An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

Review of the Satellite Earth Station Licensing Scheme

Preliminary Consultation

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Legal Disclaimer

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1 Introduction

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 2 for an overview of the legal framework and statutory objectives relevant to ComReg's management of the radio spectrum.

1.3 As noted in ComReg's Electronic Communications Strategy Statement 2021 to 2023[1], radio spectrum, as a medium over which data can be transmitted, is an essential input in the supply of wireless/radio-based ECN/ECS for a diverse range of uses and end-users. It is a valuable national resource as it underpins nearly all communications services in the State. These communication services include mobile telephony, wireless broadband, radio and television broadcasting and radio communications used by commercial business and by air and maritime transport. Many services rely on wireless connectivity as part of the backbone linking mobile base stations, providing feeds to broadcast transmitters and telemetry links that allow the monitoring of dispersed infrastructure, for example water reservoir levels and remote power transformers.

1.4 The demand for radio spectrum continues to grow, driven by society's ever-increasing requirements in terms of access to data intensive services while on the move. In this context it is ComReg's goal[2] that the management of spectrum facilitates competition, enhances connectivity and promotes efficient investment.

1.5 In its Radio Spectrum Management Strategy Statement ("RSMSS") for 2022 to 2024 (ComReg Document 21/136), ComReg committed to consult on, amongst other issues, 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 Satellite Earth

[1] ComReg document 21/70 – Electronic Communications Strategy Statement 2021 to 2023 – published 30 June 2021.

[2] ComReg's Competition & Investment strategic intention – Goal 1.6: The management of spectrum and numbers facilitates competition, enhances connectivity and promotes efficient investment.

Station 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 not been a significant demand for SES in Ireland to date, it seems likely that could change and 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.

1.6 This Preliminary Consultation, the first consultative step in this review, considers and identifies current and potential future 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.

1.7 The review of the SES licensing regime ("the Review") will also take account of wider spectrum management matters regarding the frequency bands used for SES, this includes, but not limited to, market, technology, and international changes. The Review will:

- consider the current SES use cases, understand how these use cases have evolved, and consider the future demand from use cases for the existing and future frequency bands allocated for SES;
- consider the current licensing regime for SES and consult on any proposed changes to licence duration, conditions, fees etc. including new regulations to replace; and
- consider and propose, where appropriate, changes to the Guidelines for Satellite Earth Stations.

1.8 In all, it is envisaged that the Review will comprise several stages, each culminating in a public consultation and ultimately lead to a final Decision as appropriate, currently earmarked for 2023. The project overview and estimated timelines are outlined in Figure 1 below.

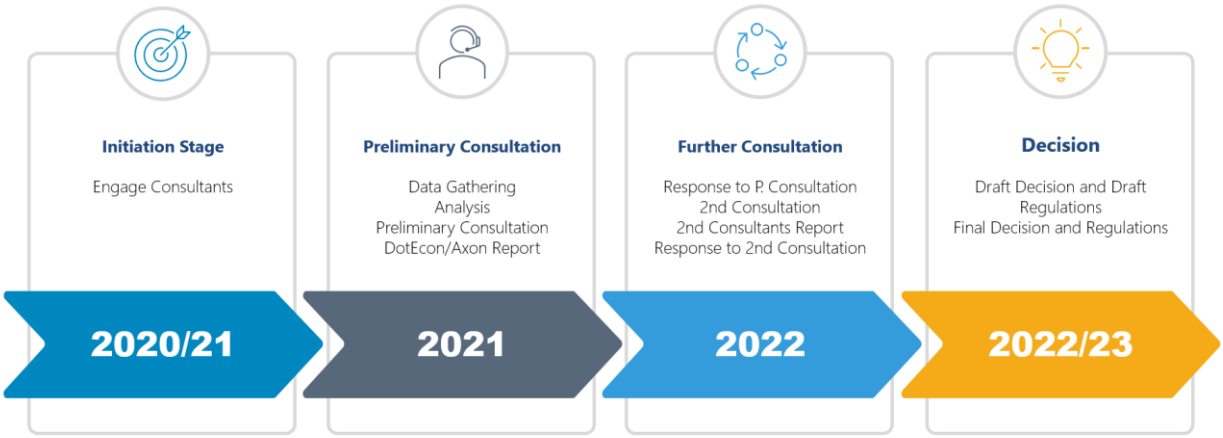

Figure 1: Indicative timeline for the Satellite Licencing Scheme review

1.9 ComReg is publishing alongside this document an interim report (Document 21/135a) prepared by ComReg's economic and technical adviser, DotEcon Limited ("DotEcon"), on the current situation regarding the satellite services environment in Ireland and a summary of emerging issues. That report ("the DotEcon Report") was informed by, amongst other things:

- Interviews, as conducted by DotEcon and ComReg, with several stakeholders including existing users and equipment manufacturers (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

1.10 This document relevantly summarises the matters discussed in the DotEcon Report and readers are referred to the DotEcon report for more detail on those matters. At a high level these relate for example to the existing and potential use cases for SES.

1.11 The review is also informed by submissions regarding the licensing and use of SES received in response to ComReg Documents 20/109[3] and 21/90[4].

1.12 ComReg seeks and welcomes the views of interested parties on all aspects of DotEcon's preliminary views and findings set out in section 3 below which will be used to inform ComReg's future consideration of a licensing framework (including

[3] ComReg 20/109 – "Review of the Fixed Radio Links Licensing Regime"
[4] ComReg 21/90 – "Proposed Strategy for Managing the Radio Spectrum 2022 to 2024"

any fees) for SES. As outlined at paragraph 1.8 above, it is ComReg's intention to follow up on such matters in a further consultation, followed by a response to consultation and draft Decision as appropriate.

1.13 This document is laid out as follows:

- Chapter 2: sets out some background information of Satellite Services.
- Chapter 3: describes the preliminary views regarding the satellite earth station use cases and related emerging issues.
- Chapter 4: sets out the request for comments and how to submit responses.
- Chapter 5: indicates the next steps in the process.

2 Background Information

2.1 This chapter provides some background information relevant the Satellite Earth Station Licencing Regime.

2.2 A satellite earth station ("SES") is a type of radio equipment used to communicate with a space station (satellite) from the Earth's surface. SES can be used to provide data, broadband and telephony connections as well as backhaul, broadcast feeder links, telemetry, and satellite control.

2.3 The current SES licensing regime authorises the use of frequencies above 3 GHz. The conditions and fees that attach to SES licences are set out in Statutory Instrument No. 295/2007[5]. ComReg Document 00/64R3[6] sets out the technical requirements, application process, licence information and frequency bands for SES use in Ireland.

2.4 There are currently 17 frequency bands available for SES operation. Two categories of licences are issued by ComReg, Fixed SES and Teleport Facility licences. Fixed SES is the umbrella term used for two sub-categories of FSES: Fixed Earth Station ("FES") and Transportable Earth Station ("TES").

2.5 Regarding Fixed Satellite Earth Stations and Teleport Facilities:

- Fixed Satellite Earth Stations ("FSES") licences are granted for:
  - Fixed Earth Stations ("FES") which are a type of SES which are used at fixed locations and which are non-transportable. This licence type includes SES which operate:
    - In the fixed satellite service ("FSS") at frequencies greater than 3 GHz;
    - As a feeder link in the mobile satellite service ("MSS") at frequencies greater than 3 GHz; or
    - As a feeder link in the broadcasting satellite service ("BSS") at frequencies greater than 3 GHz

[5] S.I. No. 295/2007 - Wireless Telegraphy (Fixed Satellite Earth Stations and Teleport Facility) Regulations 2007 - here

[6] ComReg 00/64R3 - Guidelines for Satellite Earth Station (SES) Licences operating in spectrum above 3 GHz available here

- Transportable Earth Stations ("TES") which are SES used to transmit live or recently recorded footage from different locations and are commonly referred to as Satellite News Gathering stations which are used, for example, by RTE, BBC, Sky news, etc; and

- Teleport facility which means two or more FES which collectively provide access to or from an electronic communications network, and which are located at a single location, and collectively are capable of transmitting on more than one frequency to more than one Space Station simultaneously using steerable antennas. Teleport Facilities follow the same licensing procedure as an individual FES, with the exception that a different fee is applied.

2.6 SES and Teleport Facility licensees can be licensed for:

- Transmit (referred to as uplink or Earth-to-space (E-s)) operation; and/or
- Receive (referred to as downlink or space-to-Earth (s-E)) operation, where protection is sought on the receive.

For transmit operation, a licence is required unless it is exempt from licensing.

2.7 As of December 2021, there were 56 live SES licences in Ireland, held by 21 different licensees. Approximately half of all current licences are TES licences, with broadcasters being the most common type of licence holder. The other licensees are a mix of internet services providers, private networks, and foreign embassies.

2.8 Current licences are divided between exclusive and non-exclusive bands. Sixteen licences have been granted rights of use for frequencies in the 14.0-14.25 GHz band. The remaining licences have been granted rights of use for frequencies in the shared-use bands.

2.9 The majority of current licences (including all TES licences) are for frequencies 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.

2.10 A smaller numbers of FES licences have been approved for use of frequencies in the Ka and C bands, with an increase in use of the Ka band in recent times. Figure 2 below gives an overview of all bands that could potentially be used for SES.

Band	Frequencies (GHz)
L-Band	1.518-1.675
S-Band	2
C-Band	3.4 – 7.025
Ku-Band	10.7 – 14.5
Ka-Band	17.3 - 30
V-Band	40 - 70
E-Band	60 - 90

Figure 2: Frequency Bands for SES

2.11 The typical bandwidths used with current licences vary widely. At the low end, many operators use less than 10 MHz, with some using less than 1 MHz. Other SES licences are for much larger bandwidths, up to 500 MHz.

2.12 ComReg has never received a request for a teleport facility licence.

2.13 Figure 3 below provides information on the number of licences issued for both FES and TES in a calendar year from 2008 – 2021.

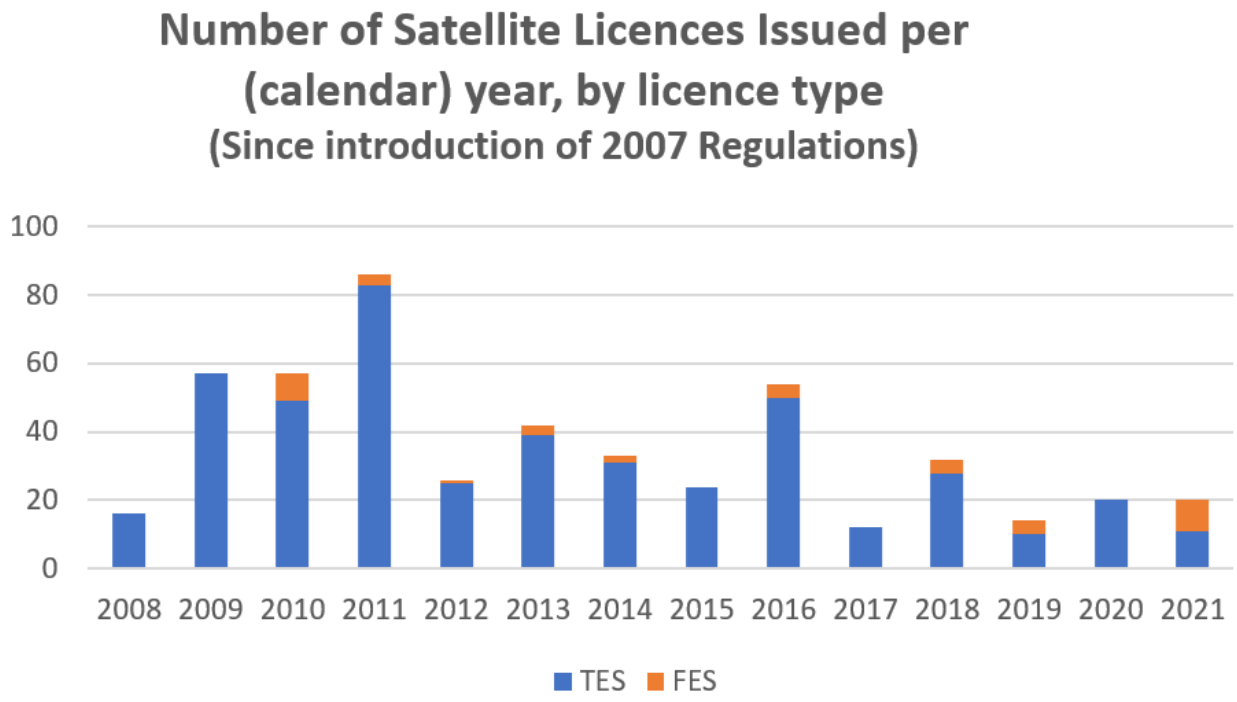

Figure 3: Number of Satellite Licences issued per (calendar) year, by licence type

Test and Trial Ireland

2.14 Currently, there are four live test licences and nine live trial licences assigned for SES use. The test and trial licences have been issued to four licensees either to test equipment or to trial potential future services. These test and trial licences operate at frequencies below 3 GHz (i.e. 400 MHz or 2 – 2.3 GHz), which are currently not available for regular SES licensing.

Licence-exempt Terminals for Satellite Services

2.15 Terminals for Satellite Services ("TSS") are a type of radio equipment used to communicate with a satellite from the Earth (terrestrial, at sea or aeronautical). TSS are used to provide business/consumer communications such as telephony, data, and fixed broadband. Certain TSS which meet the parameters as set out in ComReg 20/47, as amended[7], are exempt[8] from licensing.

2.16 Licence-exempt TSS are not within the scope of the Review, however their current and future use will be taken into account when considering SES use cases.

[7] ComReg 20/47 R3 - https://www.comreg.ie/publication/permitted-licence-exemptions-for-terminals-for-satellite-services-3

[8] https://www.comreg.ie/publication-download/s-i-no-226-of-2020-wireless-telegraphy-act-1926-section-3-exemption-of-terminals-for-satellite-services-order-2020

3 Preliminary Findings

3.1 ComReg has published alongside this document an interim report (Document 21/135a) prepared by ComReg's economic and technical advisor, DotEcon Limited ("DotEcon"), on the current situation regarding the satellite services environment in Ireland and a summary of emerging issues.

3.2 The DotEcon report provides an initial analysis and preliminary findings of the following topics:

- The current ComReg satellite licencing regime;
- Potential use cases for Satellite Earth Stations; and
- Emerging issues for Satellite Services.

3.3 This section provides a summary of DotEcon's analysis and preliminary findings and readers are referred to the DotEcon Report (Document 21/135a) for a more detailed discussion on each of its interim conclusions and other matters raised during the stakeholder engagement stage.

3.2 Current Licensing Regime

3.4 In its Report, DotEcon provides an overview of the current SES licensing regime in Ireland and preliminary findings. These include:

- Licence types;
- Frequency bands currently available SES licensing;
- Current fee structure;
- Licence-exempt TSS; and
- International aspects to SES licensing.

SES Licence Types

3.5 DotEcon notes that ComReg has never issued a teleport facility licence, and further notes that from the interviews conducted some stakeholders suggested that the teleport facility licences as they stand may be outdated and incompatible with current technology and satellite systems.

3.6 There is a need to ensure that the licence types available are fit for purpose. However, stakeholder interviews suggested there is an interest in multiple ground stations at the same site being treated as one entity and subject to one application. ComReg considers that any licence types available should not preclude any particular use case.

3.7 ComReg is of the view that the licencing regime should be suitable for any emerging or established technologies and should not favour one operating model over another. ComReg welcomes the views of respondents on the current licence types available for SES in Ireland.

Q. 1 ComReg seeks views of interested parties regarding the current SES licence types. Please provide evidence and reasoning for your views.

Frequency Bands

3.8 There are currently 17 different frequency bands available to SES for both Transmit and Receive operations all of which operate above 3 GHz[9]. SES Bands are split into two categories: shared or exclusive frequency bands and reflect the relevant allocations in the International Telecommunication Union's Radio Regulations.[10]

3.9 Frequency bands which are shared are allocated for SES and other wireless services. The nature of this sharing depends on the allocation status (Primary or Secondary) of the other service operating in the same band and has implications for how SES applications are processed and licensed.

3.10 Where two or more services are allocated the same frequency band on a Primary allocation basis, they enjoy equal status under the Radio Regulations. As such, a successful national and/or international coordination process is required before a licence can be issued.

3.11 In its Report, DotEcon notes the frequency bands currently available for SES licensing in Ireland, and further notes that some stakeholders suggest that there are frequencies allocated for satellite services by the ITU that are not currently available for SES in Ireland, including, for example:

[9] The full listing of frequency bands available for SES is available in Annex 1 of the document.

[10] https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-REG-RR-2020&media=electronic

- frequencies in bands below 3 GHz (e.g. the UHF[11], L[12] and S[13] bands) that may be particularly useful for IoT and/or earth exploration applications;
- frequencies in the Ka band[14], where several respondents commented on the fact that only 500 MHz (29.5 – 30.0 GHz) is available in the band in Ireland for SES, but the full 2.5 GHz (i.e. 27.5 – 30 GHz for Earth-to-space) could be opened up.
- Furthermore, higher bands in particular within the Q and V bands[15] are likely to become useful for some satellite services in the foreseeable future, both for use with gateway earth stations and potentially for inter-satellite links. Access to frequencies in the 70/80 GHz range might also be useful for innovative and experimental satellite use.

Q. 2 ComReg seeks views of interested parties regarding the frequency bands currently available for SES as set out in ComReg document 00/64R3[16], and on the potential for opening up of frequency bands not already available, in relation to either the bands mentioned above, or any other bands considered relevant (noting that this does not include frequencies for use with licence-exempt terminals, which is not within the scope of this project). Views on use cases for these bands and likely time scales around demand for the spectrum would be helpful. Please provide evidence and reasoning for your views.

International Aspects to SES licensing

3.12 DotEcon notes that aspects of the satellite licensing process are supranational, in particular the licensing of space components. ComReg's remit covers only terrestrial licensing, and the licensing of space stations and use of frequencies in space is beyond the scope of the Review. DotEcon further notes that to date, Ireland has very limited experience as a notifying administration in relation to satellite networks, having previously only submitted one filing for a NGSO satellite (EIRSAT 1).[17]

3.13 International coordination of SES is a requirement of all ITU member states, and the coordination process is set out in the ITU's Radio Regulations. ComReg notes that it cannot licence SES which may cause harmful interference above the internationally agreed level to receivers outside the country. Additionally, operators of receivers

[11] UHF of interest to the interviewees spans 300 to 450 MHz.
[12] The L band spans 1 to 2 GHz
[13] The S band spans 2 to 4 GHz
[14] The Ka band spans 26.5 to 40 GHz
[15] The Q band spans 33 to 50 GHz and the V band from 40 to 75 GHz.
[16] https://www.comreg.ie/media/2016/04/ComReg0064-R3.pdf
[17] https://www.eirsat1.ie/

located in Ireland are required to accept interference levels if within internationally agreed limits.

3.3 Use cases for satellite ground stations

3.14 There are a number of use cases for SES that have emerged from the stakeholder interviews conducted by DotEcon and ComReg. The identified broad use cases are as follows:

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

Broadcasting

3.15 Broadcasters (such as RTE, SKY etc.) use satellite communications for satellite news gathering (SNG) for reporting live or pre-recorded news from remote locations. A transportable earth station (typically mounted on the back of a van) is used to transmit to a geostationary satellite, which then relays the broadcast to the TV network operations centre that re-transmits it to end-users.

3.16 Satellites are also used in the broadcasting of TV to end-users. This requires end-users to have satellite terminals installed on the premises which then provides a downlink connection where TV broadcast can be received.

3.17 In its report, DotEcon notes that it understands from the interviews that news organisations are making less use of SNG as mobile networks provide faster services and better coverage. This is due to the costs associated with having a fleet of transportable earth stations, and broadcasters may use specialist equipment that can bond IP connections using several mobile networks for greater through-put and reliability.

3.18 DotEcon also notes that while the prevalence of video on demand has shifted content distribution towards IP based systems running over terrestrial networks, there is still a large installed base of satellite TV receivers; therefore, the need for broadcasters to use Earth stations to uplink the broadcast to geostationary satellite is expected to remain important for the foreseeable future.

Mobile Communications

3.19 There is potential for satellites to serve as a complement or substitute to terrestrial links in mobile communications networks. Satellites can be used as a back-up to terrestrial links and/or as an alternative to backhaul services in remote areas that have no available terrestrial links.

3.20 Satellite earth stations can be used in mobile communications to fill gaps in coverage and also to extend mobile communications to areas that would otherwise be unreachable by terrestrial links. Satellite earth stations in mobile communications would be beneficial to, for example, customers in remote areas, in aiding disaster response, search and rescue operations, and for industries operating in remote locations such as forestry or mining. Satellite earth stations can also provide resilience for fixed and mobile networks in the event any issues are experienced with the physical infrastructure.

Internet of Things (IoT)

3.21 IoT describes physical objects that are embedded with sensors, processing ability, software, and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks. IoT is beginning to be developed for use in industries such as agriculture, shipping and logistics.

3.22 These IoT services use a large number of small devices that require connectivity and satellite links can be used when traditional terrestrial connections are not available or are too expensive to use.

3.23 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.

Earth Exploration and Remote Sensing

3.24 Earth Exploration and Remote Sensing satellites capture images and transmit information regarding the Earth’s surface from space. They are used for environmental monitoring, meteorological/weather services, cartography, scientific observations and military purposes.

3.25 Earth Exploration and Remote Sensing satellites require transmission of large amounts of data and so require wide bandwidth and low latency. The satellites used for these services are typically in low earth orbit (LEO), and sun-synchronous/polar orbits are particularly important if seeking to capture images at consistent times and lighting environments.

3.26 These applications have typically operated in the VHF, UHF, S, and X bands, but are increasingly moving towards use of the Ka band which offers greater capacity. A significant amount of this spectrum is below 3 GHz (i.e. VHF, UHF, and part of S-band) and therefore not available under the existing licencing regime.

Fixed Broadband

3.27 Satellite broadband can provide internet access to remote areas that would be hard to reach by other means. Heretofore, satellite broadband was primarily delivered by geo stationary satellites which resulted in high latency due to communicating with satellites in high earth orbit.

3.28 However we have now seen the emergence of a number of new satellite broadband systems which operate in Low Earth Orbit (LEO). Such satellites significantly reduce the latency experienced in comparison to GEO systems as satellite terminals are communicating with satellite that are closer to earth i.e. Low Earth Orbit. The capacity of such systems can also be greater due to the frequent constellation type operation.

3.29 LEO fixed broadband systems require a satellite gateway, which transmits and receives a high volume of information as well as providing access to the internet, and satellite user terminals which access the LEO constellation. In CEPT countries these user terminals, which operate in the Ku band, can be exempt from licencing if an administration implements ECC Decision 17(04)[18]. ComReg has implemented ECC/DEC/(17)04 under S.I. 226 of 2020 and ComReg 20/47, as amended.

3.30 ComReg notes that the current number of active fixed satellite broadband subscriptions in Ireland was only 1,912 for the period from 1st July 2021 to 30th November 2021. This represents circa 0.10% of the 1.914 million active broadband subscriptions in Ireland. Satellite broadband subscriptions had in fact declined by 8.03% compared to Q2 2021 and by 34.25% compared to Q3 2020.[19] However, noting the recent introduction of services in Ireland by satellite operators such as Eutelsat, OneWeb, SpaceX, etc., the number of fixed satellite broadband subscriptions in Ireland seems more likely to increase, and perhaps notably, going forward.

GPS and Navigation

3.31 Satellite positioning systems can be used for providing position, navigation or for tracking the position of something fitted with a receiver (satellite tracking). The largest satellite positioning systems have been set up and run by governments, such as

[18] ECC Decision (17)04 - The harmonised use and exemption from individual licensing of fixed earth stations operating with NGSO FSS satellite systems in the frequency bands 10.7-12.75 GHz and 14.0-14.5 GHz
[19] ComReg Document 25/125 – Quarterly Key Data Report for Q3 2021 – published 9 December 2021

Galileo[20] in the EU and GPS[21] in the United States.

3.32 Positioning systems typically require at least three satellites to be in view of the device to operate, and the accuracy increases with the number of satellites. Due to the global nature of such services, the systems need a network of earth stations that can ensure worldwide coverage

3.33 These applications are frequently used in automobiles, marine navigation, aviation tracking, defence applications and timing/synchronisation. There is also a growing list of industries adopting satellite navigation technology for innovative projects, such as precision agriculture and commercial fishing.

Q. 3 ComReg seeks views of interested parties regarding:

a) any use cases that do not fall into the broad categories outlined above; and

b) views on any of the use cases identified and the understanding of these set out in the DotEcon report, in particular with regard to market trends (e.g. commercial viability) and factors relating to use of satellite earth stations and licensing requirements.

c) Please provide evidence and reasoning for your views.

3.4 Emerging Issues

3.34 The stakeholder interviews conducted by DotEcon and ComReg has revealed a number of emerging SES issues:

- Harmful Interference between ground stations;
- Interference from terrestrial uses;
- Implications for Fees;
- New Bands; and
- Regulatory Environment.

3.4.2 Harmful Interference Between Ground Stations

3.35 There is apparently some potential that SES could cause or experience harmful interference from other SES using the same frequency band. However, any interference experienced can likely be easily managed due to the operational nature of SES. As both receivers and transmitters on satellite ground stations are highly

[20] https://www.esa.int/Applications/Navigation/Galileo/What_is_Galileo
[21] https://www.gps.gov/

directional and typically point up, any harmful interference experienced can easily be rectified with a directional change to protect against harmful interference from other ground stations.

3.36 However, there have also been suggestions that there is potential for harmful interference between ground stations for different LEO constellations and that significant geographical separation may be necessary to manage this.

3.37 The multi-directional antennas used to communicate with various satellites in a constellation from the same ground station means that the techniques available to limit interference between GSO ground stations may not be as effective in the case of LEO systems.

Q. 4 ComReg seeks views in relation to any potential harmful interference between SES ground stations and also any potential for harmful interference that may occur as a result of newly launched LEO systems. Please provide evidence and reasoning for your views.

3.4.3 Harmful Interference from other Terrestrial Uses

3.38 There is also potential for harmful interference from existing terrestrial services to SES. ComReg notes that the high directionality of SES antennas means that it is significantly more difficult to rectify than the interference experienced between ground stations.

3.39 As outlined, SES are available to operate in two satellite exclusive bands in Ireland. However, SES can also operate in shared frequency bands on a Co-Primary[22] basis with other services, such as fixed links, or with other services operating as a secondary service. Concerns have also been raised by stakeholders regarding 5G services, for example, that the emergence of 5G could limit the spectrum available to satellite operators. In that regard, ComReg notes that in respect of both the 3.6 GHz and 26 GHz bands such issues have been considered and addressed by the ECC in CEPT Reports 67[23] and 68[24] and ECC Report 254[25], and by the European

[22] Co-Primary has the meaning described by The International Telecommunication Union (ITU) Radio Regulations,Article5(RR5.23RR5.36).https://www.itu.int/en/publications/ITUR/pages/publications.aspx?parent=R-REG-RR-2020&media=electronic

[23] CEPT Report 67 – Review of the harmonised technical conditions applicable to the 3.4-3.8 GHz (‘3.6 GHz’) frequency band – published 6 July 2018. https://docdb.cept.org/download/118

[24] CEPT Report 68 – Harmonised technical conditions for the 24.25-27.5 GHz ('26 GHz') frequency band – published 6 July https://docdb.cept.org/download/119

[25] ECC Report 254 – Operational guidelines for spectrum sharing to support the implementation of the current ECC framework in the 3600-3800 MHz range – published 18 November 2016. https://docdb.cept.org/download/1276

Commission in Decision (EU) 2020/590[26]and Decision (EU) 2019/235[27].

Q. 5 ComReg seeks views from interested parties regarding any potential interference to SES from other terrestrial uses, such as 5G. Please provide evidence and reasoning for your views.

Fixed Links

3.40 In several cases, certain frequency bands are allocated to both Fixed Services and Fixed-Satellite Services on a Co-Primary basis. For example, the 17.7 – 19.7 GHz frequency band is allocated at a European level to fixed services and coordinated SES, however ComReg has, thus far, not allocated the 17.7 – 19.7 GHz frequency band for SES licensing.[28]

3.41 ComReg is of the view that any current or future shared use of frequency bands is subject to a national coordination process and considers sharing/compatibility studies undertaken by CEPT and/or the ITU.

3.42 In this regard, ComReg has already received views from satellite stakeholders as part of its Review of the Fixed Radio Links Licensing Regime. Those views noted that the publication of fixed link data would assist operators in the planning of SES and assist in the mitigation of potential interference. As noted in Documents 21/134[29] and 21/136[30], ComReg intends to the publish the fixed links licence information on its public website (www.siteviewer.ie) during the 2022-2024 period which would, amongst things, assists operators in planning the deployment of future SES in Ireland.

Q. 6 ComReg seeks views from interested parties regarding any potential interference between SES and fixed links. Please provide evidence and reasoning for your views.

Information Policy

3.43 There is no overall scarcity of SES spectrum and ComReg notes that it is more likely that coordination problems will occur more in accessing the spectrum other than it not being available for use. There have been indications from stakeholder interviews

[26] Decision (EU) 2020/590 – Commission Implementing Decision (EU) 2020/590 of 24 April 2020 amending Decision (EU) 2019/784 as regards an update of relevant technical conditions applicable to the 24.25-27.5 GHz frequency band – published 24 April 2020. https://docdb.cept.org/download/167

[27] Decision (EU) 2019/235 – Commission Implementing Decision (EU) 2019/235 of 24 January 2019 on amending Decision 2008/411/EC as regards an update of relevant technical conditions applicable to the 3400-3800 MHz frequency band – published 24 January 2019. https://docdb.cept.org/download/163

[28] The 17.7 – 19.7 GHz frequency band is available for uncoordinated TSS on a licence-exempt basis (i.e. non-interfering, non-protected). See ComReg Document 20/47R3

[29] ComReg 21/134 - Review of the Fixed Radio Links Licensing Regime – Consultation and Response to Consultation

[30] ComReg 21/136 - Radio Spectrum Management Strategy Statement 2022 to 2024

that information policy may be more important than opportunity cost pricing.

3.44 In applying for access to spectrum for SES there is a possibility through the application process of harmful interference occurring between SES and either terrestrial or other satellite operators. However, there is potential for SES operators to manage any interference experienced amongst themselves, or with other terrestrial users, provided they had access to appropriate information.

3.45 The stakeholder interviews suggest that ComReg should make available details from its own licensing database, and that this would often be sufficient for operators to resolve interference without ComReg having to intervene. ComReg intends to publish the fixed links licence and SES licence data on www.siteviewer.ie during the 2022-2024 period.

Q. 7 ComReg seeks views from interested parties on what type of information would help operators resolve coordination problems and the extent to which this would reduce the risk of interference (both between SES and between SES and terrestrial services)? Please provide evidence and reasoning for your views.

3.4.4 SES Fees

3.46 Regulation 19 of the Authorisation Regulations permits ComReg to impose fees for rights of use that reflect the need to ensure the optimal use of the radio frequency spectrum.

3.47 In addition, 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 Regulation 16 of the Framework Regulations.

3.48 DotEcon proposes to set out any recommendations in relation to SES fees in due course as part of its second report. However, in the interim, DotEcon provides some preliminary views, the response to which will inform its second report and ComReg's proposals on SES Fees. These are:

- As a minimum requirement, SES licence fees need to be sufficient for ComReg to recover its administrative costs relating to:
  - processing applications for and issuing SES licences; and
  - maintaining the regulatory functions for interference management to a sufficient degree to be able to resolve problems expeditiously (even if these seldom occur).

- There is a case for setting different fees for different licence types. The nature of the interference analysis required from ComReg to process an application differs between TES and FES licences[31]. For example, Earth stations within a limited area may be charged as if they were a single Earth station.
- There is likely to be a low risk of interference and opportunity costs in respect of the spectrum used by SES will in most cases be modest or close to zero. However, there are some exceptions to this[32] and fees would need to reflect such cases.
- In relation to the structure of fees ComReg may set fees, per earth station, per satellite constellation served or per antenna; and related to bandwidth. However, DotEcon does not believe that either administrative costs or opportunity costs vary significantly with the number of constellations served from a given ground station or even per antenna used at a given location. Therefore, there may be no obvious rationale for such charging structures.

3.49 ComReg encourages interested parties to read section 4.3 of the DotEcon Report in preparing its observations and/or proposals on SES fees.

Q. 8 ComReg seeks views from interested parties on the above including:

a) the proper definition of SES to apply for licensing purposes given the potential for 'light-weight' ground stations being used for some applications (such as IoT downlinks);

b) the structure of the fee schedule (e.g., per earth station, per satellite constellation, bandwidth).

c) any pricing methodologies or approaches that would be suitable for estimating SES fees. ComReg also seeks views of interested parties on the existing charging structure and aspects of that approach that require change or not.

d) what basis should be used to allocate administrative costs, especially given that some SESs may need little or no interference protection (i.e., different fees for different licence types.;

[31] This arises because TES are not used at a fixed location, and also presumably for FES compared with teleport licences, as there is no incremental risk of interference of an additional station at the same site, operated by the same SES user in the same band, so separate interference modelling is not necessary.

[32] For example, SES might sterilise spectrum for terrestrial services in some small exclusion zone and fees may need to reflect the value of the excluded use within that exclusion zone

e) how to deal with competing terrestrial uses that might be precluded in exclusion zones around SESs needing interference protection and reflect the opportunity cost imposed so that new ground stations locate themselves efficiently.

3.4.5 New Bands

3.50 ComReg's existing satellite licencing regime is for SES operating in spectrum above 3 GHz, but as part of this review there is potential for new frequency bands to be made available to Satellite Services that are not currently available for use in Ireland.

3.51 There are currently a certain number of frequency bands allocated to both Fixed Services and Fixed-Satellite Services on a co-primary basis. Stakeholders have indicated interest in additional spectrum being made available for SES both in low and high frequency bands, with demand for sub-3 GHz spectrum potentially being more attractive.

Sub – 3GHz

3.52 EESS and IoT users have indicated that they would like sub-3 GHz bands to be opened to SES as soon as possible and have suggested that the lack of availability of low frequency spectrum has limited their ability to operate in Ireland heretofore.

3.53 Evidence suggests that demand for bands below 3 GHz would be limited to these use cases, and that other use cases would continue to use the bands that they currently have access to (e.g. Ka). Other use cases might also potentially make use of higher frequency spectrum as bandwidth requirements increase and technology is developed.

3.54 DotEcon notes that there is a significant difference in the demand for bandwidth among EESS and IoT users which can range from under 1 MHz up to several hundred MHz. Lower frequency spectrum is relatively scarce and allocating large bands for exclusive use by SES in this area could involve a large opportunity cost. However, these do not require strong interference protection and are designed to be able to cope with some level of interference and can therefore work effectively as secondary users in the band.

Higher Frequency Bands

3.55 Certain SES operators, such as satellite broadband, have increasing demand for bandwidth and have expressed interest in using higher frequencies where more bandwidth is available. In the next two to four years, the Q and V bands could potentially be used for ground stations, and there is some indication that even higher frequencies (70-80 GHz) will be used for experimental satellites.

3.56 Satellites are manufactured to work in specific bands, and it is not possible to switch

between bands while they are operational. Operators only switch between bands when new satellites are deployed, and the lifetime of these satellites is over ten years. This creates significant lead times and a need for clarity on what bands are available well in advance.

3.57 These findings are preliminary in nature and ComReg has not made any decisions on the future use of SES bands. All comments regarding the potential bands to be opened are welcome.

Q. 9 ComReg seeks views from interested parties on which frequency bands could be opened to SES in Ireland? Please provide evidence and reasoning for your views, along with supporting international harmonisation measures for these bands.

3.4.6 Regulatory Environment

3.58 DotEcon notes in its report that a number of stakeholders made general comments about the importance of a stable regulatory environment whilst noting that regulatory burden can affect whether an operator will set up SES in a particular country. .

3.59 The stakeholder interviews identified some areas where improved clarity in ComReg's guidelines would help but did not suggest that ComReg's current application and licensing process prevented them from operating in Ireland.

Q. 10 ComReg seeks any additional views from interested parties on the current SES licensing regime and guidelines? Please provide evidence and reasoning for your views.

Adoption of CEPT Decisions

3.60 Satellite services operate on an international basis and most stakeholders highlighted the importance of implementing CEPT harmonisation decisions as quickly as possible. ComReg already endeavours to implement ECC decision in a timely manner and considers the effective implementation of these if the national requirements allow it.

3.61 As outlined in the DotEcon Report, stakeholders have suggested ComReg goes further by:

- Establishing a (near) automatic process for adopting CEPT decisions; or
- Incorporating provisional CEPT decisions into Irish regulation before they are finalised

3.62 ComReg recognises that there is a need to adopt certain decisions with minimal delay but would note that any decision would require a thorough review before

adopting, with a view first to the national requirements of implementing the decision and how this may affect different services within a particular band.

3.63 ComReg would also note that incorporating provisional CEPT decisions into Irish regulation before they are finalised is not currently possible and has no basis in the current regulations.

3.64 However, ComReg would welcome any views in relation to the implementation of CEPT decisions.

Q. 11 ComReg seeks any additional views from interested parties on the current process for the implementation of ECC Decisions for the exemption from licensing of TSS? Please provide evidence and detailed reasoning for your views.

4 Request for Comments

4.1 All Inputs and comments are welcome. However, it would make the task of analysing responses easier if comments were referenced to the relevant section / paragraph number in each chapter and annex in this document.

4.2 Please set out your reasoning and all supporting information for any views expressed.

4.3 ComReg is aware that different stakeholders may refer to different portions of bands by the same acronym, e.g. Ka band is the spectrum band 26.5 – 40 GHz. To avoid doubt, please be specific in your responses as to the frequency range(s) you are referring to.

4.4 Recognising that this consultation spans the Christmas period, and that the mobilisation of resources may be challenging during this time, ComReg has provided an additional two weeks over the four outlined in ComReg's Consultation Procedures. The consultation period will run until 17:00 28 January 2022 during which time ComReg welcomes written comments on any of the issues raised in this paper.

4.5 Submissions must be provided in written form (e-mail) to marketframeworkconsult@comreg.ie, clearly marked – Submissions to ComReg Document 21/135.

4.6 Electronic submissions should be submitted in an unprotected format so that they may be readily included in the ComReg submissions document for electronic publication

4.7 ComReg appreciates that respondents may wish to provide confidential information if their comments are to be meaningful. In order to promote openness and transparency, ComReg will publish all respondents' submissions to this notice, as well as all substantive correspondence on matters relating to this document, subject to the provisions of ComReg's guidelines on the treatment of confidential information (Document 05/24).

4.8 In this regard, respondents should submit views in accordance with the instructions set out below. When submitting a response to this notification that contains confidential information, respondents must choose one of the following options:

A. Submit both a non-confidential version and a confidential version of the response. The confidential version must have all confidential information

clearly marked and highlighted in accordance with the instruction set out below. The separate non-confidential version must have actually redacted all items that were marked and highlighted in the confidential version.

OR

B. Submit only a confidential version and ComReg will perform the required redaction to create a non-confidential version for publication. With this option, respondents must ensure that confidential information has been marked and highlighted in accordance with the instructions set out below. Where confidential information has not been marked as per our instructions below, then ComReg will not create the non-confidential redacted version and the respondent will have to provide the redacted non-confidential version in accordance with option A above.

4.9 For ComReg to perform the redactions under Option B above, respondents must mark and highlight all confidential information in their submission as follows:

a. Confidential information contained within a paragraph must be highlighted with a chosen colour,

b. Square brackets must be included around the confidential text (one at the start and one at the end of the relevant highlighted confidential information),

c. A Scissors symbol (Symbol code: Wingdings 2:38) must be included after the first square bracket.

4.10 For example, "*Redtelecom has a market share of [✂25%].*"

5 Next Steps

5.1 When it has concluded its review of all submissions received and other relevant material, ComReg's intention would be to publish a response to consultation and a further consultation.

5.2 The further consultation document would aim to:

- Consider the design of a licensing framework that best provides for the effective management and efficient usage of the Satellite Earth Station Bands identified in this preliminary consultation and the responses;
- Propose a new fee schedule for Satellite Earth Stations that facilitates the greatest number of use cases, in order to ultimately promote greater use of the spectrum that are identified in this consultation and the responses; and
- Review the technical conditions and guidelines for the deployment of SES in the bands identified and consult on any proposed changes.

Annex 1: SES Bands

A 1.1 The tables below list the bands currently available for SES use. Where relevant (for shared bands), the other primary and secondary uses are listed.

Table 1 Frequency bands applicable to SES transmit operation

Frequency (GHz)	Other Primary (bold) and Secondary (plain) Sharing Services
5.15 – 5.25	
5.25 – 5.35	Short Range Devices (SRD)
5.35 – 5.47	
5.47 – 5.57	Meteorological, Amateur, Short Range Devices (SRD)
5.725 – 5.85	Amateur, SRD, FWA (5.725–5.875 GHz)
5.85 – 5.925	SRD, FWA (5.725–5.875 GHz)
5.925 – 6.7	L6 & U6 GHz P2P Links
6.7 – 7.075	U6 & L7 GHz P2P Links
7.9 – 8.4	L8 & U8 GHz P2P Links & Meteorological Satellite & Earth Exploration Satellite
10.7 – 11.7	11 GHz Point to Point Links
12.5 – 12.75	Satellite Exclusive Band
12.75 – 13.25	13 GHz Point to Point Links
13.75 – 14.0	Short Range Devices (SRD) (movement detection and alert equipment)
14.0 – 14.25	Satellite Exclusive Band (14.0 -14.5GHz VSAT uplinks)
14.25 – 14.5	
17.3 – 18.1	Feeder link bands for BSS
29.5 – 30.0	

Table 2 Frequency bands applicable to SES receive operation

Frequency (GHz)	Other Primary (bold) and Secondary (plain) Sharing Services
3.4 – 3.6	FWPMA & FWALA (3.4 – 3.8 GHz)
3.6 – 4.2	FWALA (3.4 – 3.8 GHz)
4.5 – 4.8	
6.7 – 7.075	U6 & L7 GHz Point to Point Links
7.25 – 7.3	L7 GHz Point to Point Links & Meteorological Satellite
7.3 – 7.45	L7 & 7 GHz Point to Point Links
7.45– 7.55	7 GHz Point to Point Links & Meteorological Satellite
7.55– 7.75	7 GHz Point to Point Links
7.9 – 8.025	L8 GHz Point to Point Links & Meteorological Satellite
8.025 – 8.175	L8 GHz Point to Point Links & Meteorological Satellite
8.175 – 8.215	L8 GHz Point to Point Links & Meteorological Satellite
8.215 – 8.4	L8 GHz Point to Point Links & Meteorological Satellite
10.7 – 11.7	11 GHz Point to Point Links
11.7 – 12.5	MMDS (if interference protection is required the tabulated fee applies.)
12.5 – 12.75	Exclusive (interference protection not required as this band is exclusive to satellite services)
17.3 – 17.7	Feeder link bands for BSS.
19.7 – 20.2	

Annex 2: Summary of legal framework and statutory objectives relevant to the management of the radio spectrum

A2.1 The Communications Regulation Acts 2002 as amended[33] (the "2002 Act"), the European Electronic Communications Code[34] (which has repealed the Common Regulatory Framework (including the Framework and Authorisation Directives),[35] the corresponding Framework and Authorisation Regulations[36] (which must be read in light of the EECC), and the Wireless Telegraphy Acts1926 to 2009[37] set out, amongst other things, powers, functions, duties and objectives of ComReg that are relevant to the management of the radio frequency spectrum in Ireland and to this preliminary consultation.

A2.2 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, Regulation 16 of the Framework Regulations and relevant provisions of the European Electronic Communications Code. ComReg is to carry out its functions effectively, and in a manner serving to ensure that the allocation and assignment of radio frequencies is based on objective, transparent, non-discriminatory and proportionate criteria.

A2.3 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

[33] The Communications Regulation Act 2002 (as amended), the Communications Regulation (Amendment) Act 2007, the Communications Regulation (Premium Rate Services and Electronic Communications Infrastructure) Act 2010 and the Communications Regulation (Postal Services) Act 2011.

[34] Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code.

[35] Directive No. 2002/21/EC of the European Parliament and of the Council of 7 March 2002 (as amended by Regulation (EC) No. 717/2007 of 27 June 2007, Regulation (EC) No. 544/2009 of 18 June 2009 and Directive 2009/140/EC of the European Parliament and Council of 25 November 2009) (the "Framework Directive") and Directive No. 2002/20/EC of the European Parliament and of the Council of 7 March 2002 (as amended by Directive 2009/140/EC) (the "Authorisation Directive")

[36] The European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No. 333 of 2011) and the European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations 2011 (S.I. No. 335 of 2011) respectively.

[37] The Wireless Telegraphy Acts 1926 to 1988 and Sections 181 (1) to (7) and (9) and Section 182 of the Broadcasting Act 2009.

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

New European Electronic Communications Code

A2.4 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.

A2.5 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[38].

A2.6 With some limited exceptions (see Article 124 of the EECC), Member States had until 21 December 2020 to transpose the EECC into national law[1]. The DECC is responsible for the transposition of the EECC[2] and ComReg has assisted the DECC in that regard as appropriate.

A2.7 ComReg understands that the EECC is unlikely to be transposed into national law until early 2022. However, for the avoidance of doubt, electronic communications providers must continue to comply with their obligations, and ComReg will continue to regulate the electronic communications sector under its existing powers, and redress mechanisms for customers will continue unchanged until new legislation is introduced.

A2.8 Notwithstanding, and for the avoidance of doubt, ComReg is satisfied that, to the best of its knowledge, the proposals contained in this document will not conflict with the objectives of the EECC or the obligations likely to be imposed on ComReg under national legislation implementing same.

A2.9 All references in this annex to enactments are to the enactment as amended at the date hereof unless the context otherwise requires.

Primary Objectives and Regulatory Principles under the 2002

[38] 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)

[1] With the exception of Articles 53(2), (3) and (4), and Article 54 (See Article 124).

[2] See, for example, https://assets.gov.ie/162712/1d774c6b-55d4-4b04-9253-8be6f24fb3ba.pdf

Act and Common Regulatory Framework

A2.10 ComReg's primary objectives in carrying out its statutory functions in the context of electronic communications are to:

- promote competition[39];
- contribute to the development of the internal market[40];
- promote the interests of users within the Community[41];
- 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[42]; and
- unless otherwise provided for in Regulation 17 of the Framework Regulations, take the utmost account of the desirability of technological neutrality in complying with the requirements of the Specific Regulations [43] in particular those designed to ensure effective competition [44].

Promotion of Competition

A2.11 Section 12(2)(a) of the 2002 Act requires ComReg to take all reasonable measures which are aimed at the promotion of competition, including:

- ensuring that users, including disabled 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 the effective management of radio frequencies and numbering resources.

A2.12 In so far as the promotion of competition is concerned, Regulation 16(1)(b) of the Framework Regulations also requires ComReg to:

[39] Section 12 (1)(a)(i) of the 2002 Act.

[40] Section 12 (1)(a)(ii) of the 2002 Act.

[41] Section 12(1)(a)(iii) of the 2002 Act.

[42] Section 12(1)(b) of the 2002 Act.

[43] The 'Specific Regulations' comprise collectively the Framework Regulations, the Authorisation Regulations, the European Communities (Electronic Communications Networks and Services) (Access) Regulations 2011 (S.I. No. 334 of 2011), the European Communities (Electronic Communications Networks and Services) (Universal Service and Users' Rights) Regulations 2011 (S.I. 337 of 2011) and the European Communities (Electronic Communications Networks and Services) (Privacy and Electronic Communications) Regulations 2011 (S.I. No. 336 of 2011).

[44] Regulation 16(1)(a) of the Framework Regulations.

- ensure that elderly users and users with special social needs derive maximum benefit in terms of choice, price and quality, and
- ensure that, in the transmission of content, there is no distortion or restriction of competition in the electronic communications sector.

A2.13 Regulation 9(11) of the Authorisation Regulations also provides that ComReg must ensure that radio frequencies are efficiently and effectively used having regard to Section 12(2)(a) of the 2002 Act and Regulations 16(1) and 17(1) of the Framework Regulations. Regulation 9(11) further provides that ComReg must ensure that competition is not distorted by any transfer or accumulation of rights of use for radio frequencies, and, for this purpose, ComReg may take appropriate measures such as mandating the sale or the lease of rights of use for radio frequencies.

Contributing to the Development of the Internal Market

A2.14 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:

- removing remaining obstacles to the provision of electronic communications networks, electronic communications services and associated facilities at Community level;
- encouraging the establishment and development of trans-European networks and the interoperability of transnational services and end-to-end connectivity; and
- 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.

A2.15 In so far as contributing to the development of the internal market is concerned, Regulation 16(1)(c) of the Framework Regulations also requires ComReg to co-operate with the Body of European Regulators for Electronic Communications (BEREC) in a transparent manner to ensure the development of consistent regulatory practice and the consistent application of EU law in the field of electronic communications.

Promotion of Interests of Users

A2.16 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 electronic communications services;
- 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.

A2.17 In so far as promotion of the interests of users within the EU is concerned, Regulation 16(1)(d) of the Framework Regulations also requires ComReg to:

- address the needs of specific social groups, in particular, elderly users and users with special social needs, and
- promote the ability of end-users to access and distribute information or use applications and services of their choice.

Regulatory Principles

A2.18 In pursuit of its objectives under Regulation 16(1) of the Framework Regulations and Section 12 of the 2002 Act, ComReg must apply 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;
- ensuring that, in similar circumstances, there is no discrimination in the treatment of undertakings providing electronic communications networks and services;
- safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure-based competition;
- 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 competition and consumers that exist in the various geographic areas within the State; and
- imposing ex-ante regulatory obligations only where there is no effective and sustainable competition and relaxing or lifting such obligations as soon as that condition is fulfilled.

BEREC

A2.19 Under Regulation 16(1)(3) of the Framework Regulations, ComReg must:

- having regard to its objectives under Section 12 of the 2002 Act and its functions under the Specific Regulations, actively support the goals of BEREC of promoting greater regulatory co-ordination and coherence; and
- take the utmost account of opinions and common positions adopted by BEREC when adopting decisions for the national market.

Other Obligations under the 2002 Act

A2.20 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;[45]
- have regard to international developments with regard to electronic communications networks and electronic communications services, associated facilities, postal services, the radio frequency spectrum and numbering[46]; 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.[47]

Policy Directions[48]

A2.21 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

[45] Section 12(3) of the 2002 Act.

[46] Section 12(5) of the 2002 Act.

[47] Section 12(6) of the 2002 Act.

[48] 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.

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.

A2.22 The Policy Directions which are most relevant in this regard include the following:

Policy Direction No.3 on Broadband Electronic Communication Networks

A2.23 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.

A2.24 ComReg is conscious that the three year objective described in this policy direction has now expired making this direction less relevant currently.

Policy Direction No.4 on Industry Sustainability

A2.25 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

A2.26 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

A2.27 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

A2.28 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

A2.29 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)

A2.30 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;
- the potential of alternative technology delivery platforms to support competition.

Other Relevant Obligations under the Framework and Authorisation Regulations

Framework Regulations

A2.31 Regulation 17 of the Framework Regulations governs the management of radio frequencies for electronic communications services. Regulation 17(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

and Regulation 16 of the Framework Regulations and the provisions of Article 8a[49] of the Framework Directive, ensure:

- the effective management of radio frequencies for electronic communications services;
- that spectrum allocation used for electronic communications services and issuing of general authorisations or individual rights of use for such radio frequencies are based on objective, transparent, non-discriminatory and proportionate criteria; and
- ensure that harmonisation of the use of radio frequency spectrum 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 economies of scale and interoperability of 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 the EU.

A2.32 Regulation 17(2) provides that, unless otherwise provided in Regulation 17(3), ComReg must ensure that all types of technology used for electronic communications services may be used in the radio frequency bands that are declared available for electronic communications services in the Radio Frequency Plan published under Section 35 of the 2002 Act in accordance with EU law.

A2.33 Regulation 17(3) provides that, notwithstanding Regulation 17(2), 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 frequency sharing,
- safeguard the efficient use of 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 17(6).

A2.34 Regulation 17(4) requires that, unless otherwise provided in Regulation 17(5), ComReg must ensure that all types of electronic communications services may be provided in the radio frequency bands, declared available for electronic

[49] It should be noted that this Article has now been effectively replaced by Article 4 of the European Electronic Communications Code.

communications services in the Radio Frequency Plan published under Section 35 of the Act of 2002 in accordance with EU law.

A2.35 Regulation 17(5) provides that, notwithstanding Regulation 17(4), ComReg may provide for proportionate and non-discriminatory restrictions to the types of electronic communications services to be provided, including where necessary, to fulfil a requirement under the ITU Telecommunication Union Radio Regulations.

A2.36 Regulation 17(6) requires that measures that require an electronic communications service to be provided in a specific band available for electronic communications services must be justified in order to ensure the fulfilment of a general interest objective as defined by or on behalf of the Government or a Minister of the Government in conformity with EU law such as, but not limited to—

- safety of life,
- the promotion of social, regional or territorial cohesion,
- the avoidance of inefficient use of radio frequencies, or
- the promotion of cultural and linguistic diversity and media pluralism, for example, by the provision of radio and television broadcasting services.

A2.37 Regulation 17(7) provides that ComReg may only prohibit the provision of any other electronic communications service 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 defined by or on behalf of the Government or a Minister of the Government.

A2.38 Regulation 17(8) provides that ComReg must, in accordance with Regulation 18, regularly review the necessity of the restrictions referred to in Regulations 17(3) and 17(5) and must make the results of such reviews publicly available.

A2.39 Regulation 17(9) provides that Regulations 17(2) to (7) only apply to spectrum allocated to be used for electronic communications services, general authorisations issued and individual rights of use for radio frequencies granted after the 1 July 2011. Spectrum allocations, general authorisations and individual rights of use which already existed on the 1 July 2011 Framework Regulations are subject to Regulation 18.

A2.40 Regulation 17(10) provides that ComReg may, having regard to its objectives under Section 12 of the 2002 Act and Regulation 16 and its functions under the Specific Regulations, lay down rules in order to prevent spectrum hoarding, in particular by setting out strict deadlines for the effective exploitation of the rights of use by the holder of rights and by withdrawing the rights of use in cases of non-compliance with the deadlines. Any rules laid down under this Regulation must be applied in a proportionate, non-discriminatory and transparent manner.

A2.41 Regulation 17(11) requires ComReg to, in the fulfilment of its obligations under that Regulation, respect relevant international agreements, including the ITU Radio Regulations and any public policy considerations brought to its attention by the Minister.

Authorisation Regulations

Decision to limit rights of use for radio frequencies

A2.42 Regulation 9(2) of the Authorisation Regulations provides that ComReg may grant individual rights of use for radio frequencies by way of a licence where it considers that one or more of the following criteria are applicable:

- it is necessary to avoid harmful interference,
- it is necessary to ensure technical quality of service,
- it is necessary to safeguard the efficient use of spectrum, or
- it is necessary to fulfil other objectives of general interest as defined by or on behalf of the Government or a Minister of the Government in conformity with EU law.

A2.43 Regulation 9(10) of the Authorisation Regulations provides that ComReg must not limit the number of rights of use for radio frequencies to be granted except where this is necessary to ensure the efficient use of radio frequencies in accordance with Regulation 11.

A2.44 Regulation 9(7) also provides that:

- where individual rights of use for radio frequencies are granted for a period of 10 years or more and such rights may not be transferred or leased between undertakings in accordance with Regulation 19 of the Framework Regulations, ComReg must ensure that criteria set out in Regulation 9(2) apply for the duration of the rights of use, in particular upon a justified request from the holder of the right.
- where ComReg determines that the criteria referred to in Regulation 9(2) are no longer applicable to a right of use for radio frequencies, ComReg must, after a reasonable period and having notified the holder of the individual rights of use, change the individual rights of use into a general authorisation or must ensure that the individual rights of use are made transferable or leasable between undertakings in accordance with Regulation 19 of the Framework Regulations.

Publication of procedures

A2.45 Regulation 9(4)(a) of the Authorisation Regulations requires that ComReg, having regard to the provisions of Regulation 17 of the Framework Regulations, establish

open, objective, transparent, non-discriminatory and proportionate procedures for the granting of rights of use for radio frequencies and cause any such procedures to be made publicly available.

Duration of rights of use for radio frequencies

A2.46 Regulation 9(6) of the Authorisation Regulations provides that rights of use for radio frequencies must be in force for such period as ComReg considers appropriate having regard to the network or service concerned in view of the objective pursued taking due account of the need to allow for an appropriate period for investment amortisation.

Conditions attached to rights of use for radio frequencies

A2.47 Regulation 9(5) of the Authorisation Regulations provides that, when granting rights of use for radio frequencies, ComReg must, having regard to the provisions of Regulations 17 and 19 of the Framework Regulations, specify whether such rights may be transferred by the holder of the rights and under what conditions such a transfer may take place.

A2.48 Regulation 10(1) of the Authorisation Regulations provides that, notwithstanding Section 5 of the Wireless Telegraphy Act,1926, but subject to any regulations under Section 6 of that Act, ComReg may only attach those conditions listed in Part B of the Schedule to the Authorisation Regulations. Part B lists the following conditions which may be attached to rights of use:

- Obligation to provide a service or to use a type of technology for which the rights of use for the frequency has been granted including, where appropriate, coverage and quality requirements.
- Effective and efficient use of frequencies in conformity with the Framework Directive and Framework Regulations.
- Technical and operational conditions necessary for the avoidance of harmful interference and for the limitation of exposure of the general public to electromagnetic fields, where such conditions are different from those included in the general authorisation.
- Maximum duration in conformity with Regulation 9, subject to any changes in the national frequency plan.
- Transfer of rights at the initiative of the rights holder and conditions of such transfer in conformity with the Framework Directive.
- Usage fees in accordance with Regulation 19.
- Any commitments which the undertaking obtaining the usage right has made in the course of a competitive or comparative selection procedure.

- Obligations under relevant international agreements relating to the use of frequencies.
- Obligations specific to an experimental use of radio frequencies.

A2.49 Regulation 10(2) also requires that any attachment of conditions under Regulation 10(1) to rights of use for radio frequencies must be non-discriminatory, proportionate and transparent and in accordance with Regulation 17 of the Framework Regulations.

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

A2.50 Regulation 11(1) of the Authorisation Regulations provides that, where ComReg considers that the number of rights of use to be granted for radio frequencies should be limited it must, without prejudice to Sections 13 and 37 of the 2002 Act:

- give due weight to the need to maximise benefits for users and to facilitate the development of competition, and
- give all interested parties, including users and consumers, the opportunity to express their views in accordance with Regulation 12 of the Framework Regulations.

A2.51 Regulation 11(2) of the Authorisation Regulations requires that, when granting the limited number of rights of use for radio frequencies it has decided upon, ComReg does so *"…on the basis of selection criteria which are objective, transparent, non-discriminatory and proportionate and which give due weight to the achievement of the objectives set out in Section 12 of the 2002 Act and Regulations 16 and 17 of the Framework Regulations."*

A2.52 Regulation 11(4) provides that where it decides to use competitive or comparative selection procedures, ComReg must, inter alia, ensure that such procedures are fair, reasonable, open and transparent to all interested parties.

Fees for spectrum rights of use

A2.53 Regulation 19 of the Authorisation Regulations permits ComReg to impose fees for rights of use which reflect the need to ensure the optimal use of the radio frequency spectrum.

A2.54 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 Regulation 16 of the Framework Regulations.

Amendment of rights and obligations

A2.55 Regulation 15 of the Authorisation Regulations permits ComReg to amend rights and conditions concerning rights of use, provided that any such amendments may

only be made in objectively justified cases and in a proportionate manner, following the process set down in Regulation 15(4).

Other Relevant Provisions

Wireless Telegraphy Act, 1926 as amended

A2.56 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.

A2.57 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 revocation) as may be prescribed in regard to it by regulations made by ComReg under Section 6.

A2.58 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.

A2.59 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.

A2.60 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.

Broadcasting Act 2009 (the "2009 Act")

A2.61 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)

A2.62 Article 4 of the Competition Directive 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.
> - The assignment of radio frequencies for electronic communication services shall be based on objective, transparent, non-discriminatory and proportionate criteria."