

Australian Communications and Media Authority
Implementation of the Spectrum Pricing Review
(Consultation 07/2020)

Submission:
Capricorn Space Pty Ltd
20 June 2020

Capricorn Space Submission to the ACMA Spectrum Pricing Review – Consultation 07/2020

Thank you for the opportunity to comment on the Review of Spectrum Pricing (Consultation 07/2020). As an active member of the Australian space community, Capricorn Space is directly impacted by the current pricing structure and whilst many aspects are deemed appropriate, a number of changes are required in order for Australia to become a true and dominant player in the global NewSpace market.

There can be no mistake that the cost of ACMA licences, especially for large bandwidth emissions, represents a barrier to entry for many satellite constellation operators, especially those trying to establish themselves within the NewSpace market. Quite simply, these organisations do not have the thousands to tens-of-thousands of dollars to spend on Australia-only licences each year. As demonstrated, they will simply avoid licencing in this country and approach a neighbouring country where they will get a “better deal”.

Unfortunately, this issue is compounded by the fact that the licencing costs cannot be defrayed over multiple clients as the current ACMA rules require each constellation to be individually licenced despite the fact the same spectrum is being used and with quasi identical power spectral density envelopes. This requirement *must* change if Australia is to be taken seriously within the international space market and the Australian Space Agency is to achieve its goal of tripling the domestic space economy within the decade. A recommendation for addressing this issue is offered below in response to Question 7.

Issues For Comment

Question 1

Do stakeholders have any views about the status of the ACMA's role in implementing the recommendations of the Spectrum Pricing Review?

Question 2

Do stakeholders have any views on the legislative and policy environment that may be relevant to the pricing issues outlined in this paper?

Question 3

Do stakeholders have comments on the ACMA's draft spectrum pricing guidelines including the relevant spectrum pricing decisions, guiding principles and process for changing prices?

Q3 Response & Submission

The Spectrum Management decision framework has worked for a number of years and as a structure is still fundamentally sound as the core categories of Environment, Considerations, Organisational Priorities and delivering Outcomes are equally relevant today. Of these categories it is the author's recommendation that the scope of Consideration be expanded to reflect the fundamental changes which have occurred within the marketplace over the past decade.

The concept that industry changes are incremental or limited to purely advances in technology (e.g. progressive upgrades to the next generation cellular service) is no longer valid and instead it is the commercial framework that is changing at the greatest pace. On this basis, greater attention should be given to positioning Australia to best align itself with worldwide trends so it can be at the forefront of capturing new and emerging markets.

This represents an opportunity for Australia to lead the world in accommodating NewSpace business as industry will naturally gravitate towards countries which are seen as "enablers" rather than "blockers". This shop-around mentality is widespread within the NewSpace industry as whilst there are many impressive technological firsts associated with SmallSats, CubeSats and the like, the absolute reality is that their decision on which country to land traffic is driven by the ease of securing licences and associated licence costs. If Australia is to capitalise on this market opportunity and truly become a major global player, it must provide an attractive alternative to not just neighbouring countries but also at a global level. In many ways there is just one chance to get this right as agreements and investments, once established, are often locked in for the life of the satellite program.

Question 4

Does the tax formula generally provide a solid base for incentivising the efficient use of spectrum?

Q4 Response & Submission

There is a strong view within the consultation paper that ACMA licencing taxation is inherently connected with the efficient use of the spectrum. Whilst this is an honourable intention and one which the industry as a whole supports, the reality is ACMA licence holders are consumers of RF technology (for which spectrum is required) and not designers of RF systems (for which spectral efficiency is a factor).

At the theoretical level, all users of the radio frequency spectrum are bound by Shannon's Law which states that data throughput is intrinsically related to signal bandwidth – the greater the data rate, the higher the required RF bandwidth. This relationship is compounded for many satellites services as RF power for closing space-to-ground links is often limited and uncertainty in atmospheric effects, especially for NGSO satellites, forces systems to use low order modulation and coding schemes. All this means is that spectral efficiency is invariably sacrificed for link reliability and as data rates increase so too does the demand for RF spectrum.

It is therefore inappropriate to establish spectral efficiency as a principal consideration for determining ACMA taxation rates, especially when viewing high data rate satellite based services.

Question 5

Do stakeholders have views on:

- > prioritising the features of the tax formula and other taxes by considering different focus areas
- > the criteria for prioritising the focus areas
- > other matters or focus areas that should be considered as part of the ACMA's work program.

Question 6

What are the relevant price points to undertake an opportunity cost analysis of taxes for services above 5 GHz? Examples of relevant information may include:

- > how prices for products and services have changed over time
- > how prices of radiocommunications equipment have changed over time relative to spectrum prices
- > comparisons with international auctions results or administrative spectrum prices.

Question 7

How can taxes be designed to account for multiple devices? Under what circumstances do stakeholders believe that one tax should relate to many devices and/or there should be 'discounts' for multiple devices authorised under one licence?

Q7 Response & Submission

As stated in Capricorn Space's submission to ACMA Consultation 38-2019, the greatest change in the earth station market has been the movement away from the traditional model of satellite operators installing and operating their own segment (effectively one ground segment solution to one satellite system) to Ground Segment as a Service whereby a single ground station operator communicates with multiple satellites across multiple satellite operators with multiple constellations using a variety of orbit types (LEO, MEO, GEO and in the near future cis-lunar and deep space).

Under the current commercial framework, ground segment operators in Australia must pay to access the radio frequency spectrum for each unique satellite constellation they wish to support. For example, a ground segment operator wanting to support some 10 clients in say the X-Band downlink Earth Observation spectrum must pay 10 times to use the same spectrum despite the fact the Power Spectral Density (PSD) levels of the signals are inherently identical. This is akin to a commercial television broadcaster paying one licence fee for the news, another for current affairs, another to broadcast a movie, etc. It is the same satellite downlink spectrum and the same PSD envelope. An

identical process exists in the uplink direction whereby the same spectrum licence needs to be procured multiple times to access the same frequency band segment, however, the author acknowledges that ground station emissions do require greater scrutiny.

This current framework is having a profound and dire impact on Australia's ability to compete internationally for NewSpace business and the author wishes to table the following quotation received from a prospective client who operates a major constellation of SmallSat satellites:

"Thanks for the explanations of the timing and annual cycles. Also, understood about the multiple constellations, although I'm not thrilled. (Not thrilled at ACMA, not you. Not shooting the messenger.) We'll have to think about it, but we may not license our XXX constellation. Too few satellites to be worth the fees".

This is a prime example of where we – Australia – lost business to another country because of the punitive fee structure associated with securing licences in this country. Unfortunately, this viewpoint has been expressed by multiple prospective clients.

The matter in our opinion is simple: yes, Australia should have a framework for recording and licencing emissions associated with constellations that are served through Australian based ground segment infrastructure but it should consider both the technical and commercial realities, namely that PSD levels are fundamentally consistent across multiple satellite constellations and that licencing taxation levels should not be applied repeatedly for accessing the same bandwidth.

To overcome this significant commercial barrier it is proposed that a sensible and pragmatic procedure be adopted, one which serves the ACMA's ability to manage and record all users of the RF spectrum within Australia and one which serves to grow the space industry in this country.

Specifically, it is highly encouraged that the tax per MHz (or kHz) take into consideration the reality that the very same spectrum is being applied to the same level for each satellite system it supports. To achieve this outcome it is proposed that the tax rate be applied on the basis of \$/MHz/Teleport. This would ensure that access to the spectrum is recorded and appropriated taxed. Additionally, the author considers it appropriate for the ACMA to require the teleport operator to licence all constellations utilising the teleport, however, that this incur an administrative related fee only.

Question 8

While the current low power discount provides for a significant reduction in taxes of 90 per cent, the ACMA is interested in considering further incentives to promote the greater sharing of spectrum.

Do the lower potential denial areas of different services provide a case for considering different or additional low power discounts? In responding, please provide:

- > examples of these services and the denial characteristics of these services
- > the information that may be required for the ACMA to be able to apply a discount
- > views on whether such approaches can be applied across different licence types and bands.

Question 9

Do stakeholders have comments on:

- > the proposal to monitor bands for potential changes in taxes and the balance and precision required in monitoring and pricing spectrum?
- > the use of inflation to keep apparatus licence taxes contemporary and whether there are alternative approaches?

Question 10

Do current spectrum locations or frequency ranges remain appropriate? If not, what changes should be made and why?

Question 11

What factors should the ACMA consider in determining new spectrum locations or frequency ranges?

Question 12

Do the different tax rates associated with different spectrum locations or frequency ranges influence decisions about deploying radiocommunications equipment?

Q12 Response & Submission

Whilst not a tax rate issue per se, the ACMA location weighting table strongly encourages satellite ground station operators to establish their capability outside of high density regions, typically in either low density or remote regions of the country. Indeed Embargo 49 is a prime example of the ACMA encouraging ground station operators to avoid metropolitan and high density regions and this region in mid-west Western Australia offers several benefits including negligible terrestrial interference, access to large areas of land and provides a clear pathway for securing licenses.

The issue this pseudo directive creates, however, is that outside of metropolitan and high density areas there is virtually no core infrastructure and if existent is both highly costly and often unreliable. A vital component in attracting clients to utilising a satellite teleport is its ability to provide “high-nines” availability (e.g. 99.99% of any given month or less than 10 seconds average downtime per day) for which clean reliable power and diverse high speed fibre optic communications are essential. Also, there is a need to have access to skilled technical personnel and favourable proximity to a regional airport. All of these drive costs which instantly creates a fundamental barrier to attracting clients, many of whom are themselves limited for funds.

Given that it is ACMA procedure to encourage the establishment of satellite ground stations away from metropolitan regions, it is essential that the Government address this issue of ensuring cost-effective high-quality infrastructure be available to low density and remote regions, especially when associated with an existing or future ACMA declared satellite park.

Question 13

How does the value of spectrum change across geographic locations?

Question 14

The ACMA also seeks views from stakeholders about:

- > should density areas be refined for different services/bands?

- > rather than having density areas, do models of congestion (like that used in the 400 MHz work) potentially better reflect demand for services and the value of spectrum? If so, what features would such a model have?
- > whether different pricing constructs, such as \$/MHz/Pop for different licence types should be considered?
- > whether there should be parity in pricing arrangements between services like commercial broadcasting taxes and open narrowcasting taxes?
- > whether there are other services where the ACMA should be considering providing greater parity in pricing?

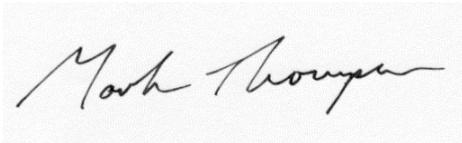
Question 15

Do stakeholders have views on:

- > the current pricing arrangements for scientific-assigned licences for new technologies?
- > the proposal for new short-term scientific-assigned licence trials and alternative pricing proposals?

Question 16

Do these proposals promote transparency and ease in calculating taxes?



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