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By Email: ian.hayne@market-dynamics.com.au

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Mr Peter Wardle
Executive Manager
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Dear Mr Wardle



PROPOSED APPARATUS LICENCE FEE – 26 GHz BANDS

Thank you for your email of 9 October 2020 in response to comments that I made by email on 8 October regarding the proposed apparatus licence fee for the 26 GHz Bands.

I am humbled by your assurance that you'll look more closely at the issues I raised.

My purpose in writing today is to provide deeper background to my comments and to extend my critique of the apparatus licence fee proposal to help inform your review.

I believe the approach taken by staff is methodologically flawed. I will detail why that is the case.

I also detail a better more robust methodology that yields a more defensible result.

The flawed methodology used by staff conjured-up a number (\$0.0003/MHz/pop). This fails the most basic "scratch-n-sniff" test.

I hope you will also appreciate the gravity and implications that the ACMA has now *explicitly* defined its market expectation for this band, and thus has likely doomed the allocation to failure.

Two questions arise in my mind:

- Why was such a flawed methodology used when there are robust methods available?
- Why did no one have the wit or wherewithal to test the result of that flawed methodology to see if the result is credible? Hint: it's not credible.

It should also have been obvious to staff that using a price/MHz/pop measure would immediately impute a baseline valuation for the entire band. Whatever were they thinking?

What has been delivered presents an absurd value in my opinion; that is an opinion informed by more than two decades doing this stuff around the world.

The bigger issue, though, is that it is politically naïve to present such a ridiculous value publicly when your Minister, the Hon Paul Fletcher MP, and former Prime Minister the Hon Malcolm Turnbull worked hard (with some advisory support from me) to expose the intellectual vacuity of doing exactly the same thing in respect of the first (failed) digital dividend auction. That is all on the public record.

I am dismayed by the absence of any political sensitivity to this.

I urge you to recant; do it publicly and do it quickly. I'll provide guidance on how to do it gracefully, below.

It would be sheer folly to leave your Minister so badly exposed to political criticism like this.

Please consider carefully what follows.

The very first thing that I did on receipt of your email outlining the proposal and seeking comment was to perform an extremely basic **credibility check**. I took the value proposed and multiplied it by the amount of spectrum on offer at 26 GHz (2,400 MHz) and the Australian population (25.5 million) and a 15-year term. It's simple multiplication. The math delivers what I see is a non-credible result.

Two hundred and seventy-five point four million dollars (\$275.4 million) is not, in my opinion, credible for this band.

What is worse is that ACMA has now let out "into the wild" a public benchmark for valuation that will likely deter at least one potential applicant that I know already finds this band to be a marginal proposition at best (and no, I am not engaged for this allocation and I act for no one but Australian taxpayers).

If that happens and demand collapses, then the ACMA will have replayed exactly the circumstances of the first (failed) digital dividend auction that your Minister (and I) railed against in the media at the time. My crystal ball predicts your future serving out days in Human Resource Branch, because all that commentary that Paul and Malcolm Turnbull and I made on unsustainable prices is on the national media public record.

Paul was a loud public critic of **inept** pricing directions by former Minister Conroy. Those unsustainable pricing directions did, in fact, lead to a market failure.

Were you not advised of this by staff?

I quoted to you in my email of 8 October 2020 some advice that I had previously provided to the Office of the Minister that cited allocation valuations for 26 -28 GHz bands licences from some of the more densely populated markets of Europe. These values are **way below** the number that staff have conjured and that has now been promulgated. Even these much lower valuations have already been questioned in the international tech media as to whether they are plausible and sustainable. Those valuations are but a **fraction** of the amount imputed by staff guesses.

I am compelled to enquire: why did not staff undertake reasonable **due diligence** before promulgating this number to you and then more widely? If you read my other submissions, you will see this is a recurring theme in my observations of the ACMA today, so mine is a fair question.

It should be apparent to the ACMA by now that 26 GHz is not an especially “valuable” band in the great scheme.

If you read the detail of my submission regarding the draft instruments for this allocation, you will have noted anecdotal reporting from a deployment in Japan that shows the challenges of making the band work. A Google search will yield other articles about the challenges being faced in other jurisdictions around the world. In-building penetration is “rubbish”. That’s well known, as are the reasons for it. Due to multi-pathing effects, the performance is reported to be problematic beyond about 150 metres range in urban settings. System links suffer a degree of rain attenuation. Sydney thunderstorms will see drop-outs like night follows day.

This is not an especially “valuable” band when compared with the bands already able to be deployed to 5G mobile telecommunications. I see other bands below 6 GHz as being far more valuable. The technical performance of 26 GHz for delivering *bandwidth* and supporting IoT is undisputed, but that comes at the cost of practical deployment issues rooted in poor propagation.

Further, as you are aware, there is pressure for technical conditions from the science community in Australia to constrain radiated power in the band. This sits in opposition to the needs of the telecommunications community.

Moving along ...

How can we move forward to resolve this for the benefit of all, and especially to avoid political embarrassment to the Minister?

You need to recant; very quickly – like today.

Firstly, it was methodologically flawed to use a price/MHz/pop valuation on the basis that you attested in your email to submitters; i.e. that the circumstances “ *...are similar to those for PMTS Class B licences that also use a \$/MHz/pop construct to determine the tax.*”

What a load of unmitigated hogwash!

The PMTS Class B is a **legacy** class of apparatus licence fee that goes back to the award of the original 900 MHz GSM licences to Telstra, Optus, and Vodafone. That’s why these licence fees are set for a fixed-dollar amount for the 900 MHz bands in the licence fee schedule. The awards pre-date the introduction of spectrum licensing in Australia. They were included in the old apparatus licence fee schedule because that was the only way that services like this were able to be licensed at the time.

The first spectrum licences for mobile telecommunications were not awarded until 1998. I managed that allocation.

Spectrum licences are awarded for *market* prices. The apparatus licence fee schedule may contain values for PMTS in certain bands on a \$/MHz/pop basis only if these bands have an established market valuation history in the context of spectrum licensing. Most deployments in those bands

will be within the spectrum licences, not as apparatus licences. It is reasonable to have an implied shadow-price from spectrum licence market values.

None of this holds true of 26 GHz.

It looks very much to me that staff looked at what was in the licence fee schedule without any depth of understanding of the history and context and had a brain-snap: “wow, that’s a great idea”. It seems they then simply invented a number without any underlying rationale. That’s very much how it appears to me.

Whatever; it is methodologically flawed. The flaw is amply demonstrated by the evidence of an implausible result which you have now inadvertently explicitly set as a valuation.

Doh!

You will be correct to ask of me how should it have been done?

Once upon a time, the SMA/ACA were held as exemplars of worlds’ best practice for rational spectrum pricing. It got to that point by drawing on several related intellectual traditions. Professor Martin Cave of Warwick University was hugely influential with his work on administrative incentive pricing for spectrum in the UK. Sir Roger Douglas from New Zealand was a champion for property-like rights in spectrum and private band management and for market-based allocation. In turn the US FCC adopted multi-object spectrum auctions for market-based allocation of scarce resources (which Cave and Douglas always argued should also be done). Our own Bureau of Transport and Communications Economics made substantial theoretical contributions. It was hugely influential.

I did some work (once upon a time) using data across a few countries that showed that the trend of spectrum values declines in a linear function of \log_{10} of frequency, to zero (0); i.e. there is no scarcity value at very high frequencies. This is a logical and practical observation noting that spectrum is planned on a logarithmic scale and it exists in abundance at higher frequencies. In my own work in Indonesia I had to nominally set a peppercorn “1” value at the 56 GHz breakpoint, because one cannot do division by zero. There is zero real scarcity up in the “big sky”.

The SMA/ACA Marketing Branch held the torch for these traditions for Australia. While I was recruited to focus on spectrum property rights and market-based allocation, the Spectrum Pricing Team seconded some bright officers from the Department of Finance to work together with radiofrequency spectrum “old hands” to rebuild a *rational* apparatus licence formula. That work survives to this day in the ACMA apparatus licence fee schedule. It was good work then. It remains good work today.

As an aside, when I was invited by agencies associated with the Department of Foreign Affairs and Trade to provide technical assistance in Indonesia, I took these same SMA/ACA intellectual traditions with me. As well as introducing spectrum auctions to Indonesia, I guided the deployment of “bandwidth licensing” approach using rational pricing based on the apparatus licence fee models developed here in Australia.

That work was so highly regarded that I was invited to become a member of the Minister’s personal staff. The work also came to the attention of the International Bank for Reconstruction and Development (IBRD) (the “World Bank”). IBRD commissioned me to take these ideas to assist the Royal Thai National Telecommunication Commission implement similar practices. I don’t claim

credit at all for developing the pricing theoretical work, but it was my delight to be able to implement it to make a lasting economic improvement in two of our regional neighbours.

So, why is the ACMA spurning this tradition of excellence in the field that its' predecessors developed by now reverting to conjuring-up unfounded and frankly silly numbers? Conjuring up silly numbers was the way that we used to do it *before* rational pricing reform.

The ACMA has an apparatus licence fee model based on sound methodology that holds good on the world stage to this day. Sensible numbers can be simply calculated using existing rational methods, rather than guesswork.

I used the ACMA Apparatus Licence Fee formula when I provided advice to the Office of the Minister about what an 800 MHz licence ought to be valued at if allocated under s.60(3) of the *Radiocommunications Act 1992*. I advocated this alternative method ought to be explored in my submission on the instruments, because the risk of failure of the proposed 26 GHz auction allocation is already so high. I set out in detail the reasons for this in those submissions. ACMA has just multiplied that risk of failure.

Let me now please guide you through the math of ACMA's licence fee formula, as I applied it.

The formula is the "Assigned Licence Tax Formula" at Appendix C on page 38 available at <https://www.acma.gov.au/sites/default/files/2020-06/Apparatus%20licence%20fee%20schedule.pdf>.

The formula provides a price per annum for different bands in different regional contexts.

The *normalisation constant* (for all bands) is 0.282945587979177. This constant appears in the formula to allow easy scaling for CPI adjustments. This is world's best practice.

Since we are working at the level of 1 MHz units, the bandwidth I use in the formula is 1000, because the reference base is **kHz**.

I am using a power factor of 1 in the formula, although for this band, I could probably be justified in using the "low power" setting of 0.1 although I note that this will simply deliver a number that is one tenth as large.

The location weighting for the 26 GHz bands for an Australia-wide licence is 3.7110. (i.e. my calculations are based on 1 MHz deployed Australia-wide).

The adjustment factor that I am using is 1. I could perhaps be justified in using 0.436933 (making the result lower) by using the adjustment for point-to-multipoint licences above 960 MHz, but let's leave it at 1. It advances your case rather than mine.

The formula is resolved by simple multiplication. The result is \$1,050.01/MHz Australia-wide *per annum*.

If 2,400 **MHz** is available in the 26 GHz bands, this sets a price of \$2,520,026.59 *per annum* for the whole band. Without doing a full nett present value calculation over 15 years (which seems a bit pointless in the current economic climate) I think that it is acceptable to do a straight linear extrapolation to **\$37.8 million** for the band for 15 years.

Presented right there for you is a completely plausible value using apparatus licence fee parameters that values the bands in a way that is broadly consistent for order of magnitude with recently published international benchmark results.

\$275.4 million, by comparison, looks “courageous”, “silly” – indeed “amateurish”.

Finally, I undertook to guide you on how to extricate the ACMA from the mess that it has created for itself by publishing what is a serious political *faux pas*.

Reach out to respondents, **today** (*i.e. do not “piss about” with this*). Advise that you have been alerted to an issue with the methodology used to generate the value of \$0.0003/MHz/pop, and that on consideration of expert advice it would be better to revert to the tried and tested apparatus licence fee formula for apparatus licence fees. This will deliver a defensible number. Moreover, it will disconnect from imputing a market valuation for the band.

You can thank me, too, for that will be very welcome and will be graciously received.

You should provide guidance to submitters about the parameters to be used, as I have. Note also to submitters that these are defensible values that are being used as the apparatus licence fee formula was always intended to be used for apparatus licences.

You will then be free to indicate a new value/MHz/pop/annum for apparatus licences which will not adversely affect the marketing prospects of this band any more than has already been done. For the record, the value is \$4.11769E-05/MHz/pop/annum, although you can calculate it yourself with ease. This resolves to a practical, defensible, and sensible value for any apparatus licence that is issued at 26 GHz.

I look forward to your prompt withdrawal from public consultation of the \$0.0003/MHz/pop value proposal today.

Please be aware that I routinely publish submissions like this to my own website <https://www.market-dynamics.com.au/Company/Pages/Publications.aspx> so that they are readily accessible to politics, industry and the media.

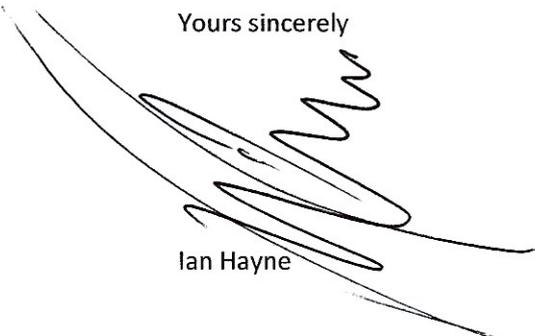
The version that I publish may include some redactions to account for political sensitivities, for I have no desire at all to embarrass the Minister. Rather, I want to see him preside over a successful auction. Alas, the risk of that being spoiled by flaws in the E-SMR allocation system always remains. We can talk about that any other time.

As is my usual practice, I am copying this to the Office of the Minister.

I am delighted to remain at your service to provide any further clarification required.

My best regards and

Yours sincerely



Ian Hayne