Response to the Department of Broadband, Communication and the Digital Economy

Digital Dividend Green Paper

26th February, 2010

Overview

This document presents Alcatel-Lucent's key points and recommendations concerning considerations required to optimise spectrum policy for terrestrial and mobile television, mobile and fixed wireless services. These recommendations are based on Alcatel-Lucent's participation in global markets as well as intimate knowledge of a range of technologies (i.e. LTE, WiMAX, HSPA, DVB-SH).

In the global market there has been considerable interest in the possibilities enabled by the replanning of digital dividend spectrum. Numerous studies have shown considerable economic benefit and potential service revenue from expanding the license definition to allow the support for mobility services. In this expansion, Alcatel-Lucent recommends some generic policies such as:

"Technology Neutrality" – To enact the most favourable market situation, it is our opinion that an operator should have the possibility to adopt the technology of its choice, provided it fits within pre-defined technical constraints.

"Service Neutrality" – As much as is practical, the definition of the service carried over the spectrum license should not be defined in regulation. For the purpose of this document our definition is directed at neutrality between fixed and mobile services.

"Global Technology Adoption" - It is Alcatel-Lucent's belief that considerable value can be extracted from the Digital Dividend if both allocations and policy are aligned towards the adoption of technologies that can leverage the economies of scale of the world market.

"A competitive framework that respects the need to deliver high bandwidth services" – While technology enhancements are delivering increased bandwidth per unit of spectrum, there is still a limit. Fragmentation of spectrum will unnecessarily increase the cost and limit the ability to deliver high bandwidth services. A balance between competitive markets via more operators and the underlying cost structure of each operator is therefore required.

"Special consideration for the interests of Public Safety" - One important area for consideration is public safety. The limited ability to afford high density networks naturally attracts public safety networks to spectrum bands below 1GHz. Additionally the desire to keep costs low via the adoptions of global technologies makes the digital dividend and 400-500MHz bands the logical choice for this industry sector.

"NBN wireless will require significant amounts of spectrum" – Alcatel-Lucent proprietary studies show that getting strict service parity between fibre and wireless networks for in home broadband service will not be practical. However to allow wireless to get close as is feasible while optimising cost will require significantly more spectrum that is typically in the past given to an individual operator.

Lastly we recommend that decisions surrounding the allocation of spectrum consider the face that bundling diverse spectra can allow operators to make specific optimisation with regard to bandwidth and geography. This is particularly the case when the possibilities for network architectures utilising the combined 700MHz and 2.5GHz bands are considered. In this

combination an optimal short range high capacity (in the 2.5GHz with 20MHz channels) and wide area network (UHF range) could be cost optimally constructed. We recommend industry discussion to debate this issue.

About Alcatel-Lucent

Alcatel-Lucent (Euronext Paris and NYSE: ALU) is the trusted partner of service providers, enterprises and governments worldwide, providing solutions to deliver voice, data and video communication services to end-users. A leader in fixed, mobile and converged broadband networking, IP technologies, applications and services, Alcatel-Lucent leverages the unrivalled technical and scientific expertise of Bell Labs, one of the largest innovation powerhouses in the communications industry. With operations in more than 130 countries and the most experienced global services organization in the industry, Alcatel-Lucent is a local partner with a global reach. Alcatel-Lucent achieved revenues of Euro 16.98 billion in 2008 and is incorporated in France, with executive offices located in Paris.

Alcatel-Lucent's commitment to Australia is not new. It has been part of the Australian telecommunications fabric since 1895. Everyday, more than 300 Terabytes of data equivalent to around 3 billion web pages or 60 million songs, is delivered across our DSL technology platforms in Australia and New Zealand,

Daily, more than 25 million calls are made across our technology platforms in Australia.

Alcatel-Lucent is proud to supply equipment and services to Australia's leading telecommunications incumbents and competitors. It has supplied the infrastructure for a significant portion of Australia's residential DSL community, making it a leader in helping Australians access the advantages of a digital lifestyle. Its solutions achieve advances in DSL, fibre optics, wireless and satellite access that help companies and individuals get maximum benefit from fast Internet services.

Its leadership in the development of Australia's communications infrastructure has included the country's first undersea cable network, the introduction of broadband Internet, the country's first 3G mobile network (m.Net) and the world's longest optical link, between Adelaide and Darwin.

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Mobile telecommunications and broadband

Questions

3.1 Should digital dividend spectrum be used to provide mobile telephony and broadband services?

3.2 How much spectrum would be required to provide these services?

3.3 When would this spectrum be required?

3.4 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

Question 3.1

The digital dividend spectrum should be used to provide mobile telephony, mobile broadband and/or fixed wireless broadband services using a "service neutral" approach.

As both the mobile broadband and fixed broadband markets mature, it is becoming increasingly difficult to differentiate their market positions and technical characteristics. An example of this is the increasing number of customers who are deciding to settle for mobile broadband as their primary and only service. Since these types of decisions are naturally market driven, Alcatel-Lucent does not believe that it is practical or even in the public's interest to mandate a particular service definition onto a spectrum band.

Another consideration is the geographic differences between fixed and mobile and their likely deployment. While some overlap between mobile and fixed broadband will exist, there is an additional consideration of fixed wireless as the primary service in rural areas. Given the wide area that rural occurs on the Australian continent, it requires a spectrum license that is almost national. This would require a large allocation of the digital dividend spectrum to a fixed classification limiting the potential for mobile broadband.

Alcatel-Lucent notes that in other advanced markets there is a trend towards "Service Neutrality". Alcatel-Lucent supports this trend and therefore recommends that as much as is practically possible the spectrum band definition should be service neutral and therefore not specify any definition of the types of content or services carried.

Question 3.2

The appetite for spectrum over the last ten years has been extremely strong. Numerous international studies show exponential growth in mobile data demand with projections of continued growth in at least the next three years. This growth is so strong in fact, that if past growth rates were to continue then nearly all spectrum possibilities below 3GHz could be

exhausted. However this probably would not be an optimal use of a valuable spectrum resource so that some consideration of the spectrum demand versus supply and network cost is required.

The value of spectrum equates normally to the business potential that is achievable from that spectrum which brings into play technology and market dimensions. To equate demand, cost, pricing and spectrum bandwidth for two potential market segments is extremely difficult. Further complicating the mixture is the requirement to provide an adequate competitive marketplace, which results in a further division of the available spectrum.

Hence there are many factors to consider when estimating the overall spectrum requirements. Firstly consider the potential requirements of the National Broadband Network (NBN). While little is known of the actual service specifications required by the NBN it has generally been stated that at least a 12Mbits/sec service is required from the terrestrial wireless segment. Out of the list of potential technical parameters that defines the broadband profile, the three that are likely to have the largest impact on the wireless capacity are the asymmetric ratio, the uplink minimum performance and the application concurrency i.e. amount of potential multiplexing possible from inactive traffic flow periods. Without a precise understanding of these basic characteristics only guidelines can be given. Nonetheless it can be seen that even in low density rural areas with the expected take up, the wireless broadband network could easily become a spectrum capacity limited network. Alcatel-Lucent would therefore recommend that the DBCDE undertake its own studies to estimate the demand side requirement, potential build scenarios and the cost/spectrum capacity trade-off of the network. It is Alcatel-Lucent's view that with reasonable assumptions of a fixed broadband service and assuming that the NBN is the sole provider that in the order of 100MHz is needed to optimise the cost point of a fixed wireless service.

We now consider the spectrum demand for mobile broadband services. The first point that needs to be made is that for mobile broadband the spectrum requirements are based on the all the bands that are available, some currently utilised, some potential. In this way the summing of requirements will consider the possibilities of augmenting bands such as 700MHz, 850/900MHz, 1800MHz, 2100MHz, 2300MHz, 2500MHz and the 3.4-3.8GHz. Hence the potential exists for significant amounts of spectrum to be made available.

In order to understand the potential demand for the 700MHz band, one should also be aware of the relative cost difference and coverage quality differences between sub 1GHz and greater than 2GHz networks. This is particularly relevant in regards to the rollout of mobile broadband services in regional and rural areas. An appreciation of the supply side possibilities, the network cost structures and demand side consideration can only be ascertained by detailed modelling. As such Alcatel-Lucent recommends that any spectrum analysis the DBCDE undertakes, considers below 1GHz for regional areas (and outskirts of capital cities) and below and above 1GHz for capital cities.

Additionally it is generally considered that to sustain a healthy competitive market place at least three operators in the metropolitan areas are required. Given that a possible 126MHz could be cleared and with some allowance for guard bands and allowing for potential public safety and mobile TV usage then a likely supply side estimation per operator for the digital dividend could

be 30MHz per operator. This amount is consistent, even greater than, comparable developed global markets.

It should be noted that the above allocation while sufficient does not extract the maximum user rate from LTE based systems. Given the likely adoption of Frequency Division Duplex, then for a user to peak up to the maximum bandwidth allowed by an LTE system, a requirement of 20MHz channelisation, in a paired arrangement (i.e. 40MHz of spectrum per operator) is needed. Additionally from a network efficiency perspective allowing higher peak rates to pass successfully through the network also improves the average utilisation of the radio access network, lowering the cost per bit per hertz. Alcatel-Lucent would therefore recommend that the DBCDE consider the end user benefit from allowing spectrum allocations of 40MHz and up for a single operator weighed up against the understanding that there may be an impact on the competition provided by a reduced number of operators.

Question 3.3

There is existing strong and growing demands for faster broadband speeds, and operators around the globe are commencing their LTE rollouts to meet this demand.

Given the current demand for fixed broadband and mobile broadband the ideal availability would be 2010. It can take an appreciable amount of time to establish new networks, even for an operator with existing towers. More so in the case where little or overladed infrastructure exists in regional/rural areas. Hence given that the primary technology for this band is very likely LTE then it is expected that in the global market, initial commercial networks will be built in 2010 with wider scale deployments proceeding into 2011. Australia could therefore follow this timeline.

Question 3.4

When considering the economic benefits of the 700MHz band to mobile and fixed broadband services, it is important to highlight a number of considerations.

Service Quality – an advantageous characteristic of the 700MHz band for mobile use is the balance between the propagation characteristics and the antenna length. In the case of a mobile handset form factor the bands between about 600-1000MHz provides an ideal coverage quality and packaging trade-off. If the 700MHz band were not available to mobile services then the likely alternative is networks designed in the 1800MHz and above bands. At the same technology and investment level, these will not provide the equivalent indoor coverage or cell edge performance that a 700MHz network can. Alcatel-Lucent therefore recommends the DBCDE consider coverage quality issues when deriving the community benefits of the spectrum band.

Global Adoption – Based on the support for LTE by major telecommunication operators in the US, Europe and China, it is now clear that significant market coverage of LTE will exist in the near future. Past history has also shown that with such a large market coverage comes a wide

range of devices with competitive pricing. Hence by following global adoption, Australian consumers can benefit from the mass economies of scale for their main equipment purchase (i.e. the Handset / Dongle), without having to commit to such volumes.

Cost Effective Upgrades to the current industry Mobile Broadband Capacity – Alcatel-Lucent undertakes numerous studies for large telecommunications networks concentrating on finding the optimum capacity options. Based on these studies it is our opinion that for an increasing amount of mobile operators the most cost effective path to cater for the large mobile broadband capacity demands of the next five years is the overlay of LTE in 700MHz band. Based on such findings it is then reasonable to assume that by allowing the most cost effective network build, combined with a healthy competitive environment, a framework is constructed that provides the consumer the lowest cost mobile broadband.

Ubiquity and continuity of a portable service – 700MHz has the potential to provide a cost effective nationwide coverage. A user with the same appliance that can stay connected between metro, regional and rural areas is desirable and attractive (e.g. Telstra's NextG).

Fixed Wireless Broadband

Questions

3.5 How might the roll-out of the NBN impact on the provision of fixed wireless broadband services?

3.6 How much spectrum would be required to provide these services?

3.7 How many networks will need to be accommodated to provide a competitive communications industry?

3.8 When would this spectrum be required?

3.9 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

Question 3.5:

It is Alcatel-Lucent's understanding that the deployment of fibre to the home will cover in the region of 90% of the population with a combination of terrestrial wireless and satellite catering for the remainder. Given the population distribution in Australia today, it can be easily seen that the geographic area coverage of terrestrial wireless will be considerable.

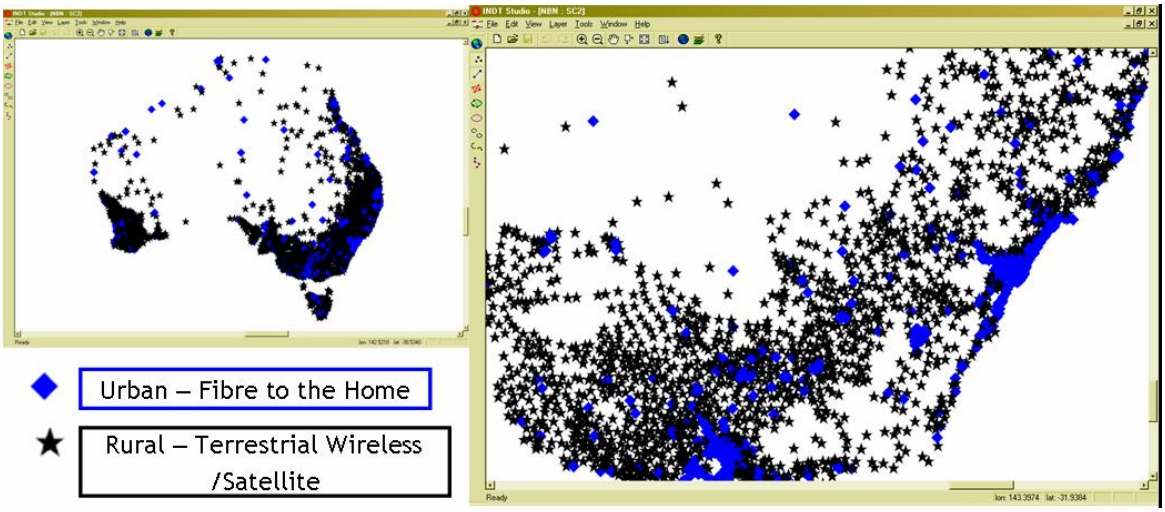

Figure 1: Alcatel-Lucent proprietary Study of Cost Technology for High Speed Broadband

The primary objectives of the terrestrial wireless broadband is therefore to;

Support High Speed Services (12Mbps and above)

Cover a wide geographic area at the lowest cost

Support large capacity given the characteristics of a 12Mbps broadband service.

An interesting observation is that even though the provision of terrestrial wireless broadband is for areas outside of economical fibre to the home (i.e. rural areas) the network usage profile of a 12Mbps and the variance of population distribution results in a network that is sometimes capacity limited and sometimes coverage limited.

Also as distinct from the requirements of mobile handsets, fixed broadband has the advantage of higher power uplink, higher gain antennas, a degree of directivity and potentially mounted above the local foliage. These four characteristics significantly decrease the sensitivity of the economics to the level of the spectrum band (whether that is below 1GHz or above 2GHz).

Hence Alcatel-Lucent foresees that with the rollout of the NBN there will be:

Requirement for wide geographic coverage, close to that of a national spectrum license.

Consideration of the spectrum demands in terms of the trade-off between coverage capability and spectrum amount (capacity).

Long Investment Horizon: Given the length of investment horizon there is a need for long term certainty in the ownership of spectrum, potentially in excess of 15 years.

Question 3.6

Determining how much spectrum is always a complicated task, typically with a range of dependencies that can only be determined with an understanding of the detail of the level of quality and particular usage of a service. Hence at this stage only indicative perspectives can be given.

Alcatel-Lucent foresees two fundamental outcomes that would affect the strategy for spectrum. In the first case the NBN Company (or other) builds the terrestrial wireless network on its own and in the second case there is a commercial construct where there is a sharing of rural infrastructure with a mobile operator. In the later case there is likely to be more consideration to leveraging mobile infrastructure including spectrum in the 700MHz band. Since this outcome is hard to predict we consider only the first outcome.

Alcatel-Lucent has undertaken proprietary studies with a principle objective to understand the relative cost and performance trade-off of a particular technology. In regards to the wireless domain, this contains a consideration of the cost performance trade-off of various spectrum options.

In a general sense, the lower the spectrum band, the better the propagation and with newer technologies, the better the performance. In terms of spectrum this favours the lower than 1GHz bands over the above 2GHz bands. However there has been a trend in wireless technologies to expand into the higher bands since there typically is more available spectrum. Additionally in

the less than 1GHz bands, competition from a range of technologies and industries results in fragmentation and hence less available spectrum. This is particularly relevant in Australia where the coverage is a more significant issue and the impact of site costs (antenna, hut, power and backhaul) is typically five times more than the cost of the radio equipment and therefore has a significant effect when comparing low and high frequency bands.

The option in the case of limited spectrum to support higher capacities is to cell split effectively decreasing the coverage area and therefore serving a given capacity over a smaller user base to a higher performance level. Higher costs typically result.

The question for high speed broadband in Australia then becomes one of whether the available spectrum below 1GHz is sufficient to allow for 12Mbit/sec broadband services in the given customer density. Understanding that the target areas are the last ten percent of customer density ,then it is possible to build a network model for an assumed service profile in the given geography.

The customer distribution in the last ten percent of towns shows a considerable relative difference between the lowest and highest density percentile. Applying this understanding to the expectation for a 12Mbits/sec broadband service shows that it is in fact possible for a terrestrial wireless network in rural areas to be capacity limited for common spectrum amounts.

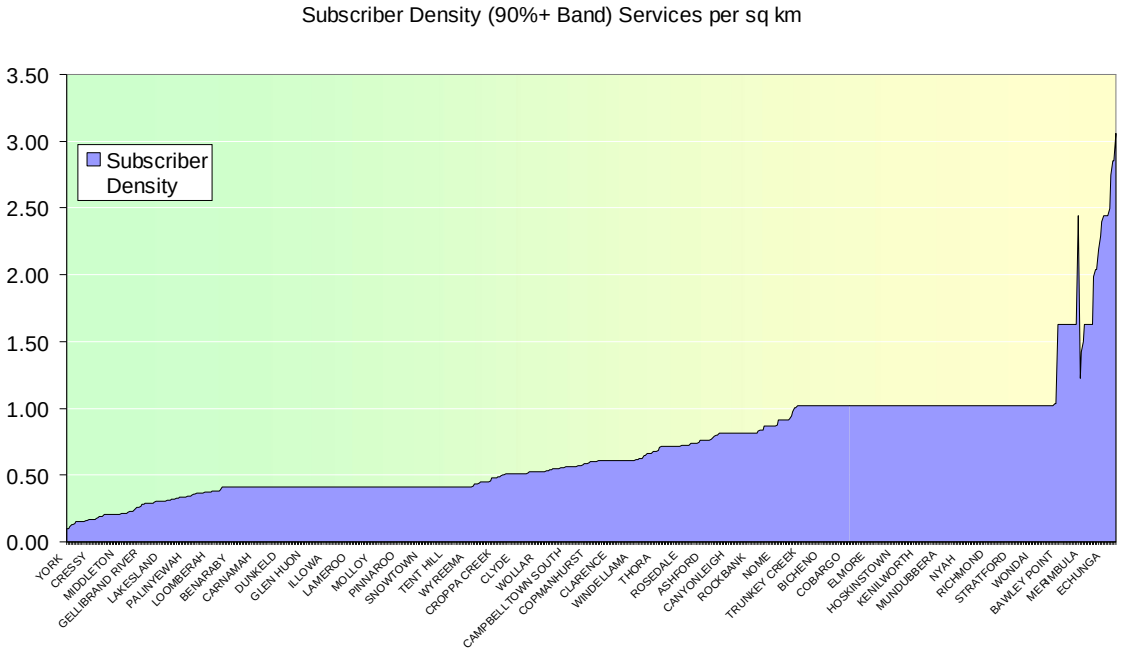

Figure 2: Subscriber Density (Lines per Square Kilometer per Town) for last 10% of homes

Further, the spectrum amount comparing between a single operator in the 700MHz license band and an operator with a larger spectrum allowance in 2.3-2.4GHz (approximately two to three times the amount) results in lower net present value for the higher spectrum band.

It is therefore Alcatel-Lucent's recommendation that since NBN services require large amounts of available spectrum (up to 100MHz per cell) that the DBCDE consider the cost advantages of the 2.3-2.4GHz and 2.5-2.69GHz bands for fixed wireless services.

One consideration that may alter this position is that there is opportunity for the NBN Company to share radio access network equipment with a mobile operator. It is a clear that mobile operators will need to use the 700MHz licence band in regional areas because of the enhance propagation characteristics. This implies that by leveraging incumbent infrastructure the 700MHz licence may provide a cost optimised solution of NBN fixed wireless services, particularly in the more rural parts of the last ten percentage of the population.

In summary, Alcatel-Lucent would recommend that a logical allocation scenario therefore could be for the available 700MHz spectrum to be allocated for mobile services taking advantage of its optimal propagation characteristics, especially in remote areas and the >2Ghz spectrum for fixed wireless broadband with NBN taking advantage of the greater available spectrum and optimised antenna installations. This of course would not preclude selective sharing of the 700MHz mobility allocations for fixed wireless mobile use where this was commercially viable and a more economic option to provide coverage.

Question 3.7

It is Alcatel-Lucent's understanding that the objective of the NBN Company is to enable a vibrant competitive environment via competition at the layer 2. Hence at the infrastructure level (layer 1) the NBN Company is the singular provider. It is therefore reasonable to assume that such a situation could also be the case in the terrestrial wireless segment. In order to enable certainty of coverage for a single terrestrial wireless provider it would be preferable to have a national spectrum license.

The question of competition therefore is centred on whether there is a desire for current mobile operators and localised providers to provide the monopoly infrastructure layer or in competition with, the monopoly infrastructure layer.

The possibilities for these structures is difficult at this stage to foresee, and under some circumstances it is required that multiple spectrum licenses be available to enable the structure to be implemented. Further since the spectrum licenses are required over a broad geographic area it may be a requirement that a national license be designated. Given the broad range of potential scenarios, Alcatel-Lucent therefore recommends flexibility in the pricing and coverage of spectrum licenses become a primary consideration.

As stated earlier, there is product substitution between fixed wireless broadband and mobile broadband which ensure an additional layer of competition.

Question 3.8

Alcatel-Lucent foresees that this spectrum is required in line with the expected objectives of the NBN build - 2011. An earlier time would be advantageous if customisation and development effort is required for wireless CPE (e.g. wireless Terminal). Particularly if feature parity with the GPON ONTs is required.

Question 3.9

See preceding answers.

National Broadband Network Spectrum Implications

Questions

3.10 What are the spectrum implications associated with the NBN?

3.11 What other implications might the NBN have for the allocation of digital dividend spectrum?

3.12 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

Question 3.10

Please see questions 3.5-3.7 for explanations of NBN spectrum and issues of cost / spectrum trade-offs.

Question 3.11

Alcatel-Lucent foresees that the main outcome of the structure of spectrum will be dependent on the ultimate commercial construct used by the NBN to deliver the wireless service. For example depending on the outcome chosen, a single provider is building the network hence a national license is required. Or if the most efficient structure is via regional providers then an apparatus system structure would be appropriate. Or if a commercial agreement was struck with a mobile operator then an additional spectrum allowance above and beyond the needs of mobile broadband would be justified. As such, Alcatel-Lucent believes that at this stage it is too early to give any recommendation on the requirements of NBN wireless.

Question 3.12

Alcatel-Lucent is of the belief that policy should be aligned towards allowing the lowest cost network to be constructed that meets the specifications for high speed broadband. This is best encouraged through making available efficient spectrum bands aligned with global technologies with appropriate spectrum amounts.

An additional consideration is the fact that it is a characteristic of broadband that usage is continually increasing for the same revenue. It could therefore be concluded that the spectrum demands moving into the future are also increasing at a constant revenue base. Policy associated with the requirements of an NBN service could therefore allow for future growth of the terrestrial wireless component.

The key social benefit of fixed wireless capability of the NBN is that it delivers service commonality between rural and metropolitan customers that can be leveraged to provide not only entertainment, but enhanced opportunities for teleworking and delivery of social services.

Mobile Television and Multimedia

Questions

3.13 Should digital dividend spectrum be used to provide mobile television services?

3.14 How much spectrum would be required to provide these services? Please provide estimates for each delivery model (i.e. unicasting, multicasting and broadcasting).

3.15 When would this spectrum be required?

3.16 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

Question 3.13

It is Alcatel-Lucent's opinion that the demand for Mobile TV services will continue to grow at a robust rate. This demand is likely to manifest itself in Mobile networks in a number of ways. Some of these are:

Broadcast such as DVB-SH, allowing popular content to be streamed efficiently to all users within a catchment area

Unicast across HSPA, LTE and proprietary networks. Based on the number of deployed networks today supporting MobileTV, Unicast over HSPA is the most common approach for delivering MobileTV services.

Transparent Unicast across HSPA, LTE. The increasing popularity of web based streaming video services is automatically creating streams of video over wireless networks. A proportion of what was originally foreseen for Mobile TV will be delivered this way. The important distinction here is that the video streaming is essentially transparent to the network, appearing as bits of data to the underlying mobile network.

Mobile based Multicast and Broadcast (MBMS) – this approach utilises a whole or proportion of a frequency bearer for the delivering MobileTV. Once a MBMS stream is activated, any user within the cell can access this content without increasing the overall demand on the cell.

Alcatel-Lucent has observed each of these approaches being successfully deployed in various world markets, driven by the particular market characteristics. It is for this reason that we recommend, as much as is practically possible, that a technology neutral strategy be enacted to allow the particular market characteristics to determine the optimal choice of technology.

Question 3.14

No comment given.

Question 3.15

The availability of Unicast MobileTV services corresponds with the timing for the availability of Mobile Broadband. The drivers for broadcast MobileTV are less urgent than those for Mobile Broadband in general and it is anticipated that a lag in the allocation of spectrum would be acceptable to the industry.

Question 3.16

No comment given.

Improving the quality and scope of existing broadcast service

Questions

3.17 Should digital dividend spectrum be used to allow expansion or enhancement of existing broadcasting services? What would it deliver?

3.18 How much spectrum would be required to provide these services?

3.19 When would this spectrum be required?

3.20 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

No comment provided.

Migration to next generation broadcasting technologies DVB-T2 and MPEG-4

Questions

3.21 Should digital dividend spectrum be used to implement DVB-T/MPEG-2 to DVB-T2/MPEG4 or DVB-T/MPEG-4 conversion strategies? If so, which strategies?

3.22 Would additional spectrum be required? If so, how much?

3.23 When would this spectrum be required?

3.24 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

No comment provided

Retention of Broadcasting spectrum for new broadcasting or similar services

Questions

3.25 Should spectrum from the digital dividend remain designated as broadcasting services bands spectrum to provide capacity for additional broadcasting services?

3.26 How much spectrum would be required for this purpose?

3.27 When would this spectrum be required?

3.28 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

No comment provided

Government Uses

Questions

3.29 Is access to digital dividend spectrum required for government purposes? If so, for what purposes?

3.30 How much spectrum would be required for these purposes?

3.31 When would this spectrum be required?

3.32 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

Question 3.29

In today's world, it is becoming a core expectation that the level of availability of information for employees in the field should be the same as those in head office. For most emergency services (police, fire, and ambulance) the requirements are met using cellular technologies and operating them as a non-operational service.

In the longer term this use of cellular systems will be seen as a significant compromise in planning the response to any real disaster or emergency. In order for emergency and other essential services to best meet community needs, the wireless system will be increasingly seen as a core operational service.

Globally, the requirement of public safety services has gained traction. In the United States the outcome was the issue of "D" band allocation and in the EU the issue of Public Protection and Disaster Relief spectrum is being discussed in various forums.

Alcatel-Lucent notes that there is a risk in not allocating spectrum. As new policing and emergency systems are developed in the United States and Europe and if Australia does not develop a matching spectrum plan, then Australia will not be in a position to take advantage of new systems as they develop. This would be in detriment to the public interest in a world where we are leveraging technology to provide high quality outcomes.

Question 3.30

Alcatel-Lucent recommends that similar spectrum amounts be considered for Australia as used in the United States and Europe. This is recommended so that technology can be adopted without modifications and also that services and applications can be developed in the same way.

Question 3.31

No comment given.

Question 3.32

The benefit to the community is a function of the services supplied in the field of public safety.

Some of these include:

- CCTV
- Telemetry (ambulance, vehicle)
- Two way mapping of incidents (search patterns, personnel locations etc)
- Safety (person down, night vision)
- Photo information (lost person, on-site info)

With the availability of broadband data in the field these services could be enhanced to the point where the availability of data sets is consistent between officers in the field and at the office.

Class-Licensed Use

Questions

3.33 How much spectrum are these devices likely to require in the future?

3.34 Will there be room in the broadcasting services bands, after digital switchover and restacking, to meet their future spectrum requirements?

3.35 Should separate UHF spectrum be reserved Australia-wide for use by these devices from the digital dividend spectrum? If so, how much?

3.36 When would this spectrum be required?

3.37 What would be the benefits of this use? Arguments should focus on the value this use of spectrum presents for the Australian community and economy.

ALU Response:

No comment provided

Impact of restacking on viewers

Questions

4.1 What issues will arise through viewers being required to rescan? Can receivers be developed that are able to automatically rescan?

4.2 In the small number of cases potentially affected, what is the likely cost for viewers associated with replacing their existing UHF antennas? It would be helpful if the cost per antenna and the likely total cost for all affected viewers could be identified.

ALU Response

No comment provided

Questions

4.4 What is required in the restacking process for broadcasters? Are there potential spectrum use implications? How much time is required for broadcasters to plan and implement transmissions at new frequencies?

4.5 How much is it likely to cost broadcasters to move digital television services to alternative frequencies, both in terms of the purchasing of new transmission equipment or the retuning of existing equipment? It would be helpful if best and worst case scenarios could be presented.

ALU Response

No comment provided

Questions

4.6 How would low-interference potential devices be best accommodated in the UHF bands in light of the proposed digital dividend and the restacking of digital broadcasting services?

4.7 Do these devices use specific frequencies within the UHF bands? Which frequencies do they use?

4.8 What costs would be involves for users to move frequencies?

4.9 Should one or more discrete frequency bands be set aside within the UHF bands for use by low-interference potential devices?

ALU Response

No comment provided

Conclusion

There are two inexorable consumer trends in the media communications industry: the personalisation of the delivery of content and the use of mobile devices. The digital dividend is a watershed opportunity to support this trend and maximise the values of spectrum for the future of Australian consumers.

In order for this to be as successful as possible it is important to follow these general principles:

- Ensure the benefits of coordinating the allocation of 2.5GHz and 700MHz spectrum to allow for optimal approach to available spectrum and propagation characteristics
- Maximise the alignment on allocation with other US and European jurisdictions to ensure that equipment can be used with little or no modification
- Allocate spectrum as early as possible (2011) to ensure we don't fall behind other markets with regard to the rollout of LTE
- Allocate spectrum to mobile operators in the maximum bandwidth practical to ensure the most efficient usage of this resource

Globally, the US market has already allocated significant chunks of spectrum to mobile broadband and the European Union is following closely. In Australia with our geographic size and relatively low population base, it is imperative that harmonisation of licenses and allowance for technology adoption be a core consideration for spectrum policy. This will ensure Australia maximises the economic value of this spectrum to business, government and commercial users.

Alcatel-Lucent thanks the department for this opportunity to have participated in the discussion of digital dividend spectrum considerations. We look forward to ongoing engagement with the department and other industry participants to meet the needs of the telecommunications industry.