The Hon Anika Wells MP
Minister for Communications and Minister for Sport
Member for Lilley

Ref No: MS25-002866

Ms Nerida O'Loughlin PSM
Chair
Australian Communications and Media Authority
PO Box 78
BELCONNEN ACT 2616
s 22(1)(a)(ii) [redacted]

Dear Ms O'Loughlin Nerida,

I am writing regarding the Australian Communications and Media Authority's (ACMA's) process to consider renewal arrangements for spectrum licences due to expire between 2028 and 2032 (ESLs), consistent with its responsibilities under the *Radiocommunications Act 1992*.

I want to first recognise the consultative approach ACMA is taking to consider the future of these licences, and reiterate the Government's support for ACMA's policy and decision-making framework developed through consultation with stakeholders. This includes the five public interest criteria that guide ACMA's evaluation of options for the future of these licences in the long-term public interest.

Spectrum is a highly valuable public asset, and decisions regarding its licensing have consequences for the diverse communications services that Australians rely on now and into the future. The vast majority of spectrum licences expiring in close succession presents an opportunity to consider the optimal path that achieves the most benefit for the Australian community.

It is my expectation that decisions on licence renewal deliver the best outcome for the Australian public in line with the Government's communications policy objectives and priorities — one of the key public interest criteria in the ACMA's decision-making framework. Addressing this criterion includes having regard to the policy objectives outlined in the *Radiocommunications (Ministerial Policy Statement – Expiring Spectrum Licences) Instrument 2024*.

I am closely monitoring public discussion on issues relating to ACMA's ESLs process, including stakeholder responses to ACMA's preliminary views on licence renewal, duration and pricing (as publicly consulted on during Stage 3 of the ESLs process). s 47C [redacted]
s 47C [redacted]

I understand ACMA is now considering stakeholder submissions, and plans to respond to issues and views raised when it publishes its preferred views on licence renewal. s 47C

s 47C [redacted]

I also note ongoing work to develop a national Public Safety Mobile Broadband (PSMB) capability and issues raised by state and territory agencies in ACMA's consultation on ESLs. Ensuring emergency services organisations have access to appropriate communications services required to do their jobs is of utmost importance to the Government. I note states and territories have put forward dedicated spectrum as a preferred solution, and that this will also be discussed at the National Emergency Management Ministers' Meeting on 12 December. s 47C [redacted]

s 47C [redacted]

s 47C [redacted]

My department will continue to engage closely with your team and keep you informed of progress on these related policy considerations.

I would appreciate your response timeframe request by 21 November.

Yours sincerely

Anika Wells

11 November 25

Australian Government | acma Australian Communications and Media Authority

Chair and Agency Head

The Hon Anika Wells MP
Minister for Communications
Parliament House
Canberra ACT 2600

Dear Minister

Advice on Expiring Spectrum Licences (ESL) preliminary views

Thank you for your letter of 11 November 2025, requesting advice on the ACMA's development of preliminary views for spectrum licences due to expire between 2028 and 2032.

We welcome the opportunity to provide further information and advice on this critical process for government, industry and Australian consumers, including on alternative views that have been put forward through consultation.

Given the importance of the ESL program, the ACMA commenced its work in 2021. Our process has involved five rounds of consultation, over 90 submissions from industry and other stakeholders, and close engagement with government stakeholders, particularly the Australian Competition and Consumer Commission (ACCC) and your department. We have analysed domestic and international technologies, markets and prices, and developed an economic approach that is supported by numerous international spectrum and valuation experts.

The ACMA developed a set of five public interest criteria to guide its analysis of options on outcomes for ESLs. The criteria covered how each option would facilitate efficiency, promote investment and innovation, enhance competition, balance public benefits and impacts, and support relevant policy objectives and priorities. We integrated the Government's priorities in the Ministerial Policy Statement on ESLs (MPS) into the criteria which were highly influential in our analysis.

Specifically, the ACMA has considered how spectrum held by the mobile network operators (MNOs) could support delivery of the government's Universal Outdoor Mobile Obligation (UOMO), as some ESL bands are candidates for low earth orbit satellite direct-to-device (LEOsat D2D) services. We also considered how spectrum held by the MNOs and NBN Co plays a crucial role in facilitating emergency calls and supports a range of regional connectivity programs. We also considered continuity matters given the importance of these licences in the provision of communications services to end users, consistent with the MPS.

Our preliminary view is that renewal of the MNOs' and NBN Co's licences would best promote the long-term public interest, including the policy objectives in the MPS. Reallocation of this spectrum via an auction process, under current market conditions, would be less likely to do so. It is reasonably likely that auctions would lead either to market consolidation or return the status quo, depending on auction design. It is worth noting that not all spectrum licences used to provide mobile services are expiring and the potential risks posed by an auction are not equal between networks. In these circumstances there is a risk that an auction, without comprehensive controls in place, might lead to reduced competition within telecommunications markets. The imposition of controls, on the other hand, is likely to reduce competitive tension and result in a status quo outcome. Our view is that auctioning this spectrum would also create years of uncertainty for consumers and industry until at least 2032, chilling investment during 5G deployment and the emergence and development of LEOsat D2D and 6G technologies.

Specific advice in response to your 5 questions follows, and further information supporting that advice is at **Attachment A**. Research examining international approaches to ESLs is at available at **Attachment B**.

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[redacted]

ESL process next steps, timeframes and opportunities for intervention

The ACMA plans to publish its preferred views on ESL spectrum in December 2025 to provide clarity and confidence for industry and consumers on the future of ESL spectrum. Through this, we will also respond formally to submissions provided through the process. This will include thorough explanations of our reasoning, including where that differs from the views presented by submitters. In parallel, we will publicly consult on updated preliminary views on valuation and pricing, and a proposed application and decision-making process, concluding in Q1 2026.

s 47C

[redacted]

We would welcome any further discussion with you on this matter or any additional advice required.

Yours sincerely

Nerida O'Loughlin PSM
21 November 2025

Encl: Attachment A: Supporting information

Attachment B: Plum Consulting, *International best practice in spectrum licence renewals*

CC: James Chisholm, Deputy Secretary, Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts

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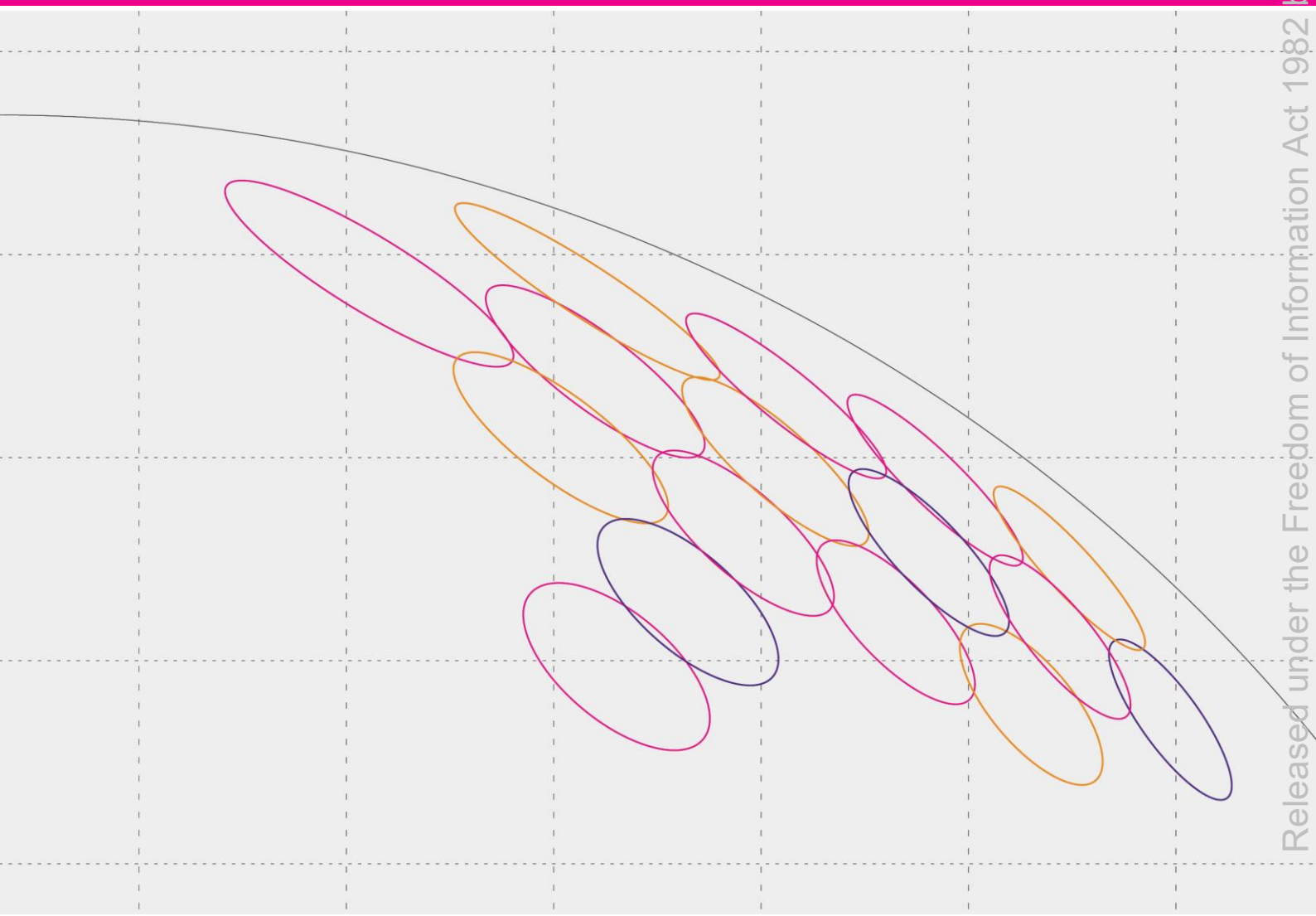
International best practice in spectrum licence renewals

June 2022

Tim Miller, Aude Schoentgen, Karim Bensassi-Nour



About Plum

Plum offers strategy, policy and regulatory advice on telecoms, spectrum, online and audio-visual media issues. We draw on economics and engineering, our knowledge of the sector and our clients' understanding and perspective to shape and respond to convergence.

About this study

This study for ACMA looks at international experience in spectrum licence renewal policies, with . Case studies from a number of countries are described and analysed, with the key decisions identified. This paper is designed to provide context to decisions to be made in the Australian market.

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Contents

1 Introduction

This report has been commissioned by ACMA to identify lessons that can be learnt from other countries' decisions over the renewal of spectrum licences. As part of their work to prepare for the expiry of a number of licences between 2028 and 2032, ACMA wish to gain a better understanding of how other spectrum regulators approach the subject of renewals. In particular:

- When should a renewal decision be made?
- Should existing users be given automatic renewals or first right of refusal?
- How should regulators balance between operational certainty and allowing for changes in use?
- How should renewed spectrum be charged for?
- Are indefinite licences or automatic renewals an efficient mechanism in the long term?
- Should there be a consistent renewals policy across all spectrum bands and users?

This report is not designed to determine the optimum policy for Australia, but instead to identify lessons learnt from elsewhere so that, where relevant, these can be applied to the Australian context.

The remainder of this report is structured as follows.

- Section 2 sets out why a renewals policy is important.
- Section 3 contains an analysis of experience in a number of different countries.
- Section 4 outlines the various options for licence renewals (or re-awards).
- Section 5 summarises the case study findings and applies these to the observed categories of policy options.

2 The need for renewals policy

Radio spectrum has become a valuable commodity over the past three decades, as its potential use has expanded beyond the legacy uses of broadcasting and amateur radio, into extensive use by mobile telecommunications, satellite, science and fixed wireless links. Spectrum is an unusual asset, in that while there is a limited amount available at any one time (and there is effectively no way of increasing this amount), the resource is endlessly renewable since every moment the spectrum is cleared and refreshed. This means that, unlike physical assets such as raw materials or tools, ownership of the spectrum is temporal in nature; there are some analogies to land as an asset, but land can be destroyed or made permanently unusable while spectrum cannot.

This nature of spectrum means that governments have needed to consider how to award spectrum for a defined amount of time, as well as a defined bandwidth and a defined location in the electromagnetic range. In many countries, when the first licences for mobile telecommunications services were granted in the 1970s, 1980s and even early 1990s, there was no prospect of excess demand for spectrum, and many licences were granted directly to applicants with no defined end date. However, as the use of spectrum by various services grew, and the demand for spectrum at specific frequencies intensified, there was a need for more competitive award mechanisms; simultaneously, the pace of technological change indicated that an efficient allocation of spectrum at one point may not guarantee that this would be the case for ever more.

Spectrum was first awarded by auction in New Zealand in 1996, following the Radiocommunications Act 1989 which had enabled the creation of property rights for spectrum. This first auction was carried out manually, but increasing complexity meant that the second auction, in 1998, required computer programming to solve.

The New Zealand government considered two ways of licencing spectrum[1].

> **“When creating a management right the Crown has two options for disposal or use of this asset – retaining the management right and allocating spectrum licences within it [for example for FM radio broadcasting], or allocating the management right itself [for example for cellular services]. Spectrum has been transferred to the MRR [management rights regime] where demand for spectrum was expected to exceed its availability. In this situation a competitive market allocation process is seen as the most appropriate way to ensure that spectrum achieves its highest value use, and to promote competition in the down stream market in which it is used. In this way the MRR promotes government’s policy objectives for spectrum …”**

The choice of tenure for licences and management rights is part of the typical policy trade off to promote the efficient use of spectrum.

Spectrum retained by the government typically has a very short-term licence, often only one year in length, but because of the low demand and excess supply there is an expectation of renewal availability. However, unless there is a guarantee of renewal this system gives the government or regulator a regular opportunity to reconsider the most efficient use of the spectrum band in terms of technology or allocation method. For example, some countries which previously used 3.5 GHz spectrum for fixed links were easily able to move away from this to awarding the spectrum for IMT networks since fixed links were typically awarded on a very short-term basis.

On the other hand, spectrum released through allocation of management rights, where there is excess demand, has been given a longer licence period, to enable users to invest in networks with the knowledge that their spectrum holdings are valid for a certain period. With this increase in certainty, however, comes a lack of flexibility for the regulator, who is not able to reassess the most efficient use of spectrum on a regular basis. As

[1] See https://www.rsm.govt.nz/assets/Uploads/documents/8380f2d85e/spectrum-auction-design-in-new-zealand.pdf for further details

noted below the approach to the renewal policy of longer-term licences had the potential to affect the ongoing incentives to use the spectrum.

2.1 Investment incentives

At the time of these first auctions in New Zealand, followed by the US, Canada and European countries, licences were often set for 10 or 15 years, so that operators would be able to build out extensive networks and make a return on this investment over a reasonable timeframe. In particular, active network equipment (such as antennas, transmission equipment, and backhaul connection) was often considered to have an asset life of between 5 and 10 years, meaning that returns were expected well within the licence period. Passive equipment, such as towers and buildings, had significantly longer asset life, but the expectation was that these could be resold at the end of a licence if the network ceased.

However, these defined licences meant that typically for the last five years of the period, operators had little incentive to invest since it was unclear whether any such capital expenditure would see an appropriate return. Coverage and quality of service would have seen slowing improvements had there been no expectation of spectrum availability or renewal.

In fact, a number of circumstances reduced this potential impact.

- By the time that licences ended, operators had a number of alternative bands they could continue to operate on (including those acquired for 3Gand LTE networks), making investment less risky – although had spectrum been withdrawn there would have been impacts on capacity and coverage.
- Before these licences ended, new mobile technologies had been introduced and there was a falling demand for 2G legacy networks, meaning that less investment was needed.
- Given the sunk costs of existing network equipment, existing operators entered any renewal process as having the highest valuation for spectrum bands, meaning there was a general expectation that their spectrum would be unchanged.

Nevertheless, without a clear statement on how renewals would be dealt with, there was significant uncertainty around how networks would continue to operate after the initial licences expired. It is crucial, for the sake of operators' business planning, that a clear renewals policy is in place well before the end of a licence period.

2.2 Evolution of licencing procedures

As discussed above, initial spectrum licences were awarded directly, often with no expiry date, due to the expected lack of excess demand for spectrum. As the demand for spectrum grew, there was a general move to competitive awards of defined-length licences of 10 to 15 years in length. There have been a number of other changes in the market over time, including the following.

- Growth in spectrum demand has escalated, due to exponential increases in demand for services. While technology is constantly improving spectrum efficiency, this does not cover the increase in demand.
- Although major changes in technology seem to progress at the same rate (for example, the gaps between 2G, 3G, 4G and 5G were approximately ten years each), there are more frequent updates within the technology bands requiring more investment during the technology lifespan. For example, major investment was required for upgrades to LTE-A and LTE-A Pro during the 4G network lifespan.

- Operators are expected to run legacy networks in addition to new technologies, to cater for all existing users, including industrial equipment.
- There is a general trend to technology neutrality in spectrum licences, so bands can be used for whichever technologies are in greatest demand.
- Coupled with this, licence periods are typically increasing, with the EU recommending 25-year licences and many countries moving to 20-year cycles.

The remainder of this report considers how countries around the world currently deal with the end of licences, and how these policy options can be categorised.

3 International experience

Given the history of licencing outlined above, it is useful to consider how countries worldwide have dealt with the question of how spectrum at the end of a licence period should be renewed. This section considered how renewals are dealt with in a number of different countries, and lessons from this research will be presented in Sections 4 and 5.

3.1 UK

Ofcom first awarded defined spectrum licences for 2G services in 1992, although these were provided free of charge to the operators at the time. There was an expectation of automatic renewal, particularly since the licences were given an initial duration of five years.

Following the highly competitive auction of 2100 MHz spectrum in 2000, in which operators committed billions of pounds to spectrum fees, there were significant pressures on Ofcom to reassess its spectrum policies, including the policies over renewal, the rights of licensees, and the ability of spectrum to be traded. Wireless licences were first made tradeable in 2004, with Ofcom believing this would lead to potentials for increased efficiency.

At the same time as spectrum being made tradeable, Ofcom decided that spectrum licences should have an indefinite term – since if spectrum was no longer being used, it would be traded to another network operator willing to pay for it. The use of indefinite licences is unusual, since there are some significant drawbacks to such a policy:

- Ofcom cannot place obligations or conditions on spectrum that has been previously awarded;
- It is difficult to change the use of spectrum, unless all spectrum in a particular band can be traded to new industries; and
- Even if spectrum is not being used, there can still be an advantage to operators of hoarding it to prevent competitors from using it.

To overcome this, Ofcom decided to put into place provisions to be able to revoke licences if needed[2].

> **“Following Ofcom’s consultations on the introduction of spectrum trading, it is in the process of varying wireless telegraphy licences, starting with those that have been made tradable in 2004, to give them an indefinite term, with a five year minimum notice period for revocation on the basis of spectrum management reasons. Ofcom has powers (under Section 1(4) of Wireless Telegraphy Act 1949) to revoke wireless telegraphy licences. This may be done in situations where it is necessary to do so for overriding reasons of spectrum management. Such reasons might be to ensure that the development of a wide swathe of spectrum was not impeded by a minority user; or that spectrum did not remain unused for an excessive period. Ofcom would only revoke or change licences for spectrum management reasons where there was a pressing need to do so, and only after careful consideration and consultation with the stakeholders affected”**

Ofcom believes that there are many reasons why the use of indefinite licences is likely to lead to an efficient and optimal use of spectrum. First, licences with indefinite duration require less regulatory intervention to reassign spectrum or to decide on a recurring basis whether to renew the licences – however, since there is the possibility

[2] See https://www.ofcom.org.uk/__data/assets/pdf_file/0020/38162/statement.pdf for further reasoning

of licence withdrawal (with a five-year notice period) Ofcom has a duty to constantly assess whether spectrum should continue to be licenced in the same way. By giving operators the rights to use this spectrum, this intervention is not needed, meaning there is more likely to be a market-led approach. Second, the defined rights over spectrum holdings encourage and allow spectrum trading which should lead to opportunities for the market to secure efficient use of spectrum. Third, the renewal or re-award of spectrum can take a significant time and effort, both from the side of the regulator and the spectrum users, and an indefinite period removes this requirement.

Initially Ofcom defined this type of licence as a minimum term followed by a rolling period, but such a description implied to some that there would need to be action taken to continue using the spectrum after the initial licence period expired. Instead, since the circumstances under which spectrum would be returned were limited and defined, the licence period was defined as indefinite. The minimum term was retained, however:

> **"The inclusion of a minimum term in the licence is required in order to give sufficient certainty to investors to incur the necessary costs to put the spectrum into use. Without a minimum period there is a risk that this may not occur and so the spectrum would not be used efficiently."**

This type of renewal policy is similar to the policy option labelled as "automatic full renewal" in Section 4.1, although since there are some cases where spectrum licences can be revoked, this could be considered as a rolling conditional renewal.

The minimum term was initially set at 15 years, but in recent awards – such as the 700 MHz and 3500 MHz auctions – it has been increased to 20 years.

During the consultation on the appropriateness of this licence type, a number of respondents requested that either network rollout obligations, or use-it-or-lose-it clauses should be imposed on the spectrum affected. Ofcom decided against such requirements.

> **"In general, in relation to the spectrum awards discussed in this document, Ofcom considers that roll-out or UIOLI conditions are unlikely to be required to meet the objective of ensuring that the spectrum is used efficiently. This is because spectrum trading and liberalisation and AIP provide or enhance market-based incentives to use spectrum efficiently. Furthermore, Ofcom has indicated in the Spectrum Trading statement that concerns regarding spectrum hoarding, which sometimes underlie proposals for UIOLI conditions, may be addressed ex post, for example through competition law."**

3.1.1 Impacts on existing licences

At the time of this decision, Ofcom did not intend to retroactively apply this indefinite duration to existing spectrum licences – in particular, the 2100 MHz, 28 GHz and 3400 MHz bands. Justifying this, Ofcom stated:

> **"Ofcom does not believe that there is an automatic linkage between the approach generally proposed for the award of new licences, and the appropriate treatment of licences that have already been auctioned. Different considerations are likely to apply to licences which have already been awarded which may mean that a different approach is appropriate. For example, where an auction has already been held, there may be concerns relating to fairness and non-discrimination in relation to unsuccessful bidders, which would need to be assessed carefully. This is because the behaviour of other bidders, and the outcome of the auction, might have been different if they had known that the licence term would be varied. It is also the case that the holders of licences that have already been auctioned have acquired them in the knowledge that they contained roll-out obligations, and that to the extent such obligations have financial costs, these should have been**

> **reflected in the bids made for them. As a general matter, it is important for Ofcom to have regard to the integrity of the spectrum auction process in considering the case for changes to a licence after an auction, while also taking into account other considerations such as any effects on the incentives for efficient spectrum use and Ofcom's objectives for the promotion of competition.**"

However, this has an important impact on renewals of these bands. Since Ofcom considers the indefinite licence to be significantly different in structure to previously awarded licences, this would imply that these previous licences should not be renewed, and in fact all spectrum should be returned and re-awarded in a competitive process.

For the 3.4 GHz band, this did not happen. Part of this band was held by UK Broadband, a fixed-wireless access operator, and was used to run limited services over a variety of technologies. UK Broadband submitted to Ofcom in 2011, ahead of the spectrum licence end, that their licence should be renewed to give certainty for investment in new technologies. Ofcom agreed with this assessment[3] and provided UK Broadband with an indefinite extension, and awarded the remainder of this spectrum band separately.

3.1.2 Spectrum fees

To encourage the use of spectrum trading alongside the indefinite licence framework, Ofcom has developed the Administrative Incentive Pricing (AIP) mechanism. This attempts to set fees at a rate which reflect the opportunity cost of the spectrum not being made available for an alternative use. AIP is generally applied after the minimum term of the indefinite licence has been reached – therefore allowing operators to have certainty over payments for the first part of the licence.

> "**Ofcom considers that it is likely to be appropriate to include a licence condition giving Ofcom the option of charging fees after the end of the minimum term if it is justified to do so in order to promote efficient use of the spectrum. [...] During the minimum term, Ofcom has a high degree of confidence that the auction, including the payment of the auction fee, will secure efficient use of the spectrum. However, it is less clear that this objective will be met after the minimum term, or indeed for the entire indefinite duration of the licence. The longer the period over which the regulator is required to look forward, the greater the uncertainty that exists. At present, the ability to revoke licences on spectrum management grounds, and the ability to charge fees are important mechanisms in the regulator's tool kit for promoting optimal use of the spectrum. Ofcom considers that it would be unwise to assume that the need for such mechanisms in the future will abate to such an extent that the regulator should be precluded from using them after the end of the minimum term. Rather, Ofcom considers that the regulator should retain the option to use these mechanisms, where it is justified to do so.**"

There are a number of arguments against this use of AIP. Many network operators have stated that such a system does not take into account any social welfare from use of the spectrum; further, the calculation does not always consider the impacts of needing to construct new networks compared to using existing equipment.

One key argument against the use of AIP after a minimum term is that the actual price to be paid is unknown at the time of licence award. Operators have argued that if an indefinite licence is being awarded, Ofcom is expecting bidders to take account of returns over an indefinite period when determining the value of spectrum. However, as bidders do not know the level of the fees which will be charged after the minimum term, it is not possible to include this in the valuation exercise.

In reality, Ofcom continues to consider which fees are payable at the end of a minimum period on a case-by-case basis. For example, when looking at the renewal of the 412 MHz spectrum band, Ofcom considered

[3] Further details are available at Extension of UKBB licence: https://www.ofcom.org.uk/__data/assets/pdf_file/0018/74610/uk_broadband_statement.pdf

whether fees should be set at a cost-based level, covering Ofcom's costs only; however, their analysis indicated that there would be excess demand if this was taken as the fee level, and instead AIP was imposed using the alternative use of Business Radio. On the other hand, when considering renewal of television broadcasting licences, AIP has not been applied due to concerns over the public and social benefits of television being lost.

3.1.3 Exceptions from indefinite licencing

While Ofcom maintains that indefinite licence periods are its preferred option, there have been a number of awards recently which have demonstrated the need for flexibility.

In the case of **mmWave awards**, Ofcom has been keen to ensure that mobile operators have access to enough spectrum so that 5G rollout and use is not inhibited. However, this is still early for this technology. Ofcom notes[4]:

> **"In light of the still-emerging potential of new uses for mmWave, there is a risk that the initial allocation of citywide licences would not reflect the most efficient allocation of mmWave spectrum in the longer term. We therefore consider our most recent approach of awarding indefinite licences with a 20-year initial term could result in an allocation of mmWave spectrum which could become inefficient over time."**

In the specific case of **40 GHz spectrum**, existing licences were on an apparatus basis, and required registration of equipment and directions.

> **"At the time of the 2008 award, there was no general expectation that the 40 GHz band would be used for future mobile services.16 The existing 40 GHz licences require operators to register the address of radio equipment including terminals using the spectrum, as well as their antenna height and antenna bearing. This requirement prevents licensees from using the spectrum for mobile services, as a mobile terminal inevitably changes location, and antenna height and bearing very frequently. [...] These licences have an indefinite duration, with an initial term of 15 years (up to February 2023) during which time Ofcom's powers to revoke the licences are limited. Since February 2018, Ofcom has been able to revoke these licences, with five years' notice, for spectrum management reasons."**

This spectrum has illustrated to Ofcom the limitations of indefinite licences, and for the forthcoming awards Ofcom is considering a number of alternative licence types with associated renewals:

- A fixed term licence with a 20-year term;
- A fixed term licence with a shorter term, such as 5, 10 or 15 years; or
- An indefinite licence with a shorter initial term, such as 5, 10 or 15 years (with annual licence fees potentially being imposed after the initial term).

3.2 European Union determinations

Before considering renewal policies in countries within the European Union, it is worth examining the international agreements and directives that have been made. In particular, the European Electronic Communications Code (EECC) has set out a number of measures relating to renewals, to harmonise spectrum award and use throughout the Union:

[4] See https://www.ofcom.org.uk/__data/assets/pdf_file/0027/237258/mmwave-spectrum-condoc.pdf

- The minimum licence terms of spectrum licences should be 25 years so as to allow operators to recoup their investment, and to ensure there is a viable market for spectrum trading.
- There should be a harmonised process around the renewal of licences; regulators must make decisions on renewals between three and five years before the end of a licence.
- Spectrum award should follow a coordinated timetable so as to provide greater certainty and predictability for bidders.

The EECC itself does not specify exactly how renewals are to be carried out. Instead, it sets out the decision framework to be followed.

> "**(129) In deciding whether to renew already granted rights of use for harmonised radio spectrum, competent authorities should take into account the extent to which renewal would further the objectives of the regulatory framework and other objectives under Union and national law. Any such decision should be subject to an open, non-discriminatory and transparent procedure and based on a review of how the conditions attached to the rights concerned have been fulfilled. When assessing the need to renew rights of use, Member States should weigh the competitive impact of renewing assigned rights against the promotion of more efficient exploitation or of innovative new uses that might result if the band were opened to new users. Competent authorities should be able to make their determination in this regard by allowing for only a limited duration for renewal in order to prevent severe disruption of established use. While decisions on whether to renew rights assigned prior to the applicability of this Directive should respect any rules already applicable, Member States should also ensure that they do not prejudice the objectives of this Directive.**"

The exact code applicable to renewals is set out in Figure 3.1.

Figure 3.1: EECC articles on renewals

Article 49

Where Member States grant individual rights of use for radio spectrum for which harmonised conditions have been set by technical implementing measures in accordance with Decision No 676/2002/EC in order to enable its use for wireless broadband electronic communications services ('wireless broadband services') for a limited period, they shall ensure regulatory predictability for the holders of the rights over a period of at least 20 years regarding conditions for investment in infrastructure which relies on the use of such radio spectrum, taking account of the requirements referred to in paragraph 1 of this Article. This Article is subject, where relevant, to any modification of the conditions attached to those rights of use in accordance with Article 18.

To that end, Member States shall ensure that such rights are valid for a duration of at least 15 years and include, where necessary to comply with the first subparagraph, an adequate extension thereof, under the conditions laid down in this paragraph.

Member States shall make available the general criteria for an extension of the duration of rights of use, in a transparent manner, to all interested parties in advance of granting rights of use, as part of the conditions laid down under Article 55(3) and (6). Such general criteria shall relate to:

(a) the need to ensure the effective and efficient use of the radio spectrum concerned, the objectives pursued in points (a) and (b) of Article 45(2), or the need to fulfil general interest objectives related to ensuring safety of life, public order, public security or defence; and

(b) the need to ensure undistorted competition.

At the latest two years before the expiry of the initial duration of an individual right of use, the competent authority shall conduct an objective and forward-looking assessment of the general criteria laid down for extension of the duration of that right of use in light of point (c) of Article 45(2). Provided that the competent authority has not initiated enforcement action for non-compliance with the conditions of the rights of use pursuant to Article 30, it shall grant the extension of the duration of the right of use unless it concludes that such an extension would not comply with the general criteria laid down in point (a) or (b) of the third subparagraph of this paragraph. On the basis of that assessment, the competent authority shall notify the holder of the right as to whether the extension of the duration of the right of use is to be granted. If such extension is not to be granted, the competent authority shall apply Article 48 for granting rights of use for that specific radio spectrum band.

Article 50

1. National regulatory or other competent authorities shall take a decision on the renewal of individual rights of use for harmonised radio spectrum **in a timely manner before the duration of those rights expired**, except where, at the time of assignment, the possibility of renewal has been explicitly excluded. For that purpose, those authorities shall assess the need for such renewal at their own initiative or upon request by the holder of the right, in the latter case **not earlier than five years prior to expiry of the duration of the rights concerned**. This shall be without prejudice to renewal clauses applicable to existing rights.

2. In taking a decision pursuant to paragraph 1 of this Article, competent authorities shall consider, inter alia:

(a) the fulfilment of the objectives set out in Article 3, Article 45(2) and Article 48(2), as well as public policy objectives under Union or national law;

(b) the implementation of a technical implementing measure adopted in accordance with Article 4 of Decision No 676/2002/EC;

(c) the review of the appropriate implementation of the conditions attached to the right concerned;

(d) the need to promote, or avoid any distortion of, competition in line with Article 52;

(e) the need to render the use of radio spectrum more efficient in light of technological or market evolution;

(f) the need to avoid severe service disruption.

3. When considering possible renewal of individual rights of use for harmonised radio spectrum for which the number of rights of use is limited pursuant to paragraph 2 of this Article, **competent authorities shall conduct an open, transparent and non-discriminatory procedure**, and shall, inter alia:

(a) give all interested parties the opportunity to express their views through a public consultation in accordance with Article 23; and

(b) clearly state the reasons for such possible renewal.

The national regulatory or other competent authority shall take into account any evidence arising from the consultation pursuant to the first subparagraph of this paragraph of market demand from undertakings other than those holding rights of use for radio spectrum in the band concerned when deciding whether to renew the rights of use or to organise a new selection procedure in order to grant the rights of use pursuant to Article 55.

4. **A decision to renew the individual rights of use for harmonised radio spectrum may be accompanied by a review of the fees as well as of the other terms and conditions attached thereto**. Where appropriate, national regulatory or other competent authorities may adjust the fees for the rights of use in accordance with Article 42.

While there is no prescribed policy to be followed in regards to spectrum renewals, it is important that decisions are made in a transparent way with full consultation from any interested stakeholder. This will mean that a full award process is more likely, apart from for spectrum where there is little demand.

The time period in which the consultation process must be carried out raised a number of objections, chiefly from BEREC who state[5] that "[t]he time frame of 3 and 5 years [...] where a Member State and/or an NRA is to take a decision on a licence renewal is not appropriate in all cases and runs the risk of introducing uncertainty with respect to the licence renewal process and has the potential to undermine the licence itself". BEREC's key concern is that this requirement prevents regulators from determining a renewal process at the outset of the licence, which would give greater certainty to operators when deciding on investment plans.

3.2.1 Spectrum fees

As mentioned in Article 50 (4) above, regulators are advised to review the fees payable at the time of any renewal. The notes to the code are more explicit here:

> "**(130) When renewing existing rights of use for harmonised radio spectrum, Member States should, together with the assessment of the need to renew the right, review the fees attached thereto with a view to ensuring that those fees continue to promote optimal use, taking account, inter alia, of market developments and technological evolution. For reasons of legal certainty, it is appropriate for any adjustments to the existing fees to be based on the same principles as those applicable to the award of new rights of use.**"

Again, it should be noted that there is no defined method for calculating these fees, and this is indicative of a lack of international consensus on the issue.

3.3 Ireland

The regulator, ComReg, has established a standard policy on renewals that all auctioned spectrum will be subject to a full award process at the end of the licence period. There is no expectation of renewal. This is made explicit in award processes; for example, during the 3.6 GHz award, ComReg stated[6]:

> "**Spectrum rights of use in this Award Process are being made available from 1 August 2017 (or some other date as may be specified by ComReg) to 31 July 2032. There is no implied or express right of renewal, extension or any other form of prolongation of a 3.6 GHz Band Liberalised Use Licence (and the spectrum rights of use granted by same) beyond the expiry date of 31 July 2032.**"

This is common with all other spectrum awards that have been completed.

During the consultation for the 3.6 GHz band, ComReg received a number of submissions asking for clarity on the renewal at the end of the licence, or suggesting that the licence should be renewed on the condition that

[5] See https://berec.europa.eu/eng/document_register/subject_matter/berec/download/9/7041-press-release-on-berec-papers-on-the-rev_9.pdf
[6] See https://www.comreg.ie/media/dlm_uploads/2016/08/ComReg-1671-1.pdf

certain performance criteria were met. These would have increased the certainty for operators over the whole period of the licence. However, ComReg did not believe it was appropriate to make decisions over renewal at the start of the licence:

> **"making a decision now rather than closer to licence expiry regarding whether to grant such a licence extension would neither be an objectively justified or proportionate response to this perceived concern. Furthermore, in relation to the suggestion that a licence should be renewed based on performance conditions, ComReg [...] observes that attempting to establish performance conditions now for a spectrum band that can be used for any ECS including, but not limited to wireless broadband, including on a fixed, mobile or nomadic basis raises clear practical and substantive difficulties, such as in terms of trying to identify appropriate performance conditions for the range of possible uses that could be made with new 3.6 GHz rights and, further, on such terms that would remain appropriate so far into the future. [...] In light of the above, ComReg considers that periodic predetermined re-release of spectrum is the most appropriate mechanism for the release of new 3.6 GHz spectrum rights. For the avoidance of doubt, there would not be any implied or express right of renewal, extension or any other form of prolongation"**

Aligning with this, ComReg also believes that indefinite licences would not give the regulator the appropriate flexibility to deal with changes to markets. When looking to award the 2600 MHz band in 2014, it was noted[7]:

> **"ComReg favours spectrum licences of finite duration because it: promotes competition, spectrum efficiency and the internal market; is wholly compatible with the Common Regulatory Framework; allows licence holders sufficient time to obtain a return on investment in line with the expected life-cycle of the technology deployed; provides a sufficiently flexible approach to address future co-ordinated approaches that may be taken to particular spectrum bands at an EU-wide level; ensures that there are no long-term barriers to a co-ordinated approach to the band"**

The automatic move to full award processes at the end of licence periods is unusual, and means that operators have little incentive to invest in network equipment towards the end of the licence period. When asked about the rational for there being no potential of renewal, ComReg noted that they issue licences with set terms and conditions, rights and obligations (including pricing) for the full duration of the licence period; since any renewal process would lead to some uncertainty over prices, timings, or conditions, this would adversely impact on the valuation process at the time of auction.

This automatic re-award policy has been written into ComReg's regulations, and there is no provision for any form of renewal in the regulations that establish the licencing regime – the licences expire in their entirety at the end of the licence period. Based on responses to consultations, there is little appetite for changing this either within ComReg or with other stakeholders, and indeed ComReg believe that this policy is the most consistent with the EECC's intention.

3.4 France

Following the "New Deal Mobile" framework[8] released in January 2018, France moved to a conditional renewal process for mobile spectrum. Under this framework, operators committed to cover all citizens in France with a 4G connection by the end of 2020. If the commitment was met, it was agreed that no auction would be organized for licence renewals.

The objectives of deployment have contractually been included in the existing license agreements, which enables Arcep to apply penalties for any non-compliance with the planned schedule, if necessary. Because

[7] See https://www.comreg.ie/csv/downloads/ComReg14101.pdf
[8] Description of the "New Deal Mobile": https://www.arcep.fr/uploads/tx_gspublication/description-dispositif-couverture-mobile-220118.pdf

mobile coverage has become a strong user expectation, the government, Arcep and the operators have decided to respond to this by prioritizing the objective of regional development in the obligations that are attached to the award of the 900, 1800 and 2100 MHz bands. The previous licences for these bands were ending between 2021 and 2024, but Arcep decided to carry out a renewal procedure in 2018: the operators made commitments – for the intermediate period – which were included from 2018 in their licences for the frequency use.

The obligations include the improvement of mobile voice and data services, as well as the use of 4G to improve fixed Internet access. They are described as follows on Arcep's website.

- Improve reception quality nationwide, and particularly in rural areas. The new baseline standard that will apply to operators' obligations will be that of "good coverage".
- Increase the pace of targeted coverage improvement programmes, requiring every operator to deploy 5,000 new cell sites, some of which will be shared. These will extend beyond so-called "white" areas, and operators will now be entirely responsible for their coverage.
- Provide ubiquitous 4G coverage, which will involve bringing 4G to more than a million additional people in 10,000 municipalities in France, by upgrading all existing 2G and 3G sites to 4G.
- Accelerate coverage of transport corridors, so that the main roadways and railway lines are all 4G-capable. This obligation applies only to the winners of the 1800 MHz band allocation procedure.
- Achieve ubiquitous indoor telephone coverage, notably by providing a voice over Wi-Fi service to customers with compatible hardware.

On 25 October 2018, Arcep awarded 10-year licences (a re-award of the existing spectrum) to the four mobile operators as they all have fulfilled the admissibility and qualification conditions required by the procedures to which they applied. The relatively short length of this extension has led to operators now starting to examine their future use of the spectrum, and Arcep launched a public consultation in May 2022 called "preparing the future of mobile networks"[9], which includes a section with specific questions by spectrum band, starting with: "Of all the frequency bands listed above and detailed below, which ones appear to be priorities for your needs? Have you identified any other frequency bands of interest to mobile services in a near future?".

3.5 Sweden

The Spectrum Strategy of the Swedish Post and Telecom Authority (PTS) sets principles that shall be applied in spectrum awards in the country[10], including the principle that PTS' selection procedures must prioritise preserving or improving competition and coverage. In December 2016, the Swedish government presented a new broadband strategy, "A Completely Connected Sweden by 2025", which contained a mobility goal stating that all of Sweden should have access to reliable and high-quality mobile services by the year 2023. This goal is designed to meet the expected demand for broadband that people might reasonably have outside the home or workplace.

In March 2021, PTS launched a public consultation for the allocation of spectrum in the 900MHz, 2100MHz and 2.6GHz bands – a **single auction for expiring licences**. It would award national permits which would allow the bands to be utilised for 5G services, as well as previous technologies. For these bands, therefore, there is no expectation of renewal.

[9] Consultation available here (French): https://www.arcep.fr/actualites/les-consultations-publiques/p/gp/detail/preparer-le-futur-des-reseaux-mobiles-230522.html

[10] https://www.pts.se/contentassets/7d9e389f716a42c59f991f33bcbe0b95/pts-swedish-spectrum-strategy-eng-pts-er-2014_16.pdf

PTS believes that a multiband auction will give the most efficient outcome for the industry. However, to accomplish this it is necessary to align the end points of a number of licences.

Initially, PTS was looking to bring forward the expiry date of 2100MHz licences from end-2025 to end-2023 so that the spectrum could be allocated in a single process. However, in April 2022, PTS opened another consultation into a proposed temporary extension of licences in the 2.6GHz band, enabling them to run for an additional two years until the end of 2025. This would allow the regulator to auction 2.6GHz licences along with those for the 2100MHz and 900MHz bands at this later date instead. Under the new PTS proposals, the auction process for all three bands is due to start in September 2023, with permits valid from the start of 2026.[11].

3.5.1 Prior renewal of the 900 MHz band

Between 2008 and 2011, the 900MHz band was restructured in Sweden[12]. The first step of the process was to renew incumbents' licences and expand the size of the band from 2×30MHz to 2×35MHz. The second step was to introduce a new licensee via a trading arrangement of transfer of incumbents' parts (2×2.5MHz). The third phase was to lift the GSM technology restrictions once the band was restructured. The regulator has designed new technical conditions and implemented technology neutral usage rights.

This process incorporated some specificities:

- The four incumbents and the mobile operator with no 900 MHz band spectrum developed a consensus proposal and decided to submit a joint application to the regulator for the four incumbents to renew their licenses and for two of them to engage in the spectrum trading transaction, which introduced the 5th 900 MHz band licensee in the country.

- The regulator encouraged the mobile operators to develop consensus and use voluntary approaches and market-based tools.

This previous renewal process therefore followed a partial renewal methodology, with some conditions attached.

3.6 Netherlands

In December 2016, the Radio Spectrum Policy Memorandum[13] stated that having radio spectrum available is an essential condition for a high-quality digital infrastructure. The Digital Connectivity Action Plan (Actieplan Digitale Connectiviteit[14]) published in 2018 provides certainty regarding the 5G networks rollout by giving operators the security that the spectrum award on a nationally exclusive basis (including the 700, 1400 and 2100 MHz bands) will be for 20 years, but it specifically makes not promises on renewals. The Plan also announces a coverage obligation to be imposed on licence holders in future auctions, enabling them to incur the associated costs into their bids. The requirement is that coverage should be provided on 98% of the surface area of each municipality with a minimum data speed.

Following the Radio Spectrum Policy Memorandum and the Digital Connectivity Action Plan, the Memorandum on Mobile Communications was published to provide a more specific policy framework on spectrum.

There have been two key examples of spectrum renewal in the Netherlands to date.

[11] https://www.commsupdate.com/articles/2022/04/27/sweden-consults-on-2-6ghz-licence-extension/
[12] https://www.gsma.com/spectrum/wp-content/uploads/2012/07/refarmingcasestudysweden900mhz20111129.pdf
[13] House of Representatives of the States General, 2015-2016 session, 24095, No. 409
[14] House of Representatives of the States General, 2017-2018 session, 26 643, No. 547

- The 900MHz licences were ending in 2010. The Ministry of Economic Affairs decided to extend them for 3 years[15] in order to align their expiry with the 1800MHz licences, and thus enabling a single auction process for both bands. In order to determine the price of this extension, the methodology that was used focused on estimating the value loss from not having early access to spectrum (between €0.36 million and €2.39 million per duplex MHz per year. A renewal price of €3.21 million per MHz duplex was set for the three-year extension[16].

- In 2020, the decision was taken that the 700, 1400 and 2100 MHz licences would be awarded in a multi-band auction, based on the substitutability of these bands. Both 700 and 1400MHz bands were available and could be used immediately after the award. However, the 2100MHz band was first awarded in 2000 for a fifteen-year licence from 2001, and this was therefore temporarily renewed in 2014 for the period from January 2017 to January 2021.

In both these cases, therefore, the regulator has made use of a temporary renewal, but the permanent solution was a full award process. This will have led to a slowdown in investment using the specified spectrum during the temporary period.

3.7 New Zealand

From public statements on renewals, it appears that there is no formal policy on how licences should be renewed in New Zealand, but there has been a tendency towards full or partial renewals under most circumstances.

In minutes from a Cabinet decision[17] on the renewal of rights in the 1800 MHz and 2100 MHz bands, the government:

> **"noted that there is no legal requirement to renew management rights when they expire, but that in the past there has been an expectation of renewal if rights are in use and there are no overriding public policy considerations"**

> **"noted that the renewal of all existing management rights would allow mobile network operators to continue providing services with least inconvenience and cost to them, and that mobile network operators have expressed a preference for this option"**

> **"noted that the complete renewal of all existing management rights would reduce options for potential alternative uses of radio spectrum, such as uses by new technologies or new competitors in the mobile phone market"**

> **"noted that the Police, Blue Reach (a wireless service provider), and the New Zealand Technology Group (which provides services to some wireless service providers) have argued against full renewal of existing rights"**

This list shows the considerations which the government (through the regulator, MBIE) followed when determining whether spectrum should be re-awarded. In the discussion paper behind this decision, the regulator set out a number of criteria to be used as a framework when evaluating potential renewals[18].

[15] https://www.government.nl/binaries/government/documenten/publications/2020/03/06/non-binding-translation-auction-regulation-and-explanatory-notes-2020/Non-binding+translation+auction+regulation+and+explanatory+notes+2020.pdf
[16] https://www.ofcom.org.uk/__data/assets/pdf_file/0031/58189/benchmarking.pdf
[17] Available at https://www.mbie.govt.nz/dmsdocument/4641-cabinet-minute-of-decision
[18] From https://www.mbie.govt.nz/dmsdocument/4640-cabinet-paper-renewal-of-radio-spectrum-management-rights-in-the-1800-and-2100-megahertz-frequency-band

- Efficiency. How much does the option promote efficient use of the spectrum? That is, under the chosen option, would all of the spectrum be in use, and would this use be valuable?
- Competition. How much does the option ensure that there is adequate competition in the cellular mobile (or other) markets?
- Capacity and coverage. How much does the option affect the capacity and coverage of services, including existing cellular mobile services?
- Certainty for operators. How consistent is the option with giving operators certainty about their future rights to use spectrum?
- Crown revenue. How does the option affect Crown revenue?
- Public policy. Is there some public policy reason (other than the ones above) to favour the option over others? This could include compliance with international obligations.

It is noted that Telstra was not offered renewal of its 2100 MHz holding because it had not used the spectrum. For those licences where the spectrum had been used, and since full and partial renewals were considered for those licences, MBIE drew up a table to consider at a high level each of these criteria

Figure 3.2: Comparison table of renewal options[19]

	Full	Partial
Efficiency	High	Depends on alternative use (difference likely modest)
Competition	Cuts off possibility of new entrants (in these bands)	Possibility of new entrants
Capacity & coverage	No change	Some minor capacity reduction for existing mobile services. Potentially an increase for alternative uses.
Operator certainty	Maximum certainty	Some reduction in certainty (goes against historical expectations, although this would not be the first case where rights have not been renewed in full)
Crown revenue	Likely highest proceeds	Depends on alternative use
Other public policy	Cuts off options for use of spectrum, to respond to technological changes or other new demands	Allows for some use of spectrum to respond to technological changes or other new demands

In this case, a partial renewal was decided on, with small parts of the spectrum being removed from most operators. Spectrum was renewed on largely the same terms as the original award, although with a longer licence period than the original 15 years.

> **"I am recommending that the rights that are renewed – partially or wholly – be renewed for a period of 20 years. This should provide the right incentives for investment in use of the band; it will ensure that new assets can be used over a long period to recover up-front costs."**

[19] From https://www.mbie.govt.nz/dmsdocument/4640-cabinet-paper-renewal-of-radio-spectrum-management-rights-in-the-1800-and-2100-megahertz-frequency-band

Each of the bands was priced at a market value, derived from a number of different methodologies.

> **"Renewal would be by direct offer, at a fixed price of $720,000 excluding GST per MHz. This price has been determined using a combination of optimal deprival and international benchmarking valuation methods."**

3.8 Canada

In the "Framework for Spectrum Auctions in Canada", the Canadian government are clear on their policy for renewal of spectrum after an initial licence period has ended[20].

> **"Licences issued via auction will have terms of up to 20 years, based on the specific spectrum being offered. Where spectrum use is not anticipated to change, longer terms would be offered. As a condition of licence, licences will have a high expectation of renewal, unless a breach of licence condition has occurred, a fundamental reallocation of spectrum to a new service is required or an overriding policy need arises."**

The effect of this is a regime very similar to that in the UK, where licensees can expect to hold their spectrum licences indefinitely, unless there is a material and significant reason why the regulator decides to reclaim the spectrum. The main difference here is that the regulator must wait until the end of the renewal period to take action, whereas Ofcom in the UK can, at any point, give five years' notice that the licence will be revoked.

This policy was used in 2020 to renew licences in a number of bands[21]. In applying the policy, ISED (Innovation, Science and Economic Development Canada, the new name for Industry Canada) noted that "*ISED proposed to renew the auctioned AWS-1, G Block and I Block licences where the licensee was able to demonstrate compliance with all conditions of licence*". Part of the work carried out ahead of this decision was defining what these conditions of licence were; ISED noted that "*these licences referred to 'deployment targets' rather than 'deployment requirements'. […] ISED proposed that deployment will be considered satisfied where the licensee can demonstrate that they are actively providing commercial mobile wireless services with their licence to at least the minimum levels*." The wording of this decision makes it clear that not only is renewal of the licence expected, but the regulator is seeking to take a lenient stance on the interpretation of licence conditions, making renewal more likely.

3.8.1 Spectrum fees

Although ISED notes that there must be a payment for spectrum when it is renewed, there is no defined formula for its calculation. Instead, in the "Framework for Spectrum Auctions in Canada", it is stated:

> **"For licences issued through a renewal process, licence fees that reflect some measure of market value will apply. Generally, when a majority of licences in a specific band are nearing the end of their licence term, a public consultation regarding the renewal process will be launched. This consultation will usually commence approximately two years prior to the end of the licence term. Comments would be sought on the appropriate conditions of licence to be applied to the new licences, including the level of fees."**

There are a number of ways of estimating market value of spectrum, including through benchmarking methods (direct or econometric), avoided cost modelling or enterprise value. Some of these methods can involve

[20] From https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01626.html#section36
[21] Details are available at https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11367.html

significant effort and time, and commencing a consultation only two years before the end of a licence period may lead to a tight timescale for renewals to be authorised.

3.9 United States

The US regulator, the FCC, reformed the national policy on spectrum renewals in 2017. Previously, different spectrum bands would have had varying rules on renewal, even for spectrum bands used for the same service. The FCC announced a consistent renewals policy across all radio spectrum licences, as shown below.

Figure 3.3: Extract from announcement of unified renewals policy[22]

> [...] the Commission today adopts uniform requirements for the renewal of WRS licenses. In particular, the Commission proposed that geographic licensees "demonstrate that they have and are continuing to provide service to the public" and that site-based licensees "certify that they are continuing to operate consistent with the applicable filed construction notification(s) (NT) or most recent authorization(s) (when no NT is required under the Commission's rules)."
>
> We adopt a unified renewal standard for most Wireless Radio Services licensees, both geographic and site-based. A clear, consistent standard will promote the efficient use of spectrum resources and will serve the public interest by providing licensees certainty regarding their renewal requirements. To qualify for renewal, each WRS licensee must demonstrate that over the course of its license term, the licensee either: (1) provided and continues to provide service to the public, taking into account the periods of time the applicable service-specific rules give licensees to construct facilities and meet performance benchmarks, or (2) operated and continues to operate over the course of the license term to address the licensee's private, internal communications needs, again taking into account the periods of time the applicable service-specific rules give licensees to construct facilities and meet performance benchmarks.
>
> More specifically, for renewal at the end of an initial license term, the licensee must demonstrate that it timely constructed to any level(s) required by the service-specific rules and, thereafter, consistent with our permanent discontinuance rules, continuously provided service or operated at or above the required level(s) for the remainder of the license term. For subsequent renewals, the licensee must demonstrate that, over the license term at issue, it continuously provided service to the public or operated under the license to meet the licensee's private, internal communications needs, at or above the level required to meet the final construction requirement during the initial term of the license. In all events, the licensee also must certify that its service or operations are continuing. This requirement is reflected in the new Section 1.949 we adopt today, which replaces separate renewal rules for each service in various rule parts [...]

The policy was that of an automatic right of renewal, provided that the spectrum had been used during the previous licence period. There would be no new obligations placed on the operators, nor changes to the format of the spectrum. In effect, this is an absolute automatic full renewal policy, with a "use it or lose it" clause included in the licence terms.

Such renewal policies had been used in the US previously.

> **"The renewal standard we adopt today follows the approach the Commission adopted in many of its proceedings for new wireless services over the past decade. Beginning with the 700 MHz First Report and Orde5 in 2007, and continuing to the 2016 600 MHz Report and Order, the Commission has established that licensees "must demonstrate that they are providing adequate levels of service over the course of their license terms." Most recently, the Commission applied the same principles in the Spectrum Frontiers Report and Order, concluding that Upper Microwave Flexible Use Service (UMFUS) licensees would meet the renewal standard in their initial license**

[22] See https://www.fcc.gov/document/fcc-reforms-license-renewal-rules-wireless-spectrum

> **terms if they met certain performance benchmarks and were "using [their] facilities to provide service." For subsequent license terms, the Commission concluded that it would "award a renewal expectancy for subsequent license terms if the licensee continues to provide at least the initially-required level of service through the end of any subsequent license terms." Today, we apply that policy across the board to most WRS licenses, finding that these renewal requirements are in the public interest and their benefits outweigh any likely costs.**"

This automatic right of renewal was part of the FCC's desire to offer a "safe harbour" for wireless licensees, increasing certainty over future holdings and encouraging investment. Operators in the US had lobbied for such automatic renewals on the grounds of this certainty and the lower administrative requirements.

Application of the FCC's processes to other countries must be undertaken with care, due to the way that ownership of spectrum is considered in the US. In many cases, the right of use for spectrum is absolute for the holders, and there is a limited range of interventions available to the FCC to prevent renewals. This is particularly true, for example, of broadcasting spectrum, which led to the use of reverse auctions to encourage broadcasters to relinquish some of their spectrum holdings in sub-1 GHz bands. This right of use means that some renewal policy options would not be possible in the US.

This has a further impact on spectrum fees. Prior to 2018, any renewal of spectrum attracted no fees, but following the reformation of policy a fee was introduced for all spectrum renewals to cover the cost of the administration involved. This is a small amount and does not reflect the value of the spectrum. There are no spectrum fees[23] charged on licences after renewal. When this was queried, the FCC responded:

> "**we would need a change in the statute to implement such fees as [...] most people's reading of the current law is that we don't have the authority to charge such fees. This is an issue that has been discussed over the years [...] both at the Commission and in Congress and there have been some congressional proposals to permit such fees, but nothing has ever come of it.**"

Again, this lack of fees appears to be a result of the way that spectrum holdings are considered in the US, and learnings from this are limited.

3.10 Hong Kong

The most recent IMT spectrum assignments in Hong Kong include the following.

- 600 MHz, 700 MHz, 850 MHz, 2.6 GHz and 4.9 GHz bands in October 2021
- 4.9 GHz in October 2019
- 3.3/3.5 GHz in October 2019
- 26/28 GHz in March 2019
- 900 MHz and 1800 MHz in December 2018

On examination, there is no consistent policy on renewals, and it is useful to look at each of these awards in turn to understand how decisions have been made.

[23] There is a small annual regulatory fee charged to all spectrum users to cover costs of ongoing registration and administration. However, this is not designed to incentivise efficient use of spectrum or prevent hoarding; it is used to fund the spectrum registration department of the FCC.

3.10.1 600 MHz, 700 MHz, 850 MHz, 2.6 GHz and 4.9 GHz bands

In the third quarter of 2020, OFCA launched four public consultations[24] to consult about making available spectrum in these bands for the provision of public mobile services. Upon consideration of comments received, the regulator decided that the available spectrum would be assigned or reassigned entirely through auction; any existing user of these bands would not have a right to renewal.

Although this did not present an issue for most spectrum bands, when the 850 MHz spectrum was assigned in 2008 for the provision of CDMA2000 services, the licences included a notice period of nearly 3 years to the licence holder to make necessary arrangements before licence expiry. The multiband award therefore needed to take this into account.

According to the Information Memorandum issued by OFCA in July 2021[25], the spectrum assigned in the auction was licenced under a Unified Carrier Licence (UCL) for a period of 15 years with "no legitimate expectation of any right of renewal or right of first refusal upon expiry of assignment of any of the frequency blocks".

3.10.2 26 GHz and 28 GHz bands

The 26 and 28 GHz bands were initially allocated primarily to fixed services and Fixed Satellite Services in Hong Kong. In a decision[26] published in December 2018, the regulator has decided to allocate the band to mobile service on a primary basis. Having considered that the demand for spectrum in these bands is unlikely to be higher than the quantity of spectrum available, OFCA decided to adopt an administrative approach for the assignment in these bands. Most of the spectrum available was designated for large scale public mobile services while a small part of the available spectrum was set aside for provision of small scale localised wireless services in specified locations.

Non-shared spectrum for provision of large scale public mobile services was licenced under a Unified Carrier Licence (UCL) for a 15-year period. Leftover spectrum is supposed to be assigned in a subsequent round of assignment for a period shorter than 15 years so that all frequencies in the non-shared spectrum can be re-assigned together in future upon the expiry of the initial assignment period.

OFCA has considered that the expected scale and innovative nature of the localised wireless services to be provided by the shared spectrum assignees does not require the same stringent set of regulations as those applied to conventional public mobile services licensed under UCL. As such, a new Localised Wireless Broadband Service (LWBS) licence[27] was created to effect the assignment of the shared spectrum. The LWBS Licence and the spectrum assignment is valid for a period of five years and may be extended at the discretion of the regulator for a further period of up to five years.

3.10.3 900 and 1800 MHz bands

Spectrum in 900 MHz and 1800 MHz was assigned to four operators in 2005. In December 2018, OFCA decided to reassign this spectrum through a hybrid approach. Under the hybrid approach, each of the four existing

[24] The 4 consultation papers are available at:
https://www.coms-auth.hk/filemanager/en/content_711/cp20200923.pdf
https://www.coms-auth.hk/filemanager/en/content_711/cp20200722.pdf
https://www.coms-auth.hk/filemanager/en/content_711/cp20200819_2.pdf
https://www.coms-auth.hk/filemanager/en/content_711/cp20200819_1.pdf
[25] https://www.ofca.gov.hk/filemanager/ofca/en/content_1517/Auction_IM_20210730.pdf
[26] https://www.coms-auth.hk/filemanager/statement/en/upload/480/joint_statement_st_052018.pdf
[27] https://www.coms-auth.hk/filemanager/common/licensing/sample_lwbs_private_licence.pdf

assignees have been offered a Right of First Refusal (FROR) for re-assignment of 2×10 MHz in the 1800 MHz band, and the remaining spectrum was put to auction.

When evaluating the proposed options for re-assignment of spectrum in the 900 MHz and 1800 MHz bands, the regulator has adopted four policy objectives which are:

- Ensuring customer service continuity;
- Efficient spectrum utilisation;
- Promotion of effective competition; and
- Encouragement of investment and promotion of innovative services.

3.11 Singapore

There has been no clear consistent policy or framework for the treatment of renewals in Singapore, other than a number of awards stating that renewal at the end of a licence is at the IMDA's "sole and absolute discretion". For the multiband award in 2018[28], the regulator went so far as to specify that even if spectrum licences were renewed, operators could not guarantee being given the same spectrum frequencies under the same terms:

> **"If, at IDA's sole and absolute discretion, there is any grant of an extension of the 700 MHz Spectrum Rights (2016), 900 MHz Spectrum Rights (2016), 2.3 GHz Spectrum Rights (2016) and/or 2.5 GHz Spectrum Rights (2016), or if there is any new allocation exercise for spectrum in the 700 MHz, 900 MHz, 2.3 GHz and/or 2.5 GHz frequency bands, in which a Winning Bidder participates or is involved, there is no commitment by IDA that the same 700 MHz Spectrum Lots, 900 MHz Spectrum Lots, 2.3 GHz Spectrum Lots and/or 2.5 GHz Spectrum Lots will be re-allocated in that subsequent extension or allocation exercise to the Winning Bidder for the respective Spectrum Lots in the Allocation Process, or that the same applicable fees and charges will apply in respect of these Spectrum Lots"**

This lack of clarity over renewal possibilities is consistent with previous spectrum licencing processes. Spectrum rights for the 2100 MHz band were issued in 2001 for a 20-year period, to support 3G services in Singapore. Extension and renewal of spectrum rights were subject to the regulator's discretionary decision as indicated in the "Template 3G Spectrum Rights"[29].

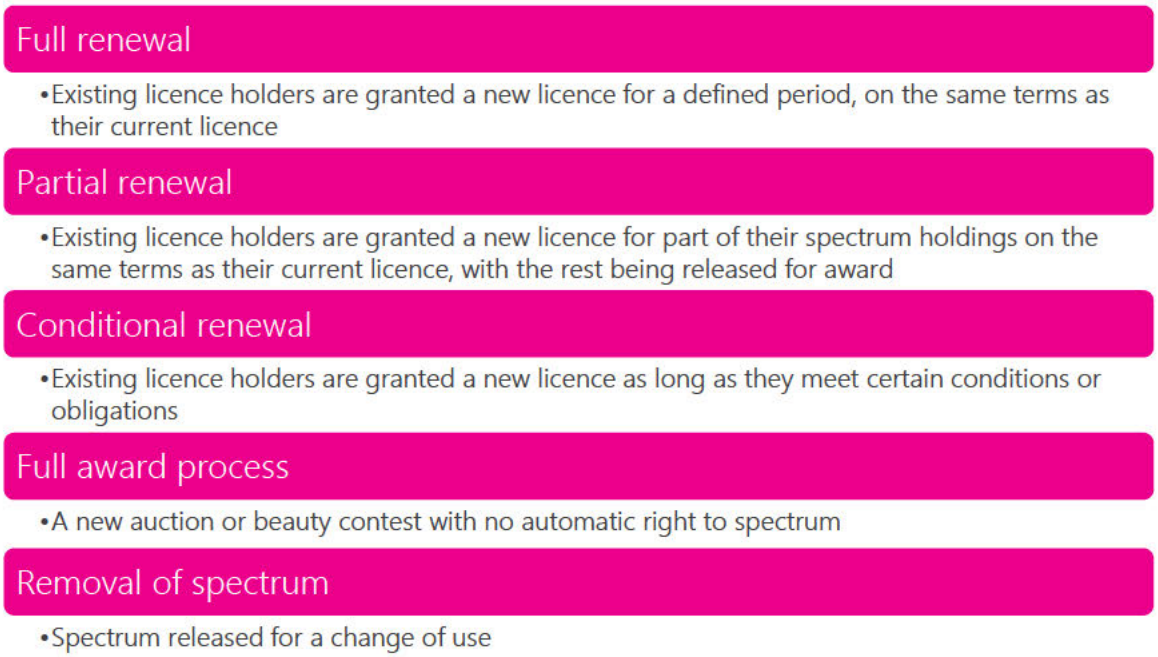
Prior to the expiry date of these licences (31 December 2021), the IMDA launched a public consultation on the policy proposals regarding the allocation and use of the 2.1 GHz spectrum. Following the consultation, the regulator decided to allocate 2×60 MHz of spectrum in the 2.1 GHz band for 5G SA network deployment via auction[30]. There was therefore no full renewal of the licence, but only established MNOs were able to participate in this award[31] – this will have increased the likelihood of operators retaining at least part of their previous spectrum holding. Further, as the IMDA believed that it was important that at least some 3G services could continue, it decided to allow part of the 2100 MHz band to be awarded using a First Right of Refusal approach: 2×5 MHz of spectrum was set aside for each of the three MNOs providing nationwide 3G services.

[28] See https://www.imda.gov.sg/-/media/Imda/Files/Regulation-Licensing-and-Consultations/Frameworks-and-Policies/Spectrum-Management-and-Coordination/Spectrum-Rights-Auctions-Assigment/Final-Information-Memorandum.pdf
[29] https://www.imda.gov.sg/-/media/Imda/Files/Regulation-Licensing-and-Consultations/Frameworks-and-Policies/Spectrum-Management-and-Coordination/Spectrum-Rights-Auctions-Assigment/Appendix_5_-_Template_3G_Spectrum_Right.pdf
[30] https://www.imda.gov.sg/-/media/Imda/Files/Regulation-Licensing-and-Consultations/Frameworks-and-Policies/Spectrum-Management-and-Coordination/2-1-GHZ-Auction/Auction-Rules-240921-final.pdf?la=en&hash=CDC40140E192F3F9DE0AE4BE1FEAF676
[31] https://www.imda.gov.sg/-/media/Imda/Files/Regulations-and-Licensing/Regulations/Consultations/2021/Next-Wave-of-5G-Growth-and-Deployment-in-Singapore/IMDA-Decision--21-GHz-Policy-and-Regulatory-Framework.pdf?la=en&hash=F6858B0C7251B64AFF5E3B95688C47ED

4 Options for licence renewal

Based on our findings from analysis of renewals policy in other countries, this section considers the ways in such policies can be structured and some of the logistics of each option. Although there are no clear categories identified through the variety of case studies above, in general there are five potential renewal policies, as shown in Figure 4.1. However, some policies may include aspects of multiple choices, and there is variation within each of the categories on how the policy can be structured.

Figure 4.1: Potential renewal policy options



These categories will be discussed in turn below. Each of these can apply to geographic or apparatus licences in any industry; it is important that a "network operator" is understood to mean any entity which controls any sort of communications network, not only mobile systems.

Finally, as well as these main categories, regulators have the option of renewing spectrum on a temporary basis – for example, to align end-dates of licences, because the regulator is not yet prepared for a full award process, or because licences expire in a time of crisis (such as has been seen during the COVID-19 pandemic, or during the conflict in Yemen).

4.1 Full renewal

Under this option, all spectrum licences are effectively extended for existing holders, with any quality of service obligations maintained. The exact frequencies assigned to operators do not change. This allows operators to continue using their spectrum as before, with minimal disruption to operations.

While this may seem to be the most straightforward option, there are in fact many decisions that need to be made by the regulator. These include the following.

- What should be the **duration** of these renewals? As with the initial awards, regulators must strike a balance between proving the operators with enough certainty to encourage investment, while also ensuring there is flexibility for spectrum to be reallocated if the market changes significantly. In many cases we have seen that full renewals are for a shorter period than the original award, since in the absence of a competitive award mechanism there is no guarantee that spectrum is being efficiently allocated.

- Should there be a **further expectation of renewal** after this period? If a licence is renewed for five years, is there an expectation that there will be another renewal option for a further five years after that? How will future renewals be determined and when will the process be clarified?

- How should this spectrum be **charged** for? In most cases an initial competitive award will have revealed the market value of spectrum at the time of the award, but it is likely that operators will have a very different value for the same spectrum at the time of renewal – this value may be higher due to increased reliance on mobile services and the sunk costs of an existing network, or it may be lower due to the availability of alternative spectrum and technologies.

Although this policy may give most certainty to operators, it also has some adverse side effects. By maintaining spectrum allocations, the industry is not given an opportunity to reallocate spectrum in a more efficient way, and operators have no incentive to make their network use more efficient. In particular, there will be a significantly reduced drive to turn off legacy networks and move consumers over to newer technologies.

4.2 Partial renewal

This option is similar to the first policy described above, but rather than the full bandwidth of spectrum being renewed, only part of the band is retained, with any remainder being released for a separate award. This would follow regulatory analysis which concluded that the previous allocation of spectrum may not be the most efficient use, and a regulator wishes to give the market a chance to carry out its own reallocation.

In some cases, the purpose of keeping part of the spectrum reserved for renewal is to allow operators spectrum to maintain legacy networks. This relies on the understanding that demand for these networks is steadily falling and, for example, 3G traffic may only require 2×5 MHz of spectrum rather than the 2×20 MHz that was previously allocated.

In other cases, partial renewal may be used where the dynamics of the market have significantly changed, with mergers leading to a significant imbalance of spectrum holdings, or new entrants wishing to acquire previously unavailable spectrum. Partial renewal will therefore be used where it is considered important for there to be some continuity of spectrum holdings but where the regulator also wishes to reconsider how the full spectrum band is assigned.

This policy overcomes some of the issues with full renewal.

- If the released spectrum is auctioned, then the value of this spectrum can be used as a proxy value for that spectrum which has been renewed, therefore setting a spectrum fee level.

- It encourages operators to ensure they are making the most efficient use of spectrum, and opens the possibility of a rebalancing of holdings between operators if this would be more effective.

- There is a possibility of new entry to the market.

However, determining which proportion of the spectrum is to be renewed is a key policy question and would require significant coordination between regulator and operators. It is crucial that operators retain enough spectrum to ensure their existing investments can continue to work – otherwise the issue previously raised of the last years of a licence will exist – but at the same time unless a significant amount of spectrum is released, there is little benefit over a full renewal.

Further, under this policy the licence duration will need to be set on a consistent basis, since it will be important for the whole band to be licenced at the same time in the future. Therefore the renewed portions of the spectrum will need to have 15-year licences if the re-awarded spectrum also has a 15-year licence, which may be required for there to be appropriate incentives for investment. This would then restrict the ability of the regulator to revisit spectrum assignments in the short term.

4.3 Conditional renewal

Under a conditional renewal, existing licence holders have their licences renewed on the condition that they meet certain conditions or obligations. These may range from a condition on the introduction or rollout of new technology, to the introduction of low-user tariffs or wholesale access. In some cases these may be an update of conditions that were in previous licences – for example, increasing the required quality of service from 10 Mbps to 1 Gbps aggregate speeds. These conditions can be either regulatory in nature (so defining service quality or services to be offered) or technical (defining power limits, number of transmitters, or similar).

Many of the considerations set out in Section 4.1 apply here, but in addition to these the following points are important.

- Which obligations should be imposed? This decision will be driven by national and regulatory objectives and the current state of the market. A regulator would generally need to carry out a gap analysis between the existing and desired state of the industry, and consider where these changes would be unlikely to be met by market forces.

- How are spectrum prices impacted by the obligations? A coverage obligation may place a significant additional cost on networks, therefore reducing the value of spectrum.

- Should licence durations be extended to allow for the imposition of these conditions, firstly to give operators time to meet the condition but also to allow time to make returns on additional investment?

Each of these points is important for regulators at the time of an initial award, but when done as part of a conditional renewal there are additional constraints that have to be considered, such as knowledge over how many operators and services are being used and what spectrum prices are to be charged.

This option can sometimes address the question of efficiency of use. If the obligations are designed so that they would force the market to resemble something that is socially optimal, then the reduced value of spectrum to operators would mean that only spectrum where a positive return would be retained; other spectrum may be released if the cost were to be too high.

4.4 Full award process

At the other end of the spectrum of policy options, this would require all operators to give up their spectrum holdings and a new auction or beauty contest would be held. Under this policy there would be no automatic right to spectrum for existing holders.

Many of the arguments for initial competitive awards remain valid here. This would lead to an economically efficient outcome, would enable new entrants to bid for spectrum, and would set a market price for the spectrum. Although Plum's recent work has shown that auctions do not take into account social welfare in spectrum assignment, adjustments can be made to conditions or obligations to offset this.

Existing operators have the benefit of an existing network, including land and sites for base stations, which new entrants will not have access to. Given this, combined with the existing costs that have been sunk into the network equipment assets, it is likely that returns on spectrum investment will be significantly higher for incumbents than for new entrants.

However, although it is likely that existing operators will win spectrum, it is not guaranteed. As such, the last years of a licence period are likely to see significantly reduced investment, and the resulting cyclical nature of investment will result in lower quality services for consumers.

4.5 Removal of spectrum

In an extreme case, a regulator may determine that spectrum should not be renewed or re-awarded at all, and instead will reclaim it for use by other industries. The decision to do this must be taken well in advance of the end of the licence, and generally applies where licences have been granted for a single set period for a specific purpose.

4.6 Temporary renewals

As well as the five main options detailed above, one further renewal option is a temporary extension of a licence, usually for a short period of time. This is generally done ahead of a permanent renewal process from the list above.

There are multiple reasons why temporary renewal may occur.

- If different frequencies in the same want were originally awarded at different times, then the licences that expire first may be given a temporary extension to align with later dates. This will then enable the entire band to be re-awarded or renewed simultaneously.
- Sometimes regulatory work or legal work on renewals or new awards may take more time than expected, either due to external influences (such as the recent COVID-19 pandemic) or internal factors (such as a chosen auction format being more complex than initially planned for).
- If a spectrum band is widely expected to be part of an ecosystem for a new technology, but the specifications for that technology have not yet been finalised, there may be a temporary extension granted (for two or three years) to ensure that the spectrum will be awarded in appropriate block sizes and with appropriate downstream and upstream separation.

In general, such temporary extensions do not come with additional obligations, and spectrum fees tend to be set according to the fees paid over the previous licence period.

5 Factors influencing renewal decisions

The international experience in spectrum licence renewals set out in Section 3 has illustrated that there is no internationally-recognised best practice in policy frameworks. Indeed, some countries do not have a consistent approach to renewals internally. We have used these case studies to inform our categorisation of renewal policy options, as shown in Section 4.

A number of countries have automatic full renewal policies (or procedures which are functionally equivalent).

- The UK states that their indefinite licences are designed to give maximum certainty to spectrum users, and to encourage investment.
- Canada similarly cited investment certainty, but also noted the lower administrative burden automatic renewals lead to.
- The US has renewal of licences as a default, largely due to the way that ownership of spectrum is considered but also because the FCC felt this would lead to the best continued service for consumers.

In some cases, only part of the spectrum is renewed.

- In Singapore, the IMDA decided that a small part of the 2100 MHz band should be renewed to ensure continuity of 3G services.
- In Sweden, when the 900 MHz band was re-awarded, operators were required to return some of their previous holdings to enable a new entrant to bid for spectrum.
- In New Zealand the MBIE have partially renewed licences in the 1800 MHz and 2100 MHz bands, with spectrum being removed from one operator who was not using it.

There are times when spectrum is renewed with additional conditions attached.

- In France, operators are required to meet additional coverage or quality of service obligations ahead of any renewal.

However, there are a significant number of cases in which there is no expectation of renewal and spectrum is generally reclaimed by the regulator ahead of a new award process.

- In Ireland, Hong Kong, Singapore and New Zealand, there is no expectation of renewal – and regulators cite the need for flexibility over future use of spectrum as a key rationale for this. However, while there is no expectation of renewal, there have been instances in countries like Singapore and New Zealand where, after taking into account the particular circumstances, licences have been renewed.

5.1 Decisions to be made

The case studies allow us to identify a number of key questions to be answered when determining renewals policy.

- **When should the decision about renewal be made?** If the policy is decided too early, it cannot take account of any changes to the market which might change the rationale. If it is too late, then operators will not be able to adjust their investment plans to take account of the decision. A number of regulators

have in fact made renewal decisions at the start of the initial licence period, which provides maximum certainty but risks spectrum being used in an inefficient way after twenty years of technology evolution.

- **How is the spectrum being used?** Is there considerable or important use of the spectrum, which may be threatened if it were not renewed? In Singapore, for example, a small part of the 2100 MHz spectrum was renewed to ensure continuity of 3G services.

- **Is spectrum use currently meeting government objectives?** In cases where coverage or service quality is lacking, adding extra conditions to licences in the case of renewal can provide a cost-effective and efficient regulatory tool.

- **Are there alternative uses?** A full award process can enable new technologies or spectrum users to acquire some spectrum – so, for example, allowing business radio to spread into previous monitoring spectrum.

- **Are there potential new entrants?** Full automatic renewals prevent new entry, which has an impact on potential competition. However, in the case of Sweden's 900 MHz award, the partial renewal actually created the opposite effect, where the regulator was forcing the entry of a new operator, even if it may have been inefficient for the market.

- **Does this set a precedent for future renewals?** Given the concerns over renewals binding regulators to a defined use or allocation of spectrum, there will be a concern over whether one renewal will lead to an expectation of future renewals.

- **How long should the renewed spectrum be licenced for?** If spectrum were initially awarded at an auction, this will have led to an economically efficient allocation of spectrum, meaning it is reasonable for this licence to span a long period. A renewal, however, does not result in the same efficient allocation, so it may be argued that a shorter licence period is reasonable. This needs to be balanced against giving certainty to operators to encourage investment.

- **How should the spectrum be charged for?** If appropriate market-based spectrum fees are charged, and there is the possibility of spectrum trading or relinquishing spectrum to the regulator, this may overcome some of the concerns over efficiency and incentives previously described.

It is unlikely that the answers to these questions will be the same for every spectrum band in every period, and so a single renewals policy may not be appropriate. Instead it seems reasonable to build a policy framework which outlines how each decision will be made and what type of renewal this will lead to.

Overall, it is clear that with such variation among peer regulators, there are no clear unanimous bet practices, and so regulators will need to consider the situation in their own market carefully to ensure that an appropriate renewals policy is chosen.