use alternatives.

A central part of these proposals recognises that new compression technologies, such as MPEG-4, will allow broadcasters to use their existing spectrum much more efficiently to deliver more channels and/or more content in high definition.

Community television is currently using what is known as the 'sixth channel' 7 MHz block of spectrum in each of the five state mainland capital cities. In the short term, to allow the transition of commercial and national broadcasting services to MPEG-4, the Government will need to free up the 'sixth channel' to assist in the testing and migration to this more efficient technology.

Over time it is likely that the highest value use of the sixth channel will be for non-broadcasting uses.

At present, community television transmitter licences are due to expire at the end of 2014. The Government will extend their transmitter licences by 12 months to 31 December 2015.

It is proposed that the ACMA should continually consider what factors (international, technological, business models, consumer preferences etc.) need to be present to enable higher value use including the amount of spectrum that would be required for an alternative approach and implementation / timing issues. For this to be fully effective, licence holders (whether private or public sector entities) should have an incentive to move the licence to alternative higher value uses.

Case Studies

Case study 1: Spectrum sharing

Vacant spectrum is becoming harder to find. Greater sharing means more intensive use of spectrum for greater technical efficiency, that is, it can help address the issue of increasing demand by squeezing more out of the available spectrum. Some technologies actively support spectrum sharing or can coexist easily with other technologies and services, and these are likely to become more prevalent over time. However, careful consideration of interference management is needed prior to introducing sharing arrangements in a band.

Internationally, there is a focus on enabling greater spectrum sharing by taking advantage of smart technologies that can look up databases to find unused spectrum and switch to the unused frequencies in real-time (these are variously called dynamic spectrum access, cognitive or whitespace technologies). While initially being implemented in the unused spectrum in the broadcasting bands, they can potentially be used throughout the spectrum bands. This would enable spectrum sharing to become a more common approach for maximising spectrum use.

Some sharing of spectrum is enabled under the current framework – these types of sharing can and do occur without the use of cognitive technologies but could be made easier with their use.

The Australian Radiofrequency Spectrum Plan is prefaced on sharing by primary and secondary services and the third party authorisation (leasing) process allows spectrum licensees to choose to share some of their spectrum. This would continue to be the case under a reformed framework.

The current framework also permits the issuing of other licence categories (coexistence of licence categories) in spectrum licensed spectrum and the broadcasting services bands but imposes relatively high legislative hurdles to do so. Under a single licensing framework the legislative distinctions between licence categories would cease to exist, as would the barriers to sharing outside of the broadcasting bands.

A single licensing framework would enable spectrum sharing or exclusive use to be set as a licence parameter. The ACMA would be able to specify in the licence that licences in a particular band are subject to sharing arrangements and the conditions for sharing. This would provide flexibility and allow a gradual evolution of spectrum management to support greater spectrum sharing as technology improves.

Under a reformed framework, the Minister would be able to issue policy statements to encourage spectrum sharing where appropriate, for example, the Minister could issue a policy statement that sharing should be permitted to the greatest extent possible where interference can be managed. The ACMA would be required to have regard to the statement when exercising its powers and performing its functions.

The ACMA would also be able to introduce private parks, private band manager and other innovative spectrum management arrangements that could also make use of spectrum sharing.

Case study 2: Private band management

Private band management involves devolving to other entities some activities that are currently undertaken by the ACMA, including planning and coordinating use of a band, licence assignment and renewal and dealing with interference issues. A private band manager could include a company, individual, government sector agency, community organisation or industry body. They could engage in band management activities for economic (profit or not-for-profit) or technical reasons.

Private band managers have the potential to increase efficiency of spectrum use, respond more flexibly to the needs of users (for example, by meeting short-term or specialised spectrum needs and offering an enhanced range of services) and more effectively manage congestion in a band.

Private band managers operate in the US and UK. They typically manage spectrum on behalf of specific industries, either under contract from the regulator or by earning fees from the industry for their management activities. For instance, in the UK Ofcom has contracted out the management of spectrum for programme making and special events (PMSE) to Arqiva and subcontracted the administration of licensing for the aeronautical and maritime sectors to the respective sector regulators. The management of spectrum in the UK for the energy sector and water industry has been delegated by the licensees to third parties, Joint Radio Company and CSS Spectrum respectively, that may also engage in spectrum trading. In the US the Federal Communications Commission (FCC) uses frequency coordinators to manage and co-ordinate spectrum use in the Private Land Mobile Radio spectrum. The frequency co-ordinators recommend the most appropriate frequencies to clients and submit applications on behalf of their clients to the FCC and these applications are processed overnight.

As can be seen from the international experience, there are a number of potential private band manager models. Band managers could arise spontaneously where a prospective band manager purchases spectrum with the intention of sub-leasing those rights to others on a for profit or not-for-profit basis, or where a group of users come together and nominate an entity to manage a band on their behalf. The ACMA could also outsource band management to another entity or grant an entity a technical coordination role over a band. The single licensing framework would enable the tiered use of licences to implement these arrangements (for example, one licence category could apply to the band manager, while another applies to the spectrum users in the band).

Allowing the ACMA to allocate encumbered spectrum and empowering the ACMA to devolve its spectrum management functions to other entities would also make private band management easier. Allocating encumbered spectrum provides a ready-made user base and potential revenue stream for a prospective private band manager. It would also facilitate the emergence of a user-initiated private band manager arrangement. Using the proposed delegation power, the ACMA could potentially delegate planning, licensing, pricing, fee collection, interference management and dispute resolution to a band manager.

There is likely to be a significant role for the ACMA in establishing the ground rules for private band management whether it is user or ACMA driven, and oversighting these arrangements to ensure they are performed well.

Questions for Stakeholders

1. What changes should be made to the proposals outlined in this paper to make them work more effectively?
2. What additional proposals should be considered?
3. What timeframes (short-term and longer-term) should apply to implementation of the reform proposals?
4. What transitional arrangements should be put in place?

How to Provide Comment

The Department welcomes feedback on the proposals in this paper. Comments can be provided by phone or email, in person or through formal written submissions if desired.

Feedback on the paper should be provided by **close of business Tuesday 2 December 2014**.

Written comments can be lodged in the following ways:

Email: spectrumreview@communications.gov.au

Post: The Project Manager
Spectrum Review
Department of Communications
GPO Box 2154
CANBERRA ACT 2601

Comment can also be provided directly to Mr Brian Kelleher, Assistant Secretary Spectrum Branch, by calling the Department of Communications on 02 6271 1382.

Written comments should include the respondent's name, organisation (if relevant) and contact details.

Respondents should be aware that written submissions will generally be made publicly available, including on the website of the Department of Communications (www.communications.gov.au). The review reserves the right not to publish any submission, or part of a submission, which in the view of the Department contains potentially defamatory material, or where it considers it appropriate to do so for confidentiality or other reasons.

All submissions will be treated as non-confidential information unless the respondent specifically requests the submission, or a part of the submission, is kept confidential, and acceptable reasons accompany the request. Email disclaimers will not be considered sufficient confidentiality requests. Note that submissions will generally be subject to the *Freedom of Information Act 1982*.

The *Privacy Act 1988* establishes certain principles with respect to the collection, use, and disclosure of information about individuals. Any personal information respondents provide to the panel through their submission is used only for the purposes of consideration of issues raised in this paper. Respondents should clearly indicate in their submission if they do not wish to have their name included in any summary of submissions that the panel may publish.