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Fixed Radio Links

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Chapter 1

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. 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.

1.2 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 disperse infrastructure, for example water reservoir levels and remote power transformers.

1.3 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.

1.4 A key service for telecommunication infrastructure development is the fixed service ("FS") which is a radio communication service between specified fixed geographic points. Some examples of FS applications are transport

[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.

networks (trunking, multi-hop, etc.), mobile backhaul networks, fixed wireless access ("FWA")[3] and temporary networks (electronic news gathering and disaster relief).

1.5 This is ComReg's fourth fixed links annual publication since 2019. The purpose of this report is to set out the most up to date information regarding the licensing of fixed radio links granted under S.I. 370 of 2009.[4] The report also provides an update on the demand and trends in fixed link licensing since the fixed links annual report published in November 2021[5], information on recent improvements to the fixed radio links application process on ComReg's eLicensing website[6], along with information on the European Conference of Postal and Telecommunications Administrations ("CEPT")[7] current fixed services work programme.

1.6 Separately, and as outlined in its Annual Action plan for 2021-2022[8], ComReg continued to advance its review of the fixed radio links licensing regime and associated frequency bands. The objective of the review is to assess the current fixed radio links licensing regime and consider what, if any, changes are required to ensure that the regime is fit for purpose and capable of facilitating future use of fixed radio links and other electronic communication services. In this regard ComReg published its Response to Consultation, draft Decision and draft Regulations on 9 November 2022[9].

1.7 The remainder of this report is structures as follows:

- **Chapter 2** provides the trends on the licensing of fixed radio links in Ireland.
- **Chapter 3** provides information on the frequency bands allocated for fixed radio links up to 30 June 2021.
- **Chapter 4** provides information on ComReg's fixed radio links review project.
- **Chapter 5** provides information on ComReg eLicensing application

[3] Fixed Wireless Access means a radiocommunication services between a base station and fixed subscriber terminals locations

[4] http://www.irishstatutebook.ie/eli/2009/si/370/made/en/pdf

[5] ComReg Document 21/97 – Fixed Radio Links Report Annual Report for 2021 https://www.comreg.ie/publication/fixed-radio-links-annual-report-2021

[6] https://elicensing.comreg.ie/

[7] https://www.cept.org/

[8] https://www.comreg.ie/media/2021/07/Annual-Action-Plan-Ye-30-06-2022-as-at-1-07-2021.pdf

[9] https://www.comreg.ie/publication/review-of-the-fixed-radio-links-licensing-regime-response-to-consultation-and-draft-decision-including-draft-regulations

system.

- **Chapter 6** provides information on the CEPT's work programme for fixed services.

Chapter 2

2 Fixed Links Licensing Trends

2.1 During the 2017-2022 period, the demand for fixed radio link licences in the frequency bands ranging from 1.3 GHz to 80 GHz continued to increase, notably in fixed radio link Point-to-Point ("P-P)[10]. As of 30 June 2022, 15,151 P-P links[11] (see Figure 1) and 22 fixed radio link Point-to-Multipoint licences ("P-MP")[12] (see Figure 2) licences were live in Ireland. The number of P-P radio links has increased by 6% while the number of P-MP radio links has remained the same during the same period.

2.2 The increase in number of live P-P links during the 2021-2022 operating year can, in the main, be attributed to continued operator improvement of their backhaul and fixed/wireless broadband networks to address growing consumer demand for increased data capacity. The increase in demand for data capacity can be seen in ComReg's most recent Quarterly Key Data Report for Q2 2022[13]. For example, in Q2 2022, total fixed broadband traffic increased by 3.8% while total mobile data increased 34.3% compared to the same period last year.

[10] A point-to-point – provides a radio communication service by a link between two stations located at specified fixed points.

[11] For dual polarity links the vertical polarisation (V) is counted as one link and the horizontal polarisation (H) is counted as a separate link

[12] A point-to-multipoint provides a radio communication service by links between a single station located at a specified fixed point and a number of stations located at specified fixed points.

[13] ComReg Document ComReg 22/76– QUARTERLY KEY DATA REPORT – Q2 2022 – published 8 September 2022 - quarterly key data report (comreg.ie)

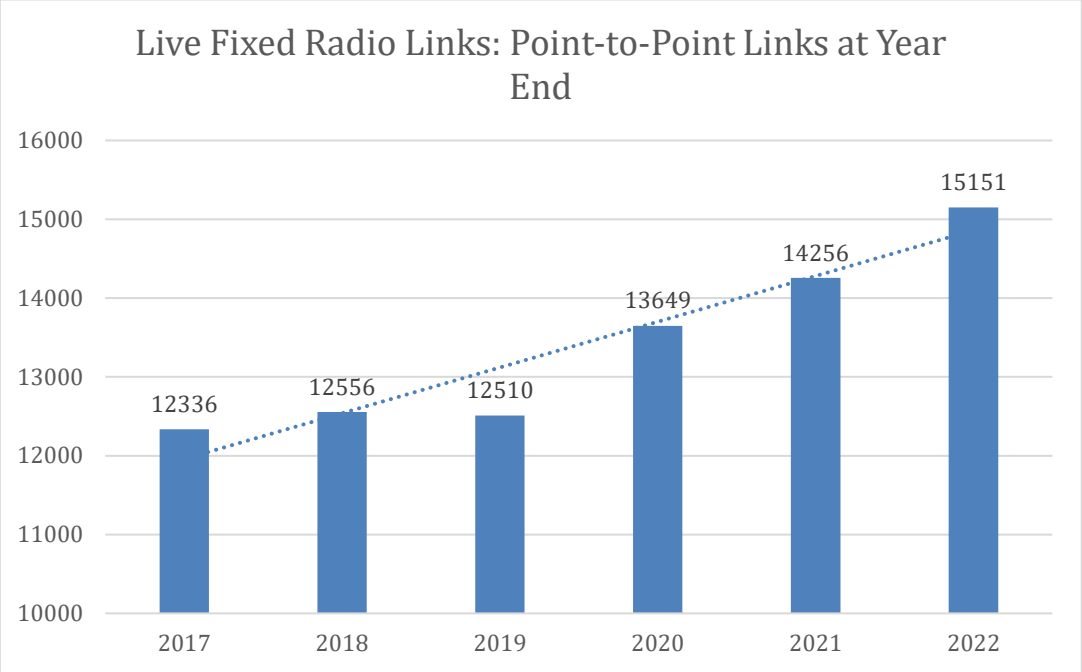

Figure 1: Live Point-to-Point Fixed Links at Year End 30 June 2017 - 2022

2.3 The number of live P-MP licences remains unchanged since the 2020 – 2021 Report. Of the 22 P-MP fixed radio link licences, 20 are held by Eir and 2 licences are held by the Office of the Government Chief Information Officer[14]. The notable decline in P-MP licences during 2018-2020 was in the main due to the ESB cancelling its P-MP licences as it migrated to its SCADA[15] telemetry network, utilising its national telemetry licence[16].

[14] gov.ie - Office of the Government Chief Information Officer (www.gov.ie)
[15] Supervisory, Control and Data Acquisition
[16] https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/telemetry/

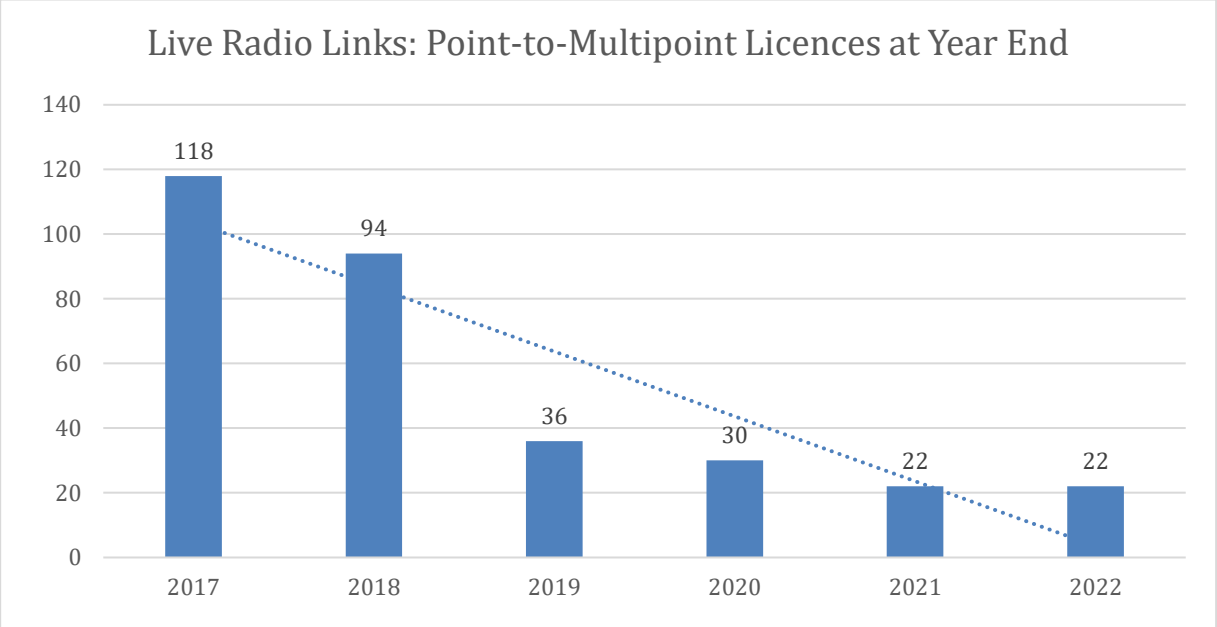

Figure 2: Live Point-to-Multipoint Licences at Year End 30 June 2017-2022

2.4 The number of reports of harmful interference to fixed links continues to decline as outlined in Figure 3 below. The low instances of harmful interference reflects the benefit of having a licensing regime that co-ordinates fixed radio links, providing applicants with more information on fixed links deployments, as we outline in Chapter 3 below, and the ongoing and proactive nature of engagements between ComReg's Spectrum Intelligence and Investigations (SII)[17] team and licensees.

[17] https://www.comreg.ie/industry/radio-spectrum/spectrum-compliance/

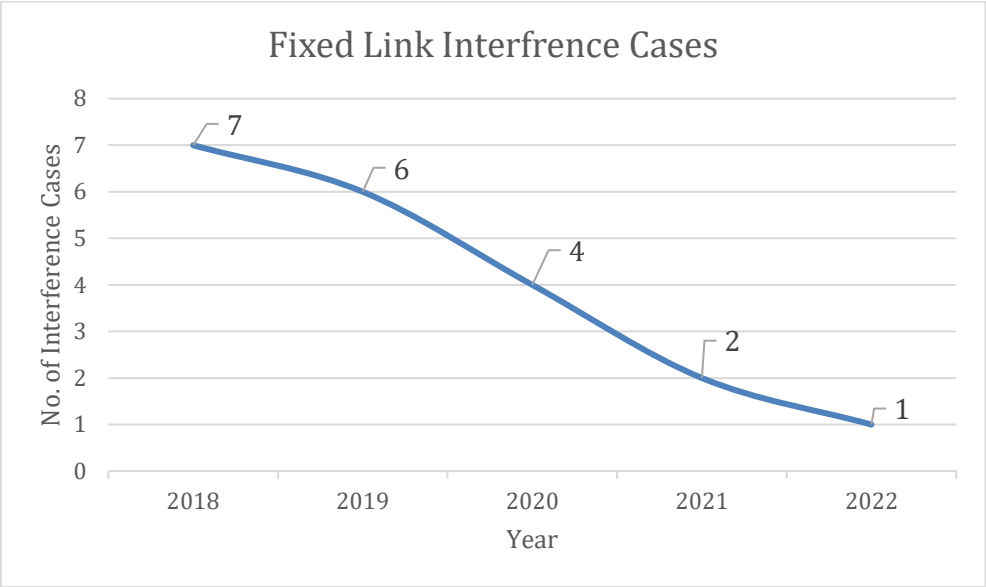

Figure 3: Fixed Link Harmful Interference Cases at Year End 30 June 2018-2022

2.5 Figure 4 below sets out those licensees that held the most fixed radio links at 30 June 2022. The mobile network operators and FWA operators continue to account for circa 80% of all licensed fixed radio links in Ireland, a ratio that has increased by 6% since 2021, which is the same increase between 2020 and 2021. The most notable increases come from Viatel Ireland Ltd (+30%), Vodafone Ireland Limited (+13%) and Virgin Media Ireland Ltd (+12%).

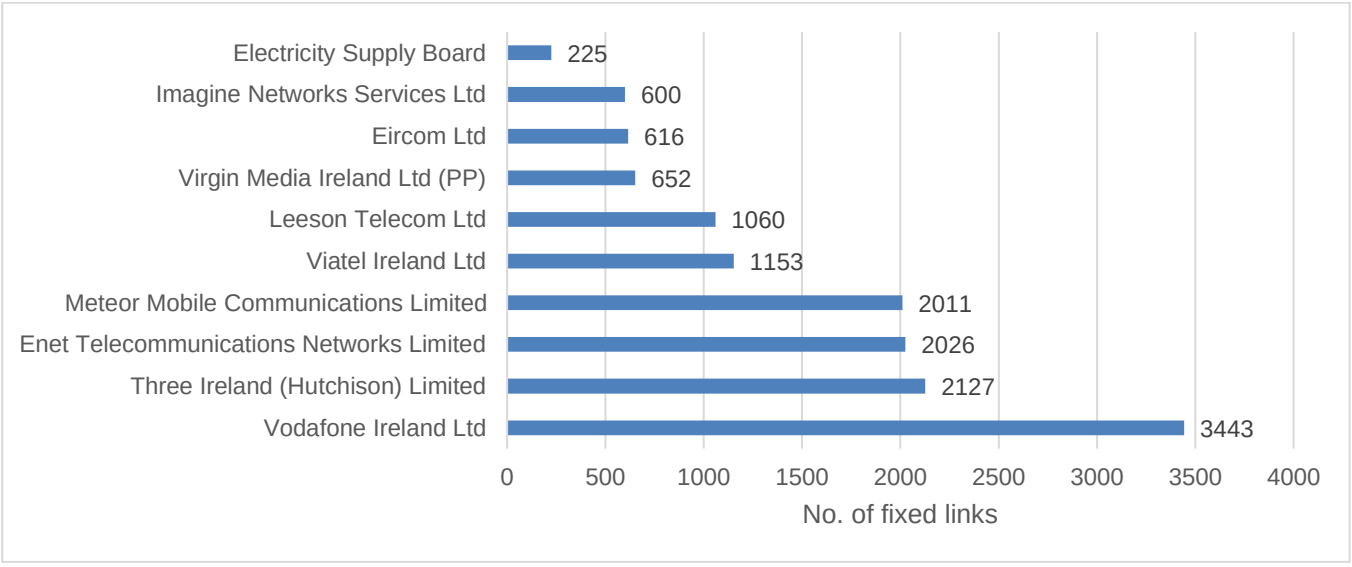

Figure 4: Top 10 Fixed Links Licensees as of 30 June 2022

Chapter 3

3 Fixed Radio Links Frequency Bands

3.1 Twenty frequency bands are currently available for P-P and P-MP fixed radio link licensing and the channel arrangements for those bands based upon internationally agreed allocation made by the ITU and CEPT[18]. While the number of fixed radio links deployed in Ireland continues to grow, certain frequency bands are more in demand than others. The demand for frequency bands for fixed radio links is being shaped by three main trends:

- Increasing bandwidth requirements shifting demand to higher frequencies, in particular the 80 GHz band and also the 18 GHz band;
- an increase in capacity requirements and use of dual polarisation where wider channels are not available; and
- some replacement of microwave links by fibre.

3.2 As outlined in Chapter 2, there are currently 15,151 live P-P fixed radio link licences in Ireland. The continued demand for fixed radio link licences is driven in part by operator's increasing the capacity of their networks to address consumer's current and future demand for data due to the roll-out of new technology standards.

3.3 Figure 5 shows the total number of fixed radio links per frequency band (from 1.3/1.5 GHz to 80 GHz) for the end periods 30 June 2019, 2020, 2021 and 2022. The frequency bands 11 GHz to 23 GHz, 38 GHz and 80 GHz continue to be the most used frequency bands for fixed radio link deployment.

[18] ECO Documentation (cept.org)

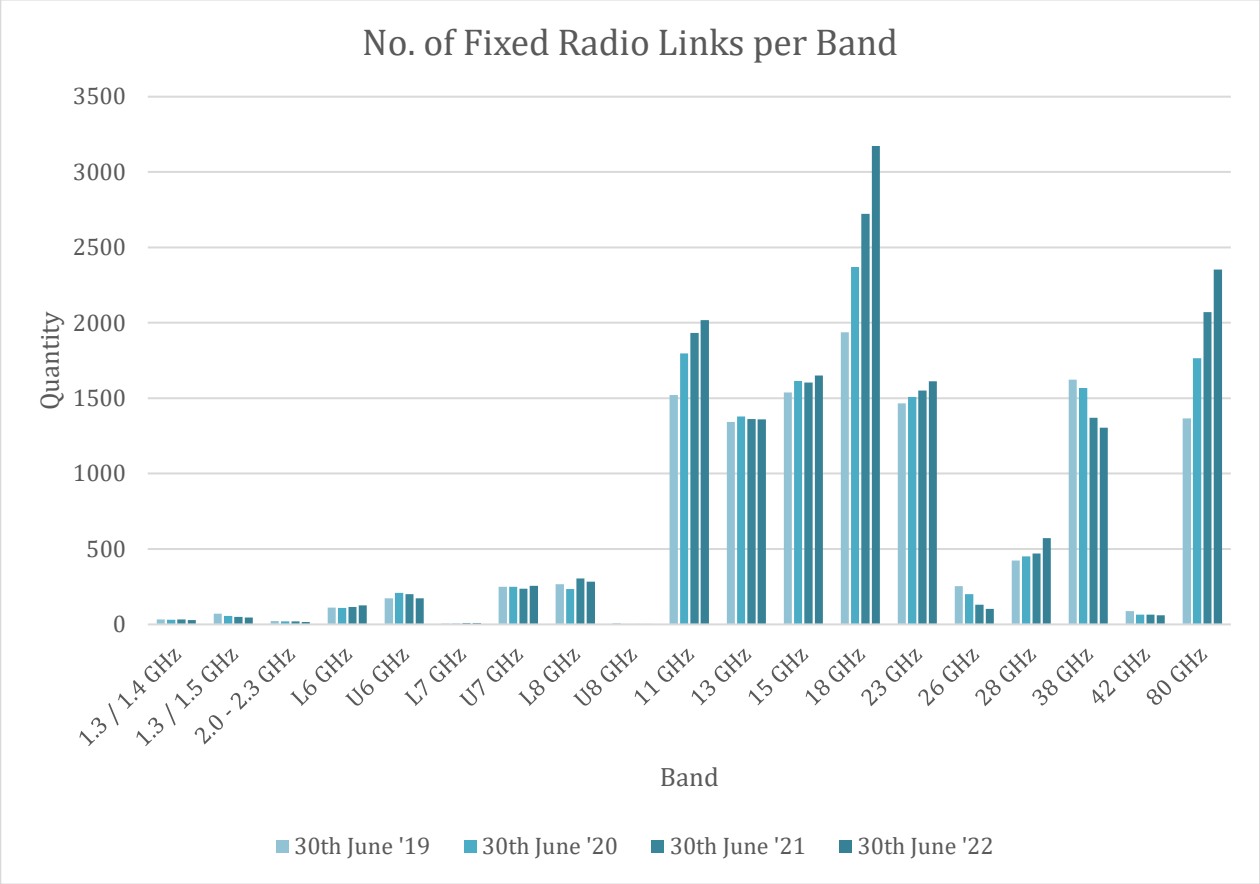

Figure 5: Number of fixed radio links per band (2019 – 2022)

3.4 The number of radio links in the frequency bands 11 GHz to 23 GHz and 80 GHz has steadily increased over the last three years. The increase in these bands can be attributed to the roll out of the "Bands and Carrier Aggregation" concept. Bands and Carrier Aggregation ("BCA") is a technology that combines multiple frequency bands over the same radio link to increase the capacity of a link. An example of BCA is using the 15 GHz band with 80 GHz band on the same radio link over 6-8 km.[19]

3.5 The sustained reduction of licences in the 26 GHz, 38 GHz and 42 GHz bands can likely be attributed to the mobile network operators migrating links to their 26 GHz national block licences which were awarded in 2018[20], given the similar propagation characteristics.

3.6 The decrease in use experienced in the 1.3 – 1.5 GHz band is due to non-renewal of licences as some licensees have migrated to other technologies such as satellite or to other frequency bands or fibre due to bandwidth

[19] See ECC Report 320 - https://docdb.cept.org/download/55908dee-b5e4/ECC%20Report%20320.pdf
[20] See ComReg Document 18/31 at www.comreg.ie

limitations in the 1.3 – 1.5 GHz band. ComReg notes that the1.4 GHz Band[21] is harmonised at an EC level[22] for WB ECS and Licensees may be migrating from the band in advance of any future award by ComReg of some or all of the 1.4 GHz Band to facilitate the introduction of Wireless Broadband ("WBB") and/or Mobile/Fixed Communications Network ("MFCN") in the band.

[21] The 1.4 GHz Band (1427 – 1517 MHz) consists of the 1.4 GHz Centre Band (1427-1452 MHz) and the 1.4 GHz Extension Bands (1427-1452 MHz and 1492 – 1517 MHz).
[22] The 1.4 GHz Band is harmonised in Commission Implementing Decision 2015/750 as amended by Commission Implementing Decision EU 2018/661 of 26 April 2018.

Chapter 4

4 Fixed Radio Links Review

4.1 In 2020, ComReg commenced a project to review its Fixed Radio Links licensing regime and associated frequency bands ("The Fixed Links Review")[23].

4.2 To inform its considerations, ComReg and its expert advisors DotEcon/Axon conducted a detailed and comprehensive stakeholder engagement process with over 90 licensees, vendors, and equipment suppliers. This engagement revealed that any new licensing framework should provide for five existing use cases[24] and two potential use cases[25]. It also provided important background information regarding recent trends in demand for the various use cases identified.

4.3 ComReg has conducted two rounds of consultation (ComReg Documents 20/109[26] and 21/134[27]) enabling interested parties to submit their views on ComReg's proposals for a new Fixed Radio Link licensing regime.

4.4 In November 2022 ComReg published its Response to Consultation and draft Decision including draft Regulations[28] ("draft Decision"). This publication sets out ComReg's draft Decision on the proposed new Fixed Link licensing framework and potential improvements that would better ensure the efficient use of the radio spectrum.

4.5 ComReg expects to publish its final Decision and final Regulations on this matter in 2023 and, subject to ministerial approval of the Regulations to implement a new Fixed Link licensing framework shortly thereafter.

[23] https://www.comreg.ie/media/2021/05/Action-Plan-Ye-300621-Update-as-at-14-May-2021.pdf

[24] Narrowband telemetry and control applications, broadcast distribution, backhaul from mobile cell sites, fixed wireless access, links within core networks

[25] Advanced FWA & specialist low latency links

[26] ComReg Document 20/109, "*Review of the Fixed Radio Links Licensing Regime*", published 9th November 2020, available at https://www.comreg.ie/

[27] ComReg Document 21/134, "*Review of the Fixed Radio Links Licensing Reg*ime", published 17th December 2021, available at https://www.comreg.ie/

[28] ComReg Document 22/93 – *"Review of the Fixed Radio Links Licensing Regime - Response to Consultation and Draft Decision including Draft Regulations"* available at https://www.comreg.ie/

Chapter 5

5 Siteviewer

5.1 In its Proposed Strategy for Managing the Radio Spectrum 2022 to 2024[29], ComReg committed to making fixed radio links information publicly available on https://siteviewer.comreg.ie/.

5.2 In that regard, ComReg intends to publish a consultation in Q1 2023 regarding its proposal to publish radio licence information in a transparent and accessible manner. The proposal would provide further information, in an open and transparent way, for the benefit of an array of interested parties and would be in-line with Government's strategic objective of making data held by public bodies discoverable by citizens, businesses, and the Public Service.

5.3 In addition, the publication of radio spectrum licence information would be beneficial to Electronic Communication Network/Service providers ("ECN/ECS") providers as it would assist them in the better planning and deployment of networks and services across a range of frequency bands. This could in turn result in more informed licence applications being submitted and reduce ComReg's licencing assessment and processing time.

[29] Proposed Strategy for Managing the Radio Spectrum 2022 to 2024 ComReg Document 21/90 - https://www.comreg.ie/media/2021/09/ComReg-2190.pdf

Chapter 6

6 CEPT's Fixed Services Programme

6.1 The CEPT and ITU, in consultation with administrations, determine which frequency bands should be allocated for fixed services, and publish recommendations on the channel arrangements for those bands. As part of that role, CEPT also has a Spectrum Engineering project team (SE 19)[30] which considers matters regarding fixed services and regularly publishes reports and recommendations on the use of P-P and P-MP fixed radio links.

6.2 SE 19 has several current work items on the future use of the fixed service and ComReg will take these into account as part of the fixed radio links review.

6.3 ComReg actively monitors SE 19 meetings and welcomes any views that interested parties may have regarding the SE 19 work items listed below. Any such views may be sent to licensing@comreg.ie or as part of submissions in response to the ongoing consultation on the fixed radio links review.

Subject	Scope	Start / Target dates	Deliverable
To derive a methodology for protection criteria for FS except long term	To derive a general methodology for "short term" criteria for Fixed service and evaluate the relationship between "long term" and "short term" protection criteria and FDP (Fractional Degradation of Performance).	S: 02-10-2019 T: 16-10-2023	ECC Report
Revision of ECC Report 173	To study and gather up to date information related to developments in the FS in CEPT	S: 20-05-2020 T: 30-06-2023	ECC Report
Representative FS parameters for sharing and compatibility studies	To collect up to date technical FS parameters from CEPT countries and compile thereof a set of representative technical FS parameters for each FS band to be used in sharing and compatibility studies.	S: 11-01-2021 T: 31-01-2024	ECC Report

Table 1: SE 19 Work Programme

[30] CEPT.ORG - ECC - Groups - ECC - WG SE - SE 19 - News