Australian Broadcasting Corporation

submission to

The Australian Government

Digital Dividend Green Paper

February 2010

ABC submission in response to the Australian Government's Digital Dividend Green Paper

Introduction

The Australian Broadcasting Corporation welcomes the opportunity to respond to the Australian Government's Digital Dividend Green Paper and to contribute to the discussion of Australia's future spectrum needs.

Digital television switchover provides a unique opportunity to address efficient use of spectrum and plan for future broadcasting and communication needs for the benefit of Australian broadcasters, viewers and communications users. This is an opportunity not to be squandered.

The ABC believes it is possible to deliver a digital dividend of the targeted 126 MHz of contiguous UHF spectrum. However, such an outcome will be challenging. It requires the balancing of competing interests, meeting the timetable for digital switchover and taking a holistic view of communications policy in to the future. In particular, it is important that the dividend is not conceived purely in financial terms at the expense of public policy outcomes.

Television broadcasting in Australia is built on a mixed model comprising commercial, national and community sectors, all of which contribute to deliver audiences some of the best free-to-air television in the world. Public broadcasting in particular delivers a range of substantial public benefits, including providing all Australians with information supporting their participation in society and democratic institutions and a diverse array of high-quality programming. The ABC is increasingly acknowledged as providing a digital "town square" in which the national conversation takes place and the voices of ordinary Australians and those in public life alike can be heard.

If the public policy outcomes delivered by the Australian television regime are to be maintained, it is of critical importance that a migration path to future broadcasting technologies be assured. Removing 126 MHz of spectrum from the broadcasting services bands without careful planning for the evolution of broadcast television will make it impossible to upgrade digital terrestrial television broadcasting beyond current standards. As other delivery platforms, such as Internet Protocol television (IPTV) and pay television, will not face the same constraints, it will become increasingly difficult for public broadcasters to offer comparable services to audiences, potentially undermining their ability to provide accessible services for all Australians. It is imperative that the public broadcasters continue to be able to play their vital role as technologies transform audience expectations.

It is also important to ensure that the "restack" of spectrum required to achieve the digital dividend is carried out in the most efficient and effective manner possible. The ABC believes

that a restack planned to minimise disruptions of services to viewers will also be the most cost-effective. The restack also presents an opportunity to correct problems with the roll-out of digital television; these should be embraced.

The Corporation supports the Government's proposal that the planning of the restack incorporate an additional channel of spectrum ("Channel A"). This could be set aside for public service content, including additional public broadcasting channels.

The ABC's legislative requirements and spectrum use

The ABC is established as a statutory corporation under the *Australian Broadcasting Corporation Act 1983* ("ABC Act"). The ABC Act, which includes the ABC Charter, sets out the basic functions and duties of the Corporation. With a responsibility to reach all Australians, to ensure participation in the national debate and to provide access to range of information, entertainment and other programming, the ABC seeks a presence on all major electronic media platforms.

In addition, the Corporation has a central role in sustaining and contributing to Australia's culture, providing education, entertainment and civic and cultural engagement. The ABC Act states that the functions of the Corporation include broadcasting programs that "contribute to a sense of national identity and inform and entertain, and reflect the cultural diversity of, the Australian community … [and] broadcasting programs of an educational nature."

The ABC is a major user of spectrum, employing frequencies to deliver analog and digital television and radio services. In addition to the spectrum required to reach audiences through transmissions in the broadcasting services bands (BSBs), the Corporation also needs access to a range of other spectrum in order to capture, process and transfer content within its production environment and to perform key ancillary activities. For example, the ABC also uses spectrum for Electronic News Gathering (ENG), Television Outside Broadcasts (TVOB), Satellite News Gathering (SNG), data links, microwave links, satellite access and wireless microphones.

Access to sufficient spectrum is crucial, given the ABC must deliver on obligations to increase production, distribution and transmission of local content in a complex, multi-channel, multi-platform environment and viewers' demand for Australian programs and increasing expectation of high-definition television (HDTV) content. In considering future spectrum needs, the ABC must also consider its ability to meet future audience demands such as 3DTV and IPTV.

General Principles

It is clear that the Government recognises the importance of digital switchover and the economic benefits that can flow from the digital dividend. The Green Paper sets out the

Government's aim to maximise the benefit that the use of spectrum will bring to the Australian community and economy over time and notes the Government's intention to reach a target digital dividend of 126 MHz. In order to reach this target dividend, the Green Paper notes that the Government must:

- Restack television services to maximise efficient allocation of spectrum
- Provide new frequencies be allocated to free-to-air broadcasters to allow them to continue to provide high-quality digital services.

The Green Paper also notes that Channel A spectrum could be kept available for new broadcasting services.

The ABC agrees with these propositions.

Achieving a 126 MHz dividend

The Corporation considers that the target digital dividend of 126 MHz is achievable, though ambitious.

The ABC agrees that the Government should aim to get the maximum public benefit from the digital dividend and recognises restacking channels to free up what is considered "waterfront spectrum" in the broadcasting services bands will maximise available spectrum for resale and alternate use. If broadcasters are to be restacked, then as a natural consequence, they must be assigned new frequencies to ensure that they can continue to deliver high-quality digital services to all Australians.

However, the ABC notes that the Government's target dividend of 126 MHz and the subsequent restack will come at considerable cost to broadcasters and some cost to viewers. The ABC and other broadcasters will continue to make major financial commitments on digital aggregation and delivery technology and viewers will be required to rescan their television sets and some may require new aerials. Indeed, the Green Paper concedes that some level of disruption to viewers is "inevitable."

Restacking presents major planning and technical challenges not previously encountered and addressed in broadcast signal delivery. While it has the potential to cause significant disruption of services within the community, careful planning will ensure all Australians continue to receive television services they currently experience. Models of potential restacking of BSB spectrum indicate the 126 MHz plan is achievable if planned and implemented carefully, requiring both channel planning and detailed implementation planning.

There are considerable costs associated with restacking. While these will vary depending on the specific channel plan adopted, the ABC notes that its current digital television services are broadcast from almost 150 transmitters in and above channel 52; all of this equipment

will need to be replaced or significantly modified if the dividend is to be achieved, as will the corresponding transmitters serving other broadcasters. Once the channel planning has been completed, it will be possible to identify services affected and transmission sites to be changed. A national implementation plan will need to be prepared to identify and cost changes on a site-by-site basis.

The detailed channel plans for the restack will be prepared by the ACMA. The ABC believes that this work should be governed by a set of principles to ensure the channel plans created result in the least possible cost and disruption to audiences. These principles are set out below.

In addition to addressing technical and financial issues, it is essential that a comprehensive information campaign is delivered to ensure Australians are fully aware of the impact of the changes and the work they will need to undertake to ensure they continue to receive television services. The work of the Digital Switchover Taskforce represents an important start. While the cost of producing and distributing information to the community will be considerable, the ABC is able to assist through the provision of broadcast airtime for on-air announcements.

Viewer disruption

The Green Paper describes a "trade-off" between efficiency gains to be realised through restacking the broadcasting services bands and viewer disruption to be experienced as a result of the restack.

The ABC agrees that some disruption to viewers will be a consequence of the restacking needed to obtain the Government's target dividend 126 MHz. However, it believes any such disruption should be limited insofar as it is possible.

While viewers stand to gain from digital switchover by way of new channels and a sharper picture, they should not be penalised unnecessarily in the switchover process. Indeed, viewers should not face broadcasting disruptions into the future as a result of decisions made today in relation to the digital dividend. Continuity of broadcasting services and the ability to ensure future maintenance and upgrades should be assured.

Spectrum and Public Interest

It is vitally important that the issues of public interest and public goods be included in the discussion of the digital dividend.

Broadcasting is subject to policy settings that distinguish it from other industry sectors. In particular, Australian media policy seeks to ensure that the community is able to receive content from a diverse range of sources. In the broadcasting industry, this diversity is preserved and enhanced by the balance of complementary national, community, commercial

and subscription broadcasting sectors. Further, these public policy goals seek to ensure high levels of Australian programming, including local news services, dramas, documentaries and children's programming. A key element of the digital dividend should be to ensure the continued ambition and delivery of these policy goals.

As the ABC has noted in previous submissions, Australian broadcasting regulation has long sought to maximise public benefit from the use of spectrum. As such, economic efficiency, while important, is one element within a regulatory suite that includes diversity requirements, planning regimes and conditions on the activities of broadcasters to ensure that the Australian public receives the greatest possible benefit from the allocation of spectrum resources.

The ABC is concerned that the weight attached to the potential economic benefits from the sale of spectrum realised in the digital dividend not be greater than equally important issues of public interest, such as Australian viewers' ability to receive to broadcasting services.

The Green Paper notes that the digital dividend should be "thought of as an economic gain," yet also acknowledges that the Government must "take into account issues relating to the public interest" before allowing the market to determine the outcome of future spectrum uses.[1] Respondents to the paper are asked to frame their responses around the value the use of spectrum "presents for the Australian community and the economy."

The ABC believes the digital dividend should not be regarded simply as a potential economic gain for the government. Rather, it should be regarded as an economic reform that has the potential to bring important public benefits and productivity gains to the nation. As such, the digital dividend is a rare opportunity for the Government to realign spectrum needs and demands and to ensure spectrum is adequately and efficiently used in the public interest—not simply re-packaged and sold to the highest bidder.

Ensuring the future of television

Free-to-air television is enjoyed in the majority of Australian homes. Despite recent commentary alleging its decline, television remains the means by which the majority of Australian viewers choose to be entertained and informed, or to share in common broadcasting experiences. If decisions about the digital dividend are made without the public interest in mind, there is a very real risk that Australian free-to-air television will indeed be adversely affected, as its ability to deliver new technologies and services that meet audience expectations will be hampered by a lack of spectrum.

The digital terrestrial television broadcasting standards adopted in Australia, which employ DVB-T transmission encoding and MPEG-2 compression, limit the carrying capacity of the

[1] Australian Government. "Digital Dividend Green Paper", p.12.

7MHz channels used for television broadcasting. The ABC, which broadcasts one HDTV channel, three SDTV channels, two digital radio services, closed captioning services and an electronic program guide, is already using its digital television spectrum to capacity.

The Corporation can already foresee a number of plausible policy and technology developments that would, if realised, place further demands on its digital television spectrum allocation. These include the normalisation of HDTV, increased media accessibility obligations and consumer take-up of 3DTV.

Accommodating such future developments will require different digital standards that allow television channels to carry more and richer content. The ABC is aware that other nations using the same television standards as Australia are moving down this path. However, a migration to the likely replacement standards without further disrupting viewers will require additional spectrum into which the new services can be introduced. Unless some facility for this migration is incorporated into the blueprint realising the digital dividend, it will not be possible for digital terrestrial television to move beyond its current limits.

HDTV

Consumer take-up of HDTV receivers has risen in recent years in line with declining prices for HD televisions and set-top boxes. It is now becoming increasingly difficult to buy non-HD television sets. According to the Digital Switchover Taskforce's "Digital Tracker Report" for the fourth quarter of 2009, 92% of integrated digital television sets and 60% of digital set-top boxes in use in Australian homes at the end of September 2009 were HDTV devices; in all, some 82% of Australian homes that have converted to digital have HD equipment.[2] It is anticipated that this proportion will only increase.

With these levels of penetration of HDTV receivers, particularly integrated televisions, and a growing market for HD-format DVDs, there is good reason to anticipate that the Australian public will increasingly expect to be able to watch more television programming in HD formats. Broadcasters are currently unable to meet this expectation, as today's digital television standards to not provide the capacity for multiple HDTV services in broadcasters' channels.

Media accessibility

The Government is committed to improving the accessibility of media services for Australians with sensory impairments. This is reflected in the captioning obligations that apply to all television broadcasters and make their services accessible to the hearing-impaired. More recently, the Government has expressed interest in trialling audio

[2] Digital Switchover Taskforce. "Digital Tracker: Report on Quarter 4, October to December 2009", Table 26, p.35.

description as a means of allowing the sight-impaired greater access to the content available through broadcast television.

As the ABC has noted in its recent submission to the Department's discussion report "Access to Electronic Media for the Hearing and Vision Impaired," the delivery of accessibility services, such as closed captioning and audio description, requires further bandwidth in addition to that required for the delivery of the audio and video components of broadcast services. Significantly, these additional bandwidth requirements accumulate with each multichannel that a broadcaster provides. In the case of closed audio description, the Corporation is aware of requirements for up to 256 kbps per additional audio channel. The need to find such additional bandwidth within its spectrum allocation would make the introduction of an audio description requirement for even one channel difficult for the ABC.

3DTV

Stereoscopic 3-dimensional television (3DTV) is generating considerable interest as a potential evolutionary step for digital television beyond HDTV. Internationally, a number of consumer electronics manufacturers, production studios and pay-television providers have announced plans to adopt the format. In Australia, Foxtel has indicated that it has been testing 3DTV technology and expects to begin delivering 3D programming to its subscribers in 2011.[3]

The ABC currently has no plans to introduce 3DTV services, but is actively monitoring local and overseas developments. Recent media reports state that 3D televisions will be available for purchase in Australia in the second half of 2010. The Corporation is acutely aware that if the technology proves attractive to the Australian public, it will come under increasing pressure to broadcast 3D content. Doing so is likely to require additional spectrum bandwidth equivalent to between one and two HDTV services, depending on the 3D format adopted.

Beyond current digital television standards

It is likely that all future directions for television as a medium will require additional bandwidth to deliver. A straightforward way to address this need for greater capacity is to migrate Australian digital terrestrial television to standards that will allow higher bitrates within 7MHz channels. A natural choice, identified in the Green Paper, is the combination of DVB-T2 and MPEG-4, which together represent the logical successor to Australia's existing digital television standard. They can be expected to deliver an efficiency gain of 50–100%.

This is the path along which Europe, which also uses the DVB digital television standards, is proceeding. The European Union is moving closer to setting "target dates for the migration

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[3] Lara Sinclair. "Film juggernaut rolls into the home, in 3D", *The Australian*, 16 January 2010, p.12.

of networks to more spectrum-efficient standards and to produce common guidelines for implementation," including migration to MPEG-4 or DVB-T2, with the adoption of a Commission Recommendation and a Communication to the European Parliament and Council in October 2009.[4] A Commission Report has noted the importance of "ensuring the availability of a compression standard on all DTT receivers sold after 1 January 2012 that is at least as efficient as the H264/MPEG-4 AVC standard."[5] In the UK, one broadcasting multiplex has already been converted to DVB-T2 to increase capacity to carry HD television services. In its 2007 consultation paper on digital terrestrial television, the UK regulator Ofcom noted DVB-T2 and MPEG-4 as "two technical advances that together could result in a very significant increase in the DTT platform's capacity."[6]

As neither DVB-T2 nor MPEG-4 are compatible with the overwhelming majority of existing receiver equipment, they will require a process of migration. As the Green Paper acknowledges, this is most easily and reasonably achieved through a simulcast of new services encoded at the more efficient standards.

The removal from the broadcasting services bands of the entire 126 MHz of spectrum identified as the digital dividend would make any transition of this kind unfeasible. In effect, it would represent a decision by the Government to prevent any future evolution of digital terrestrial television in Australia.

The Green Paper contemplates the possibility that broadcasters might bid and win access to this spectrum at auction. The ABC regards this as an extremely unlikely scenario, even for commercial television broadcasters. The public broadcasters would be simply unable to participate in such an auction without a commitment from Government to cover their costs.

The ABC is aware of arguments that high-speed broadband, such as will be delivered by the National Broadband Network (NBN), could eventually replace terrestrial broadcasting and might thus represent an alternative evolutionary path for television. If the Government was to adopt such an approach, it would be highly desirable for it make a clear and unequivocal statement to that effect in order to allow broadcasters to plan their future services with certainty. The Corporation has previously argued in submissions to DBCDE on the NBN regulatory regime and the formation of NBN Co that publicly-funded content and services carried over the NBN, including those of public broadcasters, should be available freely to all Australians.

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[4] European Commission. "Transforming the digital dividend into social benefits and economic growth", Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 28 October 2009.

[5] European Commission Information Society and Media Directorate-General. "Transforming the digital dividend opportunity into social benefits and economic growth in Europe", Consultation document, 10 July 2009.

[6] Ofcom. *The Future of Digital Terrestrial Television: Enabling new services for viewers*, Consultation Paper, 21 November 2007.

Maximising the effectiveness of the restack

While the digital dividend will be realised at the top end of the UHF bands, the restack required to accomplish it will affect all of the spectrum currently allocated for television broadcasting. A well-planned restack has the potential to significantly improve viewers' experiences of broadcast television in a number of areas and to enable the extension of digital radio services beyond the mainland capital cities. By comparison, an ill-conceived restack is likely to increase costs and unnecessarily inconvenience audiences while failing to fully deliver public benefits.

The ABC believes that the Government should articulate a set of clear guidelines to the ACMA, which will be undertaking the detailed channel planning for the restack.

Minimising frequency reallocations

As noted above, a key objective in planning the restack should be ensuring the least number of frequency reallocations. This will minimise disruption to audiences and transmitter replacement costs resulting from the process.

In any area where channels are moved to different frequencies, viewers will be required to retune their DTTB receivers and, in some cases, purchase new antennas in order to continue to receive their regular television services. This will create some level of inconvenience for the majority of households in those areas. Moreover, the ABC's experience is that viewers experiencing reception-related difficulties are very likely to contact broadcasters in the first instance. In this way, the public inconvenience created by frequency reallocation will translate directly into a need for broadcasters to commit greater resources to providing reception advice to the public.

Clearly, any reduction in the number of frequency reallocations in the restack will reduce both the level of public inconvenience and the associated impact on broadcasters.

In addition, the restack will affect transmission infrastructure. In all but a few cases, frequency reallocation will entail the complete replacement of existing transmission equipment, as transmitters and their associated equipment are built to operate across a relatively small number of channels. While there may be scope for some retuning of transmitters to broadcast on a different frequency, this is likely to be limited. The costs will vary depending on the type of transmitter and the power levels at which it operates; however, high-powered transmitters serving larger population centres can be expected to cost in the millions of dollars to replace. The ABC presently operates more than 330 digital television transmitters and is contracted to deliver up to 440 by the end of 2013. Of these, almost 150 are currently on channel 52 and above (i.e. the channels to be cleared in the restack) and will require significant modification or replacement. Moreover, the Corporation anticipates that further reallocations will be required as a flow-on effect of moving these transmissions onto lower channels.

Minimising the number of frequency reallocations will minimise the number of replacement transmitters required and thus the cost of the restack.

Ensuring equivalent coverage

As the Digital Dividend will reduce the number of channels in the broadcasting services bands, it will effectively reduce the scope for any future correction of unresolved problems with the roll-out of digital television services. Moreover, as a number of known problems are able to be solved by the allocation of additional spectrum, the switch-off of analog television represents a once-only opportunity to correct them. The ABC believes that, wherever possible, the plan for the restack should correct such known problems.

A consistent concern of broadcasters throughout the transition to digital television has been ensuring that viewers who are able to receive television services in analog continue to be able to do so after digital switch-over. This is an objective of the national television conversion scheme that ACMA is required to develop under clause 19(3)(f) of the *Broadcasting Services Act 1992* ("BSA"). In practice, coverage shortfalls can and do arise, such as in circumstances where digital services are introduced using UHF spectrum in areas where the corresponding analog services are carried on VHF channels. Achieving equivalent coverage for a given analog service may require a number of digital transmitters or services. This requirement should be included in the planning of any spectrum restack.

The Corporation has previously raised these issues, particularly in its submission to the January 2005 *Review of the Broadcasting Services Band Spectrum: Identification and Structural Efficiency* conducted by the then Department of Communications, Information Technology and the Arts (DCITA).

Elimination of SFNs

A spectrum restack also presents a significant opportunity to reduce or eliminate the problems created by single-frequency networks (SFNs). As the ABC has consistently argued, SFNs have not been successful in Australia, as they cannot achieve equivalent coverage to analog services and have given rise to a high level of transmission-related complaints in a number of areas where they are used. As described in detail in the Corporation's January 2005 response to the DCITA broadcasting services bands discussion paper, digital television audiences in areas such as the Central Coast of New South Wales and the Gold Coast and the Sunshine Coast in Queensland have suffered from "mush area" interference problems as a result of the use of SFNs. The ABC is strongly opposed to the planning of SFNs.

The Corporation has seen modelling of potential spectrum rearrangements to achieve a clearance of 126MHz that indicate that it should be possible to eliminate existing SFNs, and hence the interference problems they create, while allowing six national television channels. Accordingly, it recommends that the principles on which ACMA plans the restack should include a stipulation that all existing SFNs be eliminated and no new SFNs created.

FM Expansion

A number of frequencies in Band II that could viably be used for FM radio transmissions are currently instead used for terrestrial television services. The FM spectrum is already congested in many areas, which has inhibited attempts by the ABC to acquire FM frequencies that would allow it to retransmit its AM services in several major centres in order to overcome reception difficulties.

The Corporation proposes that when the Band II channels currently allocated for television are cleared during the restack, they be reallocated for FM radio transmission and that a proportion of these be made available for public broadcasting.

Regional expansion of digital radio

Digital radio broadcasting in VHF Band III began in Australia's mainland capital cities in mid-2009. It provides listeners with better sound and reception, the ability to rewind live radio, easier tuning and program information in text and pictures, as well access to additional services.

However, the current lack of available spectrum in VHF Band III, prevents digital radio from being delivered in most areas beyond the metropolitan centres, depriving regional Australians of these benefits. In a similar fashion, the geographically-restricted availability of digital radio broadcasts has increased vehicle manufacturers' reluctance to embrace the technology, which in turn acts an impediment to consumer take-up as almost 30% of radio listening in Australia is in-car. An expansion of digital radio into regional Australia would reverse this negative feedback cycle. However, without additional spectrum, digital radio will never achieve national adoption, and will have no long-term viability as a medium.

The switch-off of analog television will free up VHF spectrum that can be used for digital radio broadcasting. To enable the expansion of digital radio to most regional centres, the channel plan for the restack should allocate three contiguous channels of Band III VHF spectrum—from example, channels 9, 9A and 10—for digital radio nationally.

However, as VHF Band III radio broadcasts have propagation characteristics that are somewhat inferior to those of FM radio, it is not appropriate for wide-area coverage. Even after a successful roll-out of DAB+ services in regional centres, digital radio will be largely unavailable in the areas between towns. Evidence from the UK suggests that this "digital island" effect has been an impediment to take-up of digital radio receivers and the adoption of digital radio by the car industry.

A potential alternative candidate standard for wide-area digital radio broadcasting is Digital Radio Mondiale+ (DRM+), which is able to operate in VHF Bands I and II. In light of the potential long-term public benefits of the transition from analog to digital radio

broadcasting, the ABC proposes that the restack channel plan reserve spectrum cleared in Band I for future DRM+ usage.

Wireless microphones

The ABC is an extensive user of wireless microphones that operate in the UHF band. It is therefore concerned about the extent to which the spectrum available for this purpose will contract after the restack. Currently wireless microphones share spectrum with broadcasting services on a non-interference basis. After digital switchover, the spectrum space for wireless microphone operations in the broadcasting services bands will be much tighter.

As well as broadcasters, many other radiofrequency spectrum users will be affected by any changes to this band. Wireless microphones are widely in use by a range of organisations, including theatres, schools, churches, community groups, musicians and major sporting and cultural groups. Many Australian public and private events will not be able to benefit from the use of wireless microphone equipment unless some spectrum space is allocated for such use and a workable regime is in place.

The ABC notes that the UK has assigned an 8 MHz (channel 38) as a dedicated channel for wireless microphones.

The frequency planning principles for the restack should include careful consideration of the use of wireless microphones.

Channel A

The ABC considers that leaving "Channel A" spectrum outside the spectrum sale in order to deliver a national, public television multiplex would provide Australians with a social dividend as well as an economic dividend from digital switchover.

If the digital dividend is sold at auction to the highest bidders, there is little likelihood the spectrum would go to broadcasters and no likelihood at all that that spectrum would become available to a public broadcaster. Such a scenario ensures there is little chance for current terrestrial broadcasting services to grow significantly beyond their present level.

Reserving Channel A spectrum for future broadcasting services would provide public broadcasters with an opportunity to grow and deliver broadcasting services to a level that will be demanded by future generations of Australians.

The Corporation believes it is well-suited to manage the multiplex, which could include community and Indigenous television services and additional ABC channels, such as a public affairs channel and an education channel. Such a multiplex would deliver significant public benefits that are unlikely to be provided by the commercial sector.

The ABC notes the Government's November 2009 decision to provide community television stations with funding and interim access to spectrum and supports the objective of ensuring that those services do not become invisible to audiences throughout the transition to digital. However, the delivery solution that the services have adopted is based on low-cost, low-powered transmitters using extensive forward error correction. It results in the 7MHz channels that the services occupy only being able to carry one or two SDTV channels, rather than a multiplex of three or four channels, including an HDTV channel. This cannot be regarded as an efficient use of spectrum. Following digital switch-over, the services should be migrated to full multiplexes delivered using high-powered transmitters.

Conclusion

The digital television switchover presents an important moment not only for Australian broadcasting but for the nation's future. The dividend that springs from the switch to digital television is an important public benefit and a trigger for future economic reform. It is an opportunity not to be wasted.

In delivering a dividend of 126MHz it is essential the welfare of the viewing audience remains paramount. This means ensuring the minimum amount of disruption to existing broadcasting and transmission services. It also means ensuring the dividend is maximised by "future proofing" broadcasting services and providing spectrum such as Channel A is set aside for public benefit.

There are significant challenges in balancing competing interests and presenting a cogent, forward-looking broadcasting vision while meeting the tight timetable for analog switch-off. It is important to ensure the continued delivery of key broadcasting services and creates opportunities for new, enhanced communication services. Achieving these objectives will ensure the Australian public—not just industry or government—derive a dividend from digital television switchover.