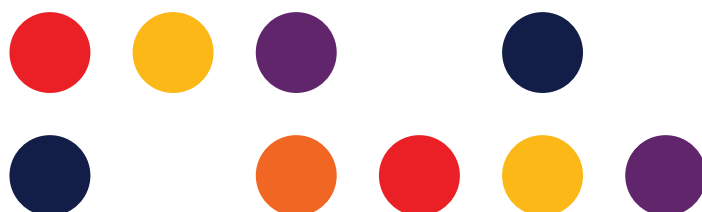


Expiring Spectrum Licences Stage 4

TPG Telecom submission to ACMA

February 2026

Public submission



Submission

*This submission is made in response to the materials released by the ACMA in its stage 4 consultation for expiring spectrum licences, published in December 2025. Specifically, the updated preliminary views on pricing consultation paper (the **Pricing Paper**). A separate submission is made in response to the renewal application and decision-making process consultation paper (the **Process Paper**).*

Introduction

TPG Telecom (**TPG**) welcomes the ACMA's preferred position to renew the expiring spectrum licences (**ESLs**).

This TPG submission focusses on the need for broad reductions to renewal prices to support a sustainable, competitive and resilient mobile industry. The ACMA's price proposal does not promote the object of the *Radiocommunications Act 1992* (**RadComms Act**) and does not promote the policy objectives in the Ministerial Policy Statement (**MPS**).

The ACMA should reduce the price of licence renewals to minimise structural risks to the industry. Alternatively, the ACMA could make the lump-sum upfront cost of renewal zero and instead impose annual licence taxes indexed to licensees' service revenue, like many European countries. This would be a superior approach than the current proposal and promotes the long-term public interest.

The ACMA has made a number of methodological adjustments between stage 3 and stage 4, which individually and collectively inflated renewal prices. We urge the ACMA to reconsider those changes.

TPG has commissioned a report by Analysys Mason (attached to this submission) to assess the ACMA's Stage 4 pricing proposal.

At a high level, Analysys Mason recommends:

- use MSR index;
- use spot foreign exchange rate;
- remove obvious outlier data points, and
- include 3.4 GHz in the upper 1-3 GHz grouping.

TPG believes a more defensible benchmarking process would produce significantly lower unit

prices (\$/MHz/pop), as set out below:

Band	ACMA Stage 4 proposal	All adjustments (1-4) together	1: CPI to MSR only	2: PPP to spot only	3: Excluding 3.4GHz outliers only	4: Combining 3.4GHz and upper 1-3GHz only
700MHz	0.7405	0.3258	0.5039	0.4789	0.7405	0.7405
850MHz	0.7558	0.3428	0.5301	0.4887	0.7558	0.7558
1800MHz	0.3030	0.1835	0.1870	0.2997	0.3030	0.3030
2000MHz	0.2757	0.1533	0.1562	0.2727	0.2757	0.2757
2.3GHz	0.1596	0.0526	0.0870	0.0968	0.1596	0.1746
2.5GHz	0.1621	0.0543	0.0898	0.0983	0.1621	0.1773
3.5GHz	0.2052	0.0517	0.1212	0.1281	0.1569	0.1731

Proposed licence fees will lead to poor market outcomes

The ACMA's preferred renewal prices will reduce TPG's ability to invest in infrastructure projects. This will lead to worse consumer outcomes across the Australian telecommunications market.

[c-i-c begins]

[c-i-c ends]

TPG is unaware of any examples of regulatory decisions made by comparable jurisdictions that forced operators to significantly scale down network investments. The ACMA's ESL cost proposal will force that outcome in Australia.

Spectrum has no inherent value – it is only valuable when combined with network infrastructure. The ACMA's pricing proposal risks spectrum being underutilised due to lower investment in new towers and delivering lower benefits to Australian consumers.

Comparison of spectrum cost impacts

TPG has previously presented data to the ACMA comparing the return on invested capital (**ROIC**) achieved by the three MNOs. That data showed TPG and Optus have ROIC well below the ACMA's 8.49% estimated industry post-tax WACC for a sustained period of time, while only Telstra is achieving ROIC just above it recently.¹ This strongly suggests that Telstra

¹ Telstra announced it achieved 8.8% ROIC in its financial results for the half-year ended 31 December 2025.

is operating at efficient scale while TPG and Optus are operating well below efficient scale.

It indicates strongly the Australia market is unable to support multiple sets of duplicate infrastructure at the rate capacity demands and input costs (including spectrum renewal costs) are increasing. There is significant uncertainty about whether future incremental network investments can be economically made under the existing market structures. Excessively high spectrum prices will multiply those risks.

To complement the assessment in the previous section of this submission, TPG also compared total spectrum costs (being ESL and non-ESL spectrum) to assess how spectrum costs impact the three MNOs.

Figure 3. Spectrum cost ratios by carrier, TPG analysis based on public information

Total spectrum costs as a percentage of market capitalization*:



Time to pay off, assuming average FY24-25 EBIT:



Figure 3 above shows two metrics:

- Firstly, the percentage of spectrum costs (all ESL and non-ESL spectrum costs) compared to each MNO's market capitalisation.
- Secondly, how many years it would take an MNO to pay off its total spectrum cost assuming all of its annual Earnings Before Interest and Taxes² (EBIT) is spent on existing spectrum costs.³ To make the calculation simple but representative, we have not made any further adjustments or forecasts about future performance.

The first metric is straightforward to understand. The key insight is it is difficult for TPG to justify and rationalise spending 30% of market capitalisation on spectrum when the incumbent operator's proportionate spend is only 8%. This suggests that smaller MNOs are currently

² EBIT is preferred for this view over EBITDA as to not hide the cost of past investments. This provides a better proxy to consider the capacity of operators to pay for lumpy capital investments in the future. EBITDA is not preferable for this assessment as it assumes past investments are sunk and assumes nothing about future investment needs; ie, past investments are paid for by someone else, and no incremental future investments are needed.

³ MNOs have recently announced half-year results. We have relied on previous years' full-year results to keep the comparison factual without needing to rely on projections for the current full-year.

operating below efficient scale relative to significant input costs like spectrum licences.

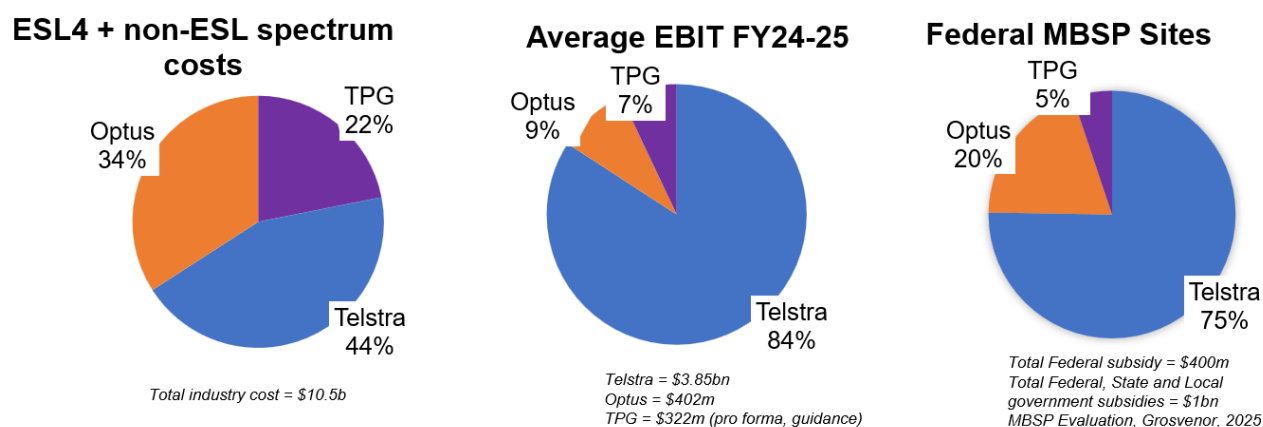
The second metric is more revealing of the growing structural problems facing the industry. It takes Telstra 1.2 years of EBIT to pay for all of its spectrum costs, while it takes competitors 7 to 9 years of earnings to pay for their spectrum costs. This suggests that both TPG and Optus have incurred spectrum access costs above what the market can efficiently sustain, especially once we start to make assumptions about the incremental costs of future network investment needs. As we explained in the section above, the high ESL spectrum costs will crowd out other investments.

Lopsided impacts

The asymmetric impact of ESL spectrum costs will further entrench the inherent structural and competitive issues that exist in parts of the Australian telecoms market. To that end, the ACCC has acknowledged Telstra has enduring structural advantages.⁴ These advantages are not available to competing MNOs, which compounds the problems introduced by large ESL costs. Smaller MNOs will find it particularly difficult to absorb ESL costs and still maintain capacity to invest in future network infrastructure at a level that supports growing user demands. This also supports the ACCC's and the ACMA's assessment there is no realistic prospect of a new market entrant.

Figure 4 below shows the structural problems in three charts. The left pie chart shows the more even spread between the three MNOs in spectrum costs. The middle pie chart shows the split of industry EBIT where Telstra captures 84%. The right-side pie chart shows the lopsided public subsidies, where 75% is provided to Telstra. These subsidies have a direct impact on competitive dynamics as coverage is a key competitive metric in the mobile market.

Figure 4. Spectrum costs, EBIT and MBSP subsidies by MNO



This structure, where costs are spread much more evenly across MNOs, but profits and public

⁴ ACCC, 'Reasons for Determination, Application for merger authorisation lodged by Telstra and TPG', December 2022, page 42-43.

subsidies are largely captured by the incumbent, is fundamentally anticompetitive and will lead to worsening competition and consumer outcomes.

Future usage demand requirements may not be met as spectrum costs crowd out other network investments. Smaller MNOs may not meet those demands due to lack of financial capacity, while Telstra would not meet them because there is no competitive need.

Future capacity demands may not be met

There is anticipated need to make significant investments later this decade for the 6G upgrade cycle due to usage demands. It is also anticipated a fresh injection of spectrum, specifically in the Upper 6 GHz band, will be needed to meet forecast user demands. These incremental investments may not be made, or will be significantly descope and delayed, if ESL renewal costs crowd them out.

For TPG, [c-i-c begins] [c-i-c ends]

The impact of ESL fees

The consequence of the ACMA's ESL pricing decision for MNOs, particularly smaller MNOs, is very negative. It compounds the existing structural issues in the market and will accelerate structural changes.

The mobile industry in Australia has been uniquely successful. The natural challenges of geography and population density have led to effective duopolies in other retail markets like groceries and airlines, or state-based monopolies like electricity and transport markets. Even in telecoms, the NBN is effectively a monopoly network provider in the fixed market.

In contrast, there are currently three national mobile carriers with three sets of infrastructure and physical shopfronts across the country that provide the Australian public a 'full service' offering. This has led to lower prices and improved services for consumers. However, the costs of providing the enormous amount of consumer surplus are unsustainable.

TPG maintains its previous call on the ACMA to implement a renewal price that supports investment, competition and innovation. We believe renewed spectrum licences should be taxed according to associated service revenue like all other industry levies and taxes.

Analysys Mason report

TPG has commissioned an Analysys Mason report to assess the ACMA's stage 4 proposals. A copy of that report is attached to this submission.

TPG agrees with the Analysys Mason assessment. We believe the recommendations made are reasonable and urge the ACMA to adopt them.

TPG believes a more defensible benchmarking process would produce significantly lower results, as set out in the table below. For detailed explanation of the proposed changes please see the attached Analysys Mason report.

Band	ACMA Stage 4 proposal	All adjustments (1-4) together	1: CPI to MSR only	2: PPP to spot only	3: Excluding 3.4GHz outliers only	4: Combining 3.4GHz and upper 1-3GHz only
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3.4 GHz should cost no more than 2.3 GHz

While we do not wish to repeat the matters covered in the Analysys Mason report, TPG will highlight one matter of concern.

TPG reiterates its previous submission regarding 2.3 GHz and 3.4 GHz comparability. TPG maintains the 3.4 GHz pricing should be no higher than 2.3 GHz pricing and make the following additional comments.

Although TPG supports the re-pricing of the relative pricing between 2.3 GHz and 3.4 GHz, TPG remains significantly concerned that the 3.4 GHz renewal price is still approximately 34% more expensive than the technically superior 2.3 GHz spectrum. The renewal price for 3.4 GHz spectrum should not be higher than 2.3 GHz spectrum, and both benchmark prices should be significantly lower than what the ACMA has proposed.

We note the ACMA's DotEcon report did not address the characteristics of 2.3 GHz and instead glossed-over the fact the 2.3 GHz band in Australia exhibits all the technical capabilities of the 3.4 GHz band, including being a 5G band, offering large – 100 MHz – contiguous bandwidth, and superior coverage over 3.4 GHz (all else being equal). DotEcon's justification for differentiating 3.4 GHz spectrum applies equally to 2.3 GHz spectrum in Australia. We do not believe DotEcon's surface level analysis is defensible.

TPG furthermore found DotEcon's justification for retaining US and Canadian benchmarks in the dataset unsatisfactory. For example, Canada set a world record for C Band spectrum pricing in its 2021 auction, with valuations double those of US C Band auctions, and 17.4

times the sample median price of the ACMA's benchmarks.^{5,6} Numerous structural features contributed to this result, including making only 125 MHz available per market, and large set-asides for 40% of available spectrum for non-national carriers. This meant the amount of available spectrum for national MNOs was artificially constrained, predictably inflating prices as a result. There are no reasonable justifications for retaining these clear outliers other than the ACMA wishes to keep pricing inflated.

Finally, DotEcon's further analysis on this cohort set showed there is actually no statistical rationale for excluding the 3.4 GHz band from the Upper 1-3 GHz cohort. Indeed, Analysys Mason found the difference between Upper 1-3 GHz and 3.4 GHz is smaller than the difference between 600/700 MHz and 800/900 MHz. Under the ACMA's logic, there is more justification to unbundle the low band grouping than there is for keeping the 3.4 GHz separate from the Upper 1-3 GHz grouping from a statistical perspective.

In such a case, the technical comparability of spectrum bands should be the only consideration in terms of spectrum band groupings. The ACMA would be acting irrationally to decide otherwise.

Flaws in the ACMA's process

In this section of our submission, we engage with matters that may have fundamental impact on the ACMA's overall approach and its proper exercise of power.

Throughout the many rounds of consultation, TPG had to engage with the materials before it. That should not be taken as acceptance of any fundamental errors that may have occurred.

Due process

TPG's previous submissions argued that the risk of setting renewal prices too high would be less network infrastructure, less competition and less innovation. These outcomes would be inconsistent with the Radcomms Act and Government's policy objectives as outlined in the MPS. The ACMA has not engaged properly with these relevant matters.

Relevantly, the ACMA stated in the Pricing Paper that it has sought advice on the capacity of licensees to pay for spectrum licence renewals to understand the implications of its pricing decisions, and whether its decisions align with the ESL policy objectives.⁷ However, the ACMA has not published that advice(s), nor explained how it has incorporated that advice(s) into its decision making.

⁵ LYA Consulting, 'Canada Sets World Record for Prices of Mid-Band Spectrum Licenses', August 2021, <https://lya.com/wp-content/uploads/2021/08/LYA-Canada-3500-Auction-July-2021.pdf>.

⁶ See attached Analysys Mason report, 'Expiring spectrum licences in Australia', page 13.

⁷ Pricing Paper, page 26.

The ACMA did not consult with licensees in the course of obtaining that advice and licensees did not have an opportunity to test the assumptions and facts underpinning the advice(s) sought by the ACMA. Licensees should have been consulted and given an opportunity to provide comment given they are best placed to provide input on their financial capacity to pay and any relevant consequences.

The ACMA has also sought advice from Plum Consulting, Ian Martin Advisory and Frontier Economics. Further, the ACMA has engaged DotEcon to conduct a peer review of the methodology and preliminary price ranges and to evaluate stakeholder feedback received. While the ACMA has published DotEcon's report, we are unable to locate public copies of the advice provided by Plum Consulting, Ian Martin Advisory and Frontier Economics.

Given those reports are not public, stakeholders did not have the opportunity to provide input, and the ACMA has not explained in detail how it has incorporated those reports into its considerations. It is unclear whether the ACMA considered all reasonable and relevant considerations in determining renewal prices.

TPG is concerned that, without proper disclosure of this information, TPG and the public is unable to determine if the ACMA has conducted a fair and transparent process.

Benchmarking methodology lacks sufficient connection to the Radcomms Act

It is unclear how much regard the ACMA had to the Radcomms Act when pricing the ESL spectrum licences.

First, we note the ACMA claims "market pricing encourages the efficient use of a public resource, supports competition, investment and innovation"⁸, however the ACMA has provided limited explanation on how those objectives would be achieved in Australia by pricing ESL spectrum using an international benchmarking methodology.

The ACMA claims its proposed prices reflect the *market value* of spectrum access however the ACMA has not undertaken an economic assessment of Australian market conditions nor an economic assessment of operators in the Australian market. Even if the ACMA can demonstrate a "market value" promotes investment, competition and innovation, the ACMA cannot credibly claim its method is suitable to determine what that market value is in Australia.

At its core, the ACMA's proposed prices are simply an ACMA-adjusted average price of global auction outcomes priced in Australian dollars. This says nothing about the market value of spectrum in Australia, or how it would promote investments, competition and innovate.

Second, we do not believe the ACMA can demonstrate its proposed prices support

⁸ See ACMA, Pricing Paper, December 2025, page 1.

competition, investment and innovation because its proposal will likely result in the opposite outcome.

The ACMA's decision making powers are governed by its consideration of the long-term public interest derived from the use of the spectrum. This is a broader concept and encapsulates considerations that cannot be distilled into commercial ideas of 'market value' and 'price'.

We do not believe the ACMA's international benchmarking exercise can substitute the legal and policy objectives the ACMA is required to promote. In the current situation, instead of asking what renewal price would maximise the public benefit derived from the use of spectrum, the ACMA has decided to ask: what is the average global auction price for spectrum access in Australian dollars (based on adjustments by the ACMA). Those are fundamentally different tasks.

To promote the policy objectives in the MPS and the object of the Radcomms Act, a reasonable assessment should have regard to also the ongoing and future costs associated with *increasing the utilisation* of that spectrum. Without having regard to that, it is impossible for the ACMA to form a view on whether investments, competition or innovation will increase.

To be clear, TPG supports licence renewals and believe the ACMA has appropriately explained in its proposal why such an outcome would promote investment, competition and innovation by providing certainty for live services to continue. TPG's consistent contention is that the ACMA price methodology, and many micro decisions failed to consider the objectives in the MPS and fails to promote the object of the RadComms Act.

ACMA has benchmarked the wrong data set

We cannot find any reasonable justification for the ACMA to exclude renewal price points in its benchmarking exercise to find a reasonable price for licence renewals in Australia. Generally speaking, a benchmarking exercise seeks to sample outcomes in similar processes, not explicitly exclude them. In this case, it would be more reasonable and defeasible for the ACMA to exclude all auction results and only include renewal results in its sample data set.

In fact, if the ACMA benchmarks licence renewal cases in other jurisdictions, it would realise its approach is an outlier.

In other jurisdictions like France, spectrum was renewed at no additional costs to the French MNOs, and the only charges levied are annual taxes of 1% of revenues generated by the use of the spectrum plus a small per-MHz fee.⁹ In exchange, the French MNOs signed up to explicit network infrastructure build out requirements that guarantees an outcome that

⁹ See <https://www.legifrance.gouv.fr/loda/id/LEGIARTI000037447798/2018-10-01>, see Chapter III.

maximises the value derived from the use of the spectrum.

TPG highlighted the French example (and others) in Stage 2 consultations as one the ACMA should consider seriously. This is because adopting a similar framework would maximise all the objectives in the Minister's Policy Statement and promote the objects of the RadComms Act.

In contrast, the ACMA's proposed pricing structure would reduce MNOs' capacity to invest, reduce competition, and reduce the capacity for innovation, ultimately resulting in a less efficient use of spectrum.



Report for TPG Telecom Limited

Expiring spectrum licences in Australia: ACMA's Stage 4 pricing approach

Mark Colville, Shahan Osman, Preet Sidhu

25 February 2026

Ref: 8884808719-71

Contents

1	Summary	3
2	The ACMA's latest approach continues to overestimate market price, and pricing outcomes distort the relative price of substitutable bands	5
2.1	Inflating spectrum prices using CPI indexation will significantly overstate market price, and the ACMA should, at a minimum, revert to its previous use of MSR-based indexation	5
2.2	The ACMA's rationale for using PPP instead of spot exchange rates does not hold, ignores stakeholder feedback, and unjustifiably inflates prices for most band groups	10
2.3	The benchmark sample for the 3.4GHz band contains several large outliers that artificially inflate the price of this band	11
2.4	The continued separation of the 3.4GHz band from the upper 1–3GHz band group is inconsistent with technical realities and the treatment of other bands in this process	13
3	Proposed adjustments reduce the total ESL spectrum renewal price from AUD7.3 billion to AUD3.1 billion	17

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1 Summary

This report, commissioned by TPG Telecom Limited (TPG), sets out Analysys Mason's views on the updated spectrum pricing approach proposed within the Australian Communication and Media Authority's (ACMA) Stage 4 consultation on expiring spectrum licences (ESL) in Australia. It is the third report that Analysys Mason has produced on behalf of TPG relating to this consultation process.

The ACMA's previous (Stage 3) proposals implied a total renewal price for the ESLs of AUD5.0–6.2 billion. This outcome was well above what we would deem a fair assessment of market price and arose because of several flaws identified in the ACMA's methodology, which were highlighted by a number of stakeholders, including TPG and the other mobile spectrum licensees.

The ACMA's Stage 4 proposals should have corrected these errors, resulting in a reduction in the cost of renewal of the ESLs. Instead, following a peer review of its pricing methodology undertaken by DotEcon, an economic consultancy, the ACMA has chosen to introduce a number of changes that have the net effect of further increasing the licence renewal cost to a total of AUD7.3 billion.¹ Furthermore, although the Stage 4 proposals improve on the relativities between the pricing of the 3.4GHz and upper 1–3GHz bands that was proposed in Stage 3, we believe they do not go far enough. The evidence strongly suggests that the bands in these two groups should not be treated differently, and yet a material gap in pricing still exists.

These changes appear for the most part to go against the previous stakeholder feedback without justification (e.g. relying solely on a purchasing-power-parity (PPP) approach to currency conversion) or introduce new aspects that have not previously been consulted on and have a material upwards impact on pricing (e.g. the use of Consumer Prices Index (CPI) indexation).

In this report we outline four main concerns with the updated (Stage 4) pricing approach and suggest reasonable adjustments. Section 2 sets out the rationale for, and quantifies the impact of, each adjustment individually. Section 3 presents their combined impact. Our proposed adjustments and their impact are summarised in Figure 1.1.²

The first two adjustments (Sections 2.1, 2.2) concern the overall pricing level and would affect pricing across all bands. The last two adjustments (Sections 2.3, 2.4) primarily concern the relative pricing between bands. The combined impact of the proposed adjustments is smaller than the sum of individual adjustments (see Section 3), but still results in a very material reduction in pricing to reach a total of AUD3.1 billion. This figure much more accurately reflects the current market price of the spectrum in Australia.

¹ ACMA (2025), *Expiring spectrum licences (stage 4) – updated preliminary views on pricing*

² A more detailed overview of resulting prices by band for each adjustment can be found in Section 3.

Figure 1.1: Summary of adjustments and impact on projected renewal price [Source: Analysys Mason, 2026]

Section	Concern	Proposed adjustments	ACMA price (AUD billion)	Price after adjustment (AUD billion)	Change
2.1	Use of CPI indexation to inflate benchmarks	At a minimum, revert to previously used indexation based on mobile service revenue (MSR)	7.3	4.5	-38%
2.2	Currency conversions are done using PPP exchange rates	Use spot rates instead of PPP		5.3	-28%
2.3	Benchmark sample for the 3.4GHz band contains outliers	Remove significant outliers		6.9	-5%
2.4	Separating the 3.4GHz and upper 1–3GHz bands is inconsistent	Group these bands together		7.1	-2%
3	Combined impact of all proposed adjustments			3.1	-58%

As noted above, although some adjustments have a limited impact on total renewal price, they still play an important role in ensuring that pricing across bands provides an accurate reflection of relative spectrum value. For instance, combining the 3.4GHz and upper 1–3GHz bands decreases total renewal price by only 2% if implemented alone, but crucially aligns the pricing of technically substitutable bands. Prices for individual bands across adjustment scenarios are shown in Figure 1.2.

Figure 1.2: Summary of pricing outputs (AUD/MHz/population) across adjustment scenarios [Source: Analysys Mason based on ACMA methodology and data, 2026]

Band	ACMA Stage 4 proposal	All adjustments (1-4) together	1: CPI to MSR only	2: PPP to spot only	3: Excluding 3.4GHz outliers only	4: Combining 3.4GHz and upper 1-3GHz only
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2 The ACMA's latest approach continues to overestimate market price, and pricing outcomes distort the relative price of substitutable bands

This section describes four main concerns with the ACMA's Stage 4 pricing methodology, and illustrates the impact of implementing simple adjustments to address each concern. In each sub-section, these adjustments are performed individually, while the next section (Section 3) presents the combined impact of making all of these adjustments in combination.

2.1 Inflating spectrum prices using CPI indexation will significantly overstate market price, and the ACMA should, at a minimum, revert to its previous use of MSR-based indexation

2.1.1 ACMA methodology

The ACMA's pricing methodology involves converting prices from benchmark auctions that have taken place across different years to the same point in time, and to carry prices for each band forward to relevant renewal dates. In the previous stage of the consultation process (Stage 3), the ACMA had used an MSR index to perform these conversions. The ACMA has now (in Stage 4) changed the process to use CPI to perform these conversions instead.

In its Stage 3 paper on pricing, the ACMA noted that mobile network operators (MNOs) suggested that ESL prices should be set conservatively to avoid the asymmetric risk associated with setting prices too high.³ These risks include unsold (or returned) spectrum, reduced network investment, and higher retail prices. By stating that auction-avoidance pricing has not been factored into their preliminary views as "...including additional elements of value may create greater risk of pricing spectrum too high", it appeared that the ACMA acknowledged this risk.⁴ At the time, the ACMA also considered its approach to have led to "relatively conservative renewal prices".

In our review of the Stage 3 proposals for TPG, we had argued that forward-looking MSR index projections used by the ACMA (at the time) did not sufficiently reflect the aim of setting prices to reflect conservative estimates of market price. This was because the MSR index projections reflected an assumption that MSR would remain largely flat in future, when, in fact, MSR had instead been declining for over a decade up to that point.

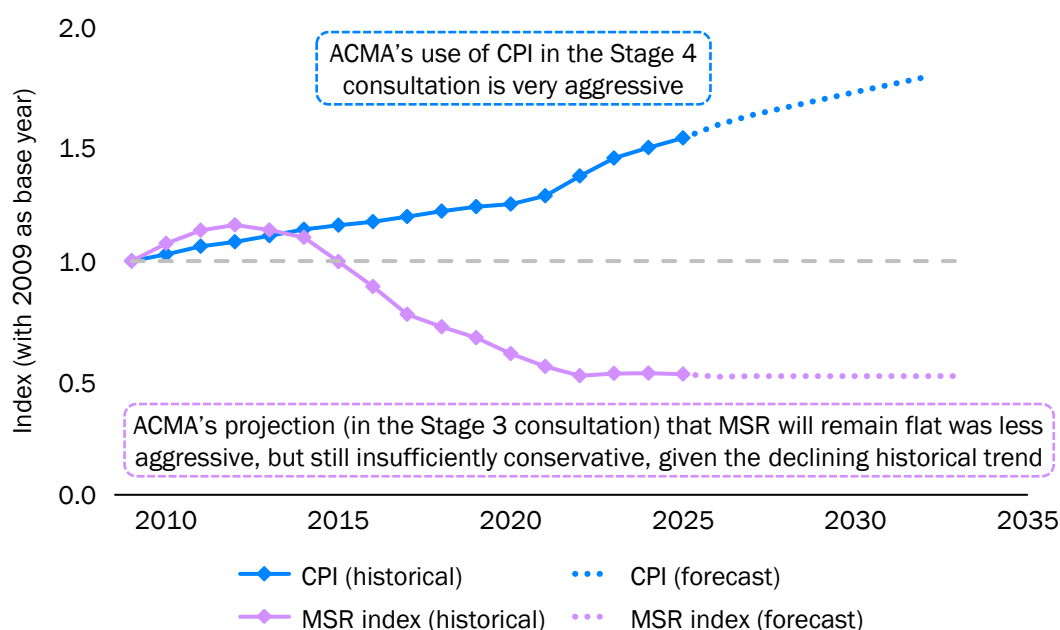
The ACMA's Stage 4 proposal to use CPI instead of an MSR index is incongruous. Not only does this fail to reflect expected decline in spectrum prices and value over time, but instead bakes in an assumed growth (both historic and future). MSR, as a measure of economic output within the sector, is correlated

³ ACMA (2025), *Expiring spectrum licences, stage 3. Preliminary views paper 4: Pricing for ESLs*

⁴ The paper also recognised MNO concerns that a conservative pricing approach may be needed to support the sustainability of the telecoms sector given declining profitability.

to the value of key economic inputs such as spectrum, but there is no evidence to suggest that CPI is as closely relevant, making its use a very aggressive assumption by the ACMA. Figure 2.1 illustrates the historical decline in MSR, juxtaposed against the past and projected future growth in CPI. As can be observed, these are very different indices.

Figure 2.1: ACMA projections for CPI and MSR [Source: Analysys Mason based on data from the ACMA's Stage 3 and 4 excel workbooks,⁵ 2026]



2018 cut off point

In its Stage 4 pricing methodology, the ACMA has attempted to account for historical declines (or rises) in spectrum prices by removing pre-2018 benchmarks in bands where pre-2018 and post-2018 benchmarks exhibited 'statistically significant' differences. The ACMA's statistical tests resulted in the removal of pre-2018 benchmarks in the sub-1GHz and lower 1-3GHz band groups, but not the upper 1-3GHz and 3.4GHz band groups. The choice of 2018 as the year in which to split benchmarks into subsets is, in our view, arbitrary, and also not meaningful for the 3.4GHz band, where only three benchmarks were available prior to 2018.

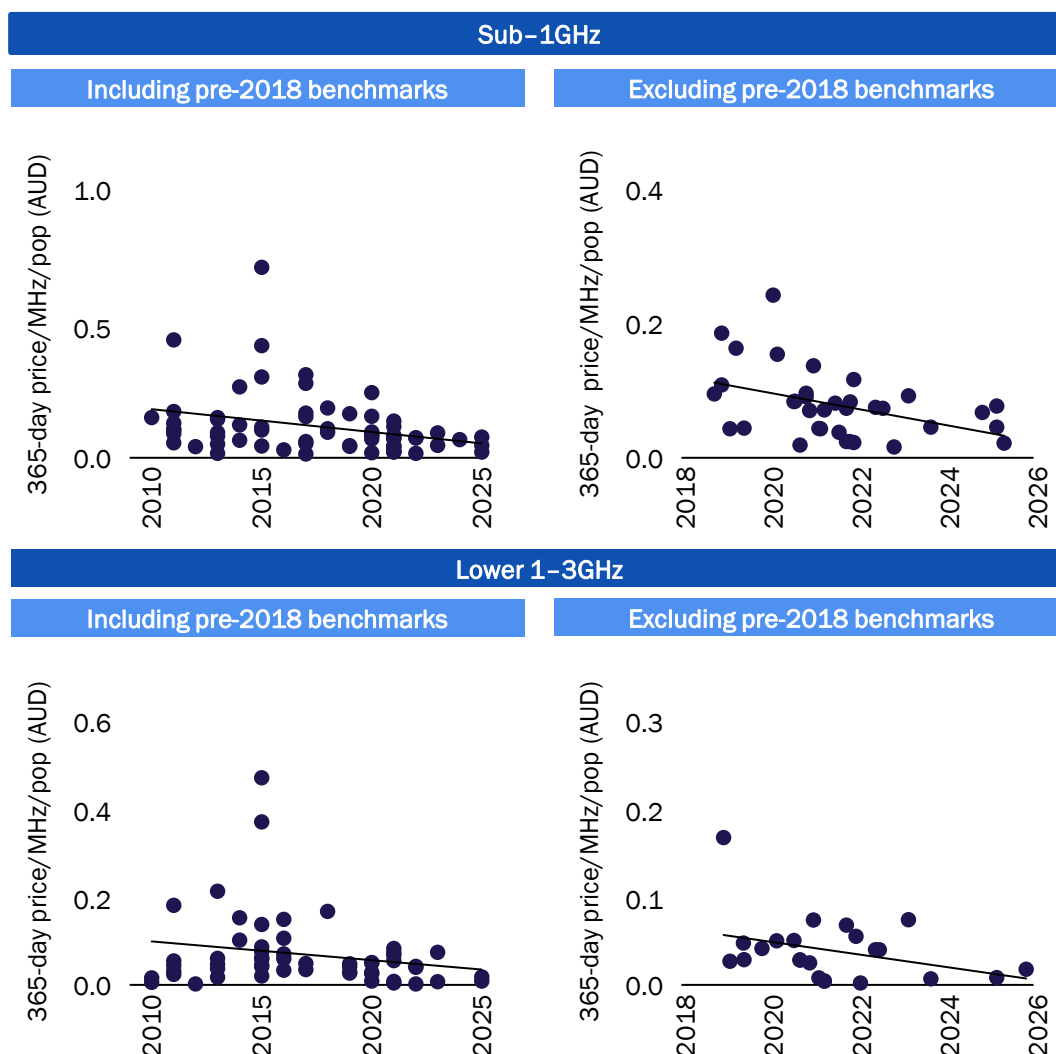
More importantly, although removing pre-2018 benchmarks for the sub-1GHz and lower 1-3GHz bands has the effect of reducing estimated prices (and thus seems an appropriate starting point, since market prices have been declining over time), this does not go far enough to reflect the fact that benchmark prices continued to decline, and in many cases more rapidly, since 2018. Figure 2.2 shows scatter plots of the ACMA's benchmarks in these two band groups.⁶ The conclusion from even a high-

⁵ In the chart, we have re-based the two indices to 2009, which is the year containing the earliest benchmark included in the ACMA's sample.

⁶ Figure 2.2 shows that trendlines are declining even when using benchmark prices that exclude the effect of inflating historic benchmarks to 2025. Inflating historic benchmarks to 2025 using CPI (as the ACMA suggests)

level analysis of these charts should not be that flat in real terms (i.e. prices increasing with CPI) is the correct forward-looking projection.

Figure 2.2: Falling spectrum prices in benchmarks used by the ACMA in the sub-1GHz and lower 1-3GHz bands⁷ [Source: Analysys Mason based on benchmarks in the Stage 4 ACMA workbooks, 2026]



2.1.2 Spectrum value

The ACMA's own empirical data does not support its (newly) proposed approach, and nor do any underlying techno-economic arguments. For framing purposes, we consider below the two main components of the value of mobile spectrum (as one driver of spectrum prices):

results in trendlines that exhibit even steeper declines, as can be seen from looking at the ACMA's equivalent charts in its Stage 4 updated preliminary views on pricing.

⁷ The trendlines shown are the linear regression lines calculated by the graphing software.

- **Technical value** refers to the network cost savings that a unit of spectrum can generate, as additional spectrum increases site capacity and reduces the number of (expensive) new sites required for a given level of coverage or capacity.
- **Commercial value** refers to the margin improvements (from revenue growth and reduced non-network costs, such as subscriber acquisition and retention costs) enabled by improvements in network performance that result from access to more or better spectrum.

Neither of these two main drivers of spectrum value support an inflation-driven increase in the value of spectrum over time. Recent trends that have influenced each driver are described below in further detail.

Trends influencing technical value

Although this can vary, technical value tends to account for the largest share of spectrum value. Over time, the technical value of spectrum tends to decline, as the unit costs of network equipment (like most electronic equipment) generally fall in nominal terms. Falling unit costs of network equipment mean that operators can deploy more sites at a lower cost per site to achieve a given level of coverage and capacity, and the network cost savings achievable from avoiding these site builds therefore reduces.

Furthermore, data traffic growth rates have materially slowed in recent years, leading to reduced forecasts of future growth rates, and hence data-traffic volumes. This lower traffic forecast will also lead to a lower technical value of spectrum. In particular, the forward-looking potential of spectrum to reduce network costs is lower today than when calculated in the period in which most of benchmarks arise. The increased supply of spectrum (compared to expectations and risk at the time of the past benchmark auctions) also contributes to technical value having declined.⁸

Technical value overall is likely to fall. It would be very aggressive to expect technical value to rise as fast as MSR,⁹ and even more unlikely at the rate of CPI.

Trends influencing commercial value

With regard to commercial value (which generally accounts for a minority share of total spectrum value), operators in saturated markets such as Australia have generally not experienced margin improvements in recent years. Subscriber growth has plateaued and competition has placed pressure on average revenues per user (ARPU). At its heart, commercial value arises from network performance improvements (relative to other MNOs) that increase market share, with the additional subscribers generating subsequent revenue and margin. If ARPU, and in particular average margin per user (AMPU), is not rising, then there is no reason to suppose that commercial value should increase over

⁸ We note that the ACMA's MSR index previously incorporated a measure of spectrum supply to try to account for this legitimate effect, which no longer features.

⁹ In some circumstances (e.g. if an MNO could profitably avoid network deployment and instead accept a market share loss in the event of having less spectrum and lower network performance) it is conceivable that it could do so.

time. In fact, if non-network costs increase faster than mobile service revenues, it may fall (in nominal terms).¹⁰

At the most, commercial value might be expected to rise in line with any increase in the MSR index (though it could rise more slowly, or fall).

2.1.3 Impact on spectrum pricing

MSR indexation should represent an upper bound on the evolution of spectrum value over time. In this context this means that market prices should not be projected to rise at a rate above that implied by an MSR indexation. And, as explained in our Stage 3 response, the MSR index should be projected to either remain flat in nominal terms, or more likely to exhibit further declines, in the coming years. There is no strong rationale for applying CPI indexation. It does not align with the underlying economics for MNOs and nor does it align with the empirical benchmark data. As such, the ACMA's choice to use CPI to index the evolution of market prices is unjustified and has a material upwards impact on the pricing for renewal of ESLs.

The ACMA should therefore, at a minimum, revert to its previous use of an MSR index from Stage 3 of this consultation process, which, though in our view insufficiently conservative, was still a much closer approximation to reality than the current use of CPI. Replacing the use of CPI with the MSR index data results in lower price across all bands, as shown in Figure 2.3. The magnitude of the decrease between different band groups is influenced by the variance in the dates of historical benchmarks, as well as future renewal dates, but in all cases is hugely significant.

Figure 2.3: Estimated price (AUD/MHz/population) for ESL bands, with and without the adjustment to indexation [Source: Analysys Mason based on ACMA methodology and data, 2026]

Band group	Band	ACMA price using CPI (AUD/MHz/population)	Adjusted price using MSR (AUD/MHz/population)	Change
Sub-1GHz	700MHz	0.7405	0.5039	-32%
	850MHz	0.7558	0.5301	-30%
Lower 1-3GHz	1800MHz	0.3030	0.1870	-38%
	2000MHz	0.2757	0.1562	-43%
Upper 1-3GHz	2.3GHz	0.1596	0.0870	-46%
	2.5GHz	0.1621	0.0898	-45%
3.4GHz	3.4GHz	0.2052	0.1212	-41%

Replacing CPI with MSR indexation in the ACMA methodology (even without forecasting a decline in the MSR index, as we have previously argued would be appropriate) reduces the total renewal price of the ESL spectrum by 38%, from AUD7.3 billion to AUD4.5 billion.

¹⁰ High CPI can, perhaps counter-intuitively, contribute to this effect. For example, increased general inflation (which is often coupled with rising interest rates to control said inflation) tends to leave consumers with less disposable income, which can decrease (rather than increase) the amount that can be spent on telecoms services.

2.2 The ACMA's rationale for using PPP instead of spot exchange rates does not hold, ignores stakeholder feedback, and unjustifiably inflates prices for most band groups

The ACMA's pricing methodology in the Stage 4 consultation uses PPP exchange rates to convert benchmark prices from local currencies to AUD. This is a departure from the previous methodology used in Stage 3 of the consultation, in which both spot and PPP exchange rates were used to define a range. While this choice simplifies the approach, it also ignores feedback from the majority of stakeholders regarding the relative advantages of using spot exchange rates over PPP,¹¹ which include:

- how the use of PPP may over-correct for local price differences, particularly when the benchmark sample consists mostly of high-income countries
- how the use of PPP exchange rates may distort market prices for specific bands.

The ACMA's justifications for favouring PPP exchange rates (on the recommendation of DotEcon) are not strong. The ACMA states that spot exchange rates "may be sensitive to precise dates chosen for converting price data". However, the spot exchange rate data included in the ACMA's pricing workbooks is taken from the World Bank, which uses rates that are derived as an average over the reference period (of a year).¹² This dataset will therefore eliminate short-term (day-to-day or week-to-week) volatility, whilst any longer term variation in exchange rates is a real effect that needs to be accounted for. The ACMA's stated rationale therefore does not hold.

Moreover, this is a good example of exactly when the ACMA's previously explicit aim to be conservative in its estimation of market price should come into effect. The ACMA stated that it had "not factored auction avoidance pricing" and was "intending to approximate marginal market value (or opportunity cost value)",¹³ which suggests the ACMA recognises that being conservative does not mean deliberately underestimating market price. We agree. However, where there is a choice between two approaches (in this case for exchange rate conversion), with one resulting in lower prices and (at best) no clear rationale for choosing the other case, the conservative choice is obvious: spot exchange rates should be used.

2.2.1 Impact on spectrum pricing

Replacing PPP exchange rates with spot exchange rates (as included in the ACMA's pricing workbooks) results in lower price estimates for all bands (see Figure 2.4).¹⁴

¹¹ ACMA (2025), *Expiring spectrum licences (stage 4) – updated preliminary views on pricing*

¹² World Bank Group, *Official exchange rate (LCU per US\$, period average)*

¹³ ACMA (2025), *Expiring spectrum licences, stage 3. Preliminary views paper 4: Pricing for ESLs*

¹⁴ The lower 1–3GHz group is much less affected by the switch, as Step 6B (cohort checks) of the ACMA's methodology is less sensitive to exchange rate changes in the event that central estimates do not fall within cohort interquartile ranges to begin with (which is the case for only the lower 1–3GHz group).

Figure 2.4: Estimated price (AUD/MHz/population) for ESL bands, with and without the adjustment to exchange rates [Source: Analysys Mason based on ACMA methodology and data, 2026]

Band group	Band	ACMA price using PPP (AUD/MHz/population)	Adjusted price using spot (AUD/MHz/population)	Change
Sub-1GHz	700MHz	0.7405	0.4789	-35%
	850MHz	0.7558	0.4887	-35%
Lower 1-3GHz	1800MHz	0.3030	0.2997	-1%
	2000MHz	0.2757	0.2727	-1%
Upper 1-3GHz	2.3GHz	0.1596	0.0968	-39%
	2.5GHz	0.1621	0.0983	-39%
3.4GHz	3.4GHz	0.2052	0.1281	-38%

This change alone would result in a material reduction in the projected total renewal price of ESL spectrum, from AUD7.3 billion to AUD5.3 billion in total across all bands.

2.3 The benchmark sample for the 3.4GHz band contains several large outliers that artificially inflate the price of this band

In the Stage 4 consultation, ACMA increased the benchmark sample from 123 to 205 observations. We agree with the principle of this approach as more evidence points are better than fewer and we had noted in our report on the Stage 3 consultation that many seemingly reasonable benchmarks had been excluded without explanation. This increase in sample size notwithstanding, some benchmarks remain excluded from the sample as they were considered by the ACMA to less accurately reflect the market price of spectrum. These exclusions include benchmarks:

- that are not from market-based awards (i.e. administrative assignments)
- from awards for small amounts of residual spectrum, unsold in a previous auction
- from uncompetitive awards with a large amount of unsold lots
- (possibly) where spectrum is restricted to specific use cases.¹⁵

The ACMA has also updated its use of several previously included benchmarks, that were from the same spectrum award but were recorded (in Stage 3) as separate observations. These relate to cases where a single spectrum award included multiple bands with “the same licence durations of closely substitutable spectrum in the same band grouping”. The ACMA now (in Stage 4) consolidates bands into a single benchmark observation to avoid overstating the effect of a single spectrum award.

¹⁵ It is unclear whether the ACMA applies this final criterion or not. Page 13 of *Expiring spectrum licences (stage 4) – updated preliminary views on pricing* states that exclusion on this basis was one of DotEcon's recommendations, whilst page 20 notes “some differences in the awards included in our [ACMA's] benchmarking samples when compared with the samples used for DotEcon's analysis in the peer review report”. The exact nature of these differences is not made clear by the ACMA, but in an earlier paragraph on the same page, restrictions to specific use cases is not listed as exclusion criteria. In general, there remains limited transparency over exactly which benchmarks have been consciously excluded and the specific reasons for exclusion in each case.

We also agree that these exclusions and updates make sense, in principle, as they seek to limit outliers that are not representative of market price and that have the potential to distort the sample. We note a potential concern that some of these criteria appear likely to disproportionately exclude low outliers, though the data provided on exclusions is not sufficiently transparent to determine whether this is an actual problem. In this context, we also previously argued in our report on the Stage 3 consultation that a small number of large outliers should be excluded as, similarly, they are not representative of market price and have the potential to distort the sample.

We observe that within the Stage 4 sample, these large outliers continue to be included, particularly for the 3.4GHz band. As mentioned in our previous submission during Stage 3 of this consultation process, artificial scarcity in some previous 3.4GHz auctions led to inflated auction prices, making make them inappropriate benchmarks for estimating the market price of the 3.4GHz band in Australia.

Figure 2.5 displays the 3.4GHz benchmarks that have been included by the ACMA in the Stage 4 sample, and highlights five significant outliers, each featuring a price that is more than three times the price of the sample median (ranging from 3.6× for the ‘Italy, 3.7GHz, 2018’ benchmark to 17.4× for the ‘Canada, 3.5GHz, 2021’ benchmark).

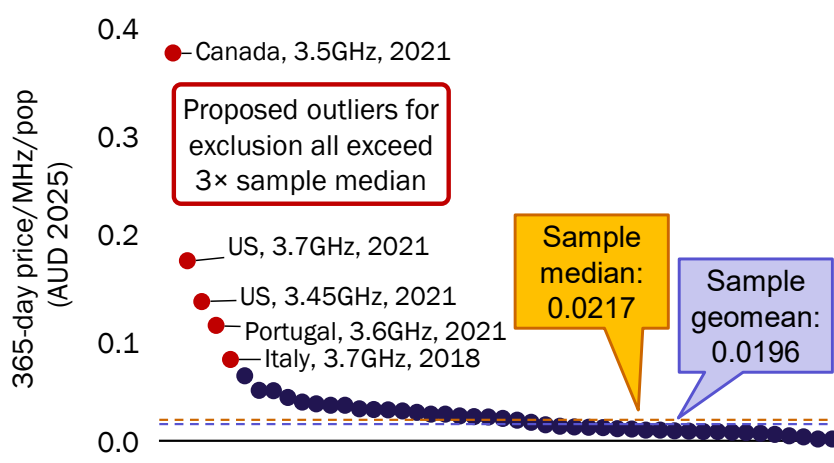


Figure 2.5: Proposed exclusion of 3.4GHz benchmark outliers
[Source: Analysys Mason based on ACMA Stage 4 benchmark data, 2026]

To be clear, we are not proposing to exclude these outliers because the prices are high, or because the markets are not comparable to Australia. We are proposing to exclude them because the prices paid in these auctions were not accurate reflections of market prices in the benchmark countries themselves (due to artificial scarcity), in much the same way as the ACMA has argued that benchmarks from non-market-based awards or for small amounts of residual spectrum are not good reflections of market price. The fact that these prices are so much higher than the benchmark average, as well as being an indicator of an underlying issue, means that their inclusion has a significant distortive effect on renewal prices.

2.3.1 Impact on spectrum pricing

These outliers distort the resulting price estimate for the 3.4GHz band. Excluding just these five outliers, while changing nothing else in the ACMA's methodology, results in a significant 24% decrease in the price of the 3.4GHz band (see Figure 2.6).

Figure 2.6: Proposed price (AUD/MHz/population) for the 3.4GHz band, with and without outliers [Source: Analysys Mason based on ACMA methodology and data, 2026]

ACMA sample	Excluding outliers	Percentage change (3.4GHz band only)	Change (total price across bands)
0.2052	0.1569	-24%	-5%

Removing these outliers derives a more representative price for the 3.4GHz band based on benchmarks. It coincidentally also aligns the price for the 3.4GHz band with prices for bands in the upper 1–3GHz band group,¹⁶ which is appropriate since these bands are technically substitutable in the Australian context.¹⁷

2.4 The continued separation of the 3.4GHz band from the upper 1–3GHz band group is inconsistent with technical realities and the treatment of other bands in this process

In our previous reports in relation to Stage 3 of the consultation, we had highlighted that bands in the upper 1–3GHz group and the 3.4GHz band should be grouped together and priced at the same level¹⁸ due to their technical substitutability in the Australian context.¹⁹ The ACMA had previously recognised the “detailed technical case for grouping” in our previous contribution, but decided to continue splitting these into two separate band groups due to “large differences in benchmark valuations” that “make it challenging to group these bands”.²⁰

This approach has been maintained in the Stage 4 methodology, even though the ACMA acknowledges that the initial “structural price differences” no longer appear as conclusive after additional data was added to the benchmarking sample.²¹ ACMA now considers that prices adjusted using the MSR index continue to show significant differences, while nominal and real prices did not.²² To justify maintaining the separation, the ACMA cited advice from DotEcon, related to the “distinct characteristics” of the 3.4GHz band, such as “large continuous bandwidths and a balance between capacity and propagation not matched by other bands”, and the availability of sufficient data to assess the 3.4GHz band without needing to pool benchmarks with the upper 1–3GHz bands.

Neither of the additional reasons provided are compelling. The argument regarding the “distinct characteristics” of the 3.4GHz band ignore and contradict the ACMA’s previous acknowledgement of the technical substitutability of the 3.4GHz and the upper 1–3GHz bands (particularly the 2.3GHz

¹⁶ AUD/MHz/population of 0.1596 for the 2.3GHz band, and 0.1621 for the 2.5GHz band.

¹⁷ As argued in both our previous submissions as part of this process.

¹⁸ Subject to legitimate differences arising from renewal licence start date and duration.

¹⁹ For example, a large 100MHz bandwidth is also available in the 2.3GHz band in Australia. For full details refer back to our report on the Stage 3 consultation.

²⁰ ACMA (2025), *Preliminary views paper 4 – Pricing for ESLs*

²¹ ACMA (2025), *Expiring spectrum licences (stage 4) – Updated preliminary views on pricing*

²² It is worth noting the inconsistency inherent in the ACMA’s use of the MSR index to justify separating the upper 1–3GHz bands and the 3.4GHz band, while replacing MSR with CPI in other steps in the methodology.

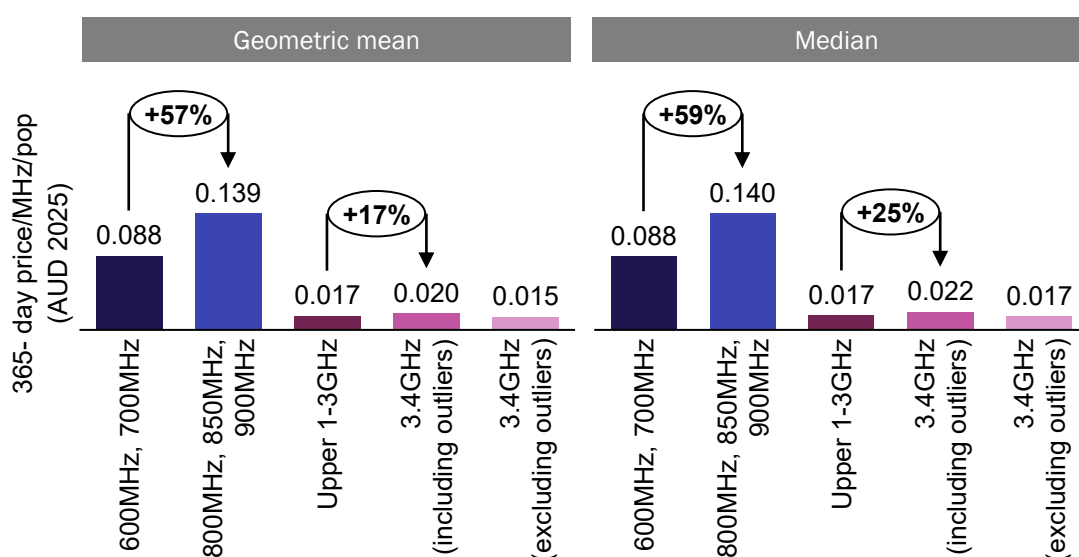
band). Meanwhile, the availability of sufficient benchmarks in the 3.4GHz band is not a valid reason to separate it from the upper 1–3GHz band group, as the argument for combining the 3.4GHz with the upper 1–3GHz bands is based on technical substitutability and not the lack of available benchmarks in the 3.4GHz band to begin with. There are also sufficient benchmarks in many other bands that are part of band groups to allow for them to be assessed on a standalone basis, but doing so does not make sense because of their technical substitutability with the other bands that they are grouped with.

Moreover, the argument that “structural price differences” justify separating the 3.4GHz band from the upper 1–3GHz bands loses further credibility when considering the ACMA’s choices in relation to other band groupings. For example, the ACMA has decided to group all sub-1GHz bands into one group, despite larger differences between the prices of constituent bands in the sub-1GHz group than between the 3.4GHz band and the upper 1–3GHz band group.

Noting the ACMA’s concern with having sufficient observations per group, we have, for illustrative purposes, split the sub-1GHz group into two sub-groups and compared the resulting difference between these two sub-groups, with the difference between the 3.4GHz band and the upper 1–3GHz bands. One of the sub-groups contains 600MHz and 700MHz benchmarks (34 observations), and the other contains 800MHz, 850MHz, and 900MHz benchmarks (29 observations).²³

As shown in Figure 2.7, the difference between the two sub-1GHz sub-groups is significantly greater than the difference between the upper 1–3GHz band group and the 3.4GHz band. This is true regardless of whether the geometric mean or the median is used as the basis for comparison.

Figure 2.7: Comparison of geometric mean and median between the 600–700MHz and 800–900MHz sub-groups, compared to the corresponding difference between upper 1–3GHz and 3.4GHz bands
[Source: Analysys Mason based on ACMA methodology and data, 2026]



²³ This analysis excludes four benchmarks from the ACMA-provided sample, as prices for these four observations combine bands across the two sub-groups (e.g. 700MHz + 800MHz / 700MHz + 900MHz).

Notably, the uplift for the 3.4GHz band over the upper 1–3GHz band group is not only much smaller than the uplift of the 800MHz, 850MHz and 900MHz sub-group over the 600MHz and 700MHz sub-group, but also practically disappears once the five outliers are removed from the 3.4GHz group (as discussed in Section 2.3).

This comparison suggests that the ACMA's separation of the 3.4GHz band from the upper 1–3GHz band group on the basis of “structural price differences” is not justified, or is at least inconsistent with its choice to group bands in sub-1GHz band group together despite significantly greater price differences between different sub-groups within that band group.²⁴

To be clear, we are not suggesting that the sub-1GHz group should be sub-divided: we agree it makes perfect sense for these bands to be treated as a group, because of the **technical substitutability** of the bands. What we do strongly recommend is the grouping of the 3.4GHz band together with the upper 1–3GHz bands owing to similar levels of technical substitutability and much smaller “structural price differences”. Doing so would produce more comparable pricing results across the 2.3GHz, 2.5GHz and 3.4GHz bands, as shown in Figure 2.8 (i.e. different only as a result of differing licence renewal date and duration).

We continue to recommend that the 3.4GHz outliers discussed in Section 2.3 are excluded, but note that once 3.4GHz is grouped with upper 1–3GHz, the inclusion or exclusion of these outliers makes only a more limited difference to the pricing outcome.

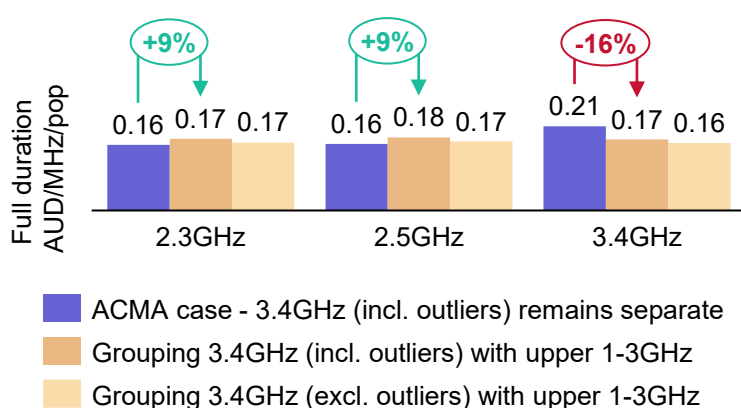


Figure 2.8: Effect of grouping the 2.3GHz, 2.5GHz and 3.4GHz bands on pricing
[Source: Analysys Mason based on ACMA methodology and data, 2026]

2.4.1 Impact on spectrum pricing

Grouping the 3.4GHz band with the upper 1–3GHz bands more accurately reflects the relative value of these three bands, given their technical substitutability in the Australian context. This adjustment would result in some impact on individual band prices (see Figure 2.9) but a relatively modest impact on total

²⁴ The significant differences appearing within the sub-1GHz group are not a product of the choice to split the group into these two specific sub-groups. Comparing figures from 700MHz-only benchmarks (32 observations) and 800MHz-only benchmarks (14 observations) produces similar differences – 800MHz-only benchmarks have a geometric mean that is 64% higher than 700MHz-only benchmarks, and a median that is 69% higher

renewal pricing, with the proposed AUD7.3 billion falling to AUD7.1 billion (if including 3.4GHz outliers) or AUD7.0 billion (if excluding 3.4GHz outliers).

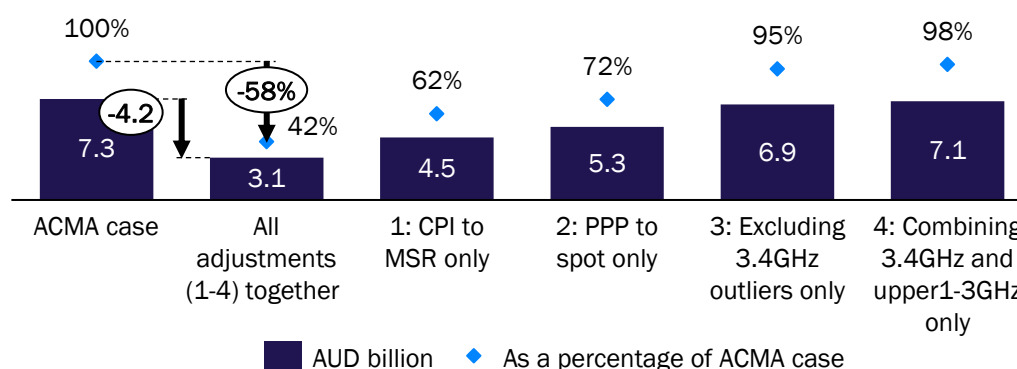
Figure 2.9: Estimated price (AUD/MHz/population) for ESL bands, with and without the adjustment to band grouping [Source: Analysys Mason based on ACMA methodology and data, 2026]

Band group	Band	ACMA price (AUD/MHz/pop)	Adjusted price grouping 3.4GHz with upper 1-3GHz, including outliers (AUD/MHz/pop)	Change	Adjusted price grouping 3.4GHz with upper 1-3GHz, excluding outliers (AUD/MHz/pop)	Change
Upper 1-3GHz	2.3GHz	0.1596	0.1746	9%	0.1654	4%
	2.5GHz	0.1621	0.1773	9%	0.1679	4%
3.4GHz	3.4GHz	0.2052	0.1731	-16%	0.1640	-20%

3 Proposed adjustments reduce the total ESL spectrum renewal price from AUD7.3 billion to AUD3.1 billion

The individual adjustments discussed in Section 2 can be combined into a single ‘all adjustments’ scenario, resulting in an overall impact that is less than the sum of the individual adjustments. As shown in Figure 3.1, making all the proposed adjustments in combination results in a 58% reduction in the total renewal price of the ESL bands, from AUD7.3 billion to AUD3.1 billion.

Figure 3.1: Comparison of total renewal price across scenarios [Source: Analysys Mason based on ACMA methodology and data, 2026]



Although some adjustments have a limited impact on total renewal price, they still play an important role in ensuring that pricing across bands provides an accurate reflection of relative spectrum value. For instance, combining the 3.4GHz and upper 1–3GHz bands decreases total renewal price by only 2% if implemented alone, but crucially aligns the pricing of technically substitutable bands. Prices for individual bands across adjustment scenarios are shown in Figure 3.2.

Figure 3.2: Summary of pricing outputs (AUD/MHz/population) across adjustment scenarios [Source: Analysys Mason based on ACMA methodology and data, 2026]

Band	ACMA Stage 4 proposal	All adjustments (1-4) together	1: CPI to MSR only	2: PPP to spot only	3: Excluding 3.4GHz outliers only	4: Combining 3.4GHz and upper 1-3GHz only
700MHz	0.7405	0.3258	0.5039	0.4789	0.7405	0.7405
850MHz	0.7558	0.3428	0.5301	0.4887	0.7558	0.7558
1800MHz	0.3030	0.1835	0.1870	0.2997	0.3030	0.3030
2000MHz	0.2757	0.1533	0.1562	0.2727	0.2757	0.2757
2.3GHz	0.1596	0.0526	0.0870	0.0968	0.1596	0.1746
2.5GHz	0.1621	0.0543	0.0898	0.0983	0.1621	0.1773
3.5GHz	0.2052	0.0517	0.1212	0.1281	0.1569	0.1731