



National Spectrum Planning with a Global Outlook

An interview with Andrew Kerans, Executive Manager for Spectrum Planning at the Australian Communications and Media Authority (ACMA)

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The conversion of broadcast television from analogue to the far-more-efficient digital format releases a 'Digital Dividend' of radio frequency spectrum that can be allocated to other wireless services, such as mobile broadband. Australia was the first country, in June 2010, to announce that it would allocate its Digital Dividend to the mobile sector, and Australia has been an influential advocate for releasing harmonised spectrum for mobile telecommunications ever since.



Since 1996, Andrew Kerans has worked for the Australian Communications and Media Authority (ACMA) — the regulatory body tasked with managing the country's spectrum, overseen by the Department of Broadband Communications and Digital Economy. Today, as executive manager for spectrum planning, Kerans leads a team of engineers whose work feeds into international bodies such as the Asia Pacific Telecommunity (APT) and the International Telecommunication Union (ITU).

It wasn't preordained that Australia's Digital Dividend spectrum would be allocated to mobile, was it?

Kerans: The ACMA attempts to have technology-neutral licensing. That said, when you design a band plan such as APT in the 700MHz Digital Dividend band, you have to base it on something. We based it on mobile Long-Term Evolution (LTE) and 3GPP standards. Those are technology-flexible, because if you work within the defined outer band limits, you can operate anything you like in there.

Why did Australia adopt the APT band plan for 700MHz?

Kerans: The US band plan isn't as efficient as we would like: You can't, for instance, get 2x20MHz, which is the optimal block of spectrum to maximise data throughput. According to Ericsson, with 2x20 blocks you can get up to four times the throughput

as with four disparate blocks of 5MHz. So that's a big difference. The band plan is based around US television channels, and that doesn't make sense for us. Also, the US plan doesn't support interoperability between operators.

The European band plan sits across a mobile system we've already got. Where people have a legacy CDMA system, for instance, they've tended to move to an HSPA or HSPA+ roll-out, and we have that in Australia. One of the biggest national networks, Telstra, is running an HSPA+ dual-channel system. And of course you can't just shut that down and move on to another technology. So the European band plan didn't fit us.

The Australian broadcast channels line up nicely with a lot of the countries in the Asia Pacific, so the Digital Dividend from 694–806MHz (up to 820MHz in Australia) fit quite well. And the Asia Pacific band plan allows for competition, allowing for 3x15MHz blocks or 2x20MHz plus 1x5MHz, so it's by far the best plan from that perspective, and by far the best plan in terms of the amount of usable spectrum it offers.

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How about the advantages of tapping a larger market represented by the APT band plan, thereby achieving potentially lower prices for consumer mobile devices?

Kerans: That argument was actually put to us in the beginning by some of our carriers as a reason to follow the US band plan. They said it was the quick-and-easy solution because the American market is huge. Our answer to that, of course, is that if you combine the Chinese, Indian and Indonesian markets alone, you’re talking billions of users.

For Australia, there are economies of scale to be realised in base equipment as well as handsets, and this is important because we are a taker of technology. Handset prices are less of an issue for our consumers, but we do have a strong international culture, and a culture of foreign aid. There’s now some talk about a \$20 or even \$10 smartphone, and giving developing markets access to that kind of technology will make a huge difference in people’s lives.

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Does ACMA or the government actively promote the APT band plan internationally?

Kerans: We are very active in this space. ACMA has recently been in Mexico and in Chile promoting the APT band plan at Latin American conferences. I’ve been to Indonesia twice now, presenting on the topic, and of course wherever we travel — Malaysia, Vietnam, India and elsewhere — we lobby very strongly in favour of the band plan. We’re strong on this because being able to roam with one’s smartphone is a key enabler of trade. We think the plan is the best and will be adopted in Regions 2 and 3 with the exception of the US and Canada.

The analogue television switch-off is scheduled for the end of 2013. What is involved in clearing the Digital Dividend spectrum?

Kerans: This is done by turning on the digital television channels and simulcasting with the analogue channels for a period of time, and then switching over fully, region by region. That began 18 months to two years ago and is still going on now. Gradually the analogue channels will be shut down. Once that is complete, we will do something called digital restacking, and that means fitting all the channels into the spectrum up to 694MHz. That is due to start soon and is to be finished by the end of 2013.

There has been a huge public campaign by the Australian government on the digital switchover — television, press, internet advertising — including some messaging on the value of the Digital Dividend to mobile services. But a lot of the focus is on the high value of digital services for television, increasing the number of channels people can get.

Australia is a vast country without land borders, and it has a relatively small population that is concentrated in a handful of large cities. How do these factors affect spectrum management?

Kerans: Our national anthem says ‘Our home is girt by sea’, which some people take to mean we can do our own thing and don’t have to share with anyone. That’s not entirely true. We do have some close neighbours such as Papua New Guinea and East Timor, as well as West Timor, which is part of Indonesia. So we have to coordinate some of our television stations with them. But we do not have the sharing challenges that our European counterparts have, and we don’t need bilateral or multilateral sharing agreements. However, with approximately 90% of Australians living in cities, we have some of the highest urban densities in the world, particularly in Sydney.

This combination of urban density and rural expanse factors strongly into our spectrum planning. For example, when you’re trying to cover these vast areas, getting as much sub-1GHz spectrum out there for mobile services is critical. Otherwise it’s simply too expensive to cover very low-population areas with high-frequency bands.

700MHz licences are to be auctioned to mobile operators in April. What are your objectives for that auction?

Kerans: Basically it's just to get the spectrum to market in the most economically efficient manner and, where possible, to enhance competition. We have a three-carrier model, which is pretty good for a country of 22 million.

How prominently does mobile figure in national broadband planning, especially given the development of the national broadband network (NBN)?

Kerans: At the moment, mobile is quite prominent, because in a lot of places the only means of accessing data is over a mobile network. If you are mobile or transient, then of course it is easier to tap into a mobile network than some of these wireless networks, such as a hotel Wi-Fi. I'm no expert on the NBN but it follows a multi-layered model, with the core being fibre, which will basically connect to the home. But I still think we'll see mobile phones and other mobile devices taking advantage of data offloading in the home. So there will be seamless integration there with the backhaul through fibre, and massive capability into the average home.

Beyond that, because Australia is very big, it's not economical to run fibre everywhere. So I do know that the NBN is looking at a wireless solution for the remote regional areas where there is, let's say, one house every 100km. And then when you get into the 'great areas of nothing', they're going to satellite delivery.

Few people find spectrum management to be a very thrilling topic, even if they understand what it means. How do you explain the importance of spectrum to them?

Kerans: We've worked out that the average person uses spectrum about 143 times a day, from the automatic car-door opener to the radio and mobile phone — even to the speeding ticket you get because a policeman tracked you with a radar gun. It may not be all that exciting, but today people could not live without radio spectrum, and managing it is getting harder and harder.

Contrary to your question, however, some people have been getting very excited about spectrum lately. Spectrum is becoming topical and it is getting into the news. Times have changed since I first started, when we wondered what we were going to do with all this spectrum. Now we have all these applications and wonder how on earth we're going to fit them in.

What spectrum challenges are on the horizon?

Kerans: Global roaming, particularly below 1GHz, is our next major struggle. We have the new Agenda Item 1.2 for WRC-15, otherwise known as the second Digital Dividend, in the Arab countries and Africa and probably also now in Europe, which will fit with some of the APT band plan. Many African countries are planning to adopt the APT band plan, which for the mass market of devices is brilliant. The same goes for Latin America.

Economies will grow if people can move freely with their communication devices, and that's a huge challenge for spectrum managers and particularly the ITU and the three regional groups. The only way we'll really, truly have a single global economy where everybody benefits is for these groups and their constituent countries to get together — actually work together, instead of coming up with their own plans.

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Securing the Digital Dividend for a Mobile Future

This is one of a series of interviews conducted by the GSM Association that aims to capture the experiences, insights and advice of industry regulators, government officials and others who have spearheaded the transition from analogue to digital television broadcasting, and released part of the surplus spectrum, known as the Digital Dividend, for mobile broadband.

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