An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

Review of the Satellite Earth Station Licensing Regime

Response to Consultation and Decision

Response to Consultation and Decision

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Chapter 1

1 Introduction

1.1 Background and Purpose

1.1 The Commission for Communications Regulation ("ComReg") is the statutory body responsible for the regulation of the electronic communications telecommunications, radio communications and broadcasting networks, postal and premium rate sectors in Ireland and in accordance with European ("EU") and Irish law. ComReg also manages Ireland's radio frequency spectrum ("radio spectrum" or "spectrum") and the national numbering resource.

1.2 Under the Communications Regulation Act 2002, as amended, ComReg has a range of functions and objectives in relation to the provision of electronic communications networks ("ECN"), electronic communications services ("ECS") and post which includes ensuring the efficient and effective use of the national radio spectrum resource. Readers are referred to Annex 1 for an overview of the legal framework and statutory objectives relevant to ComReg's management of the radio spectrum.

1.3 In its Radio Spectrum Management Strategy Statement ("RSMSS") for 2022 to 2024 (ComReg Document 21/136), ComReg committed to consult on, amongst other things, the authorisation of Satellite Earth Stations ("SES") below 3 GHz during the strategy period 2022 -2024. ComReg is of the view that a review of the SES licensing regime is timely due to the recent developments within satellite industry such as new use cases and related technology advancements (e.g. Low Earth Orbit ("LEO") constellations for the provision of broadband, satellite-based Internet of Things ("IoT") systems, imaging and monitoring of the earth and the atmosphere to understand the effects of climate change, etc.). While there has been limited demand for SES in Ireland to date, it is possible that could change and perhaps with pace, due to industry advancements such as those outlined above. Therefore, it seems appropriate that ComReg should now ensure that the SES licensing regime is fit for purpose and future-proofed to meet any potential use case demand.

1.4 On 17 December 2021, ComReg issued a preliminary consultation on the review of the SES licensing regime (ComReg Document 21/135). The preliminary consultation examined, in particular:

- the current ComReg SES licensing regime;
- potential use cases for SESs; and
- emerging issues for satellite services.

1.5 ComReg also published a report (ComReg Document 21/135a) prepared by ComReg's economic and technical experts, DotEcon Limited ("DotEcon") and Axon Consulting ("Axon"), on the current situation regarding SESs in Ireland and how this may develop in the future. Document 21/135a was informed by, amongst other things:

- Interviews, as conducted by DotEcon/Axon and ComReg, with several stakeholders (the "Stakeholder Interviews");
- Analysing fixed SES licensing regimes in other European countries, which included benchmarking the licence types, licence/technical conditions, fees, and frequency bands, etc. of those regimes with the current SES licensing regime in Ireland.

1.6 On the 4 July 2022 ComReg published its response to consultation and further consultation (ComReg Document 22/56). This document and accompanying Consultant's Report (ComReg Document 22/56A) also set out proposals and preliminary views regarding:

- the frequency bands that will be allocated for SES;
- the technical conditions associated with SES licensing; and
- the fees associated with SES licensing.

1.7 On 31 March 2023, ComReg published a further response to consultation with Draft Decision and Draft Regulations[1] (ComReg Document 23/32), accompanying Consultants' Reports (ComReg Documents 23/32a[2] and 23/32b[3]), and the non-confidential submissions to Documents 22/56 and 22/56a (ComReg Document 23/32s[4]).

1.2 Respondents to ComReg Documents 23/32, 23/32a, and 23/32b

1.8 Three parties responded to documents 23/32, 23/32a, and 23/32b:

[1] ComReg Document 23/32 – Review of the Satellite Earth Station Licensing Regime: Response to Consultation, Draft Decision with Draft Regulations, and Further Consultation – published 31 March 2023. https://www.comreg.ie/media/2023/03/ComReg-2332.pdf

[2] ComReg Document 23/32a – DotEcon Report: Review of the Satellite Earth Station Licensing Regime – published 31 March 2023. https://www.comreg.ie/media/2023/03/ComReg-2332a.pdf

[3] ComReg Document 23/32b – Plum Report: Review of the Satellite Earth Station Licensing Regime – published 31 March 2023. https://www.comreg.ie/media/2023/03/ComReg-2332b.pdf

[4] ComReg Document 23/32s – Review of the Satellite Earth Station Licensing Regime: Non-Confidential Submissions to Documents 22/56 and 22/56a – published 31 March 2023. https://www.comreg.ie/media/2023/03/ComReg-2332s.pdf

- Kuiper Systems LLC, a wholly owned subsidiary of Amazon.com Services LLC ("Amazon");
- National Space Centre Limited ("NSC"); and
- Starlink Internet Services Ltd. ("SpaceX")

1.9 ComReg would like to thank all for their submissions and has published the non-confidential versions of the submissions in ComReg Document 23/96s. Having carefully considered all submissions made over the duration of this consultation process, the views of DotEcon and Axon, and other relevant information, this document sets out ComReg's Final Decision in regard to the licensing of Satellite Earth Stations in Ireland.

1.3 Moving to the new licensing regime

1.10 The new licensing framework for SES is scheduled to begin on 1 August 2024, subject to final approval by the Minister. The existing framework for licensing SES will continue to be in operation up until 31 July 2024.

1.4 Structure of this document

1.11 This document is structured as follows:

- **Chapter 2:** sets out the responses received to documents 23/32, 23/32a, and 23/32b. This includes ComReg's assessment of the responses;
- **Chapter 3:** sets out ComReg's final Regulatory Impact Assessment ("RIA") on licence fees for SES;
- **Chapter 4:** sets out ComReg's Decision; and
- **Chapter 5**: Sets out the next steps following the publication of this document.

Chapter 2

2 Response to submissions received to Documents 23/32, 23/32a, and 23/32b

2.1 Introduction

2.1 This chapter sets out ComReg's consideration of respondents' views. The responses received are considered under the following headings:

- Licence Fees;
- Frequency bands;
- Licence types;
- Sharing and compatibility; and
- Information Policy.

2.2 Licence Fees

2.2 In Document 23/32, ComReg noted that while there was consensus among the respondents (to ComReg Document 22/56) that the proposed approach to determine fees should be administrative cost based, ComReg considered it appropriate to further examine how Option 4 could be implemented so as to:

(a) not dissuade larger bandwidth users from deploying SES in Ireland due to the level of fees;

(b) not inefficiently choke off demand from lower value users; and

(c) mitigate the risk of excessive over recovery of ComReg's administrative costs.

2.3 ComReg agreed that moving from a linear fee structure to a concave fee structure is appropriate (i.e., where the marginal price per MHz falls as the amount of bandwidth licensed increases). ComReg outlined its view that the approach would reduce the risk of significant over recovery of costs relative to the linear approach proposed in Document 22/56.

2.4 Consequently, ComReg agreed with DotEcon's recommendation to amend the pricing formula and provided detail of the proposed revised pricing formula in Annex 4 of Document 23/32.

2.5 ComReg committed to continue to monitor the demand for SES following any final decision and consider adjusting the level of fees over time so that total fees are broadly in line with ComReg's administrative costs. ComReg noted that to avoid conducting repeated reviews, a fees review would only occur when there is a significant over or under recovery of ComReg's administrative costs or where there has been a significant change in market circumstances. This would ensure that the new fees introduced as part of this review would be stable and provide certainty to licensees.

2.2.2 Views of respondents

2.6 The NSC supports ComReg´s proposal to revise the fee structure for spectrum licensing and the proposal to adopt the Option 4 concave pricing model. The NSC agrees that the proposed approach by ComReg achieves balance, by maintaining Ireland´s commercial competitiveness for those looking to operate within the European region whilst reflecting the need to recover fair value from this resource, on behalf of the Irish state.

2.7 SpaceX maintains its view that the spectrum fee Option 5 is the most appropriate but acknowledges and appreciates that the revised fee formula would lead to the marginal price per MHz decreasing in total bandwidth licensed. However, it submits that in its view and even with the revised fee formula, and especially if spectrum in the Q/V[5] and E[6] bands is opened to SES:

(a) there is a risk of significant over-recovery of administrative costs as operators increase their bandwidth usage; and

(b) fees for large bandwidths, although lower than under the previous version of the formula, would still be a barrier for many operators.

2.8 Therefore, SpaceX suggests that *"…as these new bands are made available for SES, a re-evaluation of the fee formula should be initiated*".

2.9 Amazon continues to support Option 4 and appreciates revised fee formula to reduce the risk of over-recovery. Amazon acknowledges that lower licence fees will help to attract operators to deploy in Ireland with additional economic benefits. Further, Amazon considers that this will support ComReg's efforts in Option 4 to promote competition and facilitate satellite operators to deploy.

[5] The Q/V band includes the following frequency ranges 37.5 GHz - 47 GHz, 47.2 GHz – 50.2 GHz and 50.4 GHz - 52.4 GHz.
[6] The E-band includes the 71 GHz - 76 GHz and 81 GHz - 86 GHz frequency ranges.

2.2.3 Views of DotEcon

2.10 In its report, DotEcon notes that that all three respondents agree that the use of a concave fee formula would at least partially achieve the objective of limiting over-recovery of revenue without pricing off different types of SES operator.

2.11 DotEcon remains of the view that to further lower the fees for high bandwidth operators by charging a flat fee to all licensees would not be appropriate because of the resulting significant increase in fees for small-bandwidth licences and the risk of pricing off low-value operators. DotEcon notes that SpaceX has not provided any evidence (or even argued at the level of principle) that these concerns can be discounted, that the principles behind the proposed fee structure are inappropriate, or that that a flat fee would not be a problem for low-bandwidth users. Neither has SpaceX provided any evidence as to why, in its view, the fees for larger bandwidths would be prohibitive to high bandwidth users. SpaceX's views contrast with those of Amazon and NSC which both submit that the new fee formula strikes an appropriate balance.

2.12 DotEcon agrees with SpaceX that if very large bandwidths in the Q/V and E-bands are used in future, this could lead to over-recovery of administrative costs even under the concave fee formula. However, DotEcon notes that this potential was discussed in its previous report (ComReg Document 23/32a) and has already been taken into consideration when establishing the fee recommendations. The fee structure was designed to balance:

(a) the risks of over- or under- recovery of costs, which are reduced under a more concave fee curve (as the fee is more sensitive to the bandwidth at high bandwidths) versus; and

(b) concerns over pricing for low-value users, as more concave fee curves necessarily increase fees at low bandwidths to maintain overall recovery of ComReg's administrative costs.

2.13 DotEcon notes that SpaceX has not presented any substantive arguments or evidence to suggest that the proposed fee structure is inappropriate and, in particular, that there should be greater concavity in the fees as a function of licence bandwidth. SpaceX's argument for a flat fee irrespective of bandwidth has no merit in DotEcon's view, as it does not consider the adverse impact on low bandwidth users.

2.14 DotEcon notes that ComReg will review and potentially rebase the fees (maintaining the structure but changing the level of all fees) at appropriate times in the future in response to significant changes in bandwidth licensed. This would help to avoid over-recovery of costs by ComReg if total bandwidths in use by operators continues to grow as anticipated.

2.15 DotEcon states that its understanding is that this is broadly what SpaceX is asking for, although it appears to tie (initial) re-evaluations of the fees to the timing of new bands being made available. DotEcon emphasises that whilst the effect of opening new bands is a relevant factor when it comes to ComReg's general monitoring of the SES licensing regime, DotEcon does not recommend that it is a trigger for automatically reviewing the fees (or indeed that ComReg commits to any particular timing for revising the fees). It may, for example, take some time for demand for new bands in Ireland to emerge and stabilise to the extent that fees could be adjusted with reasonable certainty that they could then remain stable for some time after. Reviewing them at a time of considerable, yet unresolved, uncertainty about demand for licences would be difficult and run risks of subsequent under- or over-recovery of costs. Therefore, DotEcon also recommends that ComReg should retain discretion over when the fees are reviewed, allowing it to judge the most appropriate time taking into account all relevant factors and prevailing circumstances.

2.16 Overall, DotEcon does not see any need to update the proposed new fees considering the comments received.

2.2.4 ComReg's Assessment

2.17 ComReg notes that respondents, in general, agree that the use of a concave formula to determine fees is more favourable than the linear approach considered previously. ComReg notes the view of SpaceX that a significant rise in bandwidth used, either in existing bands or if additional bands become available in the future, could result in a situation that ComReg significantly over recovers in relation to its administrative costs if left unchecked.

2.18 As noted by DotEcon and outlined previously by ComReg in section 2.7.5 of Document 23/32, ComReg will continue to monitor the demand for SES in Ireland and may adjust the level of fees over time so that total fees are broadly in line with ComReg's administrative costs. However, to avoid conducting repeated reviews, a fees review will only occur when there is a significant over or under recovery of ComReg's administrative costs or where there has been a significant change in market circumstances.

2.19 This ensures that the new fees introduced in this review would be stable and provide certainty to licensees over relevant investment periods. Any changes would only be made where necessary to encourage the more efficient use of the radio spectrum and ensure the effective management of the radio frequency spectrum to promote competition and maximise the benefits for consumers in terms of price, choice and quality.

2.3 Frequency Bands

2.20 In Document 23/32 ComReg proposed to:

(a) open the following frequency bands for SES licensing on a non-exclusive basis:

(i) 401 MHz – 403 MHz;

(ii) 2025 MHz – 2110 MHz;

(iii) 2200 MHz – 2290 MHz;

(iv) 17.7 GHz – 20.7 GHz;

(v) 37.5 GHz – 43.5 GHz;

(vi) 47.2 GHz – 50.2 GHz;

(vii) and 50.4 GHz – 52.4 GHz.

(b) and continue to make the 3.8 GHz – 4.2 GHz band available for SES licensing.

2.3.2 Views of respondents

2.21 Amazon notes the importance of aligning with international standards and the relevant European decisions which are generally the foundation for ComReg's decisions to open new frequency bands.

2.22 The NSC strongly welcomes the proposal that the Sub 3GHz bands should be opened, thereby enabling commercial development of this sector in the future.

2.23 SpaceX supports the intention of ComReg to open the 37.5 GHz – 43.5 GHz, 47.2 GHz – 50.2 GHz and 50.4 GHz – 52.4 GHz bands to SES to support next-generation satellite services. SpaceX urges ComReg to also begin the process of opening the 71-76 GHz and 81-86 GHz frequency band (the "E-band") for fixed-satellite service use.

2.24 SpaceX also requests that ComReg begins the process of authorising the spectrum bands above 100 GHz that are allocated on a co-primary basis to the fixed-satellite service.

2.3.3 Views of DotEcon

2.25 DotEcon notes to it observations regarding ComReg's general policy of implementing European harmonisation measures regarding radio spectrum, and also notes that

SpaceX has not presented any new or convincing evidence as to why ComReg should depart from its general policy and instead provide early access to E-band spectrum.

2.26 DotEcon notes that, as set out in its previous report, allowing early access to the spectrum for SES deployments could lead to complications for implementing harmonisation measures developed subsequently if there was a conflict with existing usage. SpaceX argues that coexistence with terrestrial services (fixed links) would be straightforward, DotEcon notes that use of the band for fixed links is changing, with increasing demand for high bandwidths and developments in technology and network configurations, especially due to 5G. Therefore, DotEcon recommends that it is prudent to wait for the results of technical studies into use of the band to ensure that ComReg is able to apply the most appropriate measures in line with international guidelines/recommendations.

2.27 DotEcon also notes that even if SpaceX's second-generation constellation is both reliant on high frequency spectrum and technically ready for deployment soon, it expects that it would require access to relevant spectrum in other countries, not just Ireland. Widespread availability of spectrum naturally follows from international harmonisation measures being in place and therefore, DotEcon observes that it is not obvious that Ireland jumping ahead of other jurisdictions would be of significant benefit to the satellite communications industry (or consumers).

2.28 For similar reasons, DotEcon does not believe ComReg should offer early access to the bands above 100 GHz. In addition, DotEcon observes that it may be possible to take a different approach to licensing in these new bands, given their physical characteristics and lack of incumbent users. However, this would need to be considered at the relevant time and is beyond the scope of this review.

2.3.4 ComReg's Assessment

2.29 ComReg notes that SpaceX has not presented any new, convincing evidence as to why ComReg should depart from its general policy of implementing CEPT harmonisation measures and instead provide early access to E-band spectrum and frequency bands above 100 GHz.

2.30 ComReg notes that in response to Document 22/56, SpaceX previously submitted that:

(a) While it requested ComReg to open the E-band for SES licensing in response to Document 21/136, it is of the view that the opening of the E-band should be subject to any future harmonised efforts, and further encouraged ComReg to support any such efforts in international fora; and

(b) It supported ComReg's proposal to continue monitoring developments in the bands above 100 GHz.

2.31 ComReg observes that:

(a) While the E-band is allocated to the satellite services at the ITU and ECA level, there is currently no ECC Decision or Recommendation in place regarding the designation and harmonisation of this band for satellite services;

(b) there is no CEPT work programme item to develop any ECC Decisions or Recommendations regarding the designation and harmonisation of this band for satellite services;

(c) there are no sharing and compatibility studies between satellite services and other services in this band, either in place, or under consideration by the relevant ECC project teams; and

(d) two agenda items have been identified for the World Radiocommunications Conference 2027 (WRC-27) to conduct studies:

(i) of technical and operational issues and of regulatory provisions for non-geostationary fixed-satellite system feeder links in the frequency bands 71-76 GHz (space-to-Earth and proposed new Earth-to space) and 81-86 GHz (Earth-to-space), in accordance with Resolution 178 (WRC-19)[7]; and

(ii) to determine the technical conditions for satellite services in the frequency band 81-86 GHz in order to protect the Earth exploration-satellite service (passive) and the space research service (passive) in the frequency band 86-92 GHz and the RAS in the frequency bands 76-77.5 GHz, 79-81 GHz and 81-86 GHz in accordance with Resolution 776 (WRC-19)[8].

2.32 ComReg notes the SpaceX view that due to their high-gain, pencil beam nature, fixed-satellite service gateway links may be designed such that they present a low risk of interference toward the horizon. However, ComReg is of the view that it is prudent and good spectrum management practice to base decisions on harmonised conditions and regulatory practices.

2.33 Further, ComReg is not aware of any other European Administrations which have made the E-band available for SES licensing.

[7] https://www.itu.int/dms_pub/itu-r/oth/0C/0A/R0C0A00000F0065PDFE.pdf
[8] https://www.itu.int/dms_pub/itu-r/oth/0C/0A/R0C0A00000F00172PDFE.pdf

2.34 Therefore, ComReg is of the view not to open the E-band under the SES licensing regime until it, at the earliest, the outcome of the proposed future ITU studies as identified by the two agenda items for the World Radiocommunications Conference 2027 (WRC-27), namely:

(i) studies of technical and operational issues and of regulatory provisions for non-geostationary fixed-satellite system feeder links in the frequency bands 71-76 GHz (space-to-Earth and proposed new Earth-to space) and 81-86 GHz (Earth-to-space), in accordance with Resolution 178 (WRC-19)[9]; and

(ii) studies to determine the technical conditions for satellite services in the frequency band 81-86 GHz in order to protect the Earth exploration-satellite service (passive) and the space research service (passive) in the frequency band 86-92 GHz and the RAS in the frequency bands 76-77.5 GHz, 79-81 GHz and 81-86 GHz study the conditions for the use of the frequency bands 71-76 GHz and 81-86 GHz by stations in the satellite services to ensure compatibility with passive services in accordance with Resolution 776 (WRC-19)[10].

2.35 Finally, similar to the E-band, ComReg will continue to monitor developments within the ECC and ITU regarding opening spectrum bands above 100 GHz for SES licensing.

2.4 Licence Types

2.36 In Document 23/32 ComReg noted that respondents to Document 22/56 generally welcomed the proposal to remove the Teleport Earth Station licence and replace it with a single Satellite Earth Station licence that permits multiple transmit antennas within a defined radius.

2.37 ComReg also proposed to continue to issue a Transportable Satellite Earth Station licence.

2.4.2 Views of respondents

2.38 The NSC supports the removal of TES licences and its replacement with a single licence for multiple antennas and agrees that this better reflects current industry needs and changes in technology over time.

2.39 The NSC supports ComReg´s view that there should be a reasonable expectation of renewal, without the right to indefinite renewal. However, NSC suggests that the

[9] https://www.itu.int/dms_pub/itu-r/oth/0C/0A/R0C0A00000F0065PDFE.pdf
[10] https://www.itu.int/dms_pub/itu-r/oth/0C/0A/R0C0A00000F00172PDFE.pdf

ability to renew a licence should not be negatively impacted by any observations made by interested parties, during any licence period, until such times as ComReg finds those observations to be valid.

2.40 SpaceX believes that a "unified light-licensing" framework supported by a transparent database of fixed links and satellite earth stations would be fit for this purpose.

2.4.3 ComReg's Assessment

2.41 Regarding the NSC's submission regarding the renewal of a licence, it is not clear what the NSC means by "*observations made by interested parties*". ComReg's licence renewal process does not provide for input from interested parties. However, ComReg notes that licensees are subject to the relevant licence conditions and regulatory obligations. ComReg has procedures in place to monitor and assess any alleged non-compliance.

2.42 ComReg notes SpaceX's submission and observes that ComReg has not proposed to implement a light-licensing regime for SES.

2.43 Regarding the point of a transparent database, ComReg notes that in Document 23/32 it stated its intention to publish a consultation in due course on a proposal to publish radio licence information, including fixed links and satellite earther station locations. That consultation is listed on ComReg's action plan for 2023/2024 and is currently due to be published in Q4 2023[11].

2.5 Sharing and Compatibility

2.44 In Document 23/32 ComReg noted that respondents agree that the prevention and mitigation of harmful interference between SES is best managed by open cooperation and coordination between service providers.

2.45 Regarding the implementation of an Inter-Operator coordination framework, ComReg set out that an Inter-Operator coordination framework was an appropriate transparent method to ensure coexistence with existing and proposed SES.

2.5.2 Views of respondents

2.46 The NSC welcomes the proposals for an Inter-Operator Coordination framework as it feels this will encourage cooperation between the applicant and the interested party. It is also right and proper that ComReg reserve the right to rule on the validity (or any lack thereof) of any observations made, when such cooperation cannot be achieved.

[11] Annual-Action-Plan-Ye-30-06-2024.pdf (comreg.ie)

2.5.3 ComReg's Assessment

2.47 ComReg thanks the NSC for its submission on this matter. The Inter-Operator Coordination framework is published at Annex 2 of this document.

2.6 Information Policy

2.48 In Document 23/32, ComReg outlined its intention to publish a consultation on a proposal to publish radio licence information on Siteviewer[12] in a transparent and accessible manner which would, amongst other things, assist facilitate coordination between operators and avoid harmful interference.

2.49 ComReg stated that it considers that this would be in-line with Government's strategic objective of making data held by public bodies discoverable by citizens, businesses, and the Public Service.

2.6.1 Views of respondents

2.50 The NSC would welcome the expansion of Siteviewer, as it would provide more information when performing e.g. project feasibility studies. However, it has some reservations with regard to general public disclosure.

2.6.2 ComReg's Assessment

2.51 ComReg notes NSC's submission. As stated in paragraph 2.43 a consultation is listed on ComReg's action plan for 2023/2024 and is currently due to be published in Q4 2023. Interested parties will be able to provide their views on ComReg's proposals at that point in time.

[12] https://siteviewer.comreg.ie/#explore

Chapter 3

3 Final Fees RIA

3.1 Introduction

3.1 In December 2021 ComReg published its consultation and associated DotEcon Report where it considered and identified current and potential future Satellite Earth Station ("SES") use cases and related matters which would assist ComReg in identifying what, if any, changes to the regime may be required to ensure it is fit for purpose and future proofed.

3.2 In July 2022, ComReg published a further consultation and associated DotEcon Report that set out its views in relation to methodologies that can be used to calculate applicable SES fees. In its draft RIA (Document 22/56), ComReg considered the impacts of the proposed fees on the relevant stakeholders and determined that its preferred option was to adopt a fee regime that retained bandwidth as a factor in the determination of fees.

3.3 In March 2023, ComReg published it's Draft Decision and maintained the view that the preferred option was to adopt a fee regime that retained bandwidth as a factor in the determination of fees. However, having considered the views of respondents, ComReg proposed a slight revision to the application of bandwidth in the licence fee formula and this was generally well received by respondents. For more information, please see Annex 3.

3.4 This chapter sets out ComReg's updated Regulatory Impact Assessment ("RIA") on the procedure for setting spectrum fees for SESs and provides ComReg's preferred option having regard to the impact on stakeholders, competition, and consumers. It concludes with an assessment of the Preferred Option against ComReg's statutory remit, including relevant functions, objectives, duties and principles (as outlined in Annex 1).

3.5 ComReg conducted this RIA having careful regard to the relevant information available to it, including:

- the first DotEcon Report (Document 21/135a);
- the second DotEcon Report (Document 22/56a);
- the third DotEcon Report (Document 23/32a);
- the views of respondents to Document 21/135 and Document 22/56; and

- the stakeholder interviews conducted in 2021.

3.2 RIA Framework

3.6 A RIA is an analysis of the likely effect of proposed new regulation or regulatory change and, indeed, of whether regulation is necessary at all. The RIA should help identify regulatory options and establish whether the proposed regulation is likely to have the desired impact, having considered relevant alternatives and the impacts on stakeholders. The RIA is a structured approach to the development of policy and analyses the impact of regulatory options. In conducting a RIA, the aim is to ensure that all proposed measures are appropriate, effective, proportionate and justified.

3.7 A RIA should be carried out as early as possible in the assessment of regulatory options, where appropriate and feasible. The consideration of the regulatory impact facilitates the discussion of options, and a RIA should therefore be integrated into the overall analysis. This is the approach which ComReg follows in this Draft Decision and this RIA should be read in conjunction with the overall Consultations.

3.8 In conducting the RIA, ComReg has regard to the RIA Guidelines[13], while recognising that regulation by way of issuing decisions, for example imposing obligations or specifying requirements in addition to promulgating secondary legislation, may be different to regulation exclusively by way of enacting primary or secondary legislation.

3.9 To ensure that a RIA is proportionate and does not become overly burdensome, a common-sense approach is taken towards a RIA. As decisions are likely to vary in terms of their impact, if after initial investigation, a decision appears to have relatively low impact ComReg may carry out a lighter RIA in respect of that decision.

3.2.2 Identification of stakeholders and approach to Steps 3 and 4

3.10 Step 3 assesses the likely impact of the proposed regulatory measures on stakeholders. Hence a necessary precursor is to identify such stakeholders. In this RIA, stakeholders fall into two main groups:

(i) Consumers (Impact on consumers is considered separately below);

(ii) Industry stakeholders.

3.11 The industry stakeholders comprise the providers and users of SES for the relevant use cases, which include:

[13] ComReg Document 07/56a, "*Guidelines on ComReg's Approach to Regulatory Impact Assessment*", published 10 August 2007, available at www.comreg.ie

- Broadcasting
- Mobile Communications
- Internet of Things (IoT)
- Earth Exploration and Remote Sensing
- Broadband (GEO and LEO constellations); and
- GPS and navigation

3.12 Step 4 assesses the impact on competition of the various regulatory options available to ComReg. In that regard, ComReg notes that it has various statutory functions, objectives and duties which are relevant to the issue of competition.

3.13 Of themselves, the RIA Guidelines and the Ministerial Policy Direction on Regulatory Impact Assessment[14] provide little guidance on how much weight should be given to the positions and views of each stakeholder group (Step 3), or the impact on competition (Step 4). Accordingly, ComReg has been guided by its primary statutory objectives which it is obliged to seek to achieve when exercising its functions. ComReg's statutory objectives in managing the radio frequency spectrum, as further outlined in Annex 1, include:

- promote competition[15];
- contribute to the development of the internal market[16];
- promote the interests of users within the Community[17];
- ensure the efficient management and use of the radio frequency spectrum in Ireland in accordance with a direction under Section 13 of the 2002 Act[18];
- promote efficient investment and innovation in new and enhanced infrastructures[19].

3.14 In addition, ComReg is guided by regulatory principles and obligations provided for

14 Ministerial Direction dated 21st February 2003
15 Section 12 (1)(a)(i) of the 2002 Act.

16 Section 12 (1)(a)(ii) of the 2002 Act.

17 Section 12(1)(a)(iii) of the 2002 Act.

18 Section 12(1)(b) of the 2002 Act.
19 Regulation 16(2)(d) of the European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011, S.I. No. 333 of 2011 (the "Framework Regulations").

under the European Union (Electronic Communications Code) Regulations 2022, S.I. No. 444 of 2022, (the "ECC Regulations"). Such principles and obligations are outlined further at Annex 1 and include:

- Regulation 24 of the ECC Regulations permits ComReg to impose fees for rights of use, which reflect the need to ensure the optimal use of the radio frequency spectrum. ComReg is required to ensure that any such fees are objectively justified, transparent, non-discriminatory and proportionate in relation to their intended purpose; and
- Regulation 27(4) of the ECC Regulations provides that, notwithstanding Regulation 27(3), ComReg may, through licence conditions or otherwise, provide for proportionate and non-discriminatory restrictions to the types of radio network or wireless access technology used for electronic communications services where this is necessary to:
    - avoid harmful interference,
    - protect public health against electromagnetic fields,
    - ensure technical quality of service,
    - ensure maximisation of radio spectrum sharing,
    - safeguard the efficient use of radio spectrum, or
    - ensure the fulfilment of a general interest objective as defined by or on behalf of the Government or a Minister of the Government in accordance with Regulation 27(7).

3.15 In this document, ComReg has adopted the following structure in relation to Step 3 and Step 4 – the impact on industry stakeholders is considered first, followed by the impact on competition, followed by the impact on consumers. This order does not reflect any assessment of the relative importance of these issues but rather reflects a logical progression. In particular, a measure which safeguards and promotes competition should, in general, impact positively on consumers. In that regard, the assessment of the impact on consumers draws substantially upon the assessment carried out in respect of the impact on competition.

3.3 Step 1: Identify the policy issues & the objectives

Policy Issues

3.16 The spectrum available for SES services is a finite resource with many different services and users. The management of this resource involves the careful consideration of a broad range of factors (e.g., administrative, regulatory, social,

economic, and technical) with a view to ensuring that radio spectrum is optimally and efficiently used.

3.17 This may also involve balancing a range of competing factors, including:

- appropriately meeting the requirements of all radio services, including commercial and public uses, such as public safety, national security, and health care; and
- promoting competition including ensuring that users derive maximum benefit in terms of price, choice, and quality, contributing to the development of the internal market, and promoting the interests of users within the Community.

3.18 Effective spectrum management also requires flexibility and responsiveness to adapt to changes in, among other things, technologies, demand from spectrum users and end-users, market developments and public policy. In that regard, ComReg identifies two broad regulatory tools that are relevant in allowing it to effectively manage to radio spectrum being made available for SES:

(i) Information Policy; and

(ii) Spectrum Fees.

Information Policy

3.19 ComReg is of the view that the information policy of the SES Licensing regime applications is likely to be central to the performance of its spectrum management functions. As noted by DotEcon, providing information on existing spectrum users' deployments is essential if SES licence applicants are to plan around existing users and if operator coordination is to be key to avoiding harmful interference.[20]

3.20 In some cases, where there is a possibility of harmful interference either between SES operators or with other terrestrial users, this can be best managed if the operators themselves have access to the necessary information to undertake a preliminary assessment regarding the likelihood of harmful interference (and the necessary mitigation/coordination procedures) and would be much more effective than trying to use fees for achieving an efficient outcome. In this way, the information policy of the SES Licensing regime applications is likely to be central to ensuring the efficient assignment and use of the radio spectrum.

3.21 ComReg currently provides useful information on deployments to interested parties on mobile base stations on the Siteviewer[21] database and fixed radio links through

[20] Document 22/56a, section 7.5.

[21] https://siteviewer.comreg.ie/#explore

its eLicensing[22] platform. In Document 21/136, ComReg signalled its intention to also make fixed radio links licence information publicly available on Siteviewer. ComReg noted that providing access to fixed radio link licence information would provide greater transparency regarding what services are deployed in particular areas and would assist operators with their network planning.

3.22 With that in mind, ComReg's information policy should be viewed as complementary to the role of spectrum fees, which is the subject of this RIA.

Spectrum Fees

3.23 Regulation 24 of the ECC Regulations[23] permits ComReg to impose fees for rights of use which reflect the need to ensure the optimal use of the radio frequency spectrum. ComReg is required to ensure that any such fees are objectively justified, transparent, non-discriminatory and proportionate in relation to their intended purpose and take into account its statutory objectives as set out in Section 12 of the 2002 Act and the general objectives of the European Electronic Communications Code[24] and the ECC Regulations.[25]

3.24 In that regard, the effective management of radio spectrum requires more than a purely technical consideration of spectrum efficiency. Functional and economic considerations must also be considered, including the extent to which the utilisation of spectrum meets a user's specific needs and the social and economic value that can be derived from it. This is particularly relevant in the current case where there is a variety of different users, providing different services using different technologies based on existing licence conditions (including spectrum fees).

3.25 Following stakeholder interviews, DotEcon identified several use cases that are supported by the operation of SES. Respondents to the consultation process provide some further details in relation to the use cases identified but did not suggest any additional uses. Therefore, ComReg is satisfied that the following are the relevant use cases in its consideration for this RIA. Readers are referred to Section 3 of Document 21/135a (the DotEcon Report) for further information on each of the following use cases:

- Broadcasting;
- Mobile Communications;

[22] https://elicensing.comreg.ie/
[23] The European Union (Electronic Communications Code) Regulations 2022, S.I. No. 444 of 2022.
[24] Directive (EU) 2018/1972 establishing the European Electronic Communications Code.
[25] See also Regulation 4 of S.I. No. 444 of 2022.

- Internet of Things (IoT);
- Earth Exploration and Remote Sensing;
- Broadband; and
- GPS and Navigation.

3.26 ComReg periodically conducts reviews of its licensing frameworks to ensure they remain fit for purpose. For instance, ComReg is also reviewing the Fixed Links licensing framework and will carry out a review of the PMR licensing framework in due course. Regarding satellite services, ComReg observes that the landscape has developed rapidly in recent years, noting the significant rollout of constellations of LEO satellites. The rapid deployment of LEO satellite constellations has enabled satellite broadband providers to provide a higher quality of service covering a wide coverage area.

3.27 While there are various methods of determining the level of a licence fee, some approaches, or even a combination of same, are likely to be more suitable than others. Therefore, the main policy issue to consider in this RIA is, in the context of ComReg's statutory objectives, how best to establish an objectively justified, transparent, non-discriminatory and proportionate fees framework for the SES licensing regime which facilitates the uses cases identified above.

Objectives

3.28 ComReg aims to design and carry out its review of the SES licensing regime in accordance with its broader statutory objectives (as outlined in Annex 1) including the promotion of competition in the electronic communications sector.

3.29 In addition, the focus of this RIA is to assess the impact of the proposed measure(s) (see regulatory options below) on stakeholders, competition, and consumers. ComReg can then identify and implement the most appropriate and effective means by which to set spectrum fees for the SES frequency bands, while achieving its relevant statutory objectives under section 12 of the 2002 Act of promoting competition by, among other things:

- Encouraging efficient use and ensuring effective management of radio frequencies;
- Promoting regulatory predictability by ensuring a consistent regulatory approach;
- Safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure-based competition.

3.30 ComReg notes that, in achieving its objectives, it seeks to choose regulatory measures which maximise the benefits for consumers in terms of price, choice and quality.

3.4 Step 2: Identify and describe the regulatory options

3.31 The current SES licensing framework has been in place since 2007 and has enabled ComReg to effectively licence SES in Ireland that provide for a variety of uses. ComReg will evaluate the existing SES fees regime as an option, given its utility to date, and to fully understand the impact of any change to an alternative option. Therefore, ComReg notes that Option 1 is to maintain the status quo and extend the use of the existing SES fees regime for the foreseeable future.

3.32 Readers are referred to ComReg Document 00/64R3 for full details on the current fees for Fixed Earth Stations and Transportable Earth Stations. However, to aid readers assessment of this RIA, the following summary is provided:

- **First**, if a licensee is operating in the exclusive SES bands, the fee is €100 for each of the first ten licences and €25 per licence beyond this.
- **Second**, if a licensee is operating in one of the non-exclusive bands, then the fee for an SES Licence depends on three factors:

  (i) Which frequency band? – where a licensee can choose from a range of frequency bands which are exclusive (12.5 – 12.75 GHz and 14.0 – 14.25 GHz) and/or shared (which range from 3 GHz to 30 GHz)[26]

  (ii) What is the antenna power limit? – where a licensee can choose an EIRP across three different EIRP categories.[27]

  (iii) What is the bandwidth required? – where a licensee can choose between five different bandwidth categories[28].

3.33 Option 1 (the existing fees regime) is illustrated in Figure 1 below.

[26] The full list of satellite frequency bands is provided in Appendix of Document 00/64R3.
[27] **1.** eirp < 50 dBW **2.** 50 dBW ≤ eirp ≤ 75 dBW **3.** eirp > 75 dBW
[28] **1.** BW < 0.5, **2.**0.5 ≤ BW < 2, **3.** 2 ≤ BW < 11, **4.** 11 ≤ BW < 40, **5.** 40 ≤ BW ≤ 80, **6.** BW > 80

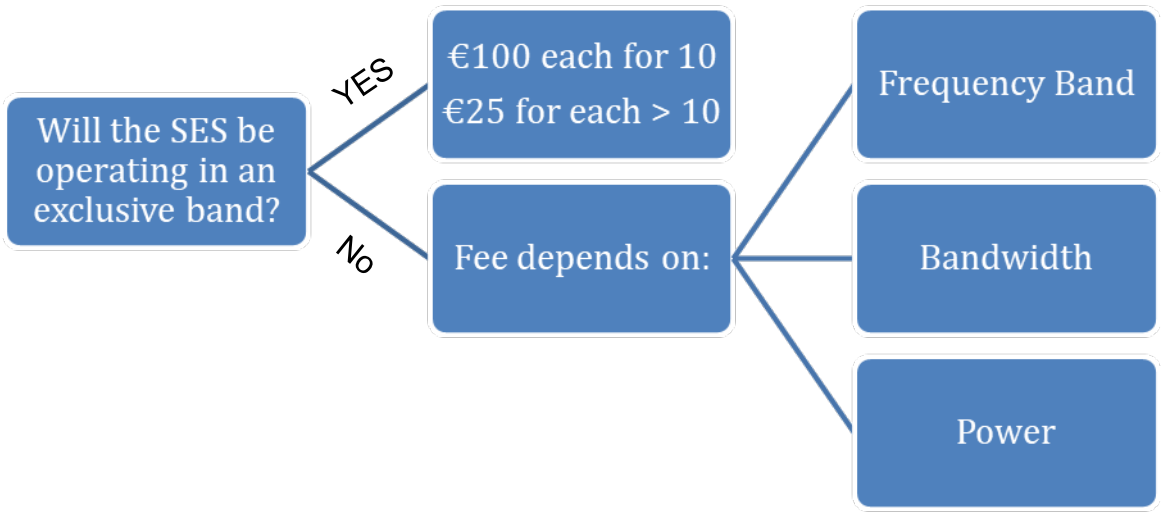

Figure 1: The current method for determining fees for SES (Option 1)

3.34 In relation to other potential options, there are various methods of determining spectrum fees and some approaches (or a combination of approaches) are likely to be more suitable than others. ComReg does not favour any one process for assigning new rights of use of spectrum as a matter of principle; it decides the most appropriate process in each individual case. Each approach will typically have its advantages and disadvantages and one process may, on balance, be found to be the most suitable in light of the particular circumstances, including the characteristics of the spectrum to be assigned, the types of rights of use to be awarded and the anticipated demand for the spectrum.

3.35 At a high-level there are broadly two approaches to setting spectrum fees:

- **Administrative cost recovery:** a minimum requirement for fees is that ComReg recovers its administrative costs associated with managing spectrum licences. The cost recovery methodology in an administrative-based approach that sets total spectrum fees equal to the overall spectrum management costs. This is one of the simplest methodologies available, albeit widely adopted, especially when there is no threat of spectrum scarcity, and it may contribute to fostering spectrum demand. Spectrum fees should also allow spectrum regulators to recover reasonable administrative costs. Such costs include:
    - one-off costs of awarding spectrum and issuing licences;
    - policing licence conditions; and

- monitoring and resolving interference problems.

- **Opportunity cost based**: This encapsulates a range of approaches where there are varying levels of scarcity and potential scarcity that need to be resolved. They can be classified into two categories.

    - A competitive market mechanism such as an auction where the interaction of bidders during the award determines who wins the spectrum and the price paid.

    - Administratively determined fees which typically aim to proxy opportunity cost and/or provide incentives for licensees to use spectrum in an efficient way. Such approaches include Administrative Incentive Pricing ("AIP")[29] or Universal System Performance Pricing methodology (USPP)[30].

3.36 Clearly, there is a sequencing in determining the appropriate fees approach. If it is the case that the spectrum can be used freely, or relatively freely, across alternative potential users over a sufficiently long period, then an administrative cost recovery approach is more likely to be appropriate. In this circumstance, no further consideration of alternative approaches would be required because there would be no opportunity cost that needs to be reflected in fees because other users are not precluded.

3.37 Therefore, prior to setting out the regulatory options available to it, ComReg first assesses the extent to which issues of scarcity arise, or could arise, in the licensing of SES rights of use.

Assessment of interference and conflicts in demand

3.38 The information contained in this section is based on several sources of information, including but not limited to:

- the initial research and interviews with stakeholders conducted in late 2021;

- the First DotEcon Report (Document 20/135a);

- response to ComReg's consultation – Document 21/135; and

- the Second DotEcon Report (Document 22/56a).

3.39 In the context of SES, spectrum scarcity is determined by the likelihood that harmful

[29] This attempts to set prices equal to opportunity cost, such that only the highest value users have an incentive to take up licences in the band

[30] This estimates the value of spectrum based on a set of relevant factors that are selected in advance (e.g. bandwidth).

interference would be created by licensing SES to a particular user and the resulting impact on the ability of other operators to use the same frequencies. Interference needs to be considered because it might imply an opportunity cost that needs to be reflected in SES licence fees and more specifically to the extent that other users are precluded by the need to protect SES and/or among terrestrial users.

3.40 DotEcon outlines two potential areas of interference that could create opportunity costs in the assignment of SES licences. [31]

(i) Interference amongst SES; and

(ii) Interference between SES and other terrestrial users

3.41 ComReg assesses each in turn below.

Interference amongst SES

3.42 There are two types of SES relevant to this assessment (i) Geostationary[32] ("GSO") systems and (ii) non-GSO[33] systems.

3.43 In its first Report, DotEcon was of the preliminary view that there was unlikely to be any significant interference between GSO SES, or between a GSO and non-GSO ground station. This is because both receivers and transmitters on SES are highly directional and point to the sky thereby limiting interference. Similarly, stakeholder interviews did not reveal any concerns about interference, and in any event, such interference is avoidable (e.g. by using elevation masks). Further, in response to Document 21/125, stakeholders agreed with DotEcon that harmful interference between two GSO systems, or between non-GSO and GSO, is unlikely[34].

3.44 However, in relation to interference between different non-GSO constellations, the stakeholder interviews indicated a greater potential for interference and suggested that geographical separation would be necessary to manage this matter. The potential for interference between non-GSO constellations arises because antennas used to communicate with various satellites in the constellation are multi-directional from the same ground station and the techniques available to limit interference between neighbouring GSOs cannot be replicated effectively between non-GSOs.

3.45 The Second DotEcon Report agrees that sufficient geographic separation would be

[31] See Section 4.1 of Document 21/135a

[32] Objects in GSO have an orbital speed that matches the Earth's rotation, yielding a consistent position over a single longitude. As a result, they appear fixed in the sky when observed from the ground. GSO satellites are at around 36 000 kilometres above the Earth.

[33] Non-GSO satellites at medium Earth orbits (MEO) altitudes are between 8 000 and 20 000 kilometres above the Earth and low Earth orbits (LEO) altitudes are between 400 to 2 000 kilometres above the Earth. Non-GSO satellites move across the sky during their orbit around the Earth, non-GSO operators must deploy a fleet of satellites, generally called "constellations", to provide continuous service from these altitudes.

[34] The Second DotEcon Report, p22

necessary to avoid harmful interference. However, this is not expected to create any issue of scarcity (in terms of access to suitable sites and spectrum) within Ireland. DotEcon notes that interference only arises if non-GSO operators have an incentive to place SES in proximity to each other. However, in its view, such issues are most unlikely to arise for the following reasons[35].

- There are currently fewer than sixty live SES licences in Ireland, of which only 16 are FES transmit licences and operators have sufficient flexibility[36] in their site selection. The supply of available sites in Ireland is more than enough to accommodate the needs of all SES operators.

- Many of the current licences belong to established use cases (e.g., broadcasting, government/community institutions) and growth in demand for SES to service these use cases is expected to be limited given the maturity of these use cases.

- Furthermore, the use of different types of technology, in particular optical links for intra-satellite communications, should reduce the number of SESs needed to provide a given level of coverage by passing data through a LEO system to the nearest SES. Over large distances, intra-satellite links may transfer data faster than fixed line networks as the optical signals are travelling in free space.

- Newer LEO systems aiming to provide high-capacity broadband may increase in the future, however, the satellite services are less than 0.1% of the overall market. Further, the number of LEO operators is likely to remain relatively small and depending on their system deployment, some satellite broadband providers may not require SESs in all countries in Europe.[37]

- If ComReg was to make available licence information of existing SES, operators might naturally choose to locate away from each other such that harmful interference would not be a concern because operators could coordinate. As discussed in Section 3.4, ComReg proposes to provide this information as a proportionate measure to reduce any potential for harmful interference.

3.46 Therefore, ComReg agrees with DotEcon that there is neither scarcity in sites for SES at present, nor any evidence that the increase in non-GSO systems will create

[35] The Second DotEcon Report, Document 22/56a, p22.

[36] DotEcon notes that if stakeholders have full flexibility as to where to position their earth stations, then we would not expect there to be any issue of scarcity (in terms of access to suitable sites and spectrum) within Ireland, in particular given expectations over the likely relatively small number of SES in operation.

[37] A Technical Comparison of Three Low Earth Orbit Satellite Constellation Systems to Provide Global Broadband. Inigo del Portillo, Bruce G. Cameron, Edward F. Crawley - 2019

spectrum scarcity for SES in the foreseeable future. As a result, interference between SES is likely manageable through coordination and modest geographic separation of SES.

Interference amongst terrestrial users

3.47 SES share frequency bands (except for two exclusive bands) on a co-primary basis with other services ("terrestrial users") and interference may occur between these uses and SES (e.g., the 28 GHz fixed links band overlaps with the Ka band used by SES). Terrestrial uses primarily refers to fixed links but also refers to other services that may be provided in the future over these bands e.g., 5G. Stakeholders have raised concerns that the expansion of 5G services in the 26 GHz band could limit the spectrum available to satellite operators. ComReg assesses the potential for interference/scarcity from Fixed Links and 5G below.

Fixed Links

3.48 In relation to Fixed Links, ComReg agrees with DotEcon that coexistence between SES and fixed links is feasible, and therefore the likelihood of harmful interference would be low. ComReg notes the following:

- Interference between terrestrial uses and satellite services is easily managed/avoided (i.e., because SES antennas point to the sky whereas, say, fixed links follow the curvature of the Earth and the difference in angles will often prevent interference occurring).[38]
- ComReg already assesses potential interference when processing fixed links and SES licence applications ensuring existing users are protected against interference from new licensees.[39]
- Interference can be avoided through coordination because satellite operators can position SESs where they will not interfere with fixed links. Further, ComReg plans to make available further information on fixed links and SES licences (through Siteviewer) which should support operator coordination between SES and fixed links.[40]
- There is general consensus amongst respondents to Document 21/135 that coexistence between SES and fixed links is feasible and potential instances of interference are likely to be low.[41]

[38] The First DotEcon Repot, Document 21/135a, p23
[39] The Second DotEcon Report, Document 22/XX, p23
[40] Ibid
[41] See sections 2.5.2 and 2.5.3

3.49 Some stakeholders in response to Document 21/135 expressed concern regarding coexistence between SES and point-to-multipoint ("PMP") fixed links. More specifically, some contended that that it is potentially more difficult to plan SES operations around PMP links because there are multiple endpoints to a point to multi-point link (i.e. the location of the PMP system is known, but the other points change frequently)[42].

3.50 However, DotEcon is of the view that coexistence between SES and PMP links could be successfully managed through a transparent information policy and interference assessment at the application stage following the practice as currently set for case for PP links. Furthermore, ComReg notes that there are currently just two PMP link licences[43] in Ireland. Although this may change in the future, demand for PMP is likely to remain low and even where they do arise, they can be comfortably managed in the same way as PP links on application. In addition, ComReg intends to make PMP licence information available along with PP licence information.

3.51 Therefore, ComReg is of the view that interference issues in relation to fixed links are manageable.

5G spectrum

3.52 Concerns expressed by respondents around scarcity/interference in relation to 5G fall into three categories:

(iii) Potential for interference between SES and 5G services in the same band;

(iv) Reduced availability of bands for satellite as further bands are assigned to 5G; or

(v) Out of band interference from 5G services in adjacent bands.

3.53 In relation to (i), in most cases, 5G services will operate in bands assigned to mobile and there should not be any significant interference between mobile terrestrial services and SES in neighbouring bands (e.g. 26 GHz and the Ka band), provided that technical conditions to limit out of band emissions are enforced. The only exception to this is the 3.4- 3.8 GHz band, which has already been awarded[44] in Ireland, and in which there is some overlap with bands included in the SES guidelines for receive operation. ComReg can confirm that no significant issues in relation to this arose during the consultation on this band, nor has it arisen since as the licensed SES operate above 3.9 GHz.

3.54 Further, if any bands are assigned to 5G and SES, these will typically be in the higher

[42] The first DotEcon Report, Document 21/135a, p29.
[43] Both licences are in the 28 GHz band.
[44] 3.6 GHz Band Spectrum Award | Commission for Communications Regulation (comreg.ie)

frequencies (e.g. mmWave bands) which we would expect mobile operators to only require in larger towns and cities. Alternatively, SES are generally located in rural areas therefore, there is a large amount of scope for coordination and satellite operators can position their SESs accordingly to minimise the risk of disruption in the future.[45]

3.55 In relation to (ii), the process of making spectrum available to 5G could negatively impact spectrum available for SES increasing potential for scarcity in the future. However, DotEcon[46] advises that this issue is likely to be limited in practice:

- bands are harmonised for mobile (or any other) use at an international level, and this is neither a matter for ComReg in isolation nor within the scope of this review; and
- in any event, any future decisions regarding the bands that are being considered for future IMT use (e.g. 42 GHz) would most likely specify out-of-band emission limits in order to ensure the appropriate protection of any existing satellite services.

3.56 Furthermore, ComReg notes that such changes are made over time and availability of spectrum for SES would be considered at an international level when such decisions are made. ComReg can assess such scenarios in future reviews to the extent necessary, noting that SES is already allocated across 17 bands with over 6 GHz available.

3.57 In relation to (iii), the out of band 5G interference refers to 26 GHz potentially not giving sufficient protection for neighbouring Ka band users. However, this is a matter for any future 26 GHz award and DotEcon advises that ComReg should consider relevant technical studies, such as CEPT Report 068,[47] when it awards spectrum in that band. ComReg is of the view that such concerns can be comfortably addressed in the context of any future 26 GHz Award as part of its normal practice in assigning spectrum rights of use.

3.58 Finally, ComReg notes that demand for SES licences in Ireland is comparatively low relative to other licence types as indicated in the table below. Although new use cases may require a large amount of spectrum, there is no evidence of a continuous growth in demand. This is consistent with views of respondents that, in general, operators have a relatively high degree of flexibility over where they can locate a

[45] Second DotEcon Report, Document 22/56a, p26.
[46] Second DotEcon Report, Document 22/56a, p27.
[47] CEPT Report 068 – Report B from CEPT to the European Commission in response to the Mandate "to develop harmonised technical conditions for spectrum use in support of the introduction of next-generation (5G) terrestrial wireless systems in the Union" Harmonised technical conditions for the 24.25-27.5 GHz ('26 GHz') frequency band. https://docdb.cept.org/download/119

SES, particularly where the satellite operator is providing an international service and can choose to locate a SES across different countries.

Licence Type	Number of live licences as of 30 June 2023
Satellite	42
Fixed Links (Point-to-Point and Point-to-Multipoint)	16,111
Business Radio	831
Radio Amateurs	21049

Table 1: Live licences as of June 2023[48]

3.59 Considering the above, ComReg is of the view that there are no interference or scarcity issues arising in respect of future 5G services.

Conclusion on interference and scarcity

3.60 From the above, there is no significant interference and/or scarcity issues arising in respect of SES. To the extent that there is potential for interference in the future, this is likely to be very rare and the impact would be decidedly limited.

- First, there are good technical reasons why interference is unlikely to arise over the period of this review. For example, much of the rationale for a likely lack of interference relates to the fact that transmitter and receivers are highly directional which vary across different use cases, and this is very unlikely to change in the future.
- Second, the potential for interference is already assessed ex-ante by ComReg when processing SES licence applications ensuring existing users are protected against interference from new licensees. This will continue to be the case in the future.
- Third, it is more likely that discussions regarding coordination between applicants and licensees will occur than actual scarcity, meaning that the information policy is important in achieving efficient resolution of the limited conflicts that might occur between users.
- Fourth, in relation to bands potentially being provided for 5G use in the future, it is important to note that this is not currently planned. However, should it

[48] https://www.comreg.ie/industry/radio-spectrum/licensing/statistics/

occur, it would only happen over a long period and beyond the period of this review. The impacts of any such a reallocation could be considered by ComReg in any future review.

- DotEcon is of the view that while ComReg should not assume that opportunity costs would always be close to zero, scarcity is sufficiently unlikely that it does not see any need to account for potential opportunity costs in the current fee schedule. This issue of potential scarcity can be revisited in future reviews.

3.61 Considering the above, ComReg agrees with DotEcon[49] that there is no efficiency role for the fees in terms of ensuring licences are assigned to the highest value users, as there is currently no evidence to suggest that scarcity is present or likely to materialise in the foreseeable future. The overall level of fees does not need to be any higher than necessary to cover ComReg's administrative costs. In that regard, the various regulatory options that would provide for opportunity cost pricing are not considered further in this final RIA.

Related Fixed Links Projects

3.62 ComReg notes that its views in relation to SES might appear to contrast with its views in relation to the Fixed Links Review[50] in which ComReg is of the view that fixed links are already at risk of potential scarcity in the future and more widespread congestion in the future than is currently the case.

3.63 However, the circumstances pertaining to the Fixed Links Review are markedly different for several reasons:

- **First**, there are no issues of potential scarcity or interference in SES for the reasons set out in the earlier assessment. For Fixed Links there is some scarcity in certain bands in the Dublin area and a risk of potential scarcity in other bands/areas of the country. On this basis ComReg has strong spectrum management grounds for an opportunity cost-based approach to that licensing regime. Those grounds do not present in ComReg's review of SES licensing.

- **Second**, the potential for significant migration between Satellite Bands under an administrative cost recovery option is unlikely to arise. This is because of the ITU allocation of bands to specific services and, generally, operational

[49] The Second DotEcon Report, Document 22/56a, p48.
[50] See ComReg Document 22/93.

bands of a satellite are decided prior to the launch of a satellite, therefore migration between bands is limited.[51]

- **Third**, the potential for increased spectrum hoarding incentives for SES under an administrative cost recovery option is low because the cost of holding those rights of use would not reduce significantly. More pertinently, licensees are dependent on specific bands due to the ITU allocation decisions. Such a scenario does not arise in respect of Fixed Links where licensees have preferences across a wide range of bands and can substitute between bands over time. (i.e. chains of substitution do not exist to the same extent with SES).

3.64 Furthermore, ComReg notes and agrees with the views of DotEcon in ComReg's proposal on Fixed Links, that congestion has already occurred in the Dublin area, and there are many users of the spectrum with growing demand for bandwidth. Alternatively in relation to SES:

- Demand for SES is low, and while new use cases may require additional spectrum, there is not a continuous growth in demand;
- DotEcon expects the SES demand to remain well below the level that would create scarcity of sites/spectrum or material opportunity costs for the foreseeable future;
- it is not feasible to incentivise the small number of satellite operators to spread out across bands, because they are often dependent on a specific band, whereas fixed links licensees are more likely to have a range of suitable bands available to them when installing a new link, and therefore some will respond to price differences; and
- It is simpler to resolve conflicts between SES by operator coordination, given the smaller number of users and the fact they are not reliant on key sites/paths.

3.65 Finally, ComReg would note that its views on the use of administrative cost pricing for SES are not fixed and are subject to review in the future. While ComReg does not expect the situation to change for the foreseeable future, should circumstances change sufficiently, ComReg may need to reconsider its position, up to and including the possible reversion to opportunity-cost pricing if appropriate.

[51] For example, since around 2010 onwards, a large number of satellite deployments have used the K band (11 GHz – 30 GHz) to take advantage of the large bandwidth available within the band's range. Future satellite deployments may be designed to operate in the Q and V bands.

Remaining regulatory options

3.66 ComReg already set out that Option 1, as outlined earlier, is the status quo option. Considering the assessment on scarcity and interference above, ComReg notes that its basis for the remaining regulatory options is limited to fees based on administrative cost recovery. However, such charges can be implemented several ways. Administrative costs can be applied equally across all licensees or applied depending on how licensees use the spectrum such that some licensees could incur more administrative costs than others.

3.67 ComReg agrees with the view of DotEcon[52] that an approach that sets fees specifically for various use cases is likely to be difficult due to the variety of different use cases and the business cases that would support each would need careful assessment by ComReg. In particular, the level of fees at which operation is economically viable is likely to vary significantly between the use cases. For example, satellite broadband services provided by the emerging LEO systems are likely to have a higher valuation for SES when compared to lower value applications, such as earth exploration or telemetry. This could lead to an unduly complicated set of fees that would be subject to regular change. In any event, information required for such as assessment is unlikely to be available. Furthermore, because fees are administratively based, ComReg should be able to control for issues that might arise such as the choking off of demand for low value users (such as earth exploration, telemetry, and university research projects). Therefore, ComReg does not consider such an approach as a valid regulatory option.

3.68 Further, ComReg notes that removal of one or more of the three factors used to determine fees in Option 1 (i.e., frequency band, bandwidth and power) would have an impact on existing stakeholders. Therefore, in order to consider the impact on existing stakeholders, the regulatory options in this RIA should consider the inclusion or otherwise of each of the three factors, noting that the removal of all factors would correspond to the same administrative fee applying to all licensees regardless of usage. The inclusion of a particular factor means that administrative costs (or at least some portion of common costs) would be allocated according to that factor (i.e. if power was used as a factor, administrative costs would be allocated in proportion to the power used).

3.69 However, consideration of these three factors would lead to eight different options if each combination of factors was considered independently, in addition to Option 1 (which also maintains the level of fees rather than setting it based on administrative costs). However, ComReg considers that the interactions between the different factors are not sufficiently strong to merit defining regulatory options based on combinations of factors, but instead regulatory options can be based on individual

[52] The Second DotEcon Report, Document 22/56a, p49

factors. As a result, these options are not necessarily mutually exclusive. Therefore, each option below, following Option 1, considers one of the factors and assesses whether that factor is necessary to ensure the effective licensing of SES services across all combinations that include that factor. In this way, if any particular combination of factors is required to ensure the effective functioning of the SES Licensing framework, the preferred option will provide for the same which streamlines this RIA process.

3.70 Therefore, the regulatory options are as follows, noting that each option would cover the administrative costs incurred by ComReg to licence SES.

- **Option 1 -** the existing framework for setting fees would continue to apply, including the three factors to determine the fees for SES.
- **Option 2** - Frequency bands (including whether exclusive or non-exclusive) would be retained as a factor for setting administrative fees for SES. A licensee's fee for SES would depend on the frequency bands (including whether exclusive or non-exclusive) associated with its licence.
- **Option 3 -** Power would be retained as a factor for setting administrative fees for SES. A licensee's fee for SES would depend on the power level associated with its licence.
- **Option 4 -** Bandwidth would be retained as a factor for setting administrative fees for SES. A licensee's fee for SES would depend on the bandwidth associated with its licence.
- **Option 5 -** No factor would be retained for setting administrative fees for SES. A flat fee would apply to all licensees irrespective of frequency band, bandwidth, or power.

3.5 Impact on Stakeholders

Identification of stakeholders

3.71 Step 3 assesses the likely impact of the proposed regulatory measures on stakeholders. Hence a necessary precursor is to identify such stakeholders who, in this RIA, fall into two main groups:

(i) industry stakeholders as described above; and

(ii) competition and consumers.

3.72 ComReg sets out below a comparative analysis of each of the three options regarding pricing outlined above, in terms of their impact on stakeholders, competition and consumers.

Impact on industry stakeholders

3.73 This section provides information on the impacts on industry stakeholders (as outlined above) arising from the regulatory options above.

3.74 ComReg notes that there are two broad categories of impacts relevant in this section:

- First, the impacts arising from how rights of use are assigned in each of the regulatory options (i.e., "Assignment Impacts"); and
- Second, the impact of the regulatory option on spectrum fees paid by Existing Licensees or would be paid by future licensees (i.e., "Financial Impacts").

3.75 Assignment Impacts refer to the nature and quantum of spectrum rights of use to be assigned to licensees. The choice of preferred option can impact an operator's ability to obtain the rights of use necessary to satisfy efficient demand and deliver one or more use cases. These impacts typically arise where issues such as congestion and scarcity arise, and/or where there is uncertainty about future fees and the extent to which they may change. As discussed earlier, there are no issues regarding scarcity and interference. Consequently, the Assignment Impacts are likely to be limited across all options.[53]

3.76 In relation to Financial Impacts, it is worth noting at the outset that the financial impacts that would arise from any of the Options would be relatively minor, with most Licensees facing reduced fees in the non-exclusive bands. The largest fee increases would depend on the circumstances of users and their spectrum assignments; however, the largest increases would arise for users who currently operate in the exclusive bands and operate with high power and or high bandwidth (depending on the preferred option(s)). ComReg notes that the majority of any increases would only however be in the order of hundreds of euro. SES licence revenues are already broadly in line with total administrative cost and any change would primarily be a redistribution of fees among users. Notwithstanding, for completeness and to inform its's overall preferred option, ComReg provides its views on the impact on stakeholders below, which it will revise following response to this consultation.

3.77 With that in mind, ComReg notes that the impact of any one option depends on the extent to which each factor (i.e. band, bandwidth or power) varies across each Licensee. If, for example, all licensees use the same bandwidth then the use of this factor to distribute administrative costs would result in those costs being the same for all Licensees, and consequently would align with Option 5. Alternatively, if

[53] ComReg notes that under Option 1 there is some uncertainty that this regime would persist in the future given the issues raised in this consultation. Option 5 is marginally simpler to understand compared to other because it is a flat fee regardless of uses.

bandwidth varies across users, the applicable fees and associated impacts would also vary and impact stakeholders differently depending on how much bandwidth is used by them. Therefore, to determine stakeholder's potential views, it is useful to assess the extent to which Licensees differ in their choice of 1. Power, 2. Frequency Band and 3. Bandwidth.

1. Power

3.78 The vast majority of SES Licensees operate in the 50 dBW to 75 dBW range. Further, there are currently no users that considered higher power users (i.e. >75dBW). Therefore, the use of power (Option 3) is unlikely to be a significant issue for most stakeholders who would likely be indifferent about the inclusion of power as a factor to allocate administrative costs. Most users would pay a broadly similar fee and be similar to Option 5 which is a flat administrative fee across all Licensees.

2. Frequency Bands

3.79 In relation to frequency bands, current licences are spread between exclusive and non-exclusive frequency bands. Sixteen licences are for spectrum in the 14.0 - 14.25 GHz exclusive band. No live licences are approved for use in the other exclusive band (12.5 – 12.75 GHz). The remaining licences are spread across the shared-use bands though the majority are in the following Ku sub-bands:

- 10.7-11.7 GHz;
- 13.75-14 GHz;
- 14-14.25 GHz; and
- 14.25-14.5 GHz

3.80 Therefore, removing consideration of frequency bands (including whether exclusive or non-exclusive) when setting administrative fees for SES could potentially create asymmetric impacts across different stakeholders. In particular, the removal of the distinction between exclusive and shared use will increase the fees paid by existing licensees of exclusive bands. This arises because fees for the exclusive use bands are significantly lower[54] than for the shared bands and are based on the number of SES licences held in those bands. In particular, the annual fee is €100 for each of the first 10 SESs and €25 for each additional SES.

3.81 ComReg assesses the potential impact on users of exclusive bands and non-exclusive bands below.

[54] There is one instance where fees in the shared bands could be lower – i.e. a licensee that require 0.5MHz at a power less than 50 in Band greater than 30 GHz. Currently, there are no such Licensees.

Impacts on users of exclusive bands

3.82 SES Licensees that operate in the exclusive bands (circa 40% of all SES Licensees) would likely prefer if fees remain at a similarly low level (e.g. €100). The removal of bands as a consideration would mean that there would be no price differential associated with operating in any frequency band, including whether the band is exclusive to SES. Users of exclusive bands would pay an administrative cost-based fee the same as shared band users for using the spectrum. Under Options 3, 4 and 5 all users of exclusive bands would have an increase in fees ranging in hundreds to low thousands of euros (single digit).

3.83 Therefore, ComReg is of the view that users of the exclusive bands (and particularly those that only use the exclusive bands)[55] would likely prefer Option 1 because, as noted above, there is a flat €100 fee for licences in the two SES exclusive bands. As noted by DotEcon, this effectively gives licensees in the exclusive bands a discount in the order of 90% relative to fees for the shared bands and this discount would be of the same order of magnitude. Similarly, such users would likely prefer Option 2 and the retention of bands and the distinction between exclusive and non-exclusive, noting that the €100 would be sufficient to cover ComReg's incremental costs of processing a licence.[56]

3.84 In relation to the remaining options, current users of the exclusive bands would also be likely to favour Option 4 because these Licensees (currently at least) tend to have lower bandwidth needs and would therefore also be likely to prefer to keep bandwidth as a consideration in determining fees[57]. The majority of SES Licensees using the exclusive bands operate in a similar power range to users of the non-exclusive bands and are therefore likely to be indifferent to the removal of power (Option 3) as a consideration for fees. Overall, these Licensees would prefer any option over Option 5 (or combination of options that excludes the use of bands) because such options would remove the consideration of frequency bands from determining fees entirely.

Impacts on users of non-exclusive bands

3.85 SES Licensees in the non-exclusive bands (circa 60% of all Licensees) are charged depending on the band and the bandwidth they wish to be assigned at a particular power. Option 5 removes all considerations of those three factors and SES licensees would be assigned rights of use based on administrative cost recovery which would be spread equally across Licensees. Therefore, all SES Licensees (except those who also have licences in the exclusive bands) would prefer Option 5 to Option 1,

[55] There are 5 SES Licensees that only use the exclusive bands. There are some exclusive users that may prefer alternative options because they have a large amount of licences.
[56] See Chapter 6 (Fees) and Section 8 of the Second DotEcon Report (Document 22/56a)
[57] It should be noted that this is not true of all Licensees and some Licensees in the exclusive bands have higher bandwidth requirements and would likely prefer Option 3.

noting that Option 1 is not based on administrative cost recovery and attracts higher fees for almost all bands regardless of power and bandwidth requirements[58]. Even those licensees who may be marginally better off under Option 1 currently would likely prefer Option 5 because the same fee would apply even if their power or bandwidth requirements increased in the future.

3.86 The extent to which a licensee would prefer any of the remaining options over Option 5 would depend on their usage requirements. For example, under Option 4 (retention of bandwidth), it is likely that the majority of licensees operating in the non-exclusive bands would see a reduction in their fees, but some large bandwidth users could face increases. Similarly, licensees with lower bandwidth requirements but higher power requirements would likely prefer options that removed power considerations because that would pass more administrative costs to higher bandwidth users. However, as noted above, most licensees tend to have licences that operate within the same range (i.e., 50 -75 dBW) so would likely be largely indifferent on use of power in determining fees.

Bandwidth

3.87 In relation to Bandwidth, and as illustrated in Figure 2 the typical bandwidths used by licensees vary widely. At the low end, many operators use less than 10 MHz, with some using less than 1 MHz. Other SES licensees require much larger bandwidths, for example over 500 MHz. Therefore, the use of bandwidth is likely to cause fees to vary across stakeholders and impact licensees differently.

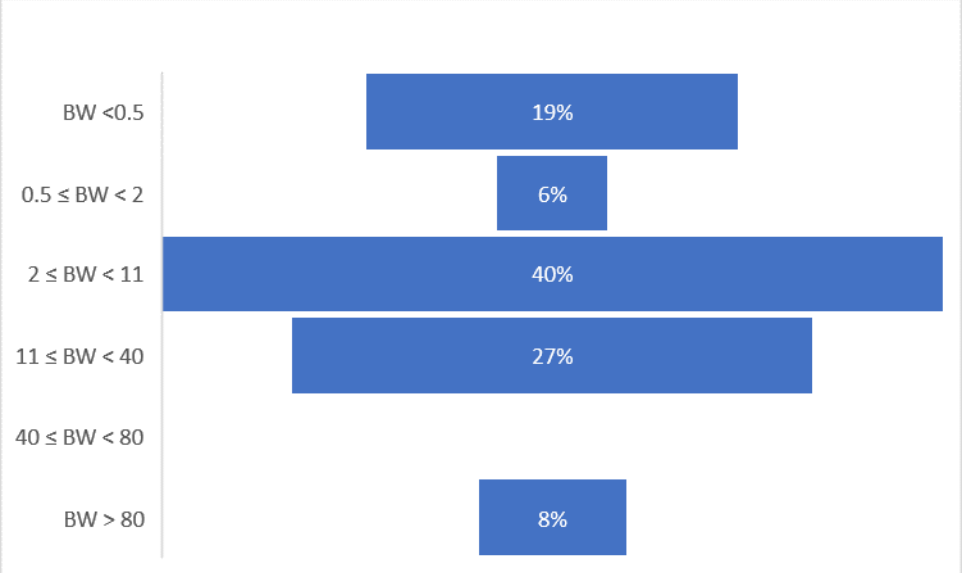

Figure 2: Percentage of licensees that use different bandwidth categories.

[58] Only bands above 15GHz with bandwidth requirements above 0.5 MHz would likely have lower fees than Option 1. There are currently no licensees fulfilling this requirement.

3.88 The use of bandwidth as a factor simply means that the more bandwidth that is used the higher the fee, noting that overall total fees only cover ComReg's administrative costs. Figure 2 provides a high-level illustration of bandwidth use across licensees and the additional cost associated with bandwidth would fall approximately in line with same. For example, regarding users of the non-exclusive bands:

- Very low bandwidth users (up to 2 MHz) would face fee decreases. Depending on the frequency band that they are operating in under the current licensing regime, they may see fee decreases of hundreds of euros.
- In general, low bandwidth users (between 2 MHz and 11 MHz) would see a reduction in their licence fees in most instances.[59]
- In general, medium bandwidth users (between 11 MHz and 40 MHz) would mostly see either a reduction or modest increases (in the order of hundreds of euro) to their licence fees relative to the existing fee schedule;
- ComReg observes that there are currently no large bandwidth users (between 40 MHz and 79 MHz). Large bandwidth users would likely see fee increases relative to the existing fee schedule, depending on their spectrum requirements.
- A small number of licensees use bandwidths greater than 1 GHz. These licensees would face similar fees or lower fees relative to the existing fee schedule.

3.89 Overall, the impact on SES Licensees ultimately depends on their usage requirements and there will inevitably be some Licensees that pay more while others would pay less under any Option relative to Option 1. However, as noted at the outset, because fees only cover administrative costs the impact on stakeholders is very modest.

3.6 Impact on competition

3.90 There are different elements to competition that are relevant in determining the impact of any of the preferred options. There is a natural overlap between the aims of the fee methodology and an assessment of ComReg's compliance with some of its statutory obligations, particularly that of promoting competition, in accordance with Section 12 of the 2002 Act.

[59] Low power users (eirp < 50 dBW) in the high frequency bands would likely face fees that are either comparable or slightly higher than under the current regime. However, ComReg observes that there are currently no licences issued fall within these conditions.

3.91 These include:

(a) Encouraging efficient use and ensuring the effective management of radio frequencies and numbering resources[60] ("Efficiency and Spectrum Management")

(b) Ensuring that there is no restriction or distortion of competition in the electronic communications sector[61] ("Distortions to competition");

(c) Promoting efficient investment and innovation in new and enhanced infrastructures[62] ("Efficient Investment"); and

(d) Safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure-based competition[63] ("Infrastructure based competition"). [64]

3.92 ComReg assesses each in turn below.

Efficiency and Spectrum Management

3.93 Under Option 1, ComReg's current fee schedule is based on:

- whether the frequencies used are in a satellite exclusive frequency band or a frequency band that is shared with other services;
- the bandwidth licensed; and
- antenna power (EIRP).

3.94 In principle, these are sensible as proxies for opportunity cost imposed on other users. However, absent evidence that opportunity costs are an issue to be concerned with, the approach to setting fees should be kept as straightforward as possible and additional costs should not be imposed, without good reason. Given ComReg's assessment of scarcity and interference above there would appear to be no efficiency or spectrum management reason to charge fees in this way. Therefore, Option 1 is unlikely to be necessary to encourage efficient use and ensure the effective management of the radio spectrum.

3.95 In relation to Options 2 to 5 which are based on administrative cost recovery, ComReg notes the views of DotEcon[65] that, while there are no efficiency grounds for setting the overall level of fees significantly above administrative costs, there may be

[60] Section 12(2)(a) of the 2002 Act.
[61] Section 12(2)(a) of the 2002 Act.
[62] Regulation 16(2) of the Framework Regulations.
[63] Regulation 16(2) of the Framework Regulations.
[64] Impact on consumers assessed separately below.
[65] The Second DotEcon Report, Document 22/56a, p43.

efficiency arguments around ensuring that:

(i) each licensee covers the incremental costs incurred by ComReg as a result of its licence; and

(ii) fixed costs are distributed to avoid inefficiently choking off demand.

3.96 In relation to (i), incremental cost of processing a licence application would be the same across all options and there would be no difference between options. ComReg sets this fee at €100 per licence.

3.97 In relation to (ii), the concern here is that more marginal, low value users (such as earth exploration, telemetry, and university research projects[66]) could be priced off if too large a share of the common costs is recovered from them. As noted by DotEcon[67] if the administrative costs are spread evenly across all licences, there may be a number of potential licensees that are priced out of the market with zero benefit, harming businesses and/or consumers that may have benefitted from those services. There is a risk that Option 5 could result in such outcomes because administrative costs are applied evenly across all licensees under that Option.

3.98 If under Option 2, fees remained substantially lower in exclusive bands and low value users are able to choose the frequency bands they use freely, then such concerns would not arise. However, ComReg agrees with the views of DotEcon[68] that the current discount applied in these bands (which effectively amounts to a 90% discount) is unnecessary given the lack of scarcity of SES spectrum. ComReg notes that there are no efficiency or spectrum management reasons as to why the exclusive use of certain bands attracts a 90% discount. Moreover, it is likely that some low value users will prefer bands other than the exclusive bands.

3.99 Furthermore, and wholly apart for the designation of certain frequency bands as exclusive, there is no basis for charging different fees depending on the frequency band required by a licensee. As noted at the outset of this final RIA, there are no interference and scarcity concerns related to any of the bands under consideration. As noted by DotEcon, *"Even if there is more spectrum in the higher frequencies, there is no obvious scarcity of spectrum for SES in any of the bands, nor are any material opportunity costs likely to emerge in the near future. Therefore, there is no need to have per MHz charges that differ across bands to capture relative scarcity (or potential scarcity) of spectrum."*[69]

[66] includes satellites for research projects (e.g. run by universities or national research funding agencies) which may be budget constrained and unlikely to operate large amounts of ground station infrastructure (potentially working with ESaaS operators instead). See Document 20/135a Section 3.2.1.

[67] The Second DotEcon Report, Document 22/56a, p49.

[68] Document 22/56a, p51

[69] The Second DotEcon Report, Document 22/56a, p50

3.100 Under Option 3, while the risk is lower than Option 5, there would still be a risk that low value users would be choked off because while these low value users have low bandwidth requirements, they do not generally operate at lower power. As noted in the impact on stakeholders above, most licensees typically fall into the 50 – 75 dBW category and power is not a distinguishing factor across licensees. Therefore, the retention of power as a factor in determining fees could increase the risk of choking off such use cases where higher power was required. Conversely, ComReg is not aware of any use case that has low power and high bandwidth requirements.

3.101 Under Option 4, and because low value users are typically defined in relation to bandwidth used (which is low), there are clear advantages to allocating common costs in proportion to the bandwidth used. Under this Option, these users would cover the incremental cost of processing a licence, however the remaining administrative costs would be kept low in line with low bandwidth use, reducing the risk of these users being choked off unnecessarily.

3.102 Therefore, ComReg is of the view that Option 4 is preferred from an efficiency and spectrum management perspective.

Distortions to competition[70]

3.103 Option 1 has delivered a variety of important use cases, including Earth exploration, IoT, GSO Broadband, non-GSO Broadband, Mobile Communications and broadcasting. These services have been delivered for over ten years and ComReg is unaware of any anti-competitive hoarding having occurred in that time. This is unsurprising given that there has been no interference or scarcity issues in the intervening period. Furthermore, ComReg notes that because there are no interference or scarcity issues arising in the assignment of SES then issues around spectrum hoarding etc. are highly unlikely to arise in the context of administratively set fees under Options 2 - 5.

3.104 Potential distortions or restrictions to competition in the assignment of SES rights of mainly arise in relation to fees potentially choking off efficient access. DotEcon observes[71] that there is an argument for applying Ramsey pricing principles to the fee structure meaning that the administrative cost still needs to be covered, but high-value users would pay a greater share than low value users, ensuring that prices for smaller users are kept low enough to enable them to operate.

3.105 With that in mind, ComReg recognises that some licensees would be affected by

[70] DotEcon notes that the primary concern regarding competition that is strictly relevant to SES licensing would be that operators might use interference protection rights that come with SES licences to preclude others from deploying earth stations in Ireland (or certain parts of Ireland). However, this concern is unlikely to arise, is unrelated to fees and is assessed separately.

[71] The Second DotEcon Report, Document 22/56a, p49

high or poorly structured fees. This is particularly relevant if bandwidth use does not fully capture the value of a particular service. DotEcon notes[72] that there may well be a small number of use cases where the assumption about the value/bandwidth relationship does not apply to the same extent as for other use cases. The most significant example is the case of a low value, low bandwidth user (and some Earth exploration applications, for example, may fall into that category).

3.106 ComReg also notes that the range of users and applications may proliferate as it becomes easier to deploy large numbers of low-cost, low-power satellites that nevertheless meet capacity requirements. This includes satellites for research projects (e.g. run by universities or national research funding agencies) which may be budget constrained and unlikely to operate large amounts of ground station infrastructure (potentially working with ESaaS operators instead). Such users utilise low value applications, such as earth exploration, telemetry, and university research projects. Such projects depending on their output have high social and economic value.

3.107 Similarly, IoT users have very low bandwidth requirements. Most IoT systems rely on terrestrial network infrastructure. However, when such infrastructure is not available or does not provide sufficient coverage, satellite communication clearly has a role in providing IoT connectivity. IoT networks and services typically transmit low bandwidth chunks of data at regular intervals (e.g., status updates, measurements, and vehicle positioning). Such IoT systems have little or no requirement for higher bandwidths and the existing fees under Option 1 are highest (even at low bandwidths) in the lower frequencies (e.g., 3GHz) which are of most relevance to IoT users.

3.108 Any concerns from such stakeholders on the level of fees are likely to be resolved by administrative cost pricing, provided it reflects incremental administrative costs, and by not charging where no additional interference analysis/management is necessary[73]. As discussed in 'Impact on Stakeholders' above, the risk of fees choking off efficient demand is higher under Options 3 and 5 and least likely to arise under Option 4 because this option significantly reduces the cost of low bandwidth uses.

3.109 Overall, ComReg is of the view that while distortions to competition are unlikely under all options, Option 4 is the least likely to result in distortions to competition, primarily because low value users are least likely to be choked off under that option.

Efficient investment and innovation

3.110 Creating the conditions for promoting efficient investment and innovation in new and

[72] The Second DotEcon Report, Document 22/56a, p50
[73] Document 21/135a, p30.

enhanced infrastructure involves ComReg exercising its regulatory functions in an appropriate and predictable fashion, thus providing regulatory certainty. As noted by DotEcon, the timeframe for a satellite project runs to many years, and consequently regulatory certainty is essential for investors.[74] Indeed, stakeholders noted in the trade-off between good geography and the regulatory regime, it often makes sense to prioritise the latter (especially within a broad area, where geographical conditions are similar, and a marginally better location is outweighed by a significantly better regulatory environment.[75]

3.111 Promoting competition and encouraging efficient investment, in ComReg's view, means allowing for a cost-effective deployment of SES services and preventing inefficient duplication of investment caused by predictable changes to the regulatory regime. With that in mind, it is important that any option considers the likely long run development of the market to avoid future changes to the regulatory framework that could have been foreseen or give rise to additional cost.

3.112 Under Option 1, investment in networks used to deliver services up to now could be considered efficient given the benefits to consumers and competition. However, it is unlikely that this Option can persist in the long run because the fee structure attempts to proxy opportunity cost where no opportunity costs exist or are likely to exist in the foreseeable future. Further, ComReg's assessment of use cases indicates that low value uses may become more prominent in the future. In such circumstances, the fee structure under Option 1 could choke off use cases. depending on the requirement of those use cases. Such use cases can also encourage innovation and development involving new radio technologies or services and the SES regime can provide longer term spectrum access in the delivery of those services.

3.113 Options 2 – 5 are based on administrative cost recovery and would provide some regulatory predictability if changes were unlikely to be required. Option 4 is unlikely to require any changes for the foreseeable future because it best protects against any choking off of low value use. Alternatively, Options 2, 3, and 5 have a higher risk of choking off demand (because bandwidth is not considered) and therefore changes may be required over the same period. Therefore, Option 4 would appear to be more likely to promote efficient investment.

Infrastructure based competition

3.114 Infrastructure based competition is competition among operators that physically own networks. This could be a fixed operator competing with a mobile operator or two operators which have similar networks competing against each other. As a general point, the SES regime provided under either Option would enhance the possibilities

[74] Document 20/135a, p21.
[75] Ibid

for infrastructure-based competition because it would allow operators to deploy services using SES even when alternative infrastructures are available (e.g., fixed/fibre/mobile).

3.115 As noted by DotEcon[76], in many cases, bands are shared between satellites and terrestrial services (primarily fixed links) that might compete for the same end customers, for example satellite broadband and FWA. There are now also several large LEO constellations in development to provide broadband, with some already launched and providing services. These ISPs focus on bringing broadband to areas with limited connectivity, but with lower latency possible due to the significantly closer proximity to the earth of LEO satellites.

3.116 DotEcon also observes that faster speeds and low latency will make these services competitive with terrestrial services in remote areas (e.g. Starlink intends to provide speeds of over 100 Mbps and latency as low as 20 ms).[77] This will provide increased competition in rural areas particularly those not currently served by fibre and more relevantly areas of the country where providing broadband is difficult due to geographic terrain (e.g., Black Valley and other related areas). Fees set to cover administrative costs across all options provides low-cost access to spectrum rights of use.

3.117 In relation to other use cases, there is strong potential for infrastructure-based competition between satellite and other terrestrial services in relation to the Internet of Things (IoT). IoT systems communicate small amounts of information at a time, with devices only communicating with satellites for short bursts at any given time. This enables Satellite IoT systems to share spectrum efficiently with other services as they require less bandwidth, while not continuously transmitting, thereby reducing the possibility of interference.

3.118 IoT networks and services typically transmit low bandwidth chunks of data at regular intervals (e.g., status updates, measurements, and vehicle positioning). Further, such services tend to require low power to prolong better performance with every transmission. Satellite can also provide such requirements over long distances with low risk of interference which cuts down the amount of other infrastructure required to deploy a large-scale IoT project.

3.119 IoT systems using SES could be constrained by fees that do not reflect that IoT systems have very low bandwidth requirements. Indeed, infrastructure competition between satellite and terrestrial networks could be restricted if fees do not reflect this requirement. For example, mobile networks typically have a very low incremental cost of carrying IoT because of low bandwidth nature of the traffic. The potential for

[76] The Second DotEcon Report, Document 22/56a, p29.
[77] The First DotEcon Report, Document 21/135a, p16

satellite providers to compete on a similar basis is important and should not be constrained in any way by how fees are structured. The proliferation of IoT systems means that infrastructure-based competition between satellite and terrestrial services will become more important in the future.

3.120 With that in mind, Option 4 best provides for this competition because it lowers the cost for services that require low bandwidth, such as IoT, and better allows for infrastructure-based competition.

3.121 Therefore, while there is unlikely to be a significant difference between Options 2 to 5, Option 4 is likely to better encourage infrastructure-based competition.

3.7 Impact on consumers

3.122 It can be generally assumed that what is good for competition, and what promotes investment in infrastructure, is good for consumers. This is because increased competition between operators brings benefits to their customers in terms of price, choice and quality of services. In that regard, options that are good for competition above are likely to be good for consumers.

3.123 Satellite services play an important role in enabling the applications that are often taken for granted today and includes emerging technologies that deliver improved ways of delivering services to consumers and providing more productive capacity throughout the economy. The use cases are discussed in detail in the DotEcon reports and can be usefully categorised into (i) those that are provided directly to consumers and businesses in downstream markets and (ii) those that are used as inputs to other services that consumers value.

3.124 In summary and in relation to downstream services directly used by consumers, these include:

- Satellite broadband, which currently has a relatively marginal use but will be more relevant in very rural/remote areas where it might be the only means of connection.
    - LEO constellations will focus on bringing broadband to such areas with lower latency possible due to the significantly closer proximity to the earth of LEO satellites.
    - GSO systems will continue to be vital to provide services and advent of new high throughput and very high throughput GSO satellites has solidified their importance to the modern satellite sector.

- Households and businesses receive television distributed via satellite broadcast and there is still a large installed base of satellite TV receivers; therefore, the service is expected to remain important for the foreseeable future.

3.125 In summary, and in relation to inputs used to provide services that consumers are likely to value, the following are most relevant.

- Internet of Things (IoT) devices are used in a growing number of industries, such as agriculture, shipping and logistics, generally for telemetry and control purposes.

- Earth exploration and remote sensing satellites capture and transmit images of and information about the Earth's surface from space. This covers a wide range of end user applications, including scientific observation, weather mapping, climate monitoring and defence uses.

- Satellite links can now serve as a complement to terrestrial communications networks, both as a reliable backup and as a primary means of providing backhaul services in some cases (e.g. from areas with no available fibre), because they are capable of the required throughputs.

3.126 Consumers are likely to prefer those options which maintain or improve services and while at the same time not deterring entry or efficient investment. With that in mind, consumers are unlikely to have strong preferences between the different options because most use cases are provided for across all options that charge based on administrative costs. As noted above, the impacts on stakeholders and competition are relatively modest across all options. That said, consumers are likely to prefer Options 2 - 5 over Option 1 because Option 1 was designed based on use cases of over 15 years ago. Alternatively, Options 2 – 5 have been designed following stakeholder engagement over the most likely current use cases.

3.127 In relation to Options 2 – 5, consumers may prefer options that avoid providers facing increased input costs to downstream services. For example, consumers that use services that have high bandwidth requirements (e.g., broadband services) may not prefer Option 4 to the extent that it increases spectrum fees. However, as noted above, such increases are negligible relative to the entire user base which those providers are competing for, and such increases are highly unlikely to increase the cost of these services. Rather, consumers are likely to be more concerned with services that could be choked off and are therefore not available at all. Therefore, consumers are likely to prefer Option 4 because it reduces the risk of low value users being choked off for providing services.

3.128 Considering the above, ComReg is of the view that consumers are likely to prefer

Option 4.

3.8 ComReg's preferred option

3.129 This RIA considers a number of regulatory measures available to ComReg within the context of the analytical framework set out in ComReg's RIA Guidelines (i.e., impact on industry stakeholders, impact on competition and impact on consumers). This section complements that analysis and provides an assessment of the extent to which any regulatory measure would, if implemented, be likely to achieve one or more of ComReg's statutory objectives in the exercise of its related statutory function or functions.

3.130 In light of the above, ComReg is of the view that Option 4 is preferred in terms of the impact on stakeholders, competition and consumers mainly because it is the Option that best provides for the provision of all use cases referred to in this consultation and appropriately weights the burden of administrative costs on those users most likely to benefit from the deployment of those costs.

3.9 Assessment of the Preferred option against ComReg's relevant statutory objective

3.131 This RIA identifies and considers the options potentially available to ComReg, within the context of the RIA analytical framework as set out in ComReg's RIA Guidelines (impact on industry stakeholders, the impact on competition and the impact on consumers). This RIA also analyses the extent to which those various options would facilitate ComReg to meet its statutory remit in managing the radio spectrum. This includes analysing the extent to which the various options would promote competition and ensure that there is no distortion or restriction of competition in the electronic communications sector, whilst also encouraging efficient investment in infrastructure, promoting innovation, and ensuring the efficient use and effective management of the frequency bands that are used to deliver SES.

3.132 In this section, ComReg assesses the Overall Preferred Option in the context of other statutory provisions relevant to the management of Ireland's radio frequency spectrum (which are summarised in Annex 2 of this document). It is not proposed to exhaustively reproduce those statutory provisions here. However, set out below is a summary of all statutory provisions which ComReg considers to be particularly relevant to the management and use of the radio frequency spectrum with an assessment (to the extent not already dealt with as part of the draft RIAs) of whether, and to what extent, the Overall Preferred Option accords with those provisions. In carrying out this assessment, ComReg has highlighted below some of the relative merits / drawbacks which would arise if it was to select some of the alternative options assessed under the draft RIA above.

3.133 For the purposes of this section, the statutory provisions which ComReg considers to be particularly relevant to the management of the radio frequency spectrum in the State are grouped as follows:

- general provisions on competition;
- contributing to the development of the internal market;
- to promote the interest of users within the Community;
- efficient use and effective management of spectrum;
- regulatory principles;
- relevant Policy Directions and Policy Statements; and
- general guiding principles (in terms of spectrum management, setting of fees and licence conditions).
- Objective justification;
- Transparency;
- Non-discrimination; and
- Proportionality.

3.9.1 General Provisions on Competition

3.134 There is a natural overlap between the aims of the draft RIA and an assessment of ComReg's compliance with some of its statutory obligations and, in particular, one of its statutory objectives under section 12 of the 2002 Act of promoting competition by, among other things:

- ensuring that users derive maximum benefit in terms of choice, price and quality;
- ensuring that there is no distortion or restriction of competition in the electronic communications sector; and
- encouraging efficient use and ensuring effective management of radio frequencies.

3.135 In so far as the promotion of competition is concerned, Regulation 4(3)of the ECC Regulations further requires ComReg to pursue general objectives including:

- Regulation 4(3)(b) requires ComReg to promote connectivity and access to, and take-up of, very-high-capacity networks, including fixed, mobile and wireless networks, by all consumers and businesses in the State;

- Regulation 4(3)(d) requires ComReg to State, by ensuring connectivity and the widespread availability and take-up of very-high-capacity networks, including fixed, mobile and wireless networks, and of electronic communications services, by enabling maximum benefits in terms of choice, price and quality on the basis of effective competition, by maintaining the security of networks and services, by ensuring a high and common level of protection for end-users through the necessary sector-specific rules and by addressing the needs, such as affordable prices, of specific social groups, in particular end-users with disabilities, elderly end-users and end-users with special social needs, and choice and equivalent access for end-users with disabilities.

3.136 Certain other provisions also relate to ComReg promoting and protecting competition in the electronic communications sector including:

- Regulation 4(5)(d) of the ECC Regulations which requires ComReg, in pursuit of the policy objectives referred to in Regulation 4(3), to apply objective, transparent, non-discriminatory and proportionate regulatory principles by, inter alia, promoting efficient investment and innovation in new and enhanced infrastructures, while ensuring that competition in the market and the principle of non-discrimination are preserved;

- Regulation 34 of the ECC Regulations which requires ComReg, inter alia, to promote effective competition and avoid distortions of competition in the internal market when deciding to grant, amend or renew rights of use for radio spectrum for electronic communications networks and services in accordance with the ECC Regulations; and

- General Policy Direction No. 1 on Competition (26 March 2004) which requires ComReg to focus on the promotion of competition as a key objective, including removing barriers to market entry and supporting new entry (both by new players and entry to new sectors by existing players).

3.137 Based on the assessment provided in the RIA above, ComReg's view is that the Preferred Option in the draft RIA would best safeguard and promote competition to the benefit of consumers for the reasons set out in this RIA i.e. (Impact on Competition above). In particular:

- ComReg completed a detailed assessment which shows that no interference and/or scarcity issues arise in respect of the frequency bands used for SES

meaning that no potential licensee would be denied access to what would be an essential input for those services.

- Spectrum fees are set solely to cover administrative cost and are set by reference to the bandwidth required which reduces the risks of lower value (low bandwidth users) being choked off from utilising the spectrum in the delivery of services.

3.9.2 Contributing to the development of the Internal Market

3.138 In achieving the objective of contributing to the development of the Internal Market, another of ComReg's statutory objectives under section 12 of the 2002 Act, ComReg considers that the following factors are of relevance for SES:

- the extent to which the Overall Preferred Option would encourage the establishment and development of trans-European networks and the interoperability of pan-European services, by facilitating, or not distorting or restricting, entry to the Irish market by electronic communication services providers based or operating in other Member States; and

- to ensure the development of consistent regulatory practice and the consistent application of EU law, the extent to which ComReg has had due regard to the views of the European Commission, BEREC and other Member States in relevant matters, in selecting an option and considering any regulatory action required by ComReg in respect of such an option.

Encouraging the establishment and development of trans-European networks and the interoperability of pan-European Services

3.139 ComReg notes the overlap between this objective and the objective of promoting competition in the provision of ECN/ECS. Encouraging the establishment and development of trans-European networks requires that operators from other Member States seeking to develop such networks are given a fair and reasonable opportunity to obtain spectrum rights of use required for such networks and, particularly, access to critical spectrum rights of use. Accordingly, options which would restrict or distort competition or otherwise unfairly discriminate against potential entrants (such as through pricing models which do not incentivise efficient use or encourage low value incumbent not to vacate) would not, in ComReg's view, satisfy the requirements of this objective.

3.140 ComReg notes the case studies completed by DotEcon which shows that fees under Option 1 are at the lower end of the fees range compared to other jurisdictions. With that in mind, the overall Preferred Option would be highly unlikely to restrict the development of trans-European networks because over all fees are broadly the same

as Option 1 and any increases are primarily in the order of hundreds of euros. Further, ComReg refers to its finding that the Overall Preferred Option is highly unlikely to choke off demand for satellite-based services because fees are set at the lowest level subject to recovering administrative costs. Finally, ComReg notes that its preferred Option does not set different charges for specific users or use cases. Such an approach would also be in line with service and technology-neutrality requirements by not preferring existing services and technologies by virtue of incumbency.

Promoting the development of consistent regulatory practice and the consistent application of EU law

3.141 In relation to this aspect of contributing to the development of the internal market, ComReg continues to cooperate with other National Regulatory Authorities ("NRAs"), including closely monitoring developments in other Member States to ensure the development of consistent regulatory practice and consistent implementation of the relevant EC harmonisation measures and relevant aspects of the Common Regulatory Framework.

3.142 For instance, ComReg has had clear regard to international developments in the context of:

- ComReg considered the international aspects of the satellite licensing in Section Document 21/135 and noted that satellite services operate on an international basis and most stakeholders highlighted the importance of implementing CEPT harmonisation decisions as quickly as possible.

- Annex B of the Second DotEcon report carefully considered SES licensing regimes in other jurisdictions (including fees). ComReg considered same in forming its view on the overall preferred Option. ComReg considered the fees regime in other jurisdictions in other to determine whether ComReg's proposed fees were excessive, considering fees charged in other jurisdictions.

- ComReg issued a Request for Information ("RFI") and received 18 responses from members of the Independent Regulators Group ("IRG")[78] which ComReg issued to gather, among other things, the most up to date information on SES Licensing; and

[78] The Independent Regulators Group ("IRG") a group of European National Telecommunications Regulatory Authorities (NRAs) that functions as a forum for exchange of best practices and discussions on regulatory challenges in communications between NRAs

- ComReg and DotEcon held stakeholder meetings with international equipment manufacturers and vendors to inform its Preferred Option.

3.9.3 Promote the interest of users within the community

3.143 The impact of the Overall Preferred Option and other options on users and stakeholders from a more general perspective and in the context of ComReg's objective to promote competition has been considered in the context of the above RIA and it is not proposed to consider this matter further here.

3.144 ComReg also observes that most measures set out in Section 12(2)(i) to (iv) of the 2002 Act, aimed at achieving this statutory objective, are more relevant to consumer protection, rather than to the management of the radio frequency spectrum.

3.9.4 Efficient use and effective management of spectrum

3.145 Under section 10(1) of the 2002 Act, it is one of ComReg's functions to manage the radio frequency spectrum in accordance with a Policy Direction under section 13 of the 2002 Act. Policy Direction No. 11 of 21 February 2003 requires ComReg to ensure that, in managing spectrum, it takes account of the interests of all users of the radio frequency spectrum (including both commercial and non-commercial users) (see discussion on this policy direction below). Importantly, in pursuing its objective to promote competition under section 12(2)(a), ComReg must also take all reasonable measures to encourage efficient use and ensure effective management of radio frequencies. Section 12(3) of the 2002 Act also requires that in carrying out its functions, ComReg shall seek to ensure that measures taken by it are proportionate having regard to the objectives set out in section 12.

3.146 Regulation 27(1)(a) of the ECC Regulations also provides that ComReg shall, subject to any directions issued by the Minister under section 12 of the 2002 Act and having regard to its objectives under section 12 of the 2002 Act Regulation 4 and Article 4 of the Code, ensure the effective management of that radio spectrum for electronic communications networks and services.

3.147 In relation to Policy Direction No. 11, the RIA set out above considers the interests of all users of the radio frequency spectrum (and assesses the extent to which such interests are consistent with ComReg's own statutory obligations), both commercial and non-commercial. ComReg is of the view that the Overall Preferred Option is one that would safeguard and promote those interests. In particular, ComReg refers to the discussion on same in spectrum management and efficiency in Section 3.6.

3.148 ComReg is of the view that the Overall Preferred Option complies with the obligations contained in the above statutory provisions. ComReg is also of the view that Option 1 would fail to satisfy the above provisions to the same extent, if at all considering

the increased requirement for bandwidth in the future.

3.9.5 Regulatory Principles

3.149 Under Regulation 4(5) of the ECC Regulations, ComReg must, in pursuit of its objectives under Regulation 4(3), apply impartial, objective, transparent, non-discriminatory and proportionate regulatory principles by, amongst other things:

- promoting regulatory predictability by ensuring a consistent regulatory approach over appropriate review periods; and
- promoting efficient investment and innovation in ECS networks and infrastructure.

Regulatory Predictability

3.150 ComReg notes that it places importance generally on promoting regulatory predictability and as illustrated below, has complied with this principle in carrying out the current process.

3.151 In the present context, ComReg considers the following objectives to be of particular importance to achieving the aims of this regulatory principle:

- promoting regulatory predictability in relation to availability of spectrum rights to other users of spectrum by applying an open, transparent, and non-discriminatory approach to accessing spectrum for Satellite services; and
- promoting regulatory predictability in relation to ensuring that the process used to determine fees is predictable and not subject to significant change such that it would compromise efficient investments.

3.152 In relation to the first objective, ComReg's approach is consistent with its general treatment of a scarce resource such that rights of use should be assigned to those who value it the most. In that regard, ComReg's scarcity and interference assessment provides clear evidence that spectrum rights of use for Satellite services are not scarce and therefore an administrative cost recovery approach is appropriate having regard to its statutory objectives.

3.153 In relation to the second objective, ComReg refers to its assessment under efficient investment below and its view that the conditions for promoting efficient investment and innovation in new and enhanced infrastructures investment involves ComReg taking its regulatory functions in an appropriate and predictable fashion as provided under Option 2. In that regard, ComReg considered that the timeframe for a satellite project is many years and investors need to know that the regulation will remain appropriate into the future. Therefore, ComReg notes that the fees proposed in this

consultation would be unlikely to change save for annual CPI adjustments.

3.154 Considering the above, ComReg is of the view that the Overall Preferred Option complies with the regulatory principle of promoting regulatory predictability.

3.9.6 Efficient Investment and Innovation in New and Enhanced Infrastructures

3.155 ComReg considers that the Overall Preferred Option is consistent with the aims of this regulatory principle for the reasons set out in Section 3.9 3.9. Further, ComReg notes that:

- it provides for a range of outcomes and differentiated services noting that this option has been designed with existing and potential use cases in mind and consulted in detail on same in Document 21/135 and associated documents. ComReg was conscious that lower value (lower bandwidth) use cases may be choked off even within an administrative cost recovery approach and therefore applied an approach which takes account of bandwidth in determining the fees level.

- Its preferred option was informed by engagement with industry stakeholders including a detailed assessment on potential use cases and an analysis recent trends and developments in the satellite industry that might impact on demand and requirements for SES's.

3.156 ComReg also refers to the discussion on same in Efficient Investment and Innovation in Impact on Competition section above.

3.9.7 Relevant Policy Directions and Policy Statements

3.157 ComReg has taken due account of the Spectrum Policy Statement issued by the then DCENR in September 2010, its Consultation on Spectrum Policy Priorities issued in July 2014 and its Statement of Strategy 2021 to 2023[79]. ComReg notes that the core policy objectives, principles, and priorities set out therein are broadly in line with those set out in the 2002 Act and in the European Electronic Communications Code (which has repealed the Common Regulatory Framework) and, in turn, with those followed by ComReg in identifying the Overall Preferred Option.

3.158 Section 12(4) of the 2002 Act requires ComReg, in carrying out its functions, to have regard to policy statements, published by or on behalf of the Government or a Minister of the Government and notified to it, in relation to the economic and social development of the State. Section 13 of the 2002 Act requires ComReg to comply

[79] https://www.gov.ie/en/publication/1a70d-statement-of-strategy-2021-2023/

with any policy direction given to ComReg by the Minister as he or she considers appropriate to be followed by ComReg in the exercise of its functions.

3.159 ComReg considers below those Policy Directions which are most relevant in this regard (and which have not been considered elsewhere in this chapter).

Policy Direction No.3 of 21 February 2003 on Broadband Electronic Communication Networks

3.160 This Policy Direction provides that:

> *"ComReg shall, in the exercise of its functions, take into account the national objective regarding broadband rollout, viz, the Government wishes to ensure the widespread availability of open-access, affordable, always-on broadband infrastructure and services for businesses and citizens on a balanced regional basis within three years, on the basis of utilisation of a range of existing and emerging technologies and broadband speeds appropriate to specific categories of service and customers."*

3.161 The purpose of this Policy Direction was to ensure that the regulatory framework for electronic communications plays its part in contributing to the achievement of the then Government's objectives regarding the rollout of broadband networks.

3.162 ComReg is cognisant of the fact that the three-year objective described in this policy direction has long since expired. In any case, ComReg is of the view that the Preferred Option is aligned with the objectives of the current Programme for Government. For example, in its Impact on Competition assessment above, ComReg recognises that some satellite services might be competing for end users with terrestrial services, (e.g., for rural broadband provision) and considered the extent to which such issues may arise in designing the SES regime. However, ComReg agreed with the views of DotEcon that precluding access to the market is unlikely because Satellite operators have a reasonable amount of flexibility when planning their networks and the impact of any blocking behaviour would be very marginalised.

Policy Direction No. 4 of 21 February 2003 on Industry Sustainability

3.163 This Policy Direction provides that:

> *"ComReg shall ensure that in making regulatory decisions in relation to the electronic communications market, it takes account of the state of the industry and in particular the industry's position in the business cycle and the impact of such decisions on the sustainability of the business of undertakings affected".*

3.164 The purpose of this policy direction is to ensure that any regulatory decisions take due account of the potential impact on the sustainability of industry players,

considering the business cycle at the time such decisions are taken.

3.165 ComReg observes that this policy direction concerns the sustainability of the industry rather than the position of individual players. In that regard, ComReg notes that total fees are broadly stable under its preferred option and may reduce depending on how licensees decide to deploy their networks in the future.

3.166 Notwithstanding, in its RIA above, ComReg has considered the impact of its Preferred Option in the context of all industry stakeholders, including different types of industry stakeholders, and refers the financial impact on these stakeholders in the Impact on Stakeholders section above. This shows that while Option 4 may result in some very modest increases for certain stakeholders, and in most cases in the order of hundreds of euros, this is highly unlikely to threaten industry sustainability.

Policy Direction No. 11 of 21 February 2003 on the Management of the Radio Frequency Spectrum

3.167 This Policy Direction provides that:

> *"ComReg shall ensure that, in its management of the radio frequency spectrum, it takes account of the interests of all users of the radio frequency spectrum".*

3.168 The purpose of this policy direction is to ensure that ComReg achieves an appropriate balance between the interests of various users of the radio frequency spectrum the respective interests of commercial and non-commercial user.

3.169 In carrying out the draft RIA, ComReg has considered the Preferred Option in light of the interests of various categories of industry stakeholders and consumers. ComReg considered whether interference and scarcity issues would arise and noted that even where such interference might arise users could coordinate sufficiently to overcomes such issues.

3.170 ComReg is of the view, therefore, that it has complied with this requirement in carrying out the RIA and that the Preferred Option is the one that best serves the interests of all users of the radio frequency spectrum and strikes an appropriate balance where those interests may conflict.

General guiding principles (in terms of spectrum management, licence conditions and setting of licence fees)

3.171 ComReg notes that it is required to comply with the guiding principles of objectivity, transparency, non-discrimination, and proportionality in carrying out its functions under the 2002 Act and under the European Electronic Communications Code (which has repealed the Common Regulatory Framework). In relation to the current process,

ComReg considers that these principles are most relevant in terms of its functions concerning spectrum use and management, attaching conditions to rights of use and the setting of licence fees.

3.172 In relation to spectrum management and use, ComReg notes that:

- Regulation 27(1)(b) of the ECC Regulations requires ComReg to ensure that the allocation of, the issuing of general authorisations in respect of, and the granting of individual rights of use for radio spectrum for electronic communications networks and services are based on objective, transparent, pro-competitive, non-discriminatory, and proportionate criteria; and

- the regulatory principle set out in Regulation 4(5)(b) of the ECC Regulations requires ComReg in pursuing its objectives to apply impartial, objective, transparent, non-discriminatory, and proportionate regulatory principles by, amongst other things, ensuring that, in similar circumstances, there is no discrimination in the treatment of providers of electronic communications networks and services.

3.173 ComReg notes that the above guiding principles are Irish and EU law principles that ComReg abides by generally in carrying out its day-to-day regulatory functions.

3.174 ComReg is of the view, having regard to the applicable legislation and legal principles, its draft RIAs and other analyses, its expert advice and reports, and the material to which it has had regard, that the Overall Preferred Option is objectively justified, transparent, proportionate, and non-discriminatory. In particular, the preferred option:

- is objectively justified given the detailed assessment provided in this RIA, including that it would be unlikely to distort or restrict competition and it better encourages the efficient use of the radio spectrum;

- would not give rise to discrimination in the treatment of undertakings because:

    - fees are based solely on administrative cost recovery and the allocation of these costs varies only in so much as a licensee requires more bandwidth; and

    - any change in fees arising from the Overall Preferred Option arise because the situation of some licensees is materially different from the other (i.e. some licensees have higher bandwidth requirements).

- whether fees increase, or decrease does not depend on the stakeholder but rather on the bandwidth;
- is transparent because, among other things:
    - the methodology is set out in Chapter 3 and the DotEcon Report whereby fees are determined based on a concave approach
    - ComReg provides an assessment of the impact on stakeholders (including financial impact) in the RIA above; and
    - the fees Chapter sets out how the preferred option would be implemented, including examples of same.
- is proportionate because, among other things:
    - the preferred option would accord with ComReg's statutory objectives and regulatory principles as described above;
    - there do not appear to be less onerous means by which these objectives and principles could be achieved; and
    - ComReg relies primarily on its information policy (discussed at the outset of the RIA) rather than fees to achieve its statutory functions, objectives and duties.

Conclusion

3.175 In light of the above, ComReg is satisfied that the Preferred Option complies with those statutory functions, objectives and duties relevant to its management of the radio frequency spectrum.

Chapter 4

4 Decision

4.1 This chapter sets out ComReg's final decision document based on the views expressed by ComReg in the preceding chapters and their supporting annexes.

Decision

Part I – DEFINITIONS AND INTERPRETATION

1. In this Decision, save where the context otherwise admits or requires:

"Communications Regulation Act 2002" means the Communications Regulation Act, 2002, (No. 20 of 2002), as amended;

"ComReg" means the Commission for Communications Regulation, established under section 6 of the Communications Regulation Act 2002;

"ECC Regulations" means the European Union (Electronic Communications Code) Regulations 2022, S.I. No. 444 of 2022;

"Minister" means the Minister of Environment, Climate and Communications;

"Licence" means a licence granted in accordance with section 5 of the Act of 1926 in accordance with and subject to the matters prescribed in these Regulations to keep, have possession of, install, maintain, work and use Apparatus in a specified place in the State granted to the licensee;

"**Duration of Licence**" means the duration of time from the commencement date that of a Licence;

"**Licence Fee**" means the fee for Satellite Earth Stations as set out in draft form in Schedule 2 to the Satellite Earth Station Regulations;

"**Renewal of Licence**" means a licence may be renewed from time to time by the Commission set out in the Satellite Earth Station Regulations;

"**Satellite Earth Station**" means apparatus for wireless telegraphy, located on the Earth's surface, intended for either the transmission of radio signals to a Space Station or the reception of radio signals from a Space Station;

"**Temporary Licence**" means a licence that is only valid for a limited time; and

"Wireless Telegraphy Act 1926" means the Wireless Telegraphy Act, 1926 (No. 45 of 1926), as amended.

Part II – DECISION-MAKING CONSIDERATIONS

2. In arriving at its decisions in this document, ComReg has had regard to:

   I. the contents of, and the materials and reasoning referred to in, as well as the materials provided by respondents in connection with, the below-listed ComReg documents (insofar as they are relevant to the present Draft Decision):

      a) ComReg Documents 21/135, 22/56, and 23/32;

      b) ComReg Document 23/96; and

      c) the consultants' reports commissioned, and the advice obtained by ComReg, in relation to the subject-matter of the documents and materials listed above (insofar as they are relevant to the present decision) and, in particular, ComReg documents 21/135a, 22/56a, 23/32a, 23/32b, and 23/96a;

   II. the powers, functions, objectives and duties of ComReg, including, without limitation those under and by virtue of:

      a) the Communications Regulation Act 2002, and, in particular, sections 10, 12 and 13 thereof;

      b) the ECC Regulations, and, in particular, Regulations 4, 5, 9, 14, 15, 16, 17, 27, 28, 29, 30, 31, 32, 34, and 36 thereof;

      c) Sections 5 and 6 of the Wireless Telegraphy Act, 1926; and

      d) the applicable Policy Directions made by the Minister under section 13 of the Communications Regulation Act 2002.

   III. and, noting that it has given all interested parties the opportunity to express their views and make their submissions in accordance with Regulation 36 of the ECC Regulations and Regulation 101 of the ECC Regulations.

Part III – DECISIONS

3. Having had regard to the above considerations, ComReg has decided:

   I. subject to obtaining the consent of the Minister to the making by it of the Satellite Earth Station Licence Regulations, to make those regulations under section 6 of the Wireless Telegraphy Act 1926, prescribing relevant matters in relation to Satellite Earth Stations, including prescribing the form of the Licences concerned, their duration, fees, and the conditions and restrictions subject to which they are granted.

II. to grant Satellite Earth Station Licences, under section 5 of the Wireless Telegraphy Act 1926 to relevant applicants subject to the conditions and restrictions (including conditions as to suspension and withdrawal), prescribed in the Satellite Earth Station Regulations as currently set out in Annex 3 of Document 23/96.

Duration and Renewal of Licence

III. that a Licence shall, unless it has been revoked, withdrawn or surrendered, remain in force from the date of grant for a period of one year unless renewed.

IV. that a Temporary Licence shall, unless it has been revoked, withdrawn or surrendered, remain in force from the date of grant until the expiry date as specified in the licence, which shall not be greater than an eleven (11) month period, and shall not be renewed.

Licence Fees

V. that the Licence Fee shall be calculated in accordance with Schedule 2 as set out in the Satellite Earth Station Licence Regulations.

VI. the Licence Fee for any period of less than one year shall be calculated on a pro rata monthly basis for such period.

VII. that if a Licence is surrendered by the Licensee, the Licensee may be entitled to a refund of the relevant Licence Fee on a pro rata monthly basis.

VIII. that if a Licence is suspended or withdrawn due to a finding by ComReg of non-compliance with any relevant licence conditions, the Licensee shall not be entitled to be repaid any part of the Licence Fee paid by the Licensee, but shall still be liable to pay any sums, including interest, that are outstanding.

IX. that if the amount of radio frequency spectrum specified in a Licence is reduced, the Licensee may be entitled to a refund of the relevant Licence Fee already paid in the relevant year on a pro rata monthly basis having regard to the nature of the amendment.

Non-Geostationary Satellite Earth Station Coordination Process

X. to implement the non-geostationary satellite earth station coordination process (see annex 2) as part of the SES licence application process.

PART V – MAINTENANCE OF OBLIGATIONS

If any section or clause contained in this Decision Instrument is found to be invalid or prohibited by the Constitution, by any other law or judged by a court to be unlawful, void or unenforceable, that section or clause shall, to the extent required, be severed from this Decision Instrument and rendered ineffective as far as possible without modifying the remaining section(s) or clause(s) of this Decision Instrument and shall not in any way affect the validity or enforcement of this Decision Instrument.

Part VI – STATUTORY POWERS NOT AFFECTED

Nothing in this document shall operate to limit ComReg in the exercise of its discretions or powers, or the performance of its functions or duties, or the attainment of objectives under any laws applicable to ComReg from time to time.

GARRETT BLANEY
COMMISSIONER
THE COMMISSION FOR COMMUNICATIONS REGULATION
THE 3RD OF OCTOBER 2023

5 Next Steps

5.1 ComReg envisages that the next step in this process will be the making and publication of the licensing regulations under Wireless Telegraphy Acts following the obtaining of the required consent of the Minister.

Annex 1: Relevant Legal Framework

A 1.1 The Communications Regulation Act 2002 (as amended) (the "2002 Act"), the European Electronic Communications Code (which has repealed the EU Common Regulatory Framework, namely the Framework and Authorisation Directives)[80], as transposed by S.I. No. 444 of 2022, the European Union (Electronic Communications Code) Regulations 2022 (the "ECC Regulations") and the Communications Regulation and Digital Hub Development Agency (Amendment) Act 2023 (the "2023 Act"), and the Wireless Telegraphy Acts 1926 to 2009[81] set out, amongst other things, ComReg's functions and objectives that are relevant to the management of the radio frequency spectrum in Ireland and to this Response to Consultation and Decision document including Regulations.

A 1.2 Apart from licensing and making regulations in relation to licences, ComReg's functions include the management of Ireland's radio frequency spectrum in accordance with ministerial Policy Directions under Section 13 of the 2002 Act, having regard to its objectives under Section 12 of the 2002 Act, and Regulation 4 of S.I. No. 444 of 2022.

A 1.3 This annex is intended as a general guide as to ComReg's role in this area, and not as a definitive or exhaustive legal exposition of that role. Further, this annex restricts itself to consideration of those functions, objectives powers, and duties of ComReg that appear most relevant to the matters at hand and generally excludes those not considered relevant (for example, in relation to postal services, premium rate services or market analysis). For the avoidance of doubt, however, the inclusion of particular material in this annex does not necessarily mean that ComReg considers same to be of specific relevance to the matters at hand. All references in this annex to enactments are to the enactment as amended at the date hereof, unless the context otherwise requires.

The European Electronic Communications Code

A 1.4 On 20 December 2018, Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code ("EECC") entered into force.

[80] Directive 2018/1972 of the European Parliament and of the Council of 11 December 20181 establishing the European Electronic Communications Code.
[81] The Wireless Telegraphy Acts 1926 to 1988 and Sections 181 (1) to (7) and (9) and Section 182 of the Broadcasting Act 2009.

A 1.5 It is important to note that further to Article 125 ("Repeal") of the EECC, with effect from 21 December 2020, the EECC replaced the EU Common Regulatory Framework adopted in 2002 (and amended in 2009) under which ComReg has regulated electronic communications since 2003[82].

A 1.6 With some limited exceptions (see Article 124 of the EECC), Member States had until 21 December 2020 to transpose the EECC into national law[83]. The statutory instrument transposing key provisions of the EECC has been published as S.I. No. 444 of 2022[84] and has been commenced by the Minister[85]. Other provisions of the EECC have been transposed in the Communications Regulation and Digital Hub Agency (Amendment) Act 2023, which has also been commenced[86].

A 1.7 All references in this annex to enactments are to the enactment as amended at the date hereof unless the context otherwise requires.

Primary Functions and Objectives and Regulatory Principles under the 2002 Act and EECC as transposed.

A 1.8 ComReg's relevant functions pursuant to Section 10 of the Communications Regulation Act 2002, as amended, include the management of the radio frequency spectrum and the national numbering resource. ComReg's primary objectives in carrying out its statutory functions in the context of electronic communications are to:

- ensure the efficient management and use of the radio frequency spectrum in Ireland in accordance with a direction under section 13 of the 2002 Act;
- Promote competition[87];
- Contribute to the development of the internal market[88]; and
- Promote the interests of users within the Community[89].

[82] For the correlation table between relevant articles of the repealed Directives and the EECC, please see Annex XIII of the EECC available here- EUR-Lex - 02018L1972-20181217 - EN - EUR-Lex (europa.eu)
[83] With the exception of Articles 53(2), (3) and (4), and Article 54 (See Article 124).
[84] S.I. No. 444 of 2022, The European Union (Electronic Communications Code) Regulations 2022.
[85] By virtue of S.I. No. 300 of 2023, the European Union (Electronic Communications Code) (Amendment) Regulations 2023.
[86] By virtue of S.I. No. 299 of 2023, the Communications Regulation and Digital Hub Development Agency (Amendment) Act 2023 (Commencement) (No.2) Order 2023.
[87] Section 12 (1)(a)(i) of the 2002 Act.
[88] Section 12 (1)(a)(ii) of the 2002 Act.
[89] Section 12(1)(a)(iii) of the 2002 Act.

A 1.9 ComReg, in carrying out its regulatory tasks specified in S.I. No. 444, shall take all reasonable measures which are necessary and proportionate for achieving the objectives set out in Regulation 4(3), including the objective to promote connectivity and access to, and take-up of, very high-capacity networks, including fixed, mobile and wireless networks, by all consumers and businesses in the State[90].

Management of radio spectrum

A 1.10 Regulation 27 of S.I. No. 444 of 2022 governs the management of radio spectrum. Regulation 27(1) requires that ComReg, subject to any directions issued by the Minister pursuant to Section 13 of the 2002 Act and having regard to its objectives under Section 12 of the 2002 Act, Regulation 4 of S.I. No. 444 of 2022, and Article 4 of the Directive, ensure:

(a) the effective management of radio frequencies for ECN and ECS;

(b) that the allocation of, the issuing of general authorisations in respect of, and the granting of individual rights of use for radio spectrum for ECN and ECS are based on objective, transparent, pro-competitive, non-discriminatory and proportionate criteria; and

(c) ensure that harmonisation of the use of radio frequency spectrum by ECN and ECS across the EU is promoted, consistent with the need to ensure its effective and efficient use and in pursuit of benefits for the consumer such as competition, economies of scale and interoperability of networks and services, having regard to all decisions and measures adopted by the European Commission in accordance with Decision No.676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in EU (namely the Radio Spectrum Decision).

A 1.11 Regulation 27(3) provides that, without prejudice to Regulation 27(4), ComReg must ensure that all types of technology used for the provisions of ECN or ECS may be used in the radio spectrum declared available for ECSs in the Radio Frequency Plan published under Section 35 of the 2002 Act in accordance with EU law.

A 1.12 Regulation 27(4) provides that, notwithstanding Regulation 17(3), ComReg may, through licence conditions or otherwise, provide for proportionate and non-discriminatory restrictions to the types of radio network or wireless access technology used for ECS where this is necessary to:

(a) avoid harmful interference;

[90] Regulation 4(3)(a) of S.I. No. 444 of 2022.

(b) protect public health against electromagnetic fields;

(c) ensure technical quality of service;

(d) ensure maximisation of radio frequency sharing

(e) safeguard the efficient use of spectrum; or

(f) ensure the fulfilment of a general interest objective as defined by or on behalf of the Government or a Minister of the Government in accordance with Regulation 27(7).

A 1.13 Regulation 27(5) provides that without prejudice to Regulation 27(7), ComReg must ensure that all types of ECS may be provided in the radio spectrum, declared available for ECS in the Radio Frequency Plan published under Section 35 of the Act of 2002 in accordance with EU law.

A 1.14 Regulation 27(6) provides that, notwithstanding Regulation 17(4), ComReg may provide for proportionate and non-discriminatory restrictions to the types of ECS to be provided, including where necessary, to fulfil a requirement under the International Telecommunication Union Radio Regulations ("ITU-RR").

A 1.15 Regulation 27(7) requires that measures that require an ECS to be provided in a specific band available for ECS shall be justified in order to ensure the fulfilment of a general interest objective as laid down by or on behalf of the Government or a Minister of the Government in accordance with EU law including, but not limited to:

(a) safety of life;

(b) the promotion of social, regional or territorial cohesion;

(c) the avoidance of inefficient use of radio frequencies; or

(d) the promotion of cultural and linguistic diversity and media pluralism, for example, by the provision of radio and television broadcasting services.

A 1.16 Regulation 27(8) provides that ComReg may only prohibit the provision of any other ECS in a specific radio spectrum frequency band where such a prohibition is justified by the need to protect safety of life services. ComReg may, on an exceptional basis, extend such a measure in order to fulfil other general interest objectives as laid down by or on behalf of the Government or a Minister of the Government in accordance with European law.

A 1.17 Regulation 27(9) provides that ComReg shall regularly review the necessity of any restrictions imposed under Regulation 27 and shall make the results of such reviews publicly available.

A 1.18 Regulation 27(10) requires ComReg to, in the fulfilment of its obligations under Regulation 27, respect relevant international agreements, including the ITU-RR and other agreements adopted in the framework of the ITU applicable to radio spectrum, any public policy considerations brought to its attention by the Minister.

Authorisation of use of radio spectrum

A 1.19 Regulation 28(1) of S.I. No. 444 of 2022 provides that ComReg shall facilitate the use of radio spectrum, including shared use, under a general authorisation under Regulation S.I. No. 444 of 2022 and limit the granting of individual rights of use for radio spectrum where such rights are necessary to maximise efficient use in light of demand and taking into account the criteria set out in Regulation 28(2).

A 1.20 Regulation 28(2) of S.I. No. 444 of 2022 provides that ComReg may decide to grant individual rights of use for radio frequencies by way of a licence taking account of:

a) the specific characteristics of the radio spectrum concerned;

b) the need to protect against harmful interference;

c) the development of reliable conditions for radio spectrum sharing, where appropriate;

d) the need to ensure technical quality of communications or service;

e) objectives of general interest as laid down by or on behalf of the Government or a Minister of the Government in conformity with EU law; and

f) the need to safeguard the efficient use of spectrum.

A 1.21 Regulation 28(3) provides that when considering whether to issue general authorisations or to grant individual rights of use for the harmonised radio spectrum, taking into account technical implementing measures adopted in accordance with Article 4 of the Radio Spectrum Decision, ComReg shall seek to minimise problems of harmful interference, including in cases of shared use of radio spectrum on the basis of a combination of general authorisation and individual rights of use.

A 1.22 Regulation 29(1) of S.I. No. 444 of 2022 provides that ComReg shall attach conditions to individual rights of use for radio spectrum in accordance with Regulation 9(1) in such a way as to ensure optimal and the most effective and efficient use of radio spectrum. Regulation 29(7) provides that Regulation 29 is without prejudice to the Act of 1926.

Publication of procedures

A 1.23 Regulation 30(2)(a) of S.I. No. 444 of 2022 requires that ComReg shall, having regard to the provisions of Regulation 27 of the S.I. No. 444 of 2022, establish open, objective, transparent, non-discriminatory and proportionate procedures for the granting of individual rights of use for radio spectrum and cause any such procedures to be made publicly available.

Duration of rights

A 1.24 Regulation 31(1) of S.I. No. 444 of 2022 provides that rights of use for radio spectrum shall be in force for such period as ComReg considers appropriate in light of the objectives pursued in accordance with Regulation 36(2) and (3), taking due account of the need to ensure competition, as well, as in particular, effective and efficient use of radio spectrum, and to promote innovation and efficient investments, including by allowing for an appropriate period for investment amortisation.

A 1.25 Regulation 31(2) provides that where ComReg decides to grant individual rights of use for radio spectrum for which harmonised conditions have been set by technical implementing measures in accordance with the Radio Spectrum Decision in order to enable its use for wireless broadband electronic communications services for a limited period, it 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 Regulation 31(1).

Conditions attached to rights of use for radio spectrum

A 1.26 Regulation 9(1) of S.I. No. 444 of 2022 provides that, notwithstanding Section 5 of the Wireless Telegraphy Act,1926, but subject to any regulations under Section 6 of that Act, where ComReg specifies conditions to be attached to rights of use for radio spectrum, it may only attach such conditions as are listed in Part D of the Schedule 1. Part D lists the following conditions which may be attached to rights of use:

- Obligation to provide a service or to use a type of technology within the limits of Regulation 27, including, where appropriate, coverage and quality of service requirements.
- Effective and efficient use of radio spectrum in conformity with the Regulations.
- Technical and operational conditions necessary for the avoidance of harmful interference and for the protection of public health against electromagnetic fields, taking utmost account of Recommendation 1999/519/EC where such conditions are different from those included in the general authorisation.

- Maximum duration in conformity with Regulation 31, subject to any changes in the National Frequency Allocation Plan.
- Transfer or leasing of rights at the initiative of the holder of the rights and conditions of such transfer in conformity with these Regulations.
- Fees for rights of use in accordance with Regulation 24.
- Any commitments which the undertaking obtaining the rights of use has made in the framework of an authorisation or authorisation renewal process prior to the authorisation being granted or, where applicable, to the invitation for application of rights of use.
- Obligations to pool or share radio spectrum or allow access to radio spectrum for other uses in specific regions or at national level.
- Obligations under relevant international agreements relating to the use of radio spectrum bands.
- Obligations specific to an experimental use of radio frequencies.

A 1.27 Regulation 9(2) provides that (a) any attachment of conditions under Regulation 1) or (b) non-application under paragraph (1) of conditions to undertakings of a class or type as may be determined by ComReg, to rights of use for radio spectrum shall be non-discriminatory, proportionate and transparent and in accordance with Regulation 27.

A 1.28 Pursuant to Regulation 9(3) of S.I. No. 444 of 2022, an undertaking shall comply with the conditions attaching to rights of use for radio spectrum applicable to it.

Procedures for limiting the number of rights of use to be granted for radio spectrum

A 1.29 Regulation 36(1) of S.I. No. 444 of 2022 provides that, without prejudice to Regulation 35, where ComReg concludes that a right to use radio spectrum cannot be subject to a general authorisation and where it considers whether to limit the number of rights of use to be granted for radio spectrum, it shall, inter alia, without prejudice to Sections 13 and 37 of the 2002 Act:

- clearly state the reasons for limiting the rights of use, in particular by giving due weight to the need to maximise benefits for users and to facilitate the development of competition and review the limitation at intervals which it considers reasonable or at the reasonable request of any undertaking affected as appropriate;, and
- give all interested parties, including users and consumers, the opportunity to express their views in accordance with Regulation 101.

A 1.30 Regulation 36(2)(a) of S.I. No. 444 of 2022 provides that ComReg may decide , having taken into account the matters referred to in paragraph (1)(a) and (b), that the number of rights of use for radio spectrum referred to in that paragraph ought to be limited and, where the Regulator so decides, it shall clearly establish, and give reasons for, the objectives pursued by means of a competitive or comparative selection procedure under this Regulation, and where possible quantify them, giving due weight to the need to fulfil national and internal market objectives.

A 1.31 Regulation 36(7) provides that where the granting of rights of use for radio spectrum needs to be limited, ComReg shall grant such rights on the basis of selection criteria and a selection procedure which are objective, transparent, non-discriminatory and proportionate. Any such selection criteria shall give due weight to the achievement of the objectives and requirements of section 12 of the Act of 2002 and Regulations 4, 16 and 27.

Fees for spectrum rights of use

A 1.32 Regulation 24(1) of S.I. No. 444 of 2022 permits ComReg, subject to sections 13 and 37 of the Act of 2002, to impose fees for rights of use for radio spectrum, which reflect the need to ensure the optimal use of the radio spectrum.

A 1.33 Pursuant to Regulation 24(2) of S.I. No. 444 of 2022, ComReg is required to ensure that any such fees are objectively justified, transparent, non-discriminatory and proportionate in relation to their intended purpose and take into account the objectives of ComReg as set out in Section 12 of the 2002 Act and the general objectives of the Directive and Regulation S.I. No. 444 of 2022. Regulation 23(3) provides that with respect to rights of use for radio spectrum, ComReg shall seek to ensure that applicable fees are set at a level which ensures efficient assignment and use of radio spectrum by: (a) setting reserve prices as minimum fees for rights of use for radio spectrum by having regard to the value of those rights in their possible alternative uses; (b) taking into account costs entailed by conditions attached to those rights; and (c) applying, to the extent possible, payment arrangements linked to the actual availability for use of the radio spectrum.

Amendment of rights and obligations

A 1.34 Regulation 14(1) of S.I. No. 444 of 2022 permits ComReg to amend rights, conditions and procedures concerning rights of use for radio spectrum, provided that any such amendment may only be made in objectively justified cases and in a proportionate manner, taking into consideration, where appropriate, the specific conditions applicable to transferable rights of use for radio spectrum or for numbering resources.

Other Relevant Legislation and Policy Instruments

Wireless Telegraphy Act, 1926 (the "1926 Act")

A 1.35 Under Section 5(1) of the 1926 Act, ComReg may, subject to that Act, and on payment of the prescribed fees (if any), grant to any person a licence to keep and have possession of apparatus for wireless telegraphy in any specified place in the State.

A 1.36 Section 5(2) provides that, such a licence shall be in such form, continue in force for such period and be subject to such conditions and restrictions (including conditions as to suspension and withdrawal) as may be prescribed in regard to it by regulations made by ComReg under Section 6.

A 1.37 Section 5(3) also provides that, where it appears appropriate to ComReg, it may, in the interests of the efficient and orderly use of wireless telegraphy, limit the number of licences for any particular class or classes of apparatus for wireless telegraphy granted under Section 5.

A 1.38 Section 6 provides that ComReg may make regulations prescribing in relation to all licences granted by it under Section 5, or any particular class or classes of such licences, all or any of the following matters:

- the form of such licences;
- the period during which such licences continue in force;
- the manner in which, the terms on which, and the period or periods for which such licences may be renewed;
- the circumstances in which or the terms under which such licences are granted;
- the circumstances and manner in which such licences may be suspended or revoked by ComReg;
- the terms and conditions to be observed by the holders of such licences and subject to which such licences are deemed to be granted;
- the fees to be paid on the application, grant or renewal of such licences or classes of such licences, subject to such exceptions as ComReg may prescribe, and the time and manner at and in which such fees are to be paid; and
- matters which such licences do not entitle or authorise the holder to do.

A 1.39 Section 6(2) provides that Regulations made by ComReg under Regulation 6 may authorise and provide for the granting of a licence under Section 5 subject to special terms, conditions, and restrictions to persons who satisfy it that they require the licences solely for the purpose of conducting experiments in wireless telegraphy.

A 1.40 Regulation 9(1) of S.I. No. 444 of 2022 provides that, notwithstanding section 5 of the Act of 1926 but subject to any regulations made under section 6 of that Act, where ComReg specifies conditions to be attached to rights of use for radio spectrum, it may only attach such conditions as are listed in Part D of Schedule 1 to S.I. No. 444 of 2022.

A 1.41 Regulation 30(7) of S.I. No. 444 of 2022 provides that for the purpose of Regulation 30, a general authorisation for the use of radio spectrum shall be facilitated by way of an order made by ComReg under section 3(6) of the 1926 Act, declaring that a particular class or description of apparatus for wireless telegraphy is one to which the licence requirements of section 3 of the 1926 Act do not apply.

Broadcasting Act 2009 (the "2009 Act")

A 1.42 Section 132 of the 2009 Act relates to the duties of ComReg in respect of the licensing of spectrum for use in establishing digital terrestrial television multiplexes and places an obligation on ComReg to issue:

- two DTT multiplex licences to RTÉ by request (see Sections 132(1) and (2) of the 2009 Act; and
- a minimum of four DTT multiplex licences to the BAI by request (see Sections 132(3) and (4) of the 2009 Act) for the provision of commercial TV content.

Article 4 of Directive 2002/77/EC (Competition Directive)

A 1.43 Article 4 of the Competition Directive[91] provides that:

> *"Without prejudice to specific criteria and procedures adopted by Member States to grant rights of use of radio frequencies to providers of radio or television broadcast content services with a view to pursuing general interest objectives in conformity with Community law:*
>
> *Member States shall not grant exclusive or special rights of use of radio frequencies for the provision of electronic communications services.*

[91] Commission Directive 2002/77/EC of 16 September 2002 on competition in the markets for electronic communications networks and services.

The assignment of radio frequencies for electronic communication services shall be based on objective, transparent, non-discriminatory and proportionate criteria."

Radio Spectrum Policy Programme

A 1.44 On 15 February 2012, the European Parliament adopted, via a Decision[92], the five-year Radio Spectrum Policy Programme ("RSPP") which establishes a multi-annual radio spectrum policy programme for the strategic planning and harmonisation of the use of spectrum. The objective is to ensure the functioning of the internal market in the Union policy areas involving the use of spectrum, such as electronic communications, research, technological development and space, transport, energy and audiovisual policies.

A 1.45 Among other things, Article 5 of the RSPP, entitled "Competition", provides:

"*1. Member States shall promote effective competition and shall avoid distortions of competition in the internal market for electronic communications services in accordance with Directives 2002/20/EC and 2002/21/EC.*

They shall also take into account competition issues when granting rights of use of spectrum to users of private electronic communication networks."

Policy Directions[93]

A 1.46 Section 12(4) of the 2002 Act provides that, in carrying out its functions, ComReg must have appropriate regard to policy statements, published by or on behalf of the Government or a Minister of the Government and notified to the Commission, in relation to the economic and social development of the State. Section 13(1) of the 2002 Act requires ComReg to comply with any policy direction given to ComReg by the Minister for Communications, Energy and Natural Resources ("the Minister") as he or she considers appropriate, in the interests of the proper and effective regulation of the electronic communications market, the management of the radio frequency spectrum in the State and the formulation of policy applicable to such proper and effective regulation and management, to be followed by ComReg in the exercise of its functions. Section 10(1)(b) of the 2002 Act also requires ComReg, in managing the radio frequency spectrum, to do so in accordance with a direction of the Minister under section 13 of the 2002 Act, while Section 12(1)(b) requires ComReg to ensure the efficient management and use of the radio frequency spectrum in accordance with a direction under Section 13.

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[92] Decision No 243/2012/EU of the European Parliament and of the Council of 14 March 2012 establishing a multiannual radio spectrum policy programme.

[93] ComReg also notes, and takes due account of, the Spectrum Policy Statement issued by the Department of Communications Energy and Natural Resources in September 2010

A 1.47 The Policy Directions which are most relevant in this regard include the following:

Policy Direction No.3 on Broadband Electronic Communication Networks

A 1.48 ComReg shall in the exercise of its functions, take into account the national objective regarding broadband rollout, viz, the Government wishes to ensure the widespread availability of open-access, affordable, always-on broadband infrastructure and services for businesses and citizens on a balanced regional basis within three years, on the basis of utilisation of a range of existing and emerging technologies and broadband speeds appropriate to specific categories of service and customers.

Policy Direction No.4 on Industry Sustainability

A 1.49 ComReg shall ensure that in making regulatory decisions in relation to the electronic communications market, it takes account of the state of the industry and in particular the industry's position in the business cycle and the impact of such decisions on the sustainability of the business of undertakings affected.

Policy Direction No.5 on Regulation only where necessary

A 1.50 Where ComReg has discretion as to whether to impose regulatory obligations, it shall, before deciding to impose such regulatory obligations on undertakings, examine whether the objectives of such regulatory obligations would be better achieved by forbearance from imposition of such obligations and reliance instead on market forces.

Policy Direction No.6 on Regulatory Impact Assessment

A 1.51 ComReg, before deciding to impose regulatory obligations on undertakings in the market for electronic communications or for the purposes of the management and use of the radio frequency spectrum or for the purposes of the regulation of the postal sector, shall conduct a Regulatory Impact Assessment in accordance with European and International best practice and otherwise in accordance with measures that may be adopted under the Government's Better Regulation programme.

Policy Direction No.7 on Consistency with other Member States

A 1.52 ComReg shall ensure that, where market circumstances are equivalent, the regulatory obligations imposed on undertakings in the electronic communications market in Ireland should be equivalent to those imposed on undertakings in equivalent positions in other Member States of the European Community.

Policy Direction No.11 on the Management of the Radio Frequency Spectrum

A 1.53 ComReg shall ensure that, in its management of the radio frequency spectrum, it takes account of the interests of all users of the radio frequency spectrum.

General Policy Direction No.1 on Competition (2004)

A 1.54 ComReg shall focus on the promotion of competition as a key objective. Where necessary, ComReg shall implement remedies which counteract or remove barriers to market entry and shall support entry by new players to the market and entry into new sectors by existing players. ComReg shall have a particular focus on:

- market share of new entrants;
- ensuring that the applicable margin attributable to a product at the wholesale level is sufficient to promote and sustain competition;
- price level to the end user;
- competition in the fixed and mobile markets; and
- the potential of alternative technology delivery platforms to support competition.

Promotion of Competition

A 1.55 Section 12(2)(a) of the 2002 Act requires ComReg to take all reasonable measures which are aimed at the promotion of competition, including:

- encouraging efficient use and ensuring the effective management of radio frequencies and numbering resources;
- ensuring that there is no distortion or restriction of competition in the electronic communications sector; and
- ensuring that users, including disabled users, derive maximum benefit in terms of choice, price and quality.

A 1.56 Regulation 34(1) of S.I. No. 444 of 2022 provides that ComReg shall promote effective competition and avoid distortions of competition in the internal market when deciding to grant, amend or renew rights of use for radio spectrum for electronic communications networks and services in accordance with these Regulations.

Contributing to the Development of the Internal Market

A 1.57 Section 12(2)(b) of the 2002 Act requires ComReg to take all reasonable measures which are aimed at contributing to the development of the internal market, including:

I. removing remaining obstacles to the provision of ECN, ECS and associated facilities at Community level;

II. encouraging the establishment and development of trans-European networks and the interoperability of transnational services and end-to-end connectivity; and

III. co-operating with electronic communications national regulatory authorities in other Member States of the Community and with the Commission of the Community in a transparent manner to ensure the development of consistent regulatory practice and the consistent application of Community law in this field.

A 1.58 In so far as consolidating the development of the internal market is concerned, Regulation 17(2) of S.I. No. 444 of 2022 provides that in carrying out its tasks under these Regulations, ComReg shall, taking the utmost account of its objectives under section 12 of the Act of 2002 and Regulation 4, contribute to the development of the internal market by working with national regulatory authorities in other Member States, BEREC and the European Commission in a transparent manner to ensure the consistent application of the Directive.

Promotion of Interests of Users

A 1.59 Section 12(2)(c) of the 2002 Act requires ComReg, when exercising its functions in relation to the provision of electronic communications networks and services, to take all reasonable measures which are aimed at the promotion of the interests of users within the Community, including:

- ensuring that all users have access to a universal service;
- ensuring a high level of protection for consumers in their dealings with suppliers, in particular by ensuring the availability of simple and inexpensive dispute resolution procedures carried out by a body that is independent of the parties involved;
- contributing to ensuring a high level of protection of personal data and privacy;
- promoting the provision of clear information, in particular requiring transparency of tariffs and conditions for using publicly available ECS;
- encouraging access to the internet at reasonable cost to users;
- addressing the needs of specific social groups, in particular disabled users; and
- ensuring that the integrity and security of public communications networks are maintained.

Technological Neutrality

A 1.60 Further to Regulation 4(5) of S.I. No. 444 of 2022, ComReg, in pursuit of the policy objectives referred to in paragraph (3), shall apply impartial, objective, transparent, non-discriminatory and proportionate regulatory principles by, inter alia —(c) applying European Union law in a technologically neutral fashion, to the extent that this is consistent with the achievement of the objectives set out in paragraph (3).

Regulatory Principles

A 1.61 Further to Regulation 4(5) of S.I. No. 444 of 2022, ComReg, in pursuit of the policy objectives referred to in paragraph (3), shall apply impartial, objective, transparent, non-discriminatory and proportionate regulatory principles by, inter alia: promoting regulatory predictability by ensuring a consistent regulatory approach over appropriate review periods and through cooperation with each other, with BEREC, with the RSPG and with the European Commission:

- ensuring that, in similar circumstances, there is no discrimination in the treatment of undertakings providing ECN and ECS;
- promoting efficient investment and innovation in new and enhanced infrastructures, including by ensuring that any access obligation takes appropriate account of the risk incurred by the investing undertakings and by permitting various cooperative arrangements between investors and parties seeking access to diversify the risk of investment, while ensuring that competition in the market and the principle of non-discrimination are preserved,
- taking due account of the variety of conditions relating to infrastructure, competition, the circumstances of end-users and, in particular, consumers that exist in the various geographic areas within the State, including local infrastructure managed by individuals on a not-for-profit basis, and
- imposing ex-ante regulatory obligations only to the extent necessary to secure effective and sustainable competition in the interest of end-users where there is no effective and sustainable competition and relaxing or lifting such obligations as soon as that condition is fulfilled. BEREC

A 1.62 Under Regulation 4(4) of S.I. No. 444 of 2022, ComReg must:

- having regard to its objectives under section 12 of the 2002 Act and its tasks under these Regulations, actively support the goals of BEREC of promoting greater regulatory coordination and consistency; and

- take the utmost account of guidelines, opinions, recommendations, common positions, best practices and methodologies adopted by BEREC when adopting decisions for the markets in the State.

Other Obligations under the 2002 Act

A 1.63 In carrying out its functions, ComReg is required, amongst other things, to:

- seek to ensure that any measures taken by it are proportionate having regard to the objectives set out in section 12 of the 2002 Act;[94]
- have regard to international developments with regard to the radio frequency spectrum[95]; and
- take the utmost account of the desirability that the exercise of its functions aimed at achieving its radio frequency management objectives does not result in discrimination in favour of or against particular types of technology for the provision of ECS.[96]

[94] Section 12(3) of the 2002 Act.
[95] Section 12(5) of the 2002 Act.
[96] Section 12(6) of the 2002 Act.

Annex 2: Non-Geostationary Satellite Earth Station Coordination Process

A 2.1 Non-Geostationary Orbit satellite ("NGSO") systems are inherently more complex than traditional geostationary systems as they utilise constellations comprised of hundreds of satellites in multiple low Earth orbital planes. These satellite systems are in motion so they must be tracked by steerable SES antennas. This contrasts with geostationary systems where the antenna points to a single satellite in the Clarke belt[97]. With steerable SES antennas operating at lower elevations the interference environment around NGSO SESs is more complex.

A 2.2 Recognising that the potential for harmful interference is greater for NGSO SESs, the ITU has defined Equivalent Power Flux Density ("EPFD") limits in the Radio Regulations to protect GSO networks from NGSO systems. There are also limits on GSO networks in Article 22 and Resolution 169 to protect NGSO systems. The antenna radiation pattern envelope must meet the minimum performance specified by ITU-R Recommendation ITU-R S.465, or ITU-R.S.580. The component of effective isotropic radiated power directed towards the horizon and the minimum elevation[98] angle above the horizontal must comply with ITU Regulations and not exceed those limits specified by Radio Regulations 21.8 – 21.15.

A 2.3 While coordination is a requirement under the ITU Radio Regulations these regulations only address coordination between different countries and do not consider the specific locations of SESs within an individual state. Therefore, due the possibility of overlapping portions of the spectrum being allocated to multiple operators, ITU coordination alone may not always be sufficient to guarantee harmonious coexistence of multiple SESs within the state. It may be necessary to have significant physical separation (tens of kilometres) between SESs to minimize interference. Therefore, inter operator coordination is beneficial in mitigating interference issues and ensuring the efficient use of the radio spectrum.

A 2.4 To assure coexistence with existing Licensees, applicants for SES licences (new licences and amendments to existing Licences) to operate with a NGSO system must demonstrate how coexistence is possible between their proposed non-

[97] The Clarke Belt is term used to describe a Geostationary Orbit. A Geostationary Orbit is a Geosynchronous Orbit which is located at a latitude of zero degrees, directly above the Earth's Equator.
[98] ITU Radio Regulation 21.14 stipulates that Earth station antennas shall not be employed for transmission at elevation angles of less than 3 degrees measured from the horizontal plane to the direction of maximum radiation.

geostationary satellite gateway and:

a) existing non-geostationary satellite gateways that are already licensed;

b) non-geostationary satellite systems for which an application has been made and which has been published for comment on ComReg's website; and

c) other co-frequency SESs registered with the ITU.

A 2.5 ComReg's notification process enables interested parties to submit any views they have on a proposed SES regarding, for example, potential harmful interference or the potential impact on future SES deployments. The notification process provides transparency to all interested parties and allows ComReg to consider views regarding SES deployments operating with NGSO systems [99]. The notification process does not conflict with nor attempt to replace the ITU procedures.

A 2.6 The following steps in the notification process are as follows:

Step 1 Prior to submitting an application, applicants should seek to have an agreement with regards to coexistence with relevant Licensees. The agreement can be either an ITU coordination agreement and/or a local coordination agreement whereby the relevant parties agree to work together to mitigate any potential harmful interference and to existing and future SES deployments in Ireland.

If no such agreement exists, the applicant should set out in detail, in their application, how the proposed SES would coexist with existing and future SES deployments. The applicant needs to set out in detail what measures can be put in place, by either the applicant and/or existing/future Licensees, to achieve coexistence, and provide an assessment of the potential impact on network availability and throughput for existing or future SES deployments. The information provided by the applicant would be subject to the provisions of ComReg's guidelines on the treatment of confidential information as set out in Document 05/24[100].

ComReg will review the application and assess whether applicant has provided a detailed plan with sufficient information for how coexistence can be achieved.

[99] Document11/34a sets out that ComReg is fully committed to a transparent consultation process and recognises that public policymaking can be enhanced through the active involvement and contribution of all stakeholders with an interest in particular policy developments. By ensuring that interested parties can express their views about a particular proposal, the decision-making process becomes better informed, more rigorous and more accountable. See ComReg Document 11/34a – Information Notice on ComReg Consultation Procedures – published 6 May 2011

[100] ComReg Document 05/24, "*Guidelines on the treatment of confidential information*", published 22 March 2005, available at www.comreg.ie

Step 2 ComReg will review the application and assess whether the applicant has provided a detailed plan with sufficient information for how coexistence can be achieved and may seek further information or seek clarity on specific points from the applicant.

Step 3 ComReg would then publish an Information Notice setting out the relevant information of the proposed SES and the applicant's proposals regarding coexistence with existing and future services. Interested parties will be invited to provide any views they may have on the proposed SES. Where an interested party is of the view that an SES Licence should not be granted, they will be required to provide evidence as to why the coexistence measures provided by the applicant will not succeed in limiting the impact to existing or future licensees. This shall include setting out why, in their view, the proposed coexistence measures are insufficient or unreasonable.

An existing licensee would need to provide sufficient evidence of harmful interference issues from any proposed new SES or use of a frequency band beyond a certain distance (20km) of their site. ComReg intends to reserve the right to address any disputes on a case-by-case basis, for example considering any perceived abuse of the system or lack of coordination efforts on the part of an incumbent Licensee.

Step 4 ComReg will then carefully consider any submissions before making a decision regarding the granting of an SES licence. Where required, ComReg may seek clarifications or additional information from the applicant on foot of any submissions received.

Annex 3: Concave approach under Option 4

Introduction

A 3.1 In Chapter 4 ("the RIA") ComReg set out its view that Option 4 was its preferred option, which sets fees based on administrative cost and taking bandwidth as a parameter in the calculation of same. This chapter further specifies this approach and considers other matters in relation to fees that will apply to the pricing of SES.

Fees

A 3.1 In Chapter 4 ("the RIA") ComReg set out its view that Option 4 was its preferred option, which sets fees based on administrative cost and taking bandwidth as a parameter in the calculation of same. This chapter further specifies this approach and considers other matters in relation to fees that will apply to the pricing of SES. Fees

A 3.2 ComReg's administrative costs for managing the SES licensing framework are in the region of €140k per annum. Furthermore, the incremental cost of processing any SES licence application is estimated at approximately €100. Therefore, in order to ensure that every Licensee pays at least the incremental cost of processing a licence, €100 will act as a floor on all fees regardless of the bandwidth associated with the licence.

A 3.3 Under the preferred Option the fee calculation would be a two-part tariff:

- The first part, a constant applied to all licences, reflects the incremental cost of any SES licence application to ComReg.
- The second part of the tariff calculation is a per-MHz charge that distributes ComReg's fixed costs in proportion to bandwidth. This provides for an incremental administrative cost and a cost based on bandwidth, outlined as follows:

$$Annual\ Fee\ (in\ €) = 100 + 150(BW)^{0.75}$$

A 3.4 This implements Option 4 because each licensee covers the incremental costs incurred by ComReg as a result of its licence and the remaining fixed costs are distributed to avoid inefficiently choking off demand.

A 3.5 The bandwidth charge distributes ComReg's fixed costs to recover the remaining fixed costs of the SES licensing regime, based on the licences currently in

operation.

A 3.6 Licences that are required for less than 12 months will continue to be adjusted prorata, as is the case under the current licensing regime, outlined as follows:

$$Temporary\ Licence\ Fee\ (in\ €) = A \times \left(\frac{B}{12}\right)$$

where A is the relevant annual fee and B is the number of whole months for which the licence is granted.

Indexing of Fees

A 3.1 In Document 22/56a, DotEcon advised that SES fees should be indexed on an annual basis according to CPI. In particular, DotEcon advised that:

- ComReg needs some way for fees to increase in line with its administrative costs over time and indexing in line with CPI should prevent the need for ComReg to review and potentially change fees frequently, even if administrative costs do increase at times.
- Operators face less uncertainty when planning investments if fees are indexed rather than updated in line with new administrative cost estimates, because they are likely better able to forecast inflation than they would be able to predict changes in ComReg's costs.

A 3.2 ComReg agrees that fees should be indexed for inflation (using CPI), and this is consistent with ComReg's long established approach of applying a CPI adjustment annual licence fee.[101] The CPI is the official measure of inflation in Ireland and is, therefore, an appropriate and accessible benchmark for measuring changes to the value of money. In this regard, the Central Statistics Office notes that the CPI "can also be used to update or determine the value of a sum of money from the past e.g. the equivalent value of £2,000 in 1951 to today's level. In effect, the CPI shows the change in the value of money over time".[102]

[101] See Document 15/131 and Document 16/48

[102] https://www.cso.ie/en/media/csoie/methods/consumerpriceindex/frequentlyaskedquestions16.pdf

Annex 4: Final Draft Licensing Regulations

A 1.64 **Any final version of these regulations, which would be made by ComReg under section 6 of the Wireless Telegraphy Act 1926, is expressly subject to the consent of the Minister for the Environment, Climate and Communications under section 37 of the Communications Regulation Act 2002, as amended.**

A 1.65 ComReg may make such editorial changes to the text of any final regulations as it considers necessary and without further consultation, where such changes would not affect the substance of the regulations.

STATUTORY INSTRUMENTS

S.I. No. of 2023

WIRELESS TELEGRAPHY (SATELLITE EARTH STATION LICENCE) REGULATIONS 2023

S.I. No. of 2023

WIRELESS TELEGRAPHY (SATELLITE EARTH STATION LICENCE) REGULATIONS 2023

The Commission for Communications Regulation, in exercise of the powers conferred on it by section 6(1) of the Wireless Telegraphy Act 1926 (No. 45 of 1926) as substituted by section 182 of the Broadcasting Act 2009 (No. 18 of 2009), and with the consent of the Minister for the Environment, Climate and Communications (as adapted by the Communications, Climate Action and Environment (Alteration of Name of Department and Title of Minister) Order 2020 (S.I. No. 373 of 2020)) in accordance with section 37 of the Communications Regulation Act 2002 (No. 20 of 2002), hereby makes the following Regulations:

Citation

1. (1) These Regulations may be cited as the Wireless Telegraphy (Satellite Earth Station Licence) Regulations 2023.

(2) These Regulations shall come into force on the day on which they are made.

Interpretation and Definitions

2. (1) In these Regulations, except where the context otherwise requires:

"Act of 1926" means the Wireless Telegraphy Act 1926 (No. 45 of 1926);

"Act of 1972" means the Wireless Telegraphy Act 1972 (No. 5 of 1972);

"Act of 2002" means the Communications Regulation Act 2002 (No. 20 of 2002);

"Apparatus" means apparatus for wireless telegraphy as defined in section 2 of the Act of 1926;

"Wireless Telegraphy" has the same meaning as set out in section 2 of the Act of 1926;

"Bandwidth" or "BW" means the frequency range occupied by a modulated carrier signal;

"Commission" means the Commission for Communications Regulation established under the Act of 2002;

"Consumer Price Index" or "CPI" means the consumer price index as published from time to time by the Central Statistics Office;

"Central Statistics Office" means the Central Statistics Office of Ireland or its successor;

"ECC Regulations" means the European Union (Electronic Communications Code) Regulations 2022 (S.I. No. 444 of 2022);

"Electronic Communications Network" and "Electronic Communications Service" have the meanings assigned to them in the ECC Regulations;

"EIRP" means equivalent isotopically radiated power and is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);

"Harmful Interference" has the meaning set out in the ECC Regulations;

"International Telecommunication Union" means the United Nations agency for information and communication technologies;

“Interim Fee” means the fee which applies to a Licence from the day on which these Regulations were made until 31 July 2024;

"Licence Fee" means the fee which applies to a Satellite Earth Station from 1 August 2024;

“Licence” means a non-exclusive licence granted in accordance with section 5 of the Act of 1926 in accordance with and subject to the matters prescribed in these Regulations to keep, have possession of, install, maintain, work and use Apparatus in a specified place in the State granted to the licensee;

“Licence Type” means either a Satellite Earth Station or a Transportable Satellite Earth Station;

“Licensee” means the holder of a Licence;

“Non-exclusive”, in relation to a Licence, means that the Commission is not precluded from authorising the keeping and having possession by persons other than the Licensee, on a Non-Interference and Non-Protected Basis, of Apparatus for wireless telegraphy for the radio frequency spectrum specified in the Licence;

“Non-Interference and Non-Protected Basis” means that the use of Apparatus for wireless telegraphy is subject to no Harmful Interference being caused to any Radiocommunication Service, and that no claim may be made for the protection of Apparatus for wireless telegraphy used on this basis against Harmful Interference originating from Radiocommunication Services;

“Radio Equipment Regulations” means the European Union (Radio Equipment) Regulations 2017 (S.I. No. 248 of 2017);

“Radio Regulations” means the international treaty which facilitates efficient and effective operation of all radiocommunication services;

“Radiocommunication Service” means a service as defined in the Radio Regulations of the International Telecommunication Union involving the transmission, emission or reception of radio waves for specific telecommunication purposes;

“Satellite Earth Station” means Apparatus for wireless telegraphy, located on the Earth’s surface and operated within a 500-meter radius centred on a single geographic point, intended for either the transmission of radio signals to a Space Station or the reception of radio signals from a Space Station, or both;

“Space Station” means Apparatus for wireless telegraphy that is located on an object which is beyond the major portion of the Earth’s atmosphere, and which is not a high altitude platform station;

“Temporary Licence” means a Licence that is issued only for a period up to a maximum of eleven months and which shall not be renewed;

“Transportable Satellite Earth Station” means a Satellite Earth Station which is transportable, which operates at varying locations, and which remains in a fixed location during operation” and

“Undertaking” means a person engaged or intending to engage in the provision of electronic communications networks or services or associated facilities.

(2) In these Regulations –

(a) a reference to a Regulation or a Schedule is to a Regulation of, or a Schedule to, these Regulations, unless it is indicated that reference to some other enactment is intended;

(b) a reference to a paragraph or subparagraph is to the paragraph or subparagraph of the provision in which the reference occurs unless it is indicated that reference to some other provision is intended;

(c) a word or expression that is used in these Regulations and that is also used in the Act of 1926 has, unless the context otherwise requires, the same meaning in these Regulations that it has in that Act;

(d) a word or expression that is used in these Regulations and that is also used in the Act of 2002 has, unless the context otherwise requires, the same meaning in these Regulations that it has in that Act;

(e) a word or expression that is used in these Regulations and that is also used in the ECC Regulations has, unless the context otherwise requires, the same meaning in these Regulations that it has in those Regulations.

Licences to which these Regulations apply

3. These Regulations apply to Satellite Earth Station Licences.

Limitation of Licence

4. (1) A Licence granted under these Regulations does not grant to the Licensee named therein any right, interest or entitlement other than the right to keep, install, maintain, work and use, at a specified locations in the State, Apparatus for wireless telegraphy for the purpose of the provision of a Satellite Earth Station.

(2) Nothing in these Regulations shall absolve the Licensee from any requirement in law to obtain such additional approvals, consents, licences, permissions and authorisations that may be necessary for the discharge of the obligations or the exercise of entitlements under the Licence. The Licensee is responsible for all costs, expenses and other commitments, financial and non-financial, in respect of the Licence and the provision of a Satellite Earth Station and the Commission shall bear no responsibility for such costs, expenses or commitments.

Application for Licences and Form of Licences

5. (1) An application for a Licence will be made to the Commission and shall be in writing in such form as may be determined by the Commission.

(2) A person who makes an application under paragraph (1) of this Regulation shall furnish to the Commission such information as the Commission may reasonably require for the purpose of assessing the application and carrying out its functions under the Act of 1926, the Act of 2002 and the ECC Regulations and, if the person, without reasonable cause, fails to comply with this paragraph, the Commission may refuse to grant a Licence to the person.

(3) The Commission may issue a Temporary Licence for a period up to a maximum of eleven months which shall not be renewed.

(4) The grant of a Licence is subject to payment of the prescribed fee as set out in Schedule 2 to these Regulations.

(5) Subject to Regulation 7, a Licence shall be in the form specified in Schedule 1 with such variation, if any, whether by addition, deletion or alteration as the Commission may determine from time to time or in any particular case in accordance with the EECC Regulations.

Duration and Renewal of Licences

6. (1) A Licence shall, unless it has been withdrawn or had its duration reduced under Regulation 8, remain in force from the date of grant for a period of one year unless renewed under these Regulations.

(2) A Licence may be renewed from time to time by the Commission under this Regulation.

(3) A Temporary Licence shall, unless it has been withdrawn or had its duration reduced under Regulation 8, remain in force from the date of grant until the expiry date as specified in the licence, which shall not be greater than an eleven-month period, and shall not be renewed.

(4) Prior to the expiration of a Licence, the Commission may, by notice in writing given to the Licensee or sent to the Licensee at the address of the Licensee specified in the Licence and subject to the payment of the relevant fees in advance of the expiry date, renew the Licence for one year from the day following the expiration of the last previous period during which it was in force. The granting or renewal of a Licence shall not be construed as warranting that the Licence shall be renewed at any time in the future.

(5) In considering whether to renew a Licence, the Commission shall have particular regard to:

(a) whether the Licensee has complied with these Regulations and the conditions attached to the expiring Licence;

(b) the efficient management and use of radio spectrum; and

(c) the avoidance of Harmful Interference.

Conditions of Licences

7. (1) It shall be a condition of a Licence that:

(a) the Licensee shall comply with these Regulations and the conditions attached to the Licence;

(b) the Licensee shall ensure that the Apparatus is used only on such radio frequency spectrum as may be specified in the Licence and such radio frequencies shall be used in an efficient manner;

(c) the Licensee shall make payments of the fees as set out in Schedule 2 to these Regulations, and in accordance with Regulation 9 of these Regulations;

(d) the Licensee shall request the Commission to consider and decide on an amendment to the licence to reflect any proposed changes to the information contained in the Licence;

(e) the Licensee shall furnish such information and reports in respect of the Licence, including relating to the Apparatus and its use, as may be requested by the Commission from time to time;

(f) the Licensee shall ensure that the Apparatus, or any part thereof, shall be installed, maintained, operated and used so as not to cause Harmful Interference;

(g) the Licensee shall ensure compliance with any special conditions imposed under section 8 of the Act of 1972 and subject to which this Licence is deemed by subsection (3) of that section to be issued;

(h) the Licensee shall ensure compliance with the relevant articles in the International Telecommunication Union's Radio Regulations;

(i) the Licensee shall ensure that, save as may be required by law, access to, and use of, the Apparatus is restricted to the Licensee, employees or agents of the Licensee, and persons authorised by or on behalf of the Licensee;

(j) where the Commission is satisfied that a Licensee has failed to comply with any provision of these Regulations or a condition of the Licence, and the Commission has served on the Licensee a written notice prohibiting the use of Apparatus by such date and time as may be specified in the notice, then the Licensee will cease to use that Apparatus on or before the applicable date and time until such notice has been withdrawn by the Commission, and the Licensee shall take such measures as may be specified by the Commission in the notice;

(k) the Licensee shall upon becoming aware of any event likely to materially affect their ability to comply with these Regulations, or any conditions set out or referred to in the Licence, notify the Commission of that fact in writing within 5 working days;

(l) the Licensee shall on request from an authorised officer of the Commission permit the inspection of the Apparatus, enable access to the site or sites on which the Apparatus is located and produce the associated Licence for inspection;

(m) having notified and obtained the prior written consent of the Commission, the Licensee may lease or transfer the Licence to another undertaking where the attached conditions are maintained;

(n) the Licensee shall comply with all obligations under relevant international agreements relating to the use of Apparatus or the frequencies to which they are assigned;

(o) ensure that all Apparatus, or any part thereof, complies with the Radio Equipment Regulations.

Enforcement, Amendment, Withdrawal and Suspension

8. (1) Enforcement by the Commission of compliance by a Licensee with conditions attached to their Licence shall be in accordance with the ECC Regulations, and any other requirements under applicable national or European Community law.

(2) The Commission may amend the Licence from time to time where objectively justifiable and in a proportionate manner. Any amendment shall be made subject to and in accordance with the ECC Regulations, and any other requirements under applicable national or European Union law.

(3) Without prejudice to paragraph (2) of this Regulation, at the request of the Licensee, the Commission may, if it considers it appropriate to do so, amend the Licence by adding to, deleting from or altering the radio frequency spectrum specified in the Licence on which the Apparatus may be used. Any such amendment shall be effected by notice in writing from the Commission specifying the amendment and given to the Licensee or sent to the Licensee at the address specified in the Licence or notified to the Commission pursuant to the Licence.

(4) A Licence may be suspended or withdrawn by the Commission in accordance with the ECC Regulations, and any other requirements under applicable national or European Community law.

Licence Fees

9. (1) Fees as set out and provided for in the fees table in Schedule 2 are hereby prescribed in relation to Licences for the purpose of section 6 of the Act of 1926, as amended.

(2) The fees set out and provided for in Schedule 2 shall be payable by the Licensee to the Commission prior to the grant or renewal of a Licence.

(3) Fees shall be paid to the Commission by way of Electronic Funds Transfer or such other means, and on such terms (including terms as to the place of payment) as the Commission may decide. Where the date of payment falls on a Saturday, a Sunday or a public holiday payment shall be made on or before the last working day before the date of payment.

(4) Fees for any period of less than one year shall be calculated on a pro rata monthly basis for such period.

(5) If a Licence is suspended or withdrawn, the Licensee may be entitled to a refund on a pro rata monthly basis for the remaining period of the Licence of the relevant fee.

(6) If a Licence is suspended or withdrawn due to a finding by ComReg of non-compliance with any relevant licence conditions, the Licensee shall not be entitled to be repaid any part of the fee paid by the Licensee, but shall still be liable to pay any sums, including interest, that are outstanding.

(7) An amount payable by a Licensee may be recovered by the Commission as a simple contract debt in any court of competent jurisdiction.

(8) The fees will be implemented in accordance with Schedule 2.

Transitional Arrangements

10. (1) Subject to paragraph (2) of this Regulation, the Wireless Telegraphy (Fixed Satellite Earth Stations and Teleport Facility) Regulations 2007 (S.I. No. 295 of 2007) are hereby revoked.

(2) A licence issued under the Wireless Telegraphy (Fixed Satellite Earth Stations and Teleport Facility) Regulations 2007 (S.I. No. 295 of 2007) in force immediately before the commencement of these Regulations will continue in force as if it had run continuously from the date of its issue until its next renewal date.

SCHEDULE 1

WIRELESS TELEGRAPHY ACT, 1926

WIRELESS TELEGRAPHY (SATELLITE EARTH STATION LICENCE) REGULATIONS, 2023

LICENCE CERTIFICATE

Part 1

Licence Number: .....

The Commission for Communications Regulation, in exercise of the powers conferred on it by section 6(1) of the Wireless Telegraphy Act, 1926 (No. 45 of 1926), as substituted by section 182 of the Broadcasting Act 2009 (No. 18 of 2009), grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use Apparatus as specified in Part 2 of this Licence subject to the Licensee observing the conditions contained in Regulation 7 of the Wireless Telegraphy (Satellite Earth Station Licence) Regulations, 2023 (S.I. of 2023)

Licensee: .....

Address: .....

Satellite Earth Station Type: .....

Commencement and Termination Dates (if applicable):

The Licence comes into effect on ***DD/MM/YY*** and, subject to withdrawal or suspension, expires on ***DD/MM/YY*** unless renewed in accordance with these Regulations.

or

This Temporary Licence comes into effect on ***DD/MM/YY*** and shall expire on ***DD/MM/YY.***

Signed: .....

on behalf of the Commission for Communications Regulation

Date: .....

Part 2

Licence Details

- Licence Reference;
- Earth Station Reference Name;
- SES Licence Type:
    - Fixed;
        - Transmit/receive;
        - Transmit or receive; or
        - Receive only
    - Transportable.
- Licensee name;
- Licensee address;
- Vehicle Registration Number (for Transportable Satellite Earth Stations); and
- Licence Issue Date.

Apparatus

- Radio
    - Make;
    - Model; and
    - Class.
- Antenna
    - Make;
    - Model; and
    - Class.

Locations(s) and Technical Conditions of Apparatus:

- SES geographic location;
- Frequency Band(s) (GHz);
- Centre Frequency(ies) (GHz);
- Bandwidth(s) (MHz);
- Space Station;
- Space Station Orbital Longitude (Degrees E/W);
- Earth Station Co-Ordinates;

- Max EIRP (dBW); and
- Antenna
    - Gain (dBi)
    - Height (Meter (agl))
    - Polarisation (H/V)

SCHEDULE 2

From the day on which these Regulations were made until 31 July 2024, the annual payable fees ("Interim Fees") for Satellite Earth Station Licences are set as below.

Interim Fees

1. Where the Licence concerned relates to a Satellite Earth Station having an equivalent isotropically radiated power greater than 50dBW, for use in one or both of the frequency bands 12.5-12.75 GHz and 14.0-14.25 GHz, or in another frequency band determined from time to time by the Commission to be a frequency band for which the fee structure set out in this paragraph should apply, operating to a Single Space Station, the Licensee shall pay:

   (a) the annual Licence fee for the Satellite Earth Station on the issue of. The amount payable in relation to each Licence shall be:

      (i) €100 where the Licensee has 10, or less than 10, other Licences for Satellite Earth Stations, and,

      (ii) €25 for each additional Satellite Earth Station above that specified in sub-paragraph (i).

2. Where the Licence concerned relates to a Satellite Earth Station for use in any frequency bands other than those specified in paragraph 1 above, and the frequency band is above 3 GHz, operating to a single space station, the Licensee shall pay a Licence fee on the issue of the Licence. The amount payable in relation to the Licence fee will depend on the frequency band of operation, the bandwidth of the radio spectrum used and the power emitted by the Satellite Earth Station, each of which shall be set out in Part III of the Licence. The Licence fee may be calculated with reference to the table and formula in the following sub-paragraphs:

   (a) (i) In relation to a Licence for a Satellite Earth Station for use in the frequency band 3-10 GHz and operating at an equivalent isotropically radiated power less than 50 dBW the following fees will apply:

BANDWIDTH OF RADIO SPECTRUM USED	LICENCE FEE PAYABLE (€)
Less than 500 kHz	1000
500 kHz to < 2 MHz	1250
2 MHz to < 11 MHz	1500
11 MHz to < 40 MHz	1750
40 MHz to 80 MHz	2000
Above 80 MHz	2000+(Bandwidth - 80) x 25

(ii) Where the equivalent isotropically radiated power is between 50 and 75 dBW the fee may be calculated by increasing the fee for the appropriate bandwidth which would otherwise be payable by virtue of sub-paragraph (i), by €250.

(iii) Where the equivalent isotropically radiated power is greater than 75dBW the fee may be calculated by increasing the fee for the appropriate bandwidth, which would otherwise be payable by virtue of sub-paragraph (i), by €500.

(b) In relation to a Licence for a Satellite Earth Station for use in the frequency band 10-15 GHz, the fee which would otherwise be payable by virtue of sub-paragraphs (i), (ii), (iii) shall be reduced by €500;

(c) In relation to a Licence for a Satellite Earth Station for use in the frequency band 15-20 GHz, the fee which would otherwise be payable by virtue of sub-paragraphs (i), (ii), (iii) shall be reduced by €875;

(d) In relation to a Licence for a Satellite Earth Station for use in the frequency band 20-30 GHz, the which would otherwise be payable by virtue of sub-paragraphs (i), (ii), (iii) shall be reduced by €900;

(e) In relation to a Licence for a Satellite Earth Station for use in the frequency bands above 30 GHz, the fee which would otherwise be payable by virtue of sub-paragraphs (i), (ii), (iii), shall be reduced by €950.

(f) Notwithstanding the above, in the case where a Satellite Earth Station is licensed for use as a receiving Satellite Earth Station, or a receive only Satellite Earth Station, the fee payable shall be the amount specified in sub-paragraph (a) (iii) as applied to the bands specified in paragraphs (a), (b), (c), (d) and (e).

3. Where the Licence concerned relates to a Satellite Earth Station which is licensed for a portion of a year, operating to a single space station, up to eleven months, then the Licensee shall pay:

where a Licence is granted for a portion of a year the Licence fees to be paid by the Licensee shall be calculated as follows:

$$A \times (B/12) = C$$

where A is the relevant annual Licence fee set out in paragraph 1 or paragraph 2; B is the number of whole months for which the Licence is granted (without prejudice to Part 4 of the Licence, if a Licence is granted for a period of less than one month then, for the purpose of these calculations only, the Licence shall be considered as a Licence granted for a period of one month); and C is the appropriate Licence fee to be paid.

Licence Fees

From the 1st August 2024, the annual fee payable for an Satellite Earth Station Licence (Licence Fee) is equal to the fee for that Satellite Earth Station Licences in the base year of 2023 (the "base fee"), indexed to the annual rate of inflation since 2023 using the Consumer Price Index.

The base fee for a SES licence is calculated as follows:

$$A = €100 + 150 \times (BW)^{0.75}$$

Where:

- A is the base fee for an annual SES licence;
- €100 is the marginal cost to ComReg of issuing a licence;
- 150 is the parameter level needed to recover administrative costs given a concavity of 0.75;
- BW is the total bandwidth in use at a particular site by a licensee. This can be Transmit and Receive OR, Transmit or Receive or Receive only where protection is sought on the receive; and
- 0.75 is the concavity parameter that adjusts total bandwidth.

The Consumer Price Index ("CPI") adjustment, is set out in the following formula as follows:

$$\mathrm{C} = \frac{CPI_t}{CPI_{2023}} * 100$$

Where CPI_t represents the 12-month Consumer Price Index figures published by the Central Statistics Office, for year *t*, the year immediately preceding the indexation. CPI_{2023} represents the 12-month Consumer Price Index figures published by the Central Statistics Office for 2023. The first indexation shall take place on the 1 August 2025 and shall occur annually thereafter on that same date.

The annual fee indexed to the Consumer Price Index is equal to:

$$D = A \times C$$

Where:

- A is the base fee for an annual SES licence; and
- C is the CPI adjustment for the relevant period.

Temporary Licence Fees

For both Initial and Licence Fees, where a licence is required for a period less than 12 months, Licence Fees are applied pro-rata using the number of months for which the licence is granted as follows:

$$F = D \times (\frac{E}{12})$$

Where:

- D is the annual fee indexed to the Consumer Price Index;
- E is the number of whole months for which the SES licence is granted; and
- F is the appropriate fee to be paid.

If a Licence is granted for a period of less than one month, then, for the purpose of these calculations only, the licence shall be considered as a licence granted for a period of one month.

GIVEN under the Official Seal of the Commission for Communications Regulation, 2023

On behalf of the Commission of Communications Regulation

The Minister for the Environment, Climate and Communications (as adapted by the Communications, Climate Action and Environment (Alteration of Name of Department and Title of Minister) Order 2020 (S.I. No. 373 of 2020)), in accordance with section 37 of the Communications Regulation Act, 2002, consents to the making of the foregoing Regulations.

GIVEN under the Official Seal of the Minister for the Environment, Climate and Communications

2023

Minister for the Environment, Climate and Communications.

EXPLANATORY NOTE

(This note is not part of the Instrument and does not purport to be a legal interpretation.)

These Regulations provide for the issue of licences for Apparatus for Wireless Telegraphy for the provision of a Satellite Earth Station for the regulation of such Apparatus, and for the payment of fees by persons granted licences for that Apparatus.