# Spectrum Review

## Submission to the Department of Communications and the Arts

May 2016

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# 1. Introduction

The radiofrequency spectrum is a valuable asset in modern economies. It enables services including mobile telecommunications, radio-astronomy, aircraft and maritime communications. The Australian Government indicates the value of spectrum to the national economy is around $177 billion over 15 years.

The mobile industry is one of the main drivers of value in the spectrum economy. Mobile devices shape our nation's social activities, enhance productivity and bolster workplace participation. Deloitte Access Economics estimates these flow-on benefits to the economy from Australians' use of mobile services to be worth around $43 billion in 2015.

Mobile Networks Operators (**MNO**s) require access to spectrum to operate. Successive generations of mobile technologies have increased the industry's demand for spectrum across two dimensions – the number of frequency bands used and the quantity of spectrum required in each band. MNOs also use spectrum in other parts of their networks (e.g., connecting sites to aggregation points). The growth in demand for mobile services has led to the mobile industry becoming one of the largest users of spectrum in the country.

Vodafone Hutchison Australia (**Vodafone**) strongly supports the modernisation of the spectrum management framework. The existing framework is cumbersome and administratively complex. The regulatory processes that have emerged from the framework have inhibited investment, discouraged innovation and imposed unnecessary costs on spectrum users. It is vital to overhaul the framework and improve the efficiency of spectrum management in Australia.

# 2. Reform objectives

The purpose of the spectrum management framework is to maximise Australia's prosperity from the allocation and use of the spectrum. There is an implicit inter-temporal dimension to maximising prosperity that requires the spectrum management framework to provide **certainty** to users to encourage investment, while ensuring there is **flexibility** for spectrum to transition from low value uses to high value uses. Freyens and Alexander (2015) affirm that enhancing flexibility and certainty in spectrum allocation and use is the topmost priority of spectrum policy and that "maximising the *dynamic* efficiency enabled by spectrum allocation and use should become the overarching goal of spectrum policy".[1]

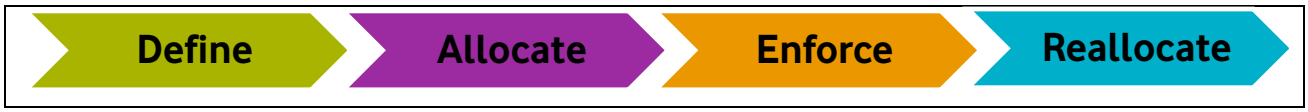
[1] Freyens, B. P. and Alexander, S. (2015), 'Policy objectives and spectrum rights for future network developments', *Proceedings of IEEE Dynamic Spectrum Access Networks (DySPAN) Conference*, Stockholm, 30 Sep – 2 Oct 2015, pp. 229-240.

Dynamic efficiency is best achieved via a market-oriented system of property rights. Spectrum policy-makers often emphasise an apparent trade-off between certainty for licence holders and flexibility for regulators in the spectrum management framework. However, if property rights are well-defined, spectrum can be reallocated via trading without the need for regulatory intervention.

The role of property rights should be carefully considered in determining the objects of the proposed Bill. Well-defined property rights are the best remedy to the *tragedy of commons* phenomenon that might otherwise characterise many parts of the radiofrequency spectrum. In this respect, the new spectrum management framework must enable the performance of four functions in relation to property rights (see **Figure 1**):

- Defining property rights;
- Allocating property rights;
- Enforcing property rights; and
- Reallocating property rights.

**Figure 1: The four functions in relation to property rights**




The object of the Act should provide the Minister and the regulator with over-arching guidance on the performance of these four key functions. As such, Vodafone recommends the following changes to the Department's proposed object of the Bill:

> *To promote the long-term public interest derived from the use of radiofrequency spectrum by:*
>
> a) *Maximising flexibility for users of the spectrum;*
>
> b) *Facilitating the economically efficient~~, flexible and innovative~~ allocation~~ and use~~ of spectrum with, where relevant, appropriate regard to promoting competition in downstream markets;~~and~~*
>
> c) *~~Providing arrangements for~~Having regard for the net social benefits arising from the provision of spectrum for public or community purposes; and*
>
> d) *Safeguarding the integrity of the licensing and authorisation system.*

Vodafone considers two additional criteria are required in the object – criteria (a) and (d).

1. We recommend criterion (a) as it focuses on the flexibility of the spectrum management framework for users. The purpose of this criterion is to encourage the regulator to focus on increasing the **transferability** of licences in the new spectrum management framework. In the existing framework, licences are often designed to align with common standards. The purpose of standards is to harmonise international use. This is different to maximising the flexibility with which spectrum might be used. Under the existing framework, changes of use often require regulatory intervention because licences are based on standards. However, standards should act as constraints rather than the objective of licence design. The objective of the Act must be to maximise the transferability of licences, while ensuring that licenses have the minimum conditions necessary to support their expected purpose.

2. Vodafone recommends adding criterion (d) to the object of the Bill. This criterion is focused on safeguarding the integrity of the licensing and authorisation system. A regime of property rights will only be effective if it delivers **enforceability** of those rights. There is little merit in developing a system of property rights if those rights can be misappropriated by others or undermined by a regulator creating "over-the-top" licences. The Department's proposed streamlining of equipment regulation and graduated remedies (Proposals 13 and 14) will improve the enforcement of spectrum property rights, however these tasks ought to have a logical connection to the object of the Act if they are to be given due focus by the regulator.

Vodafone further recommends a modification of one of the Government's proposed criteria. The over-arching focus on the long-term public interest references "use" of the spectrum. We are concerned that an additional reference to "use" in criterion (b) is both duplicative and likely to encourage regulatory behaviour that is inconsistent with the transition to a market-oriented framework. We also consider the focus on "flexible and innovative" is misplaced in criterion (b). Innovation is an outcome from a successful, well-functioning spectrum management framework. There is no reason to include innovation as an attribute of managing spectrum allocation processes. While flexibility is a desirable attribute of allocation processes, Vodafone considers that this attribute is reflected through an "economically efficient" allocation process. Criterion (b) should make explicit reference to economic efficiency as there is often ambiguity between technical (or productive) efficiency and economic (or allocative) efficiency in spectrum regulation, and the latter is more consistent with delivering prosperity.

Competition policy requires greater focus in the spectrum management framework. The existing framework considers spectrum allocation at an industry (or purpose) level rather than at a company level. Such an approach could be problematic from a competition policy perspective. Purpose-based allocation enabled the near monopolisation of the 1800 MHz band in certain parts of Australia. Telstra was historically assigned *spectrum licences* for mobile services and *apparatus licences* for fixed links enabling to exercise control over up to 100% of regional 1800 MHz spectrum in Australia's most popular 4G band. Indeed, Telstra was provided with its apparatus licences for the regional 1800 MHz spectrum at a cost far

below the market value of the spectrum. Telstra's parallel assignments in the 1800 MHz band have significantly delayed VHA's 4G investments in cities such as Canberra.

When the ACMA proposed auctioning 1800 MHz spectrum licences, the ACCC recommended competition limits that ensured Telstra could, if successful at the auction, hold no more than 2x40 MHz in the band regardless of the purpose for which Telstra used the spectrum. Under the arrangements prior to the auction, Telstra had been permitted to use, or at least control, up to 2x75 MHz of spectrum in a region.

The role of competition policy in spectrum management is only partly addressed via the Government's proposed approach to setting allocation limits (Proposal 8). To ensure competition policy is given appropriate weight in the spectrum management framework, we recommend a modification to criterion (b) so that the "promotion of competition" must be directly considered by the ACMA in spectrum allocation decisions. Given the ACMA's proposed new responsibility to set limits, it is appropriate to include such a modification in the object of the Act so as to provide the ACMA with guidance on how it should approach competition matters, particularly when setting allocation limits.

Competition policy is typically addressed via the *Competition and Consumer Act 2010* with additional, industry-specific measures for telecommunications in Part XIB and Part XIC of that Act. However, Vodafone does not consider an additional reference to the promotion of competition in the Bill will lead to any ambiguity or misalignment between the two pieces of legislation. The UK has adopted a similar approach through references to "promoting competition" in clause 3(2)(d) of the *Wireless Telegraphy Act 2006* and clause 3(1)(b) of the *Communications Act 2003*. On balance, Vodafone considers a reference to "promoting competition" in the object of the Act will provide the ACMA with much needed clarity regarding its role and responsibility in relation to setting limits for spectrum allocation processes.

# 3. Licensing as a system of property rights

Reforms to the spectrum management framework must focus on improving how property rights are defined via the licensing system to facilitate spectrum transitioning between different uses. The introduction of the current spectrum management framework in 1992 was intended to facilitate a market-based system of spectrum management. Market-based systems were recognised as being more flexible and better at encouraging innovation and investment than centrally-planned systems. Unfortunately, the 1992 reforms retained many of the "command and control" measures that characterised past approaches to spectrum management.

Under the existing framework successive regulatory institutions have favoured the use of highly prescriptive (and hence technically restrictive) licensing instruments, which limited tradability and led to a thin secondary market for licences. As a consequence, regulatory intervention has often been required to reallocate spectrum between different uses. The crucial lesson from the 1992 reforms and the

subsequent 25 years of spectrum management is that regulatory prescriptiveness in licensing has undermined the efficacy of a market-based system of spectrum management.

The new regime must provide licence holders with greater control over the spectrum they hold and limit the regulator's propensity toward prescriptive licensing conditions. In so doing, the new regime will facilitate the emergence of a market-oriented system of spectrum management and the emergence of new types of players (e.g., spectrum brokers or band managers).

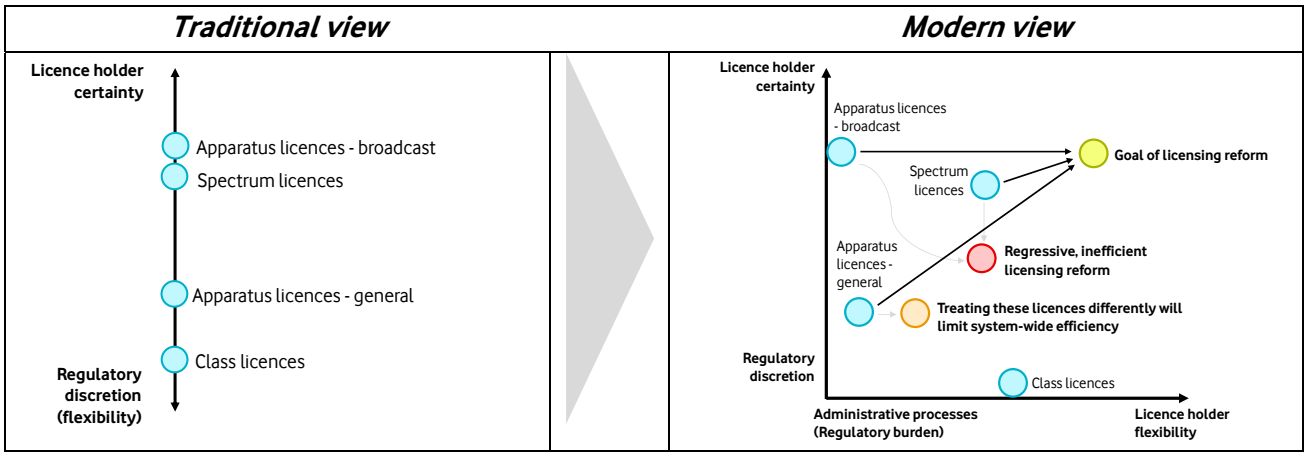
The transition to a market-oriented system is desirable because markets are effective at transferring assets from low-value uses to high-value uses in a timely manner in circumstances where information about the value of those assets is uncertain or privately held. In contrast, regulators are not well-placed to make timely, long-term decisions regarding the highest value use of spectrum. This is due to uncertainty over:

- forecast demand for different uses;
- technological progress; and
- the timing and size of capital investments by spectrum users.

The information challenges confronting the regulator will increase as demand for spectrum access increases. It will not be possible for the regulator to consider all the facts required to make a decision. Rather, the way forward is to improve the transferability of licences and incentivise spectrum users to manage licences as assets (see **Figure 1**). The commoditisation of licences will enable the efficient reallocation spectrum from low-value to high-value uses by encouraging:

- prospective spectrum users to pursue a least-cost approach to acquiring spectrum;
- existing licensees to find buyers/lessees to acquire/rent unused or under-utilised spectrum; and
- the regulator to focus on designing commoditised, technology neutral licences.

**Figure 1: Modernising the licensing system's conception of certainty and flexibility**




Source: Vodafone Hutchison Australia.

Many of the problems associated with the reallocation of spectrum arise from the pervasive use of apparatus licences. Apparatus licences are an imperfect property right because they are technically prescriptive, geographically ill-defined and they have a short tenure. These characteristics severely limit their transferability. Apparatus licences are typically issued without a competition assessment and there is no requirement for the ACMA to consider the potential monopolisation of spectrum. Despite these problems, apparatus licences are the most common form of licensing used by the ACMA today. The new regime must transition away from the use of licences with these characteristics.

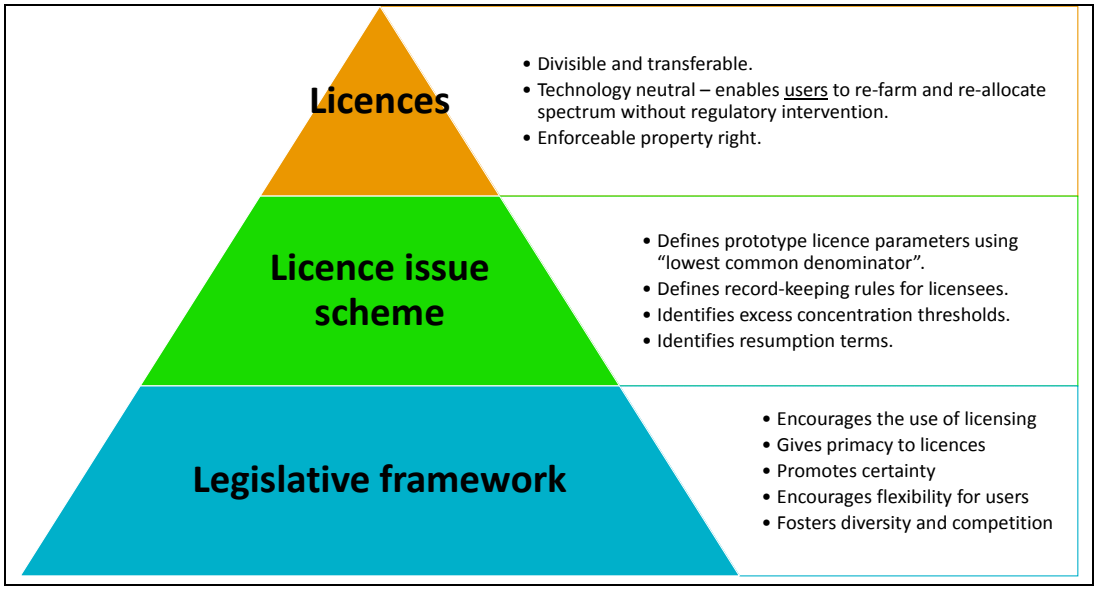
# 4. The allocation (and reallocation) of licences

Vodafone supports the Government's objective to streamline and simplify arrangements for issuing licences. It is not clear that the proposed licence issue schemes achieves this objective. For instance, if the regulator makes numerous idiosyncratic licence issue schemes, the practical administration of the spectrum management framework will continue to be complex and cumbersome. However, broadening the role of licence issue schemes could revolutionise the spectrum management framework.

## Licence issues schemes

Vodafone envisages licence issue schemes taking the form of standing orders that provide a broad, over-arching framework that governs both the issue and operation of licences across multiple bands and purposes. Under this model, the licence issue scheme would become an administrative document that retains an ongoing purpose within the spectrum management hierarchy (see **Figure 2**).

**Figure 2: Licensing hierarchy**




Source: Vodafone Hutchison Australia

The Bill should set out principles that guide the ACMA's creation of licence issue schemes. Foremost among these principles should be an emphasis on maximising the transferability of licences by maximising the flexibility of the licence to be used (or re-purposed) for different uses. The number of licence issues schemes should be limited as this will require the ACMA to generalise allocation processes. Moreover, it will encourage the design of technology neutral licence conditions, which will enable licences issued under a particular scheme to be transferred to new purposes, without the need for regulatory intervention.

The use of generalised licence issue schemes as standing orders overcomes one of the main challenges with the existing spectrum management framework – its emphasis on purpose-based allocation process. Purpose-based allocation processes lead to purpose-based marketing plans and technical licence conditions that fundamentally inhibit the secondary market from transitioning spectrum to its highest value use. The legislative framework must avoid creating a propensity for licence issues schemes to multiply and technical conditions diverge as this will create a multiplicity of effectively non-transferable licence types. This would lead to an ongoing need for cumbersome and interventionist reallocation processes – an outcome that does not accord with Government's objective to streamline and simplify the arrangements for issuing licences.

## Allocation limits

The role of competition policy in issuing licences has not been adequately considered. The proposed approach to setting allocation limits is not sufficient to ensure the promotion of competition in contestable issues. It is not clear on what basis the ACMA determines whether it is "appropriate and reasonably practicable" to consult the Australian Competition and Consumer Commission (**ACCC**). In addition, the Bill proposes to provide the ACMA with responsibility for setting allocation limits (after consulting the ACCC where it is reasonable practicable to do so) yet the Bill provides the ACMA with limited guidance on how it should approach this problem. Both these issues can be addressed by introducing a requirement for the ACMA to have regard to promoting competition in the allocation of spectrum (as we have set out in section 2).

Given the ACCC's proposed role in setting allocation limits, the Bill must make clear the basis for the ACCC's advice. Vodafone agrees the test set out in section 50 of the *Competition and Consumer Act 2010* (**CCA**) to determine whether there has been a substantial lessening of competition (SLC) is not appropriate for new spectrum allocations. An alternative to the SLC test is the "promotion of the long-term interests of end-users" (LTIE) test set out in Part XIC of the CCA. The ACCC has traditionally referenced the LTIE test when setting allocation limits when spectrum is expected to be used for mobile services. Yet, as Part XIC is intended to apply to the telecommunications access regime, it is important to consider the legislative basis for applying the LTIE test when licences are more technology neutral, new industries emerge and the Bill extends the general spectrum management framework to broadcasting services.

Our proposed approach to reference the promotion of competition in the object of the Bill (see section 2) may supersede any requirement to reference the LTIE test. Alternatively, the Department may wish to

replicate parts of the LTIE test directly in the Bill so that its core elements are retained for use by the ACCC in providing advice on allocation limits to the ACMA yet the framework it is customised for use in spectrum allocation and covers non-telecommunications access services.

Finally, Vodafone supports ultimate responsibility allocation limits residing with a single institution (as proposed, the ACMA). There is a strong interplay between auction design, reserve prices and allocation limits. In order to ensure allocation outcomes are in the long-term public interest, it is imperative for a single institution to take responsibility for spectrum allocation decisions and be held accountable for the subsequent impact of allocation processes on contestable industries.

## Excess concentration

A transition to technology neutral licences and market-based reallocation mechanisms may introduce new challenges to the spectrum management framework. One emerging area of concern is where changes in international standards lead to changes in the purpose for which spectrum might be used. In these circumstances, an allocation that may not have previously caused competition concerns due to the availability of substitute spectrum may become an *ex-post* competition concern if the existing holdings of spectrum are concentrated and there are limited spectrum substitutes for the new purpose.

As an example, the processes that were used to enable new licences to be issued (with allocation limits) for regional 1800 MHz spectrum might be more difficult under the new framework. As such, the regulator would either need to take an *ex-ante* decision to limit the allocation of spectrum licences to a single user, even if there is no excess demand for the spectrum, or make *ex-post* decision to intervene and resume spectrum to prevent excess concentration of a scarce and valuable resource. The Bill should make both remedies available to the regulator and set out principles for when the ACMA (possibly with advice from the ACCC) should consider *ex-post* interventions of this nature when it is in the long-term public interest to do so.

# 5. The commons: Spectrum authorisations

Vodafone supports the proposed transition from class licences to use of spectrum authorisations. The legislative framework should enable the use of self- or co-regulatory approaches to the development of technical frameworks associated with spectrum authorisations. Such an approach will enable the evolution of spectrum authorisation areas so that new and innovative technology can be deployed in a timely manner.

Spectrum authorisations (and class licences) provide a means of managing the commons. They impose technical conditions on the use of spectrum with a view to limiting access to spectrum to devices that are less likely to interfere with each other or where the supply of the spectrum is less than its demand for the

spectrum. In that regard, spectrum authorisations might be regarded as a non-transferable property right. In this context, two challenges arise with the use of spectrum authorisations within the spectrum management framework:

- when demand for the spectrum exceeds supply; and
- when higher value uses begin to emerge for the spectrum.

There is already some evidence of both problems arising with respect to parts of the 900 MHz band due to the emergence of Internet of Things (**IoT**). It is possible to address the former problem through the use of "private parks", with entry limited through access fees. The legislative framework should permit spectrum authorisations to be administered in this manner by the ACMA (and accommodate licence holders creating similar arrangements with licensed spectrum).

Ultimately, licensing should be the primary means of managing spectrum where demand outstrips supply. As such, it is imperative for the legislative framework to address when and how:

- spectrum administered via spectrum authorisations is transitioned to becoming licensed spectrum; and/or
- particular users of the spectrum authorisations are prevented from ongoing use of the "commons" and required to use licensed spectrum.

Both factors are critical if innovation is to flourish under the spectrum management framework. Often experimental technologies are first deployed in spectrum "commons". However, successful development and commercialisation of innovations may require a timely transition to licensed spectrum.

# 6. Safeguarding the integrity of the licensing system

Vodafone welcomes the proposed set of compliance and enforcement reforms. In recent years, Vodafone has experienced a significant increase in the number and instances of devices causing interference to our equipment in the 900 MHz band. Typically, the interference is caused by equipment that is not authorised for use in Australia. The impact from interference is not benign, as an unexpected inability to make calls can have serious economic, social and public safety consequences for consumers. Our experience of the existing framework is generally positive however, there is a tendency for enforcement activities to be reactive, cumbersome and to impose unnecessary regulatory burdens on licence holders (i.e., the adversely impacted party from the interference). The proposed changes, particularly the introduction of a graduated range of offences and civil penalties, may address some of the problems with the existing compliance and enforcement system.

However, for the reforms to the compliance and enforcement elements of the spectrum management framework to be effective, they must be accompanied by greater emphasis on the role of the ACMA in safeguarding the integrity of the spectrum management framework. Such an emphasis is required to ensure equitable access to the enforcement regime, particularly licence holders with limited capacity to access the protections afforded by the existing framework.

Equitable access to the protections afforded to licence holders by the spectrum management framework requires the ACMA to take a more proactive approach toward its compliance and enforcement role. For this reason, as we identified in section 2, safeguarding the integrity of the spectrum management framework must become one of the over-arching objectives of the Bill. This is an important change that will enhance the proposed compliance and enforcement measures by embedding the ACMA's role in the enforcement of property rights at the core of the spectrum management framework.

# 7. Institutional accountability

Vodafone strongly endorses the Government's proposal to ensure institutional accountability through the proposed continuation and extension of provisions for certain decisions of the ACMA to able to be reviewed by the AMCA and then the Administrative Appeals Tribunal (**AAT**).

One area where institutional accountability has been deficient is in how allocation limits have been set for spectrum licences. Under the existing framework, the Minister sets allocation limits and the ACMA allocates the spectrum. The Minister typically seeks the advice of the ACCC prior to setting allocation limits. The regional 1800 MHz auction is the most recent example of this process. In regional Australia, 20% (2x15 MHz) of the 1800 MHz band had been allocated to Vodafone and Telstra in 1998 and the remaining 80% (2x60 MHz) of the 1800 MHz band was made available via the auction. The ACCC advised an allocation limit of 2x25 MHz for all players and only applicable the 2x60 MHz available. As a consequence, Telstra was afforded an opportunity to acquire up to 2x40 MHz of the 1800 MHz band in many regions (which it subsequently did for most regions at the auction) while the maximum amount of spectrum most other competitors could acquire in the band was 2x25 MHz.

The ACCC's advice for the regional 1800 MHz auction did not create equivalence of opportunity; instead it embedded structural incumbency advantages. The statutory criteria used by the ACCC to inform its advice was unclear and Vodafone is strongly of the view the ACCC's advice on allocation limits did not serve to promote competition in downstream markets. Perhaps of greater concern was the lack of accountability and redress mechanisms regarding the advice. It was not, and should not be, the Minister's reliance (and in the future, the ACMA's reliance) on the ACCC's advice that is problematic. It is reasonable for the Minister to rely on advice from the competition regulator in setting allocation limits, and therefore

the problem was with the advice itself. Yet, the existing and proposed frameworks do not provide adequate basis for challenging the soundness of advice on allocation limits.

Competition policy will have an increasing important role in spectrum allocation decisions. It is therefore important for the process of setting allocation limits to be transparent and to work effectively. As we have set out section 4, the statutory criteria for the competition must become clearer. If the ACCC is providing advice to the ACMA, the legislative framework should require it to publish and consult on its draft advice. A requirement to publish and consult of draft advice on allocation limits is consistent with the ACCC's legislative requirements for other administrative responsibilities – for instance, the ACCC consults on draft access determinations under Part XIC of the CCA.