An Coimisiún um
Rialáil Cumarsáide

Commission for
Communications Regulation

Electronic Communications
Strategy Statement
2021 to 2023

Legal Disclaimer

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Foreword

There can be no doubt that the Covid-19 pandemic has reshaped global society, transforming how we operate as individuals, as families, and as workers and businesses. Notwithstanding the threat to our health and our healthcare system, the impact of Covid-19 on Ireland has been profound – from economic uncertainty to social isolation. Despite these seemingly insurmountable challenges, Irish society has shown great resilience as we rebuild the economy in the years ahead.

The electronic communications sector has played a central role in fostering this resilience, supporting our essential services, and enabling us to stay connected in new ways. Throughout the pandemic, telecommunications operators have generally been able to cope with the surge in network traffic with little disruption. This will only continue to be possible through further investment in reliable, high-quality networks and improved customer care, especially for those end-users who do not have sufficient connectivity to benefit from new remote learning, teleworking, e-commerce, and e-health services that have arisen in response to the pandemic.

As the regulator for the communications sector, ComReg strives to ensure the electronic communications markets operate in the interest of all end-users – especially vulnerable users – and to incentivise efficient investment where competition may be insufficient. The new European Electronic Communications Code will provide an updated regulatory framework by which to strengthen our tools of competition

and compliance in light of these new technological and market developments. We also look forward to the implementation of primary legislation to enhance our enforcement powers, as set out in the Programme for Government, and welcome the recent increase in ComReg's resources to ensure the effective delivery of our work programme.

This document sets out our high-level Five-Year Strategy for the electronic communication sector and our programme of work over the next two years to implement this Strategy. The Strategy reaffirms our vision, mission, and values, with an increased emphasis on the importance of resilience in the sector and the need for continued high-quality investment.

An effective strategy is not created in a vacuum, and we would like to thank our stakeholders for their active engagement in the development of this Strategy. We look forward to continuing this dialogue and progressing our vision for the sector – that consumers and businesses in Ireland have affordable, high-quality, and widespread access to secure communications services and applications that support their social and economic needs.

Garrett Blaney
Chairperson

Jeremy Godfrey
Commissioner

Robert Mourik
Commissioner

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Executive
Summary

1. Executive Summary

1.1 Five years ago, it would have been difficult to predict the scale of the transformation of the electronic communications sector and the impact of global challenges, such as the Covid-19 pandemic. Today, the electronic communications sector plays a vital role in supporting consumers and businesses to live, work and communicate as our society and economy adapts to the challenges presented by the pandemic.

1.2 Access to high quality and resilient communications networks and services have become integral to the social and economic fabric of Ireland. The retail Irish Communications market is now worth €3.5 billion a year[1] as consumers avail of a range of products and services including home phones, home broadband and mobile phone services. Today over 72% of Irish households avail of a home broadband service and consume over 5 billion gigabytes of data per year, an increase of over 200% in the last five years.

1.3 Electronic Communications Services ('**ECS**') and Electronic Communications Networks ('**ECN**'), together referred to as 'the ECS sector', play an important role in shaping our economy and enabling the digital economy. As we look forward, it is impossible to foresee all of the technological and social innovations that will shape the way we live and work.

However, what does appear certain is that the ECS sector will play an increasingly central role. The next five years will see transformational change in the sector, as commercial investment in fibre and mobile network rollout and public investment through the National Broadband Plan put us within touching distance of ubiquitous coverage of high quality fixed and mobile networks by 2026.

1.4 The European Electronic Communications Code ('**EECC**'), the new regulatory framework for the sector and one of the pillars of the EU Digital Single Market initiative, includes a number of new regulatory powers and tools for ComReg. The EECC also includes a new principal objective, connectivity – to foster investments in Very High Capacity Networks ('**VHCN**'). The EU has also introduced a number of policies to complement the Connectivity Objective, including the Connectivity Toolbox[2] and Recommendation[3] calling on EU Member States to boost investment in VHCN and connectivity infrastructure.

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1 The total retail revenues of the Irish communications market for the year 2020 (Q1-4), Source: ComReg QKDR
2 https://digital-strategy.ec.europa.eu/en/policies/connectivity-toolbox
3 https://ec.europa.eu/digital-single-market/en/news/commission-recommendation-common-union-toolbox-reducing-cost-deploying-very-high-capacity

The Role of ComReg

1.5   The Commission for Communications Regulation (ComReg) was established on 1 December 2002, replacing the Office of the Director of Telecommunications Regulation ('**ODTR**'), which had existed since 1997. ComReg is the statutory body responsible for the regulation of ECS, ECN, associated facilities[4] and the postal sector in Ireland. We have a wide range of responsibilities in the sectors we regulate and operate under Irish and EU legislation in these areas.

1.6   While the role of regulation has changed over the last 20 years, the basic tenet of regulation remains the same – to facilitate competition principally through the regulation of network access where bottlenecks exist, to protect consumers and to encourage innovation in the sector. Providing regulatory certainty and consistency helps ensure the right incentives to invest exist. Our role therefore involves dealing with complex issues of law, economics, and technology, and ensuring that our decisions are timely, taken fairly and are clearly explained.

Our Strategy

1.7   Under the Communications Regulation Act 2002 (as amended), we are obliged to publish a Strategy Statement document every two years. We have decided to adopt a five-year perspective when developing this strategy for the period 2021-2026. This five-year time horizon allows us focus on medium-term developments and innovations that will shape the role of regulation in the future.

1.8   Our Five-Year ECS Strategy, set out in this document, outlines our Vision, Role, Mission and Strategic priorities, including Goals, for the period 2021-2026. This document also acts as our Strategy Statement for the period 2021-2023 and sets out the various projects and programmes of work we will undertake to implement the first

two years of our Five-Year ECS Strategy. In 2023 we will publish a further Strategy Statement, which will incorporate a mid-term review of our Five-Year ECS Strategy.

Our vision for the communications sector for the next five years

1.9   Our vision is of a sector where *Consumers and businesses in Ireland have affordable, high-quality, and widespread access to secure communications services and applications that support their social and economic needs.*

Our role and mission

1.10   Our role and mission set out the contribution that ComReg makes toward achieving the vision for the sector. As an economic regulator, our role is to *ensure that communications markets operate in the interests of end-users and society. Ensuring a well-regulated market is one of the most important tools in working towards our vision of the communications sector.*

1.11   Our Mission is therefore that *effective and relevant regulation, we facilitate the development of a competitive communications sector in Ireland that attracts investment, encourages innovation, and empowers consumers to choose and use communications services with confidence*

Context

1.12   There are a number of global and macroeconomic trends that are likely to shape the wider economy, industry, and consumer behaviour over the coming decade. These include:

◉   **Economic uncertainty**: arising out of the impact of the Covid-19 pandemic, Brexit and changing international trade and taxation matters.

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4   Including telecommunications, radiocommunications and broadcast transmission services.

- **Digitalisation**: The digital ecosystem is rapidly evolving as consumers become more reliant on ECN/ECS, online/digital services and platforms.

- **Sustainability**: The ECS sector can play an important role in creating a more sustainable economy. The carbon footprint of the sector is also changing as new networks get deployed.

1.13 In addition, from an examination of the future evolution of the sector it is apparent that there are a number of relevant sectoral trends that will shape the sector over the coming decade. These include:

- **Connectivity & New Technologies**, including investment in commercial networks, the National Broadband Plan and 5G technologies.

- **Network Demand, Network Security and Resilience**: the demand on ECN has grown considerably as more people work remotely. Issues around network security, integrity and resilience are expected to grow in importance as end-users become more reliant on ECN / ECS.

- **Consumer Experience**: consumer use and adoption of ECS and associated technologies will continue to evolve as new networks and services become available, however consumer experience may not evolve uniformly across all consumer types or geographic areas.

- **Related Markets**: The evolution of related markets and ecosystems, including input markets (e.g. ECN / ECS equipment), complementary markets (e.g. mobile handsets), downstream markets and the digital ecosystem, will shape the adoption, use and experience of ECN / ECS.

- **The Future of Regulation**: The EECC and other legislative changes/proposals will impact the way ComReg regulates the ECS sector and potentially the scope of our role and remit.

ComReg's Strategic Intent

1.14 The tools available to us to deliver our role and mission derive from our regulatory powers. For each of these areas, we have developed a statement of strategic intent, and goals that support the strategic intent.

Competition & Investment

1.15 Our guiding principle is that where competition is sustainable, markets deliver optimal outcomes in terms of investment and price, quality, choice, and innovation, ultimately to the benefit of consumers. Timely regulatory intervention by ComReg helps ensure that the various electronic communications markets operate effectively, efficient investment occurs and scarce resources, such as spectrum and numbers, are managed appropriately. As the competitive landscape in Ireland evolves, the scope of regulation changes. This means, for example, that ComReg can target the regulation of access in upstream markets where bottlenecks persist and exit regulation elsewhere where that is appropriate. The strategic intention associated with this role is that **the electronic communications sector in Ireland is a competitive sector that delivers efficient investment, innovation, and choice.**

1.16 Under this Intent, ComReg has a number of activities planned:

- Monitoring of relevant retail, wholesale, and related markets, including the Irish Mobile Market and digital markets (e.g. gateway platforms).

- Timely Market Review decisions, updating our key market analyses over the 5-year period.

- Ensuring regulatory certainty (including timely signals on pricing and rates of return) to facilitate efficient investment.

- Engage with stakeholders on the orderly transition from legacy networks.

- Completion of key spectrum and numbering projects that are currently underway, including the MBSA2 auction, review of Fixed Links and 'Over the Air' Provisioning.

Consumer Protection

1.17 Consumer Protection involves setting rules to ensure that consumers can access basic services and that they are armed with the information they need to engage in the market with confidence. At each stage of the Consumer Journey, ComReg's actions help ensure consumers are protected from harms, informed of their rights, aware of service offerings and have access to a range of market information tools. New consumer rights, introduced under the EECC, impose a range of new regulatory obligation on service providers and will enhance the protection for consumers navigating and using ECN and ECS. The strategic intention associated with this role is that **consumers can choose and use electronic communications services with confidence.**

1.18 Under this Intent, ComReg has a number of activities planned:

- Monitoring of new obligations placed on Industry, including those relating to Contract Summary information and Best Tariff Advice.

- Provision of useful market information tools, including Comparison Tools and Coverage Map.

- Proactive consumer engagement to address issues faced by consumers.

Connectivity & Network Resilience

1.19 As we become increasingly reliant on digital platforms, online media and remote working, the importance of widespread, continuous, and high-quality connectivity increases. As our reliance on ECN / ECS has grown, we have also become more dependent and reliant on the proper functioning of our networks and services. ComReg's role in this area is to have a holistic understanding of connectivity

deficits and network security and resilience issues facing the country, to use the regulatory tools available to us to address these deficits and to support others (e.g. State Aid intervention by DECC) who have relevant tools as a knowledgeable and informed regulator. The strategic intention associated with this role is **that end-users have widespread access to high-quality and secure communications networks, services, and applications**.

1.20 Under this Intent, ComReg has a number of activities planned

1.21 Further develop our understanding of the connectivity and digital inclusion issues affecting end-users and how these can be addressed.

- Compile geographic maps of broadband networks, including forecast network coverage.Assist DECC and other state bodies and agencies (through technical advice, etc.) where required (e.g. matters relating to the NBP).

- Network Resilience project, focussing on issues that may arise in different components of ECN network elements.

Compliance and Enforcement

1.22 Regulatory obligations have no effect unless regulated entities comply with them. An effective compliance and enforcement strategy underpins the previous three strategic intentions. ComReg's view is that a strong and effective deterrence regime and regulatory powers help develop a positive culture of compliance within the ECS sector. We continuously monitor the application of regulatory obligations to ensure markets develop properly and seek to take targeted enforcement action in a way that maximises the effectiveness of the regulatory regime. The strategic intention associated with this role is that **regulated entities comply with regulatory requirements**. Under this Intent, ComReg has a number of activities planned:

- Proactive monitoring of regulatory obligations on ECN / ECS providers.

- Continue to review the effectiveness of the RGM Settlement Agreement and consider if more regulatory actions are necessary.

- Continue to work with Government to ensure ComReg has an effective enforcement regime.

ComReg's Organisation

1.23 The electronic communications sector is fast moving, complex and increasingly fundamental to the functioning of Irish society and business. To enable us to undertake our role and adapt to the changing expectations, we must continue to ensure that **we are an effective, agile, and relevant regulator**. We do this through being a well-informed regulator, utilising high-quality data and the best-practice analytical techniques to inform our regulatory decisions. Our organisation is staffed by skilled experts whose work is underpinned by efficient organisational processes and a mandate that meets the needs of the sector.

1.24 Under this Intent, ComReg has a number of activities planned:

- Continue to develop an in-depth knowledge of markets, consumers, technologies, and regulatory areas relevant to our role.

- Engage with stakeholders through a variety of channels, including industry forums, conferences, our website, and our outreach activities.

- Engage with other regulatory bodies and Government in the development of regulation for digital markets and platforms.

- Develop ComReg's role relating to eIDAS and the Free Flow of Data Regulation.
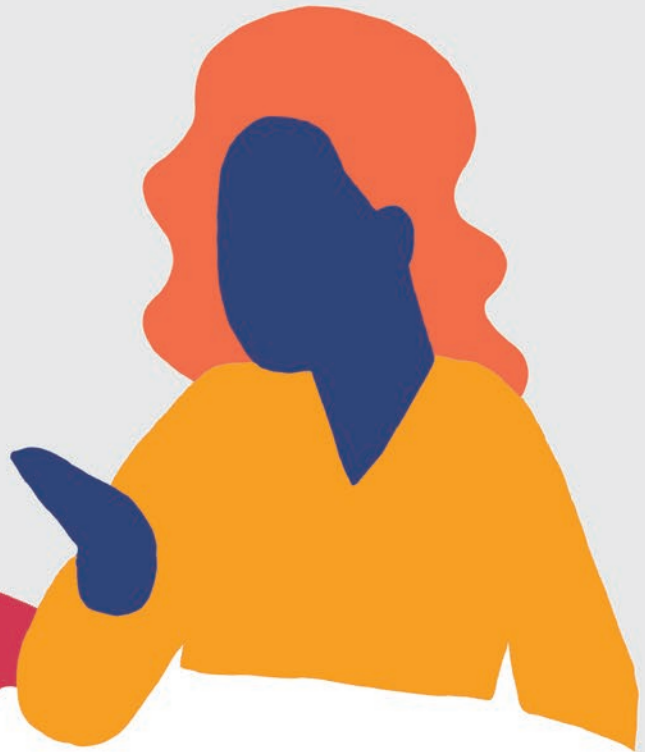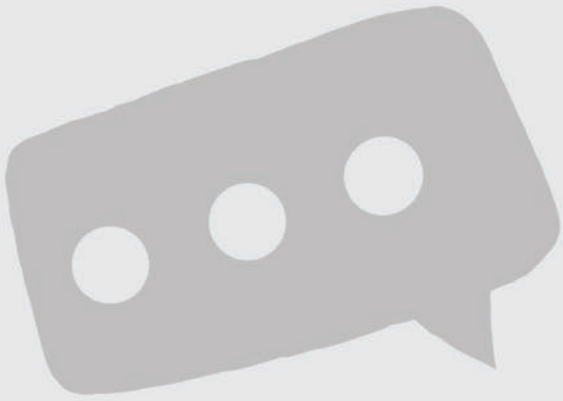
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Introduction

2. Introduction

Background

2.1 Electronic communications services ('**ECS**') – such as broadband, mobile, and the fixed (home) telephone services – impact our lives in new ways every day. Today, as the country continues to deal with the Covid-19 pandemic, our electronic communications have become central to everything we do and how we do it. Innovation, new technologies and digital services have transformed our social and economic life. From how we stay in contact with friends and family, through to how we consume our entertainment, work or conduct our business, to how we interact with public services (e.g. education and health), there is virtually no part of our lives that is not potentially affected by our ability to connect digitally.

2.2 Over the last five years operators have continued to invest heavily in ECS and electronic communications networks ('**ECN**'). Today 1.47 million premises in Ireland can access a Very High Capacity network ('**VHCN**') capable of delivering a broadband service greater than 500Mbps[5]. Over the next five years, continued investment will deliver near ubiquitous fixed VHCN coverage. Additional investment in mobile and wireless network coverage will also enhance 4G coverage and begin to provide a greater availability of 5G services across the country.

2.3 The strategic importance of this investment has been underlined by our experience of the Covid-19 pandemic. Trends toward digitalisation have accelerated. As well as affecting how and what goods and services we consume, there are also profound social consequences affecting, for example, how and where we work, where we live, and the sustainability of our economy. The essential nature of connectivity has never been more apparent.

Our Operating Environment

2.4 Established on 1 December 2002, the Commission for Communications Regulation (ComReg) is the statutory body responsible for the regulation of the ECS sector[6] and the postal sector in Ireland. We have a wide range of responsibilities in the sectors we regulate and operate under Irish and EU Legislation in these areas. This Strategy Statement relates to the regulation of ECN and ECS[7].

2.5 Broadly speaking, we are responsible for facilitating competition, for protecting consumers and for encouraging innovation. Our role involves dealing with complex issues of law, economics, and technology, and ensuring that our decisions are taken fairly and are clearly explained to our stakeholders.

2.6 The economic characteristics of the various retail and wholesale ECS markets are fundamental to the dynamics in the overall sector. For example, the commercial nature of private investment may mean that high-quality electronic communications networks are only rolled out in certain areas (e.g. urban areas) while in other areas (e.g. rural areas) the quality of basic networks may not be maintained where costs are higher.

2.7 These economic characteristics and market failures impede the ability of the normal competitive process to yield welfare optimal outcomes. The objective of economic regulation in the ECS sector is to attempt to correct or compensate for the presence of market failures through appropriate interventions. Many of ComReg's statutory functions and legal powers map back to an underlying market failure.

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[5]   For the purposes of this document, VHCN refers to networks that offer download speeds in excess of 500Mbps.
[6]   Including telecommunications, radiocommunications and broadcast transmission services.
[7]   This Strategy Statement relates to the regulation of ECN and ECS. ComReg publishes a separate Postal Strategy Statement every two years.

2.8 ComReg uses the various legal powers available to it to regulate the activities and behaviours of relevant industry players operating in Ireland. These industry players include service providers offering wholesale and/or retail services in the ECS sector, such as Eircom Limited, Virgin Media Ireland Limited, Vodafone Ireland Limited, Sky Ireland Limited, BT Ireland, Three Ireland[8], NBI Infrastructure DAC and a range of other ECN / ECS providers and Premium Rate Services providers.[9]

2.9 There are a number of other key groups, organisations and bodies who play a role in the development of the ECS sector in Ireland, including:

- 'End-Users', including Consumers, Business users of retail ECN / ECS.

- Industry, Service Providers, and Investors offering ECN / ECS or investing in the Irish market.

- Representative Groups, including consumer and industry groups.

- The Department of Environment, Climate and Communications ('**DECC**'), other Government Departments, other public bodies, and regulators of other sectors.

- The Competition and Consumer Protection Commission ('**CCPC**') with whom we have concurrent competition powers and other economic regulators with who we collaborate through the Economic Regulators Network ('**ERN**')[10].

- Agencies and Bodies of the European Union, including the European Commission and Body of European Regulators for Electronic Communications ('**BEREC**').

- Other international bodies, such as the European Conference of Postal and Telecommunications Administrations ('**CEPT**') and the International Telecommunications Union ('**ITU**').

2.10 In preparing this Strategy, ComReg has been mindful of the various behaviours, policies, plans, agendas, and proposals of these stakeholders, including:

- Consumer Behaviour regarding the adoption, selection and use of ECS, ECN and related technologies and services.

- Investment plans and proposals published by Industry.

- Relevant plans, proposals, policies, and strategies put forward by DECC, other Government Departments, the 2020 Programme for Government and strategy/policy documents put forward by other public bodies.

- Plans, Consultations, Best Practice Guidance and Common Opinions put forward by EU bodies and agencies, other International bodies and agencies and economic regulators in other sectors.

2.11 In October 2020 ComReg issued a public Call for Inputs[11] to help prepare this Five-Year ECS Strategy. A public consultation[12] on a draft Five-Year ECS Strategy was published in March 2020. ComReg uses the responses to the Call for Inputs and Consultation to ensure the Five-Year ECS Strategy meets the needs of a range of stakeholders, the sector itself and ComReg staff.

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8   Including Three Ireland (Hutchison) and Three Ireland Services (Hutchison) Limited

9   ComReg maintains an electronic register of 'Authorised Undertakings' and 'Premium Rate Service'' providers on its website.

10   The Economic Regulators Network is composed of the Competition and Consumer Protection Commission ('CCPC'), Commission for Regulation of Utilities ('CRU'), Broadcasting Authority of Ireland ('BAI'), Central Bank of Ireland, National Transport Authority ('NTA') and ComReg.

11   ComReg Doc 20/91

12   ComReg Doc 21/32

Our Mission

2.12 As an economic regulator, our role is to ensure that communications markets operate in the interests of end-users and society. Ensuring a well-regulated market is one of the most important tools in working towards our vision of the communications sector.

2.13 Our mission over the next five years is that through effective and relevant regulation, we facilitate the development of a competitive communications sector in Ireland that attracts investment, encourages innovation, and empowers consumers to choose and use communications services with confidence.

ComReg's Values

- **Integrity**
- **Impartiality**
- **Effectiveness**
- **Transparency**

2.14 In order to be effective as an economic regulator, it is important that stakeholders have confidence that we discharge our functions independently, based on quality evidence and analysis, that we are not biased towards any market participant and that we do not suffer from so-called "regulatory capture". Our values – also unchanged from the last strategy statement – enable stakeholders to have this confidence.

Our Vision

ComReg's Role and Mission

ComReg's role is to ensure that communications markets operate in the interests of end-users and society.

Through effective and relevant regulation, we facilitate the development of a competitive communications sector in Ireland that attracts investment, encourages innovation, and empowers consumers to choose and use communications services with confidence

2.15 Reflecting our legal remit and mission, we have adopted a vision for the communications sector. We recognise that delivering on this vision cannot be done in isolation and that a combination of Government policy interventions, regulatory interventions, and industry actions will be required. However, we believe our strategy should be guided by a vision of the outcome which we aim to help to bring about.

2.16 Five years ago, it would have been difficult to predict the scale of the transformation of the sector and the impact global challenges, such as the Covid-19 pandemic, would have on the communications sector. Similarly, looking towards 2030, it is impossible to foresee all of the technological and social innovations that will shape the way we live and work. However, what does appear certain is that our ECS and ECN will play an increasingly central role, both economically and socially.

Our Vision for the communications sector

Consumers and businesses in Ireland have affordable high-quality, and widespread access to secure communications services and applications that support their social and economic needs.

Our Strategy over the next Five Years

2.17 ComReg's strategy has been informed by its understanding of the key trends and challenges facing the sector over the next five years, the changing regulatory context and legal framework and our engagement with key stakeholders. ComReg has decided to adopt a five-year perspective when developing this electronic communications strategy for the period 2021-2026, allowing focus on medium-term developments and innovations shaping the role of regulation in the future.

2.18 Under the Communications Act 2002 (as amended), we are obliged to publish a Strategy Statement document every two years. **Our Five-Year ECS Strategy**, set out in this document, also acts as our Electronic Communications Strategy Statement for 2021-2023 and sets out how we will implement the first two years of our Five-Year ECS Strategy. This document sets out various goals for the organisation and particular programmes of work which we intend to undertake over the period 2021 to 2023. In 2023 we will publish a further Strategy Statement, which will incorporate a mid-term review of our Five-Year ECS Strategy. This structure is graphically represented in Figure 1 below.

Figure 1: ComReg's Five Year ECS Strategy

2021-2023 Strategy Statement	Programme of Work
Five Year ECS Strategy	Strategic Priorities
Five Year ECS Strategy	Regulatory Toolkit
Five Year ECS Strategy	Vision & Mission
Set Out in Legislation	Mandate

2.19 The tools available to ComReg to deliver on its mandate and vision for the sector derive from its regulatory powers. These can be summarised into four main categories: **promoting effective competition and facilitating investment, protecting consumers, ensuring widespread connectivity**, and making sure that **regulated entities comply with the rules**.

Our ability to use these tools depends on the skills and resources of **our organisation**. For each of these areas, we have developed a statement of strategic intent, and goals that support the strategic intent. These strategic intents are set out in Table 1 below. The relationship between the tools at our disposal and our role and mission is captured in our strategic framework which is illustrated in Figure 2 below.

Figure 2: ComReg's Strategic Framework
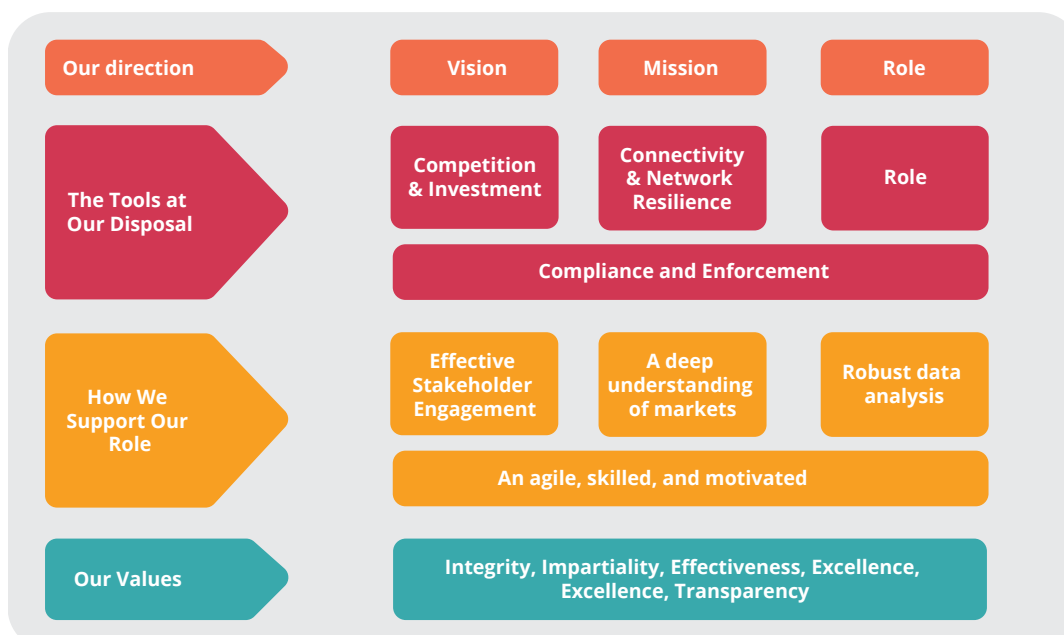
Table 1: ComReg's Strategic Intents

ComReg's Strategic Intents	
SI 1: Competition & Investment	A competitive sector that delivers efficient investment, innovation, and choice
SI 2: Consumer Protection	Consumers can choose and use electronic communications services with confidence
SI 3: Connectivity & Network Resilience	End-Users have widespread access to high-quality and secure communications networks, services, and applications
SI 4: Compliance & Enforcement	Regulated entities comply with regulatory requirements
SI 5: Organisation	We are an effective, agile, and relevant regulator

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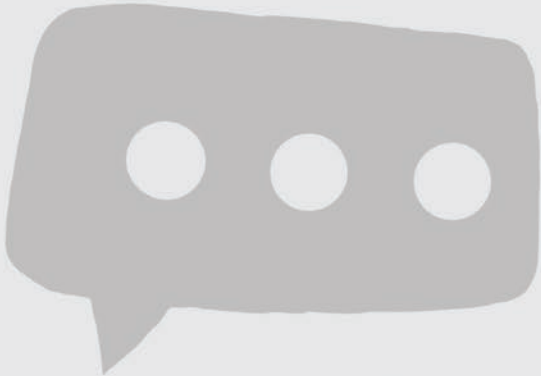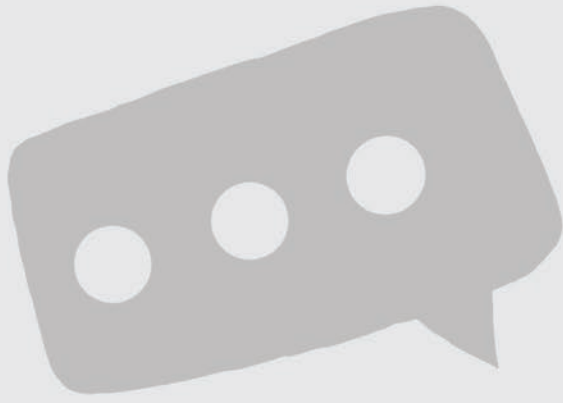
The Context of our Strategy

3. The Context of our Strategy

3.1 This chapter sets out an overview of economic and legal context within which ComReg has prepared its Five-Year ECS Strategy, along with an overview of the various trends and challenges that will impact the sector and the nature of regulation over the next five years. A complete analysis of the context and various trends is set out in the Appendix document (ComReg Doc 21/70a).

Economic Context

The Economic Environment

3.2 The electronic communications sector is affected by developments in the wider economy. The Covid-19 pandemic has rapidly accelerated digitalisation across the economy and has increased the use and reliance on ECS and ECN. At the same time, the profound effects of Covid-19 on the wider economy, mean that the medium-term outlook for the Irish economy is uncertain. The small, open nature of Ireland's economy also means that other international developments and the development of the global economy can significantly impact our economy. The longer-term impacts on growth will depend upon, among other things, the extent of scarring effects on the productive capacity of the domestic and global economy.

3.3 Broader trends in the global economy are also of relevance to the sector. Many ECN / ECS providers in Ireland operate as part of wider groups of companies, providing services in a number of countries. Investments in ECN and ECS in Ireland can depend on the domestic and international performance of these companies.

The Economics of Electronic Communications

3.4 The economic characteristics of ECS markets are fundamental to the dynamics in the sector. The commercial nature of private investment may mean that high-quality networks are only rolled out in areas where population densities are such that potential revenues from the end-users in those areas exceed costs. Furthermore, the quality of basic networks may not be maintained in areas where costs are high, and competition is correspondingly weak. The commercial price of ECN / ECS may also be unaffordable for certain end-users who wish to purchase these services.

Market Failures

3.5 Market failures impede the ability of the normal competitive process to yield welfare optimal outcomes. The objective of economic regulation is to attempt to correct or compensate for the presence of market failures through appropriate interventions. Many of ComReg's statutory functions and objectives map back to an underlying market failure, including market power, the presence of externalities, information asymmetry and behavioural biases.

Legal Context

3.6 ComReg's remit and powers allow it to intervene in various ECS markets (as appropriate) to help ensure these markets operate efficiently in the interests of society and end-users. While the fundamental rationale for regulation remain unchanged, the scope of the regulatory remit and the legal framework continues to evolve alongside these markets and technologies.

3.7 For further detail on the Irish and EU legislation that governs ComReg's activities, visit **comreg.ie/about/legislation**

The European Electronic Communications Code

3.8 On 17 December 2018, the European Parliament adopted the European Electronic Communications Code ('**EECC**'), or simply "the Code",[13] which provides a new legislative framework for ECS markets. The Code is considered a central piece of legislation to achieve Europe's Gigabit society and ensure full participation of all EU citizens in the digital economy and society. The EECC has four stated objectives - promoting competition; contributing to the development of the internal market; promoting the interests of EU citizens; and promoting the widespread access to, and take-up of, very high capacity networks ('**VHCN**') - both fixed and wireless.

3.9 The emphasis on connectivity in the EECC is reflected in ComReg's strategy and broadly aligns with ComReg's vision for the electronic communications sector, that consumers and businesses in Ireland have affordable, high-quality, and widespread access to secure communications services and applications that support their social and economic needs.

3.10 As the new Code is being introduced across the EU by way of a single new directive, this directive is being transposed into the national law of each Member State, and this process of transposition is entirely for each individual Member State to undertake. In Ireland, the primary responsibility for transposition of the new Code into domestic Irish law lies with the Department of the Environment, Climate and Communications ('DECC'). The transposition process to date has included extensive and ongoing engagement with relevant key stakeholders, including ComReg, industry, the Office of the Data Protection Commissioner, other Government Departments and the European Commission.

3.11 The Code was to be transposed by Member States by 21 December 2020. ComReg understands that the Code is now likely to be transposed into national law later in 2021[13]. In the interim, electronic communications providers must continue to comply with their obligations, ComReg continues to regulate the electronic communications sector under its existing powers, and redress mechanisms for customers continue unchanged until new legislation is introduced. The Communications Regulation Act 2002 continues in force (without further change/amendment), and the suite of 2011 Electronic Communications Regulations continue in force until further legislation is introduced, which amends or repeals them.

3.12 ComReg's Regulatory Guidance on the End-User Rights of the European Electronic Communications Code was first published on 10 November 2020 and the first update was published on 23 December 2020. On 4 December 2020, DECC published draft regulations in respect of the end-user rights provisions of the Code.

3.13 In respect of the likely timing of transposition, DECC has most recently stated:

The Department has decided that the transposition of the enforcement provisions of the Code should be given effect to through primary legislation. However, it remains the Department's intention that much of the transposition will still be effected by way of statutory instrument...The Department is currently preparing Heads of Bill for a General Scheme for the proposed primary legislation. Where the General Scheme has been approved by Government, it is the intention of the Department to hold a public consultation on the Scheme. The remainder of the statutory instrument will also be consulted upon at this time. It is anticipated that this will be possible over the summer period.[14]

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13 The Department's most recent current communications in relation to the Code can be found at its website, here: www.gov.ie/en/publication/339a9-european-electronic-communications-code-eecc/

14 See footnote 13 above.

3.14 Specific measures included in the EECC are further discussed in this document and in Appendix: 1 The Economic and Legal Context.

Trends and Challenges

3.15 The development of the electronic communications sector is shaped by different social, economic, legislative, and technological forces. Some of these forces have a positive impact on markets, acting as catalysts for the advancement of technology and digital inclusion, while others present challenges. ComReg has identified four principle trends which are likely to shape the sector and pose regulatory challenges over the next five years:

- ◉ Enhanced Connectivity and New Technologies

- ◉ The Consumer Experience

- ◉ The Evolution of Adjacent and Related Markets

- ◉ The Changing Future of Regulation in the Sector

3.16 These four factors are summarised below and discussed in more detail in Appendix: 2 Trends & Challenges.

Enhanced Connectivity and New Technologies

3.17 The deployment of high-speed ECN will play an increasingly important role across the country over the next 5 years, enabling innovation and digitalisation across different sectors of Irish society. Between 2011 and 2019, commercial network operators invested €5.5 billion in expanding the reach of their fixed and mobile networks,[15] centred around the roll-out of fibre network technologies and upgrading existing networks. Despite these advances, however, the commercial realities of network rollout mean that rollout may not occur in geographic areas where the population is spare. The National Broadband Plan ('**NBP**') is the

government's initiative to ensure the availability of high-speed fibre to the home ('**FTTH**') broadband services to all premises in Ireland. Through this state-aid intervention[16], the Irish Government, via National Broadband Ireland ('**NBI**'), is investing in FTTH broadband access for these premises.

3.18 While new networks can provide faster download speeds, lower latency, and increased bandwidth, they will also bring increasing demands for data, especially with the likely widespread adoption of fibre and 5G networks in the future. In addition to ensuring coverage and reliability, a key consideration regarding future networks and connectivity will be improving security and reliance. Network security depends not only on technical security features, but also on the design, implementation, and operation of the network.

The Consumer Experience

3.19 The development of networks and the adoption of new technologies have enabled people to connect in new ways. Consumers' reliance on ECN and ECS to carry out various social and economic-related activities has only accelerated with the onset of the Covid-19 pandemic, with the growth of remote working and greater use of video-calling applications. In December 2020, 75% of online users reported that the reliability of internet connection had become more important in the last year.[17] Online activities (including remote working) are also becoming more important for enterprise, and digital services such as e-Government, e-learning, and cloud storage are becoming increasingly popular.[18]

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15 Eurostat

16 In 2008 the Irish Government awarded a contract to Three Ireland to provide broadband to the areas under the National Broadband Scheme (NBS) for rural areas. Although this scheme came to an end in August 2014, many rural users still depend on the mobile broadband service provided by Three Ireland on a commercial basis.

17 Digital Services & Online Safety Survey, (2021), ComReg Document 21/09

18 Central Statistics Office, (2019), Information Society Statistics – Household

3.20 However, the pattern of network rollout across the country as well as varying levels of technology adoption across demographics mean that consumer experiences in the sector are not uniform. In addition to differing connectivity levels between urban and rural areas, the use and take-up of ECN / ECS also varies across demographic groups.

3.21 These factors, among many others, influence consumers' access to telecom goods and services as well as consumers' confidence to choose and use these services. ComReg has a role to protect consumers' rights and prevent operators from exploiting consumers in the telecom markets. Nevertheless, given the increasing reliance on connectivity, these developments may serve to further deepen digital divides and therefore draw increased regulatory and political attention over the coming period

The Evolution of Adjacent and Related Markets

3.22 As the markets relevant to the regulation of ECN / ECS evolve, the lines between them blur and change the industry's structure and competitive landscape. Due to these changing dynamics, effective regulation will require an understanding of the complex eco-system of related markets and the role of electronic communications as an enabler of innovation in these markets. As such, ComReg considers input markets, complementary markets, and downstream markets.

3.23 Input markets include areas such as network equipment manufacturers, which create the equipment to facilitate the use of ECN / ECS. Input markets affect the sector in various ways, such as the cost of network roll-out, quality of service and security. Complementary markets (e.g., handsets or IoT devices) are important to consider as they affect the quality of experience of using ECN / ECS services, including coverage and security.

3.24 Finally, downstream markets are also considered (e.g., OTTs, Broadcasting), as consumer demand for ECN/S is ultimately driven by consumers' desire to participate in these downstream markets.

The Changing Future of Regulation in the Sector

3.25 Given the rapidly evolving and expanding nature of the ECS sector, the final key trend relates to the range of developments in regulation that will arise during this strategy statement. In addition to the transposition of the EECC and the 2020 Programme for Government's commitment to the publication of a National Digital Strategy, several legislative changes and developments are anticipated to take place that will impact ComReg's role and mandate, concerning the following areas[19]:

- Consumer protection mandate

- Cybersecurity strategy for the digital decadeBroadband cost reduction

- Privacy and electronic communications

- Market surveillance

3.26 The European Commission has made 'Making Europe fit for the digital age' a key pillar of its current mandate, setting out a number of initiatives related to the ECS sector. New rules concerning the digital economy, including the Digital Services Act ('**DSA**') and Digital Markets Act ('**DMA**') proposals (see Chapter 8 for more detail), aim to better protect consumers online and foster innovation, growth and competitiveness in the single market.

3.27 Increasing awareness and attention is also being placed on the relationship between the ECS sector and climate change. While the sector is enabling decarbonisation across the economy, from remote working to smart meters, greater use of ECN / ECS services and devices could potentially increase waste and emissions. The European Commission has emphasised the importance of a sustainable digital sector and will consider measures to

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19 For more detail, see Appendix: 2 Trends and Challenges

improve the circular economy performance of the digital sector as well as its energy efficiency.[20] In 2019, ComReg issued a Call for Inputs[21] to better understand the relationship between connectivity and decarbonisation, the learnings from which help to shape a number of key projects and commitments in this strategy. ComReg is also actively contributing to an expert networking group on Sustainability at BEREC and will continue to monitor initiatives to address the carbon footprint of the ECS sector.

3.28 ComReg also notes National legislation is in progress regarding Climate Action and Low Carbon Development. It is envisaged by the Irish State that this legislation will establish a legally binding framework with clear targets and commitments set in law, and ensure the necessary structures and processes are embedded on a statutory basis to ensure Ireland achieves national, EU and international climate goals and obligations in the near and long term. This framework, when established, will require ComReg and other public bodies to perform our functions in a way that is consistent with approved national climate plans, strategies, and objectives – as far as is practicable.

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20 Communication from The Commission to The European Parliament, The European Council, The Council, The European Economic and Social Committee and The Committee of The Regions. The European Green Deal COM/2019/640 Final
21 ComReg Doc 19/126

4

Competition & Investment

4. Competition & Investment

Introduction

4.1 ComReg's guiding principle is that effectively competitive markets deliver optimal outcomes in terms of investment and price, quality, choice, and innovation, ultimately to the benefit of consumers and society. Over the past five years, end-users in Ireland have benefited from access to new networks offering high-speed data communications both at fixed locations and on the move. Regulation has been a critical factor in enabling the environment in which these investments have occurred. Decisions made by ComReg have created a competitive incentive to invest in new networks and to upgrade existing ones. The electronic communications sector in Ireland today is in a much better place than it was five years ago, with advancing VHCN and mobile/wireless network rollouts.

4.2 This Chapter sets out ComReg's strategic goals associated with the first high-level strategic intent, that the ECS sector in Ireland is **a competitive sector that delivers efficient investment, innovation, and choice**.

As illustrated in Figure 3, ComReg's view is that Regulatory actions by ComReg play a key role in facilitating competition and encouraging efficient investment across Ireland. Regulating in an evolving market is a dynamic process, requiring continual monitoring, updating and adjustment, and the scope of regulation should reduce as sustainable competition becomes entrenched.

4.3 ComReg has a range of tools at its disposal relating to competition and investment, including imposing regulatory obligations on firms found to have Significant Market Power ('**SMP**') in a market; setting the regulated cost of capital for electronic communications and broadcasting markets; sending appropriate build-or-buy signals to encourage deeper network competition; and the allocation and assignment of spectrum and numbering resources.

Strategic Intent 1: **A competitive sector that delivers efficient investment, innovation, and choice.**

What does this look like?

- There is clear evidence of:
  - Sustainable competition over time
  - Innovation in electronic communications and in related markets, and
  - Consumers exercising choice
- Infrastructure coverage that enables all end-users to participate in the digital society
- Wholesale ECN / ECS that meet market demand
- Regulatory certainty allows for efficient investment
- A sector that is attractive to investors

Figure 3: Regulation enables Competition and Investment

Competition in Fixed and Mobile Markets

4.4 Ireland, as a small country of 5 million people[22], has retail ECS markets that are national in nature. In these markets, multiple Service Providers sell a range of ECS services that are often bundled with services sold in adjacent related markets (e.g. TV broadcasting). The competitive conditions in retail ECS markets depend heavily on the nature of the underlying competitive conditions in upstream wholesale markets, which in turn depend on the ability to sustain competing networks. Network deployment depends crucially on population density as a driver of average cost, dense areas are cheaper to deploy and maintain than in less dense areas. While the level of network competition is changing as new technologies are deployed, the geographic scope of network competition is likely to be limited to more densely populated areas.

ECN / ECS and the competitive landscape of Ireland

4.5 As set out in Chapter 3, the competitive landscape in Ireland is not always uniform with more densely populated areas well-served by ECN, having benefited from investment in networks driven by competitive forces. In certain areas, competitive forces may be strong enough such that *ex-ante* regulatory intervention is not required.[23]

4.6 Outside of these areas, there will likely remain a need for ex-ante regulation as lower population densities and higher network deployment costs mean that competitive forces are not as strong. In these areas, regulation ensures the incumbent operator maintains its network to an adequate standard and grants wholesale access to other service providers.

4.7 In the most remote parts of Ireland, some ECN / ECS services are not available. While Eircom, as the USO provider, provides universal telephony services, some 540,000 premises do not have access to a quality broadband service (with download speeds greater than 30Mbps). Through state-aid intervention[24],the Irish Government, via National Broadband Ireland ('**NBI**'), is investing in '**FTTH**' broadband access for these premises.

4.8 Similarly, mobile and wireless network operators typically focussed investments in areas of greater population density and later expanded network coverage along transport infrastructure routes and into more sparsely populated areas.

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22 CSO Population Statistics, 2020.
23 However, ex ante regulation may remain in some of these markets where competition concerns persist.
24 In 2008 the Irish Government awarded a contract to Three Ireland to provide broadband to the areas under the National Broadband Scheme (NBS) for rural areas. Although this scheme came to an end in August 2014, many rural users still depend on the mobile broadband service provided by Three Ireland on a commercial basis.

4.9 Developments in related markets are also important. Investment and innovation will come not only from traditional ECN / ECS operators in fixed and mobile markets, but also from other operators, such as Over the Top ('**OTT**') service providers. Innovations in other markets (e.g. digital markets and mobile handset markets) can also often lead to changes in the competitive dynamics of the sector.

Competition on fixed networks

4.10 Competition involving fixed ECN can be thought of as a continuum between service-based competition and infrastructure-based competition[25]. Pure service-based competition is where entrant operators utilise or resell the network of another operator to supply their own services, without making infrastructure investments of their own. Pure infrastructure-based competition is when operators rely entirely on their own infrastructure and not on inputs supplied by other operators. In practice, the majority of operators are somewhere in between, using a mix of their own infrastructure and rental access to others' networks. In addition, some operators will decide to only offer services to other operators in a wholesale market.

4.11 Over the last decade, Eircom has been upgrading its legacy copper network with new fibre to the cabinet ('**FTTC**') and FTTH technologies. This network now passes about 2 million premises, serving approximately 798,000 subscribers.[26]

4.12 Eircom faces varying degrees of network competition from other operators across parts of Ireland. Virgin Media's DOCSIS network passes 946,500 premises in mostly urban areas, with 383,000 broadband subscribers.[27] SIRO's FTTH network rollout has passed about 369,000 homes[28], largely outside of the Virgin Media footprint. There are also a number of other network operators, e.g., Magnet, with smaller fibre networks.

4.13 Eircom also faces competition from BT, Vodafone, Sky, and a variety of other players (including fixed wireless operators) who have made varying levels of infrastructure investment, in large part due to the availability of wholesale access products mandated through SMP regulation.[29]

4.14 By Q4 2020, 81.6% of all fixed broadband subscriptions were at least 30Mbps, by sold download speed.[30] On the basis of the proposed NBI rollout and the various rollout plan announcements, it is possible that the vast majority of households and businesses in Ireland will have access to high speed broadband by the end of 2026 (30Mbps or greater download).

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25 In many cases, an operator may use a variety of wholesale products in different areas to provide national coverage. This could include rolling out their own network assets in one area (e.g. FTTH), investing in network backhaul to avail of wholesale unbundled products (e.g. Virtual Unbundled Access) in another area, and buying wholesale bitstream products in another part of the country. In addition, some operators decide to offer only wholesale services, or business-only services (e.g. connections with dedicated capacity).

26 Eircom Group Results for the second quarter FY21 to 31 December 2020

27 Liberty Global Q4 2020 Fixed Income Release
https://www.libertyglobal.com/wp-content/uploads/2021/02/Fixed-Income-Q4-2020-Release.pdf

28 https://siro.ie/. Accessed on 18th March 2021.

29 For example, some operators have invested in network backhaul to allow them avail of Virtual Unbundled Access products.

30 ComReg QKDR Q4 2020, (2021), ComReg Document 21/20

Competition on mobile networks

4.15 There are three main sources of competition in the retail mobile market, as set out in Table 2 below.

Table 2: Operators in the Retail Mobile Market [31]

Mobile Network Operators (MNOs)	Mobile Virtual Network Operators (MVNOs)	MNO Sub-Brands
◉ Eircom ◉ Three Ireland ◉ Vodafone Ireland	◉ Lycamobile ◉ Post Mobile ◉ Tesco Mobile Ireland ◉ Virgin Mobile	◉ Gomo (Eircom) ◉ 48 Mobile (Three Ireland) ◉ Clear Mobile (Vodafone)
Network-level competition: each operator obtains spectrum rights of use and builds a mobile network to provide services.	**Service-based competition**: MVNOs purchasing capacity from an MNO, instead of building their own mobile access network (base station transmitter, antenna and associated backhaul)	A sub-brand is typically part of a commercial strategy pursued by an MNO to address and serve segments that cannot be reached with the MNO's main brand.

4.16 Competition in mobile networks also includes the presence of network sharing arrangements for two or more network operators. The main potential benefit for mobile operators from network sharing is the reduction of cost [32] and more efficient use of spectrum. On the downside there may be a risk of a diminution of competition if operators lose control over some network operations and strategic technology choices.

4.17 The rollout of 5G services in Ireland is still at the early stages with mobile operators only recently having launched 5G services in 2019 and 2020. The rollout of 5G networks is likely to advance further as spectrum in the Multi Band Spectrum Award 2 is released, in particular the 700 MHz band.

4.18 In addition, the investments made in mobile networks to date have allowed mobile voice and data networks (such as 3G or 4G) to be rolled out to areas currently unserved by fixed networks. All MNOs now claim to have at least 98% 4G population coverage and have launched 5G networks[33]. While Ireland ranks above average among EU Member States in terms of 4G population coverage,[34] there are still geographic areas unserved by 4G networks, primarily due to these areas not being economically viable to serve.

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31 Cubic Telecom is headquartered in Ireland, but does not operate as an MVNO in Ireland, and relies instead on roaming agreements for its Irish connectivity
32 Communities can also be favourable to sharing arrangements as it can reduce the number of cell-sites required to provide service or they get access to connectivity sooner due to reduced network deployment costs for the operators.
33 See https://n.vodafone.ie/network/5g.html https://www.three.ie/coverage-checker/ https://www.eir.ie/5G/
34 European Commission, Digital Economy Society Index - Connectivity

The state of competition in retail markets

4.19 Figure 4 below shows the level of market concentration in retail fixed broadband, fixed voice, and mobile markets (excluding mobile broadband and M2M). The graph uses the Herfindahl-Hirschman Index ('**HHI**')[35]. The higher the market's concentration (suggestive of weaker competition), the higher the HHI.

4.20 In the fixed voice and broadband markets, the gradual decline in retail market concentration is indicative of increased competition as increasing levels of infrastructure-based competition take hold. The Irish mobile market, now a three MNO market since the merger of Hutchison 3G and Telefónica 02 in 2014, has a number of MVNOs and sub-brands providing competitive pressures. This market remains the most heavily concentrated market within the sector.

Figure 4: Retail Concentration (HHI), 2013 – 2020[36]
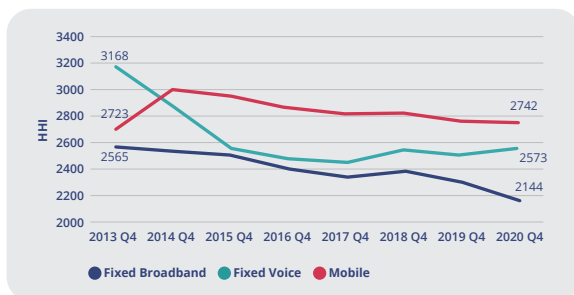
Investment in ECN / ECS

4.21 Private investment in the sector increased over the period 2011 to 2019, as shown in Figure 5. Over this period, total investment amounted to €5.5 billion.[37] Aside from the peak in 2012 - at 19% - corresponding to ComReg's Multi-Band

Spectrum Award, the trend depicts steady or slightly increasing investment as a percentage of overall industry revenue, averaging approximately 15% over the period.

Figure 5: Investment in ECN / ECS (Ireland, € million)[38]
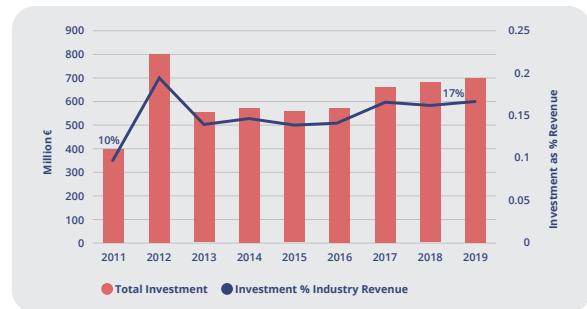
Competition and Investment

Retail Competition

4.22 Over the last 25 years, there has been a steady decline in regulation of retail ECS markets, predicated on the introduction of effective regulation at the wholesale level where persistent bottlenecks arise.

4.23 ComReg aims to use its regulatory tools only where required to address market failures and assure optimal end-user outcomes. The EECC notes that the role of ex-ante regulation is to achieve effective and sustainable competition in retail markets. ComReg can therefore only impose upstream wholesale access obligations where one or more downstream retail markets are not likely to become effectively and sustainably competitive without regulatory intervention.

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35 This is a common measure of market concentration used to analyse market structure. It is calculated by squaring the market share of each firm competing in a market and summing the resulting numbers. The higher the number the more concentrated the market, with a pure monopoly having a HHI of 10,000. A market split exactly five ways would have a HHI of 2,000

36 ComReg QKDR Q4 2020, (2021), ComReg Document 21/20

37 The peak in 2012 corresponds to ComReg's Multi-Band Spectrum Award.

38 Eurostat and ComReg Quarterly Key Data Report

Goal 1.1

There is effective and sustainable competition in retail ECS markets.

4.24 In this context it is ComReg's goal that **there is effective and sustainable competition in retail ECS markets**.

4.25 A developed understanding of why markets may not be working well for end-users allows ComReg to better target regulatory interventions across the breadth of its functions. ComReg considers it important to monitor the effectiveness of competition not only in the regulated markets themselves, but in other related markets within the wider ECN / ECS eco-system.

4.26 In this regard, ComReg has a number of key projects planned for the next two-year period:

- **Monitoring retail ECS and relevant OTT Markets** – ComReg will continue to monitor developments in retail ECS markets and relevant OTT markets to ensure they meet consumer needs.

- **Study of the Irish Mobile Market** – In 2020 ComReg began a study of the mobile market, which will conclude in 2021.

- **Monitoring key related/adjacent Markets** – ComReg will monitor key related/adjacent markets as these have the potential to have disruptive effects on ECS markets.

Wholesale Markets and Access Regulation

4.27 A key market failure is that an operator might possess Significant Market Power ('**SMP**'), i.e., the ability to operate without constraint from competitors. Unchecked, SMP can lead to high prices, poor quality of service, delayed or loss of investment/innovation or the slower entry or expansion of competitors in ECS markets.

4.28 ComReg has a number of regulatory tools at its disposal to intervene to control and mitigate the adverse effects of market failures where they occur in wholesale ECS markets. These tools include:

- Access obligations via the SMP Framework,

- Ex-Post Competition Law, and

- Provisions in the EECC to encourage efficient investment.

4.29 This toolkit helps ensure ComReg can intervene in ECS markets to address persistent bottlenecks and barriers to entry, ensuring these markets deliver innovation and choice to consumers. This toolkit is complemented by ComReg's other tools used to enhance connectivity and its various consumer protection, dispute resolution, and enforcement powers.

4.30 ComReg's objectives are to only impose regulation in those markets where competition is not likely to be effective and, to address competition concerns at the most upstream level possible. This typically involves regulation aimed at addressing bottlenecks at the wholesale rather than the retail level.

4.31 It is therefore ComReg's goal that **there is effective and sustainable competition as far as is possible in wholesale markets, in the light of persistent bottlenecks and barriers to entry**. A lack of effective and sustainable competition in wholesale markets can undermine effective retail competition and dampen incentives to investments in ECS/ECN.

Access Regulation – the SMP Framework

4.32 Under the regulatory framework, where an operator is identified as having SMP in a given market, ComReg may impose a range of regulatory obligations as appropriate, including those relating to access, pricing, non-discrimination, and transparency. Such obligations are designed to promote competition by enabling entrants to compete on a level playing field with the SMP operator.

4.33 Where SMP regulation is necessary, ComReg will focus on the imposition of obligations that encourage both infrastructure and service-based competition. However, ComReg's regulatory approach will seek to facilitate opportunities that enable greater infrastructure-based competition, as this ultimately enables the development of more effective and sustainable competition and greater levels of investment in ECS/ECN.

4.34 ComReg is required to undertake a review of various regulated markets every five years. In this regard, over the coming period ComReg plans to continue to monitor the various markets set out in Table 3 below and undertake market reviews where necessary.

4.35 Where an event, such as an acquisition or merger that has the potential to fundamentally change the nature of competition in the relevant wholesale market or downstream markets, ComReg may bring forward a formal market analysis to re-assess competition and examine the extent of any market failures and competition problems that arise from such an event.

4.36 ComReg has not previously conducted a review of the market for Physical Infrastructure Access ('**PIA**') in its own right, mandating instead access to Eircom's duct and poles as a remedy for Wholesale Local Access. Over the coming

period ComReg will review the market for PIA as it is the most upstream market that could potentially be regulated and therefore this may afford the possibility of further de-regulation downstream. The use of PIA by other operators provides a high degree of control over their product features and technology choices, for example, in comparison to the use of virtual unbundling. This has the potential to increase the dynamism of competitive forces.

4.37 ComReg also intends to explore the opportunities afforded by various new regulatory provisions set out in the EECC in an Irish context, as a complement to the SMP framework. These include:

◉ **Symmetric Access Obligations (Article 61 of the EECC**) - Obligations to provide 'symmetric' access to local facilities to avoid 'inefficient' duplication of network assets. ComReg may impose access to wiring, cables, and associated facilities inside buildings or up to the first concentration or distribution point.

◉ **Wholesale-only operators (Article 80 of the EECC**) – To date no wholesale-only operator has been found to have SMP in a regulated wholesale market in Ireland. However, such operators are a key consideration in assessing SMP in various wholesale markets.

Table 3: Proposed Market Reviews

Market	Current Review	Indicative Review Completion Date
Retail Access to the Public Telephone Network at a Fixed Location and Wholesale Fixed Access and Call Origination	Last reviewed 2014/2015	2021
In June 2020, ComReg consulted on a proposal to fully de-regulate the retail access market and partially de-regulate the wholesale market.		
Fixed and Mobile Termination	last reviewed in 2019 (updated in 2020)	2023
In December 2020 the EC adopted a single maximum EU-wide termination rate which comes into effect on 1 July 2021. The EC has also removed termination markets from its 2020 Recommendation. ComReg will further consider the implications for existing SMP regulation in these termination markets in light of these developments as part of its next market review cycle.		
Physical Infrastructure Access (PIA)	-	2023
The review of the PIA market is at the early stages of development, but it is expected that a final decision on this review will be adopted at least in parallel with the WLA and WCA markets.		
Wholesale Local Access and Wholesale Central Access (WLA and WCA)	last updated 2018	2023
In line with the commitment given in its 2018 Decision, in January 2021 ComReg consulted on proposed further de-regulation of the WCA market. A final decision is expected in 2021.		
Wholesale High Quality Access and Dedicated Capacity (WHQA/DC)	last reviewed in 2020	2025
ComReg is continuing to collect data, as part of its ongoing monitoring of this market. This should enable a timely review of this market as part of the next market review 5-year cycle.		
Wholesale Broadcasting transmission and distribution services	2021	2026
In February 2021 ComReg updated its 2013 decision on the Broadcasting Transmission Services markets (ComReg doc 21/14), which continues to regulate RTÉ / 2RN. ComReg will continue to monitor developments in these markets, including the evolution of retail broadcasting		

Goal 1.2

There is effective and sustainable competition as far as is possible in wholesale markets, in the light of persistent bottlenecks and barriers to entry.

Timely withdrawal of regulation

4.38 Where wholesale regulation has delivered effective competition in downstream retail markets, ComReg seeks to exit regulation of those markets. ComReg will also exit regulation of wholesale markets where effective competition develops. While de-regulation of retail and downstream wholesale markets is desirable, this process depends on the effectiveness of regulation in upstream markets. ComReg has recently imposed proportionate remedies in wholesale markets which we believe will increase the likelihood of this occurring and has also deregulated some sub-national wholesale markets[39], where sustainable and effective competition can be found.

Goal 1.3

Sustainable and effective competition can allow for the timely withdrawal of regulation.

4.39 The EECC provides that where ComReg removes regulation in a way that minimises disruption, it must also be ensured that regulation does not continue for longer than necessary. ComReg therefore has a goal to ensure that **sustainable and effective competition can allow for the timely withdrawal of regulation**.

4.40 Under this goal, over the coming period ComReg intends to continue to monitor regulated markets to ensure remedies are effective in addressing market failures and where possible to remove regulations where no longer necessary.

Investment and Regulatory Certainty

4.41 ComReg recognises that unregulated ECN / ECS may not function well enough to provide the right incentives for investment. ComReg will employ measures aimed at driving, and safeguarding the competitive market process - as the greater the scope for driving competition, the greater the extent of commercial investment made by private operators to bring innovative products and services to market.

4.42 As newer fixed (e.g. VHCN) and mobile (e.g. 5G) networks get rolled out, other older ECN and technologies will diminish in their use and importance in the sector, leading to migration and eventual retirement.

4.43 ComReg's role is to facilitate innovation by creating a stable investment environment and predictable regulatory regime, ensuring industry can develop and grow new products and services.

4.44 It is therefore ComReg's goal that **competitive incentives facilitate efficient commercial investment in new and existing infrastructure and services to the widest extent possible**.

4.45 In general, ComReg has a preference for infrastructure-based competition, based on inter-platform competition as well as access-based competition at the deepest level possible. At all times, ComReg's pricing decisions aim to strike a balance between the following:

◎ Encouraging investment in VHCN by the network operators. It is important that regulated access prices are not set so low that investment that would otherwise be commercially viable is choked off;

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39   ComReg deregulated the Urban WCA Market in 2018 (D10/18) and the Zone B MI WHQA Market in 2020 (D03/20)

- Encouraging viable investment in own infrastructure by those who purchase access from other networks, particularly those who use regulated access to Eircom's network;

- Ensuring that regulated prices reflect efficient practice and that excessive recovery by the SMP operator does not happen;Ensuring that wholesale prices do not lead to price squeezes;

- Wholesale prices do not lead to excessive end user prices; and

- Wholesale prices ensure a timely and efficient migration to new infrastructure over time.

Goal 1.4

Competitive incentives facilitate efficient commercial investment in existing and new infrastructure and services to the widest extent possible.

4.46 It is also important that there is reasonable certainty about the trajectory of prices for all players, as far as possible. Insofar as existing price controls are concerned, where there are prices directed as part of the price control (including maximum prices), such prices will remain in place for the duration of the price control period, unless ComReg intervenes where there are material changes or exceptional circumstances.

4.47 At this time, ComReg does not have any plans to impose cost-orientated pricing obligations on Eircom's FTTH network. Over the coming period, ComReg will continue to analyse the relevant competitive conditions and monitor the costs associated with Eircom's FTTH network. ComReg notes that a review of the wholesale pricing of Eircom's FTTH network will be well flagged in advance with industry and the imposition of cost-orientated pricing is not inevitable over the lifetime of this Strategy.

4.48 While ComReg will monitor accounting (historic) cost recovery by Eircom, this will be only one part of the assessment of the appropriateness of wholesale prices. Setting the most appropriate investment signals – especially the appropriate build or buy signals, will continue to be a critical part of ComReg's regulatory pricing policy.

4.49 ComReg will continue to encourage investment at the deepest level of the network that makes economic sense. In this regard ComReg considers that there is an opportunity to encourage investment using regulated access at the deepest level possible, which is by providing access to already existing passive infrastructure such as ducts and poles. Ensuring access in this way will require the provision of functional and efficient access to passive infrastructure by Eircom at prices that set the appropriate incentives for all players. ComReg will also monitor access by NBI to Eircom's physical infrastructure assets to help contribute to the successful and timely rollout of the NBP. Where additional investment is required to achieve desired market outcomes, beyond what would be delivered in an effectively competitive market, such investment should be undertaken in a manner which creates minimal market distortions and does not crowd out commercial investment.

4.50 Creating the conditions for investment is as much about regulatory certainty as it is about shaping operator financial incentives. ComReg expects significant amounts of investment will occur in fixed and mobile networks as operators seek to rollout new networks and services to consumers. Making such large commercial investments depends at least in part on an expected rate of return and expected price level.

4.51 In many regulated ECS markets, ComReg imposes price control obligations, including obligations to charge cost-oriented wholesale prices. Setting such a cost-oriented wholesale price includes a reasonable rate of return on investment and an estimated Weighted Average Cost of Capital ('WACC'). ComReg ensures that the regulated WACC is set at a level that is

appropriate to promote efficient and timely investments and promotes innovation in ECN / ECS and broadcasting transmission infrastructure and services in Ireland.

4.52 It is therefore ComReg's second goal to ensure that **regulatory certainty, including certainty on wholesale pricing and the rate of return, facilitates timely investment decisions**. In particular, the choice of wholesale pricing regime and cost recovery should be appropriate to the circumstances taking account of the need to promote efficiency and effective competition and maximise consumer benefits.

4.53 In the context of these two goals, ComReg intends to do the following:

◉ **Pricing Signals**: Wholesale prices imposed by ComReg in regulated markets to enable deeper infrastructure competition act as pricing signals to the SMP operator and other operators seeking to invest in ECN / ECS. Effective pricing signals should encourage an operator to invest efficiently and migrate away from legacy infrastructure.

◉ **Reasonable Rate of Return**: ComReg will also encourage investments by other operators in downstream markets by mandating and enforcing appropriate access to inputs controlled by the SMP operator on fair, transparent and non-discriminatory terms. In order to encourage investments by the SMP operator, including in next generation networks, ComReg shall take into account the investment made by the operator, and allow a reasonable rate of return on adequate capital employed.

◉ **Cost of Capital**: ComReg updated the WACC applicable to Fixed & Mobile Telecommunications and Broadcasting in October 2020[40]. Following this decision, ComReg will recalculate the WACC on an annual basis using updated parameters. The recalculated WACC values will then be used when price controls are amended or updated as part of any subsequent ComReg decision. Where prices have been previously set by

ComReg (including in the form of maximum prices), for a defined future period, a subsequent change in the WACC will not automatically lead to any change in those prices.

◉ **Co-investment**: To incentivise investment further, the EECC introduces new conditions relating to co-investment agreements between operators. ComReg will consider co-investment proposals to ensure that efficient commercial investments can occur and VHCN infrastructure can be deployed to the widest extent possible.

Legacy Networks

Goal 1.5

Regulatory certainty, including certainty on wholesale pricing and the rate of return, facilitates timely investment decisions.

4.54 As noted previously, the EECC's new Connectivity objective aims to foster investments in VHCN across the EU. ComReg recognises that to deliver widespread VHCN, it may be necessary for a service provider to migrate away from its legacy network over time. Recognising the benefits of VHCN over non-VHCN or legacy network technologies, including faster download speeds, network reliability and lower energy consumption, ComReg is supportive of VHCN network rollout and the transition from legacy networks.

4.55 In March 2021, Eircom published a white paper on transitioning away from its legacy copper services to a predominantly fibre based VHCN environment (based on Eircom's FTTP network). ComReg consider that such a transition has the potential to deliver high-quality and reliable connectivity to end-users across the country who are currently using Eircom's copper and FTTC networks.

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40   ComReg Document 20/96

4.56 ComReg would note that while the migration from legacy networks is ultimately the responsibility of the Industry, this will require extensive consultation and planning in order to ensure an efficiently managed transition and that competition and end-users (including vulnerable end-users) are protected at all stages of the process.

4.57 In May 2021, ComReg published an information notice[41] setting out its view on its role overseeing the transition of regulated services to new VHCN and the related impact on regulated services and competition generally. ComReg set out that its approach to these issues will also be guided by the relevant regulations including the provisions of the EECC regarding the decommissioning or replacement process for legacy networks (Article 81). This includes that the transition must happen in a predictable and transparent manner for all stakeholders, with adequate notice periods.

The EECC requires ComReg to ensure that migrations from legacy copper networks subject to SMP obligations carry transparent timetables and conditions, and that end-users can continue to access broadband and telephony products.

4.58 ComReg set out its intention to engage with relevant stakeholders, including holding bi-lateral stakeholder meetings and publishing a 'Call for Inputs' to gather written views. In addition, a public consultation, to include detailed proposals on how the transition process should be conducted, will be published in due course.

4.59 In the meantime, existing regulatory obligations imposed on Eircom (e.g. USO and obligations not with withdraw services) remain in place. ComReg expects the transition from the copper network will begin in the next five years.

Essential Inputs: Spectrum and Numbering Resource

4.60 Radio spectrum is a scarce resource having a diverse range of uses and end-users. Radio spectrum, as a medium over which data can be transmitted, is an essential input in the supply of wireless/radio-based ECN / ECS.

Most ECN, even fixed networks, contain wireless segments. The availability of spectrum is therefore necessary for the entry and expansion of many operators in electronic communications markets. The growing demand for radio spectrum is driven by society's ever-increasing demands for access to data-intensive services while on the move. In addition, access to numbers is essential to the functioning of electronic communications markets. As a finite national resource, ComReg seeks to ensure that there is always an adequate supply of numbers to support the demands of existing and new customers and service providers. In this context it is ComReg's goal that **the management of spectrum and numbers facilitates competition, enhances connectivity and promotes efficient investment**.

Spectrum

4.61 Spectrum management[42] is the process of regulating the use of radio frequencies to promote its efficient use in the interests of society, involving a broad range of factors (e.g. administrative, regulatory, social, economic, and technical). This involves spectrum **allocation**[43] and **assignment**[44], as well as the monitoring, compliance and enforcement of licence conditions and equipment standards. In relation to the assignment of spectrum rights for ECN / ECS, ComReg determines the appropriate approach on a case by case basis.

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41 ComReg Document 21/43

42 See ComReg's Spectrum Management Strategy for 2019 to 2021 (Document 18/118) for ComReg's current thinking on a number of topical spectrum management issues

43 Spectrum allocation refers to the designation of given frequency bands for use by one or more types of radiocommunications services, where appropriate, under specified conditions. Radiocommunication services are defined by the international radio regulations – for example three of the 35 defined radiocommunication services include; the Fixed Services, the Broadcast-Satellite service and the Meteorological Aids Service

44 Spectrum assignment refers to those spectrum management activities which involve the issue, and authorising the use of, rights of use for radio frequencies. In Ireland, the possession and/or use of radio equipment requires authorisation from ComReg and may take the form of either a licence or a licence exemption under the Wireless Telegraphy Acts, 1926-2009.

Goal 1.6

The management of spectrum and numbers facilitates competition, enhances connectivity and promotes efficient investment.

4.62 The international harmonisation process for radio spectrum is a key driver of investment as it facilitates economies of scale in the manufacture of radio equipment. Importantly, from an investment perspective, the International harmonisation process is a key factor determining the technology roadmaps adopted by suppliers of radio equipment.

4.63 This process involves many aspects, including the harmonisation of technology standards in organisations such as ETSI 3GPP, and the harmonisation of radio spectrum allocations and technical conditions in organisations such as the International Telecommunications Union ('**ITU**'), BEREC, Radio Spectrum Policy Group ('**RSPG**') and Conference of European Post and Telecommunications Administrations ('**CEPT**').

4.64 Harmonisation activities focus on advancing the use of radio spectrum, and ComReg, together with DECC, plays an active role in international forums to ensure that, as far as possible, decisions relating to the international radio spectrum regulatory framework accommodate Ireland's specific requirements.

4.65 Participation in the international harmonisation process assists ComReg in actively taking into account and acting upon relevant developments in the exercise of its spectrum management functions in Ireland.

4.66 There are a number of spectrum projects that ComReg is already committed to that will take place in the coming period, including the second multi-band spectrum award (**MBSA2**), Fixed Links and Satellites:

◉ **MBSA2**: Completion of the MBSA2 award will see the release of 470 MHz of harmonised spectrum rights in the 700 MHz Duplex, 2.1 GHz, 2.3 GHz and 2.6 GHz Bands[45]. This represents a 46% increase in the harmonised spectrum assigned for the provision of wireless broadband services.

◉ **Fixed Links**: ComReg has held a consultation[46] to review the current Fixed Links licensing regime, and intends to issue a final decision in 2022, after which a number of work streams may emerge in order to open new bands, close some bands, realign uses, etc.

◉ **Satellites**: There has been a resurgence of interest in using constellations of small satellite in low earth orbits (LEOs) to provide internet access.

◉ To ensure that Ireland has an appropriate legislative framework, ComReg recently adopted a single exemption order[47] to cover all terminals for satellite services. This permits any user terminals that meet the conditions of the exemption order to be used in Ireland. Over the period of this Strategy, ComReg will review its licence regime for satellite earth stations.

4.67 ComReg operates a special licensing regime to encourage innovation and development involving new radio technologies or services. Two licence types are available, one covering technology tests and the other covering service trials involving third parties or the public. Both licences are intended to support genuinely novel research and development activities and are not intended for the commercial delivery of electronic communication services. A glance at the list of previously issued Test and Trial licences[48] will reveal some of the users of these licences and the innovative technologies and services tested or trialled in Ireland. ComReg intends to consult on and publish a new Radio Spectrum Management Strategy Statement 2022 to 2024, which will helps define ComReg's workplan across this two-year period.

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45   See https://www.comreg.ie/industry/radio-spectrum/spectrum-awards/proposed-multi-band-spectrum-award/
46   ComReg Document 20/109
47   See https://www.comreg.ie/publication/information-notice-on-the-permitted-licence-exemptions-for-terminals-for-satellite-services
48   See https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/wireless-test-trial/

Explanatory Box 1: Licence Exempted Devices

In Ireland the possession and use of radio equipment falls under the Wireless Telegraphy Act of 1926, as amended. Under this legislation the possession and use of wireless telegraphy ('WT') equipment requires a licence, issued by ComReg, unless the equipment has been exempted from the need for a licence.

Short Range Devices

Short Range Devices ("SRDs") occupy a range of frequency bands ranging from very low frequencies (kHz) to microwave frequencies (GHz). Due to their low power and localised usage, SRDs are generally regarded as having a low capability of causing interference. This is confirmed by extensive compatibility analysis studies which consider all the existing systems in the bands being considered. Consequently, SRDs have generally been made exempt from the need for individual licences, subject to compliance with certain technical conditions. SRDs cover an enormous range of diverse devices such as cordless telephones, alarms, field disturbance and Doppler apparatus ("FDDA") systems, wireless microphones, helicopter anti-collision applications and wireless local area networks ("WLANs").

WiFi6

To support WiFI6, a new band, 5945 – 6425 MHz, has undergone harmonisation in the CEPT and will shortly be harmonised by a directive across the EU. This new technology has had to slot into a band which is extensively used by fixed links across Ireland and WiFi6 will operate on a non-interference and non-protected basis in the band to protect the licensed services. ComReg is preparing to implement that directive by adding this band into the list of short-range devices that are exempted for the need for licencing.

There are a range of other devices that are being considered in the CEPT for licence exemption in the coming years including for example asset tracking tags, industrial level probing radar and a variety of ultra-wideband devices which are used in many applications.

Numbers

4.68 ComReg is tasked with the management of the National Numbering Scheme, including attaching conditions for rights of use of numbers. ComReg's role is to balance the need to conserve this finite national resource while ensuring that there is always an adequate supply of numbers to support the demands of existing and new customers and service providers. Any new conditions of use that support competition and innovation need to ensure that consumers remain protected against number misuse.

4.69 Numbers are likely to remain the most common universal identifiers between now and 2026 and well beyond. Numbers are trusted because they are coordinated at national level (by NRAs) and international level (by the ITU).

4.70 The EECC requires ComReg to introduce a dedicated number range for M2M services that explicitly permits 'extraterritorial' (i.e. permanent overseas) use. ComReg introduced this dedicated M2M number range in 2018, prompted by ComReg's forecasted exponential growth of M2M connections and the clear market need for extraterritorial use. ComReg will contribute to any BEREC and CEPT working groups that seek to address any remaining issues impeding the provision of global M2M/IoT connectivity solutions.

4.71 Related to the above goal, ComReg will undertake the following activities:

◎ **Completing improvements to the Non-Geographic Numbering (NGN) platform**: During 2021, three number ranges (1850, 1890 and 076 numbers) will cease to operate. From 1 January 2022, only the Freephone 1800 and Standard Rate 0818 NGN products will remain. These changes will ensure that Ireland has a fit for purpose and easy to understand NGN platform, and a competitive market for NGN services.

◎ **Factoring OTT services and 'cloud' numbers into updates of the Numbering Conditions of Use**: ComReg updates the Numbering Conditions of Use every 2-3 years, to take account of legislative changes, new technologies and market developments. Numbers are increasingly being used by the major online platforms, sometimes on a temporary basis, to provide 'click-to-call' features and to enhance end-user privacy. The next update in 2021 will reflect several changes to numbering legislation in the EECC.

◎ **Developing a strategy for promoting over-the-air (OTA) provisioning**: The EECC requires Member States to promote over-the-air ('**OTA**') provisioning to facilitate provider switching, with the emphasis on switching between M2M service providers. OTA provisioning relies on 'embedded' SIM ('**eSIM**') technology. ComReg commissioned an expert study in early 2021 to support the development of a strategy for the promotion of OTA provisioning in Ireland. ComReg is also seeking to engage with both national and international stakeholders as part of the study.

5

Consumer Protection

5. Consumer Protection

5.1 Well-functioning markets should maximise benefits for consumers.[49] However, markets do not always deliver optimal outcomes for consumers. Even in the presence of wholesale regulation, not all consumers in downstream retail markets may be adequately served and protected.

In addition, market failures such as information asymmetries can prevent consumers from making fully informed choices. Issues may also arise when service providers do not uphold consumers' rights or provide inadequate complaints and redress mechanisms to assist consumers.

Strategic Intent 2:

Consumers can choose and use communications services with confidence.

What does this look like?

- Consumers have easy access to the information they need
- Consumers have a choice of service providers but there is at least one provider available for basic (universal) services
- Vulnerable and Disabled end-users are protected
- The sign-up process is transparent and simple yet secure
- Consumers can switch without service disruption, inappropriate penalties or notice periods
- Consumers get the service they sign up for
- Consumers understand their bill and are billed correctly
- Consumers have timely access to customer care and redress

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49   ComReg's consumer role and associated protections, in certain cases, applies to small enterprises or microenterprises, not for profit organisations as well as consumers. Where this chapter uses the term consumer(s), it may also mean other end-users.

5.2 This Chapter sets out our strategic goals associated with protecting and informing consumers with the high-level objective of ensuring that **consumers can choose and use communications services with confidence.**

5.3 We describe the consumer navigation of the market, or the "Consumer Journey", in four broad phases, as set out in paragraph 5.15 below.

5.4 At each stage of the Consumer Journey, we seek to ensure consumers, including disabled consumers, are adequately informed of their consumer rights, and are equipped with the necessary information to make informed decisions. In addition, the EECC is introducing new measures to enhance consumer protection. Our role also includes consideration of a Universal Service for the ECS sector to ensure consumers have access to certain fixed electronic communication services at an affordable price. Finally, we have a role in consumer redress, complaint handling and an Alternative Dispute Resolution mechanism.

5.5 In this chapter we set out the range of consumer protection measures and information channels/tools we will be using over the coming period to address consumer harm issues and ensure consumers can choose and use communications services with confidence.

Consumer Harm

5.6 ComReg's consumer role is to protect and inform consumers so that harms are overcome, and they can choose and use communications services with confidence. In this context, our goal is that **ComReg identifies and understands consumer harms**. ComReg has several ways of identifying potential and actual consumer harms which need to be addressed using its consumer protection regulatory toolkit, including:

◉ Consumer queries and complaints;

◉ Market Research;

◉ Advisory Panels and Engagement; and

◉ Information Gathering, Compliance Monitoring and Investigations.

Consumer queries and complaints

5.7 Significant numbers of consumers continue to experience issues when availing of ECN / ECS and PRS. Our analysis of contacts to our Consumer Line highlight some notable trends[50]. Figure 6, below, shows the relative volumes of queries and complaints received over the past 5 years. Figure 7 below, shows the relative breakdown of ECN / ECS complaints by complaint type. Billing, contractual and service issues have been and remain the main ECN / ECS issues raised by consumers, while number portability and switching concerns have increased significantly more recently. Issues with PRS persist in particular in respect of subscribing, representing a significant percentage of total contacts received.

Goal 2.1

ComReg identifies and understands consumer harms.

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[50] ComReg reports consumer line statistics on a quarterly basis. Available at: www.comreg.ie/publications/

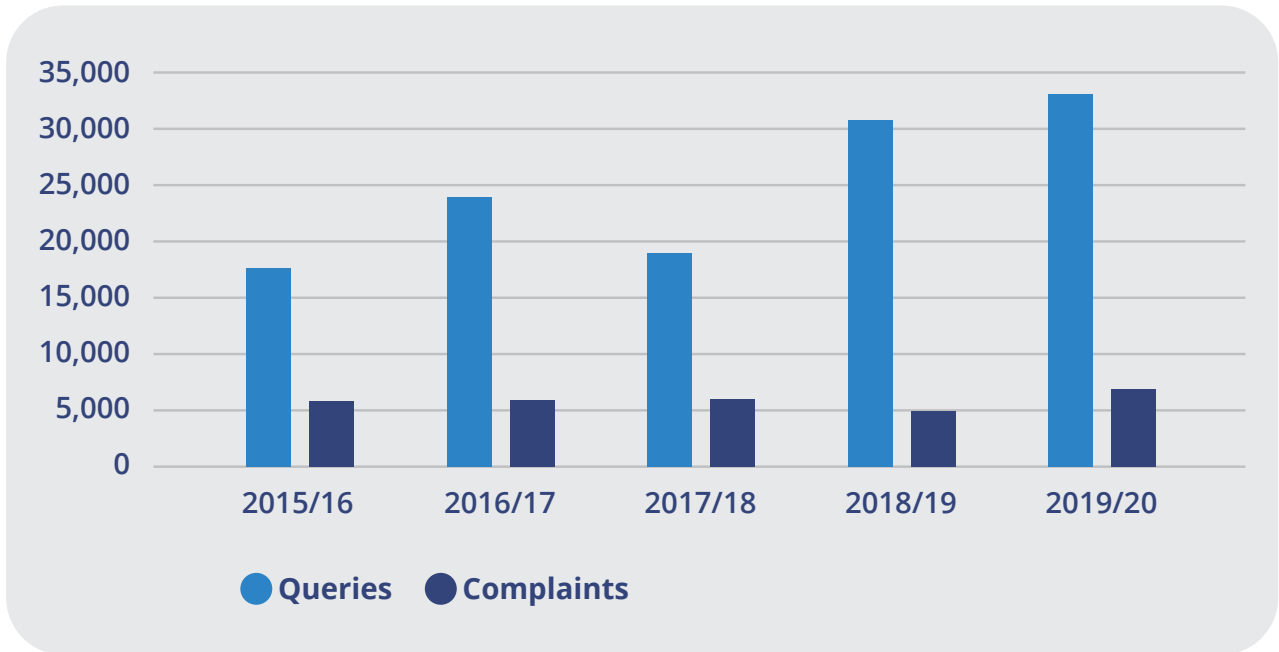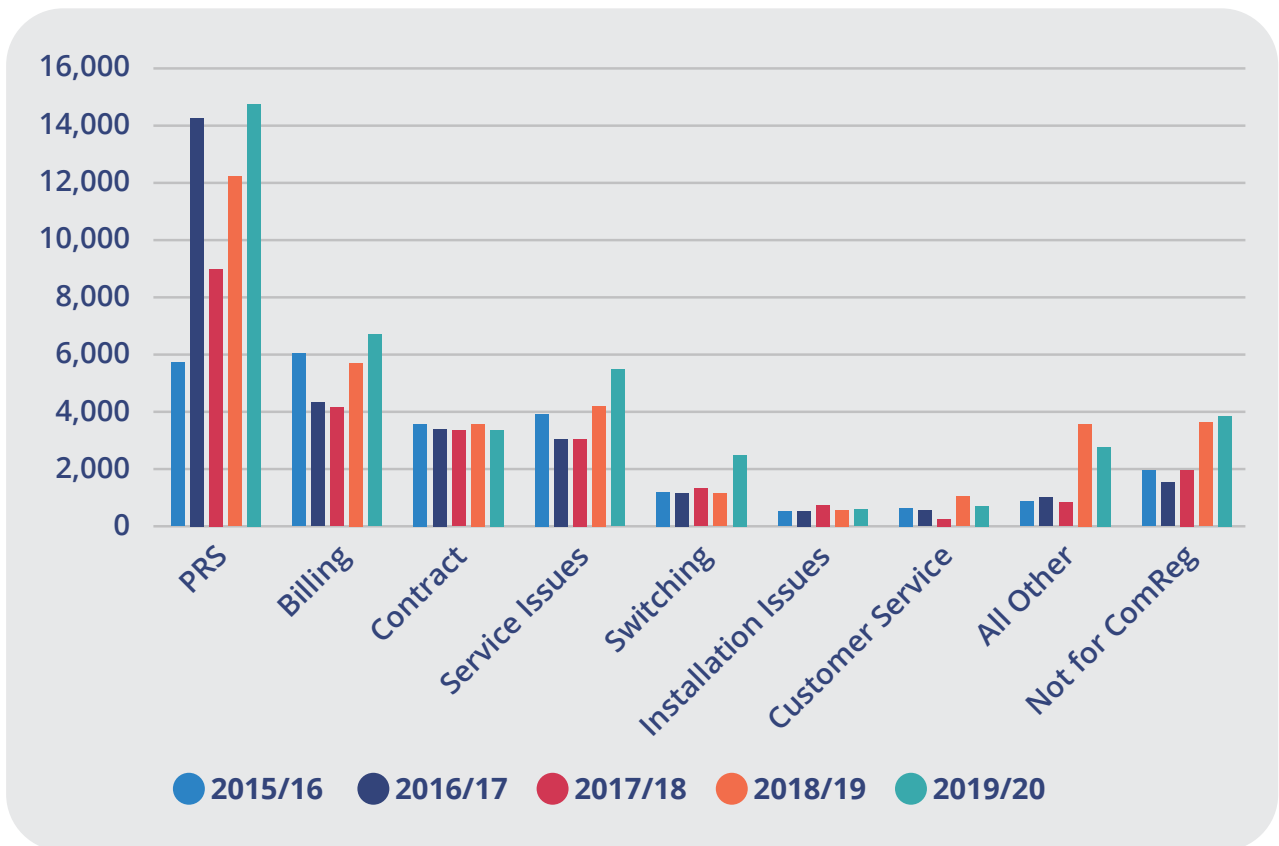**Figure 6: Breakdown of Issues Logged (Queries/Complaints), 2016 - 2020** [51]

Figure 7: Queries/Complaints Total ECN / ECS and PRS combined, 2016 to 2020 [52]

51   ComReg Consumer Line Statistics
52   ComReg Consumer Line Statistics

Research, Market Information and Behavioural Studies

5.8 Products and services sold in the ECS sector are complex. Rational decision-making in the presence of such complexity can be difficult for some consumers, indicating that markets may not function effectively. In addition, consumer decision-making can sometimes be affected by behavioural bias. Such biases can affect consumer preferences, consumer beliefs and decision making. Service providers frequently use these biases to nudge consumers into behaving in ways that better align with the commercial interests of the service provider (e.g. by moving consumers up the value chain). ComReg conducts regular research to gain insights into consumers' behaviours, preferences, and experiences. Further details are set out in Chapter 8.

Advisory Panels and Engagement

5.9 ComReg regularly hosts advisory panels to gain insights into consumer issues, including issues for end-users with accessibility requirements. The Consumer Advisory Panel ('**CAP**') was established in accordance with Section 12 of the Communications Act 2002[53]. The purpose of the CAP is to advise us on developments, innovations and areas of consumer concern which are relevant to ComReg's role. ComReg also periodically conducts disability workshops to explore specific accessibility topics and issues. This gives us an insight into harms that may be arising from an accessibility point of view that we may have a role in addressing.

5.10 ComReg also meets consumers and the public and through outreach events and activities and learns about issues and concerns arising through this channel. Further details are set out later in this Chapter.

Information Gathering, Compliance Monitoring and Investigations

5.11 ComReg regularly monitors service providers practices (e.g. information they provide to customers; contracts; and business processes) to obtain an understanding of the potential consumer harms that may arise. We achieve this via mystery shopping, information gathered directly from consumers and service providers, and through our compliance monitoring activities and investigations. ComReg is also contacted by service providers who observe practices in the market that may give rise to consumer harm. These insights help inform our information campaigns, policy interventions and enforcement actions.

Addressing Consumer Harm

5.12 Over the coming period we will continue to evolve and harness the insights from these sources to deepen our understanding of consumer harms and to design regulatory interventions to mitigate them. We use these insights into consumer harm to help identify groups of consumers who may be vulnerable or need support in ECS markets and to help inform how we deploy our regulatory toolkit to maximise its effectiveness. These vulnerabilities can emerge due to issues such as a lack of access to ECN / ECS, a lack of knowledge or information, personal circumstances, behavioural biases, the presence of market failures, etc.

5.13 To address any instances of consumer harm, including for vulnerable and disabled end-users, ComReg can use its powers to specify an intervention or a support measure to ensure that markets work effectively for all consumers and that disabled end-users are protected. In this context, it is ComReg's goal that **consumer rights and protections, including for vulnerable and disabled consumers, are adequate to mitigate consumer harm.**

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53   The CAP consists of representatives from the Consumers' Association of Ireland, National Disability Authority, Northern & Western Regional Assembly and Chambers Ireland

5.14 In the following sections, specific consumer harms are called out at various stages of the Consumer Journey and where appropriate specific actions to mitigate against these harms by ComReg are highlighted. Over the coming period, ComReg will consider whether it is appropriate to implement, enhance or evolve measures to mitigate against consumer harm.

Goal 2.2

Consumer rights and protections, including for vulnerable and disabled consumers, are adequate to mitigate consumer harm.

The Consumer Journey

5.15 ComReg describes the consumer navigation of the market, or the "Consumer Journey", in four broad phases, shown in Figure 8 below:

- ◉ Looking
- ◉ Signing Up
- ◉ Using
- ◉ Switching

5.16 ComReg's objective is to ensure that consumers are protected through every stage of the Consumer Journey and to achieve this ComReg uses its regulatory toolbox to intervene and assist consumers as issues arise and more generally where it identifies actual or potential consumer harm issues. Where relevant, specific consumer harms are highlighted and addressed through ComReg's various powers and work streams.

Figure 8: The Consumer Journey
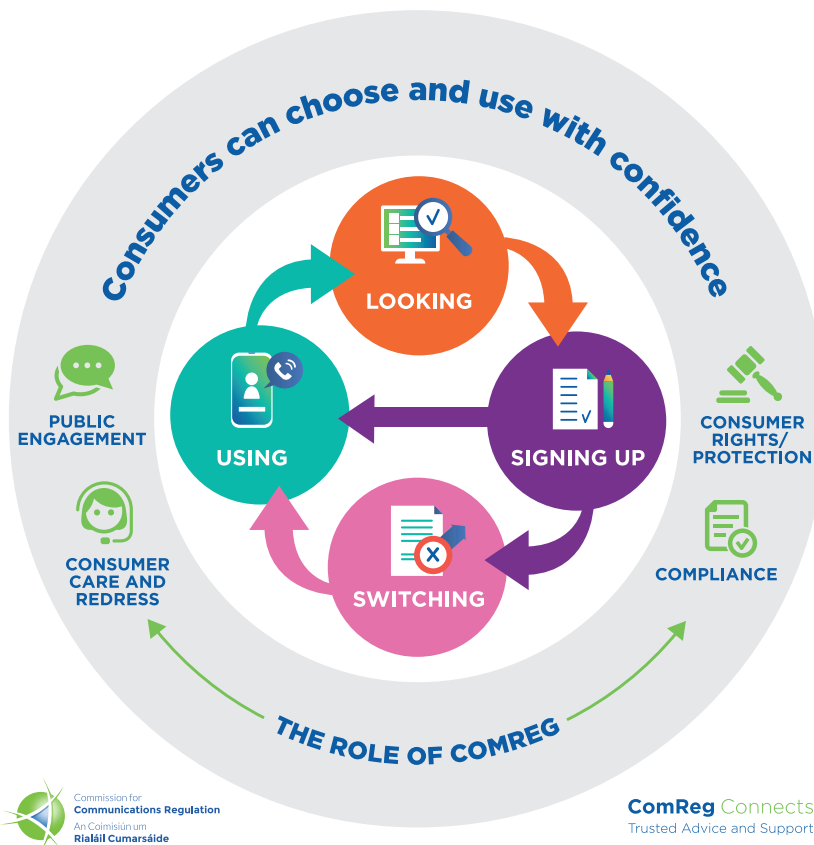
Stage 1 - Looking for a service offer

5.17 The market for ECN / ECS products and services is complex and the choices available to consumers are wide and varied. Without guidance or support to make an informed choice, some consumers, including disabled consumers, may be unable to make a decision, or they may postpone making a decision, possibly indefinitely. Having guidance and information presented in a manner that is accessible, useful, comparable, and accurately represents the product or service will assist consumers to make informed decisions. In addition, ComReg has powers to set rules regarding the way certain information about products and services is presented to the consumer.

Goal 2.3

Consumers, including vulnerable and disabled end-users, are supported by clear, accurate and up to date information throughout the Consumer Journey.

5.18 ComReg is committed to providing 'trusted advice and support' to ensure consumers can make informed decisions. We do this through the use of easy to understand language in our engagement with consumers and the public.

ComReg's goal relating to the provision of easily accessible, useful information and guidance is that all **consumers, including vulnerable and disabled end-users, are supported by clear, accurate and up to date information throughout the Consumer Journey.**

5.19 There are a number of useful information sources available to consumers when making a purchasing decision. Two of these are key sources – (1) Information provided by Service Providers and (2) Information provided by ComReg.

5.20 **Information from Service Providers**: The availability of transparent, accurate and timely information on the switching process should increase consumer confidence in switching and make them more willing to seek out new market offers. In addition, consumers are entitled to receive a Contract Summary, including in an accessible format for disabled end-users, to ensure their access needs are met and in view of the equivalence of access for disabled end-users that is envisaged by the Code[54]. When entering into a contract for both stand-alone and bundled services, the Contract Summary sets out the main terms of the service offer in a clear and understandable form and is intended to enable consumers to more easily compare services offered by different providers. Providers may also include information on switching in the Contract Summary. The Contract Summary also helps consumers to consider offers in their own time and prior to entering into a contract. Over the coming period ComReg will ensure appropriate easily accessible information is provided to consumers, including:

◉ **Pre-Contractual Information**: ComReg will ensure consumers are provided with Pre-Contractual Information relating to: contract duration, any switching charges, compensation and refund arrangements for delay or abuse of switching, information about how to switch, information on how to obtain a refund of prepaid credit when switching, and details of any early termination fees (including handset unlocking costs).

◉ **Contract Summary**: Over the coming period we will monitor the market to ensure that Contract Summary information is provided at the appropriate stage to consumers as required and is in an accessible format for disabled end-users.

◉ **Best Tariff Advice**: For those already in a contract, Best Tariff Advice[55] which is provided by service providers during the contract, will also be a useful tool to assist consumers in their choice of offers available.

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54   Commission Implementing Regulation (EU) 2019/2243 of 17 December 2019
55   Article 105(3) of the EECC

5.21 **Information from ComReg**: ComReg provides a range of tools and information to assist consumers in their comparison of offers and in enhancing their understanding of ECN / ECS products and their associated rights. Through our consumer engagement channels, discussed later in this chapter, we provide information to consumers on their rights. Over the coming period our work relating to this goal includes the following items:

◉ **Consumer Care**: Service providers must be able to efficiently address their own customers' queries and issues. We will work to drive service providers to improve the experience they provide to their customers by improving transparency on Quality of Service and ensuring that they are tackling systemic and root cause issues. ComReg's Consumer Line will assist consumers with their queries and complaints, and we will continue to assist consumers who need advice and support.

◉ **Consumer website**: Through our website we aim to provide consumers with easy to understand information on topical issues which might impact their choice or use of ECN / ECS. We will continue to evolve our ways of communicating information to ensure it is accessible, understandable, and consistent. Our website hosts our Comparison Tools, Outdoor Coverage Map and PRS Service Checker.

◉ **ComReg Comparison Tools**: Our comparison tool allows consumers to compare costs for mobile phone, home phone, broadband & TV market offers. This comparison tool is available at https://www.comreg.ie/compare. Over the coming period we will ensure that the ComReg Comparison tool offers additional features and functionality, including information on attributes such as total cost, contracted speeds, data allowances and other important information consumers need when selecting a service. We also plan to develop an accreditation process, should websites offering commercial comparison tools, who fulfil the necessary requirements, apply to have their comparison tool accredited by ComReg.

◉ **Outdoor Coverage Map**: We provide an outdoor mobile coverage map on our website (and via an app) to allow consumers to check service providers' outdoor mobile phone coverage predictions at locations throughout the country. This map is available at https://coveragemap.comreg.ie. Over the coming period we will publish 5G outdoor mobile coverage maps and will be consulting with industry on the proposed methodology to take account of 5G technologies (e.g. 5G coverage thresholds). We expect to publish these maps, pending industry engagement, in Q4 2021. We also plan to provide further information and guidance on other factors that may be affecting their mobile experience. In addition, we are also considering providing a broadband coverage map on our website for consumers.

◉ **Premium Rate Service checker**: Our PRS service checker allows consumers to check the name and number of a PRS they intend to use or have been billed for. Available at servicechecker.comreg.ie

Stage 2 - Signing Up for a service

5.22 Equipped with relevant information and guidance about the offers available, consumers may decide to sign-up or enter a contract for services with their chosen service provider.

5.23 We consider that effective competition in the ECS sector depends on, amongst other things, the ability and willingness of consumers to switch service provider or plan/bundle in response to a better deal in the marketplace. It is therefore our goal that **there are low barriers to consumers exercising their choice when signing up for a service.**

Goal 2.4

There are low barriers to consumers exercising their choice when signing up for a service.

5.24 Having considered the Contract Summary made available by a service provider and considered all the relevant options and information, a consumer who wishes to switch should contact their new service provider. The new service provider will then arrange the switch and the consumer's existing contract will be terminated. There should be no break in service and phone numbers can be transferred (ported) from one service provider to another.

5.25 ComReg provides a consumer guide on our website to assist consumers who wish to switch. Based on ComReg's knowledge and experience of consumer harm issues in the market, and additional protections afforded by the EECC, ComReg aims to minimise barriers to consumers including disabled end-users exercising choice.

In this context, over the coming period, our principal focus in this area will include the following matters:

- Signup;.
- Durable Contracts;
- Bundled Offers; and
- Delayed Installations.

5.26 Further information on these matters is set out in Table 4 below.

Stage 3 - Using the Service

Table 4: Areas of focus

Signup
We will work to ensure that sign-up processes are easily accessible and consumers have accurate information to fully understand the process and the contract that they are signing up to and that contracts are fair. We have powers in respect of unfair contract terms and have sought to have co-enforcement powers under the Unfair Commercial Practices Directive so that we may play a role in eradicating misleading sales and other unfair commercial practices in our sector.

Durable Contracts
We will work to ensure that consumers receive their contracts when they sign up and upgrade, in particular over the phone or on-line and that they are afforded their cooling-off rights. We will monitor to ensure that contracts and contract summaries are consistent across service providers and in accordance with the legislation.[57]

Bundled Offers
Article 107 of the EECC requires service providers extend certain end-user rights provisions to all elements of a bundle[58]. These provisions will help facilitate consumers in switching provider more easily and taking advantage of competitive offers for the entire bundle if it is in their interests to do so. ComReg will monitor compliance with these requirements under the EECC.

Delayed Installations
ComReg will develop its approach to remedies for missed service and install appointments as provided for under Article 106 of the EECC.

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57 ComReg has published relevant Regulatory Guidance (https://www.comreg.ie/publication/regulatory-guidance-on-title-iii-end-user-rights-of-the-european-electronic-communications-code-2).

58 Including terminal equipment, digital content or digital services and ECN / ECS that are not otherwise directly covered by the scope of those end-user rights provisions.

5.27 Having signed up to a service, completed any necessary equipment installation and switched service provider, consumers should now be able to use their service. However, issues may arise at any stage, including while using the service, despite the consumer protections that are in place. In this context, it is ComReg's goal that **consumer rights throughout their journey are upheld by their service providers**.

Goal 2.5

Consumer rights throughout their journey are upheld by their service providers.

5.28 There is a range of rights and protections relating to a consumers' use of their ECN / ECS service. At all times, consumers should be treated fairly in accordance with their consumer rights. Where rights are not upheld, service providers risk enforcement action by ComReg. Further details on our enforcement activities are set out in Chapter 7.

5.29 Over the coming period, relating to this goal, ComReg will undertake the following activities:

◎ **Regulatory Guidance on End-user Rights**: To assist service providers understand the range of end-user rights, in 2020 we published Regulatory Guidance on the End-User Rights of the EECC[59]. Over the coming period we will further consider our approach to this guidance on new rights together with enhanced publication of enforcement actions.

◎ **Provisions for Disabled End-Users**: ComReg is currently undertaking a review of existing obligations on Service Providers, including the Irish Text Relay Service, to ensure that the measures put in place for disabled end-users reflect market evolutions and continue to meet consumer needs. ComReg may consult on issues to be addressed as part of its wider review and in light of provisions in the EECC relating to accessible information. ComReg will ensure that end-user access needs are met and support the equivalence of access provisions for end-users with disabilities envisaged by Article 111 of the EECC.

◎ **Premium Rate Services**: ComReg will continue to monitor developments in the PRS markets to ensure that consumers are not incorrectly subscribed and that PRS providers adhere to requirements set out in ComReg's PRS Code of Practice.

Consumers have the right to block mobile PRS if they do not wish to avail of them and we are considering if further protections related to third-party billing are appropriate.

◎ **Net-neutrality monitoring**: ComReg will continue to actively monitor compliance in respect of elements including traffic management practices and consumer contracts as well as monitoring of zero-rated practices.

◎ **ECAS**: ComReg will continue its work in the ECAS industry forum to improve location information and to assist where appropriate with new provisions in the EECC. ComReg will enforce compliance with connectivity to the ECAS.

◎ **Battery Backup measure**: As the availability of VoIP over broadband networks and OTT services expands across geographical areas (due to the rollout of new VHCN), it is recognised that power outages could have a more pervasive impact. ComReg will consider a review of its 2018 decision on Battery Back-up[60] and any appropriate obligations in respect of vulnerable users.

5.30 Notwithstanding the existence of various end-user rights and consumer protection measures highlighted above, there may still be a risk of harm to consumers where these protections may not be sufficient to safeguard consumer interests.

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59 ComReg document 20/111R

60 ComReg document 18/04 D02/18

Stage 4 - Leaving the Contract/ Switching

5.31 Consumers may decide to exit their contract for a variety of reasons, including:

- They have decided they no longer require the service.

- They are dissatisfied with their current service.

- They have come to the end of the contract (minimum term).

- Their service provider has increased the price or altered another part of their contract and they have been given the right to exit and decided to exercise this right.

- They are moving premises.

- They have been given Best Tariff Advice or an upgrade offer and they wish to enter into a new contract with their existing service provider.

5.32 A fundamental aspect of ensuring that this part of the journey is seamless for consumers is information, including accessible and adequate information on terminal equipment and unlocking costs and procedures, early termination fees, refunds, switching provider, cancelling a contract, ceasing the service, final bill issues and complaint handling.

5.33 It is critical that this information is provided to consumers at the relevant stages of their Consumer Journey, and should be provided in an accessible format for end-users with disabilities. ComReg considers that misinformation can cause uncertainty for consumers as to what steps they have to take to cancel a contract, what early termination fees might apply, what fees are due for terminal equipment (such as handsets and modems) and the exact date the service will cease. Consumers should also be informed about any remaining standing orders and direct debits, when they can expect their final bill, and any refunds due to the consumer. In addition, any mobile handsets should be unlocked promptly when final balances are paid.

5.34 In some cases, practices and issues can create barriers to switching by making the process unnecessarily difficult for consumers (e.g. complex switching processes, service or number loss, locked mobile handsets, unissued refunds or lack of an appropriate cooling-off period).

Goal 2.6

There are low barriers to consumers exercising their choice when leaving a contract.

5.35 ComReg monitors the level of switching in the ECS Markets through the data we gather from industry and market research. Through our compliance and enforcement actions, we ensure consumers are not disadvantaged by unfair or illegal practices that serve to limit consumer switching rights or create disincentives to switching.

5.36 It is therefore our goal that **there are low barriers to consumers exercising their choice when leaving a contract**.

5.37 Over the coming period, ComReg will focus on ensuring that accurate, easily accessible information is available to consumers and that cancellation processes (as well as switching processes) are being implemented appropriately by service providers, including through enforcement. Our work will include the following:

- **Contract Change Notification**: ComReg will monitor providers' approaches to issuing Contract Changes Notifications for any changes to terms and conditions they propose, while advising consumers whether or not the right to terminate arises, given the change(s) outlined in the EECC. ComReg may further specify requirements to ensure contract change notifications are made in a clear and comprehensible manner, and on a durable medium.

- **End of Contract Notification and Best Tariff Advice**: Before a contract is automatically prolonged, providers are required to inform a consumer in a prominent, timely manner, and on a durable medium, of the end date of the fixed term contract and how to terminate the contract (the "End of Contract notice"). At the same time, Best Tariff Advice relating to their services should be provided. After a contract has been prolonged and during the prolonged period of the contract, such Best Tariff Advice, should be provided at least annually.

  ComReg will monitor providers' approach to compliance with Regulatory Notifications required to be sent to end-users on foot of Article 105 (3) of the EECC. ComReg has set out its initial policy considerations and views on best practice as regards how to provide Best Tariff Advice and will consider if further intervention is needed to ensure the objectives of the EECC are met.

- **Disincentives to Switch**: ComReg will continue to identify disincentives to switching and will take action to ensure that practices that may be obstacles to consumer switching are removed. We will focus on ensuring industry switching processes are working effectively for consumers.

Universal Service - Affordable access to basic services

5.38 Under the EECC, the purpose of Universal Service is to ensure consumers have access at an affordable price to an available adequate broadband internet access service and to voice communications services, including the underlying connection, at a fixed location.

This Universal Service is only required when the market fails to deliver, and relevant public policy interventions have been exhausted. In this context it is our goal that **all end-users have affordable access to adequate broadband and voice services at a fixed location**. Currently, Eircom Ltd is designated as

the Universal Service provider, and provides a voice service at a fixed location that is a safety net ensuring access to basic ECN / ECS.

Goal 2.7

All end-users have affordable access to adequate broadband and voice services at a fixed location.

5.39 The Universal Service requirements set out in the EECC reflect advances in technology, with a view to ensuring that the Universal Service Obligation ('**USO**') can be adapted to meet the circumstances in Ireland, and to meet future demands for data and voice communication services.

5.40 In addition to the above Universal Service, consumers are also entitled to access emergency call answering services. All providers of publicly available ECN / ECS must provide free access and connection to emergency services.

5.41 Eircom Ltd, as the designated Universal Service provider has obligations regarding the provision of certain services including:

- **Provision of a voice connection and service**: Eircom must meet every 'reasonable' request for a phone connection at a fixed location. The service provided must be capable of local, national, and international phone calls; fax communications; and data communications at rates that are sufficient to permit functional internet access. Eircom must deliver access at a fixed location at a uniform price and at a specified quality.

- **Retail price cap**: The existing price cap was imposed on Eircom from October 2007 and provides a safeguard on fixed line rental and connections fees. The price cap ensures that Eircom cannot increase the prices by more than the rate of inflation as published by the Central Statistics Office. The necessity and

appropriateness of this measure is considered as part of the market analysis of the fixed access call origination ('**FACO**') market.

5.42 Over the coming period, relating to this goal, ComReg has a number of activities planned:

- **USO QoS**: ComReg will continue to publish information on Eircom's USO Quality of Service ('**QoS**') performance on its website[61].

- **USO Funding**: In respect of funding for the universal service, in 2019 Eircom legally challenged ComReg's USO funding application decisions for 2010-2015. Over the coming period ComReg will defend each of these USO funding application decisions. ComReg is also progressing Eircom's 2015-2016 USO funding application.

  Eircom has informed ComReg that it reserves its right to make applications for USO funding for the financial periods 2016 to 2020 and for any further funding applications that become due before its appeal of ComReg's decisions in respect of the various funding applications relating to the 2010-2015 period is determined[62].

- **Adequate Broadband**: ComReg has liaised with DECC in relation to the transposition of the Universal Service Provisions of the Code, and ComReg understands that the definition of adequate broadband ('**ABB**') and the procedure for the imposition of affordability measures will be progressed following transposition. It is anticipated that ComReg will have a role in implementing a USO(s), if appropriate.

  We note the requirement under the Code for Member States to ensure access to an available adequate broadband internet access service ('**ABB IAS**') and voice communications services at a fixed location at the quality specified in their territories, including the underlying connection, at a fixed location. The Code requires Member States to ensure that ABB IAS is available through the provision of a USO where this need cannot be ensured under normal commercial circumstances or by other potential public policy tools.

Separately, the NBP is the government's initiative to deliver high speed broadband services to all premises in Ireland. This will be delivered through investment by commercial enterprises coupled with intervention by the State in those parts of the country where private companies have no plans to invest.

Upon completion of rollout of the NBP it is anticipated that all premises in the Intervention Area will have access to high speed broadband. This rollout, coupled with commercial roll out by operators, is expected to reach an overwhelming majority of premises. In this context the need for a USO to provide an adequate broadband connection and service will be assessed following transposition.

Consumer Complaints and Redress

5.43 For consumers to have confidence in choosing and using telecommunications services, they need to have a resolution process that addresses the imbalance in power between that of a service provider and the consumer. In this context it is ComReg's goal that consumers have effective redress mechanisms, **including access to timely query and complaints handling processes**.

Goal 2.8

Consumers have effective redress mechanisms, including access to timely query and complaints handling processes.

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61 Published as Universal Service Requirements – Provision of Access at a Fixed Location (AFL) by Eircom Limited – Quality of Service Performance Data. See ComReg Doc 20/120 for information from Q2 2020 and 2019/2020

62 High Court Record 2019/167 MCA. ComReg Information notice 21/44.

5.44 All ECN / ECS Providers are obliged to have a Code of Practice for Complaints Handling, detailing how they deal with disputes and what steps a consumer must follow. Where a complaint has not been resolved within 10 days, ComReg can intervene to achieve a resolution that we consider acceptable for the consumer.

5.45 In addition to our complaint handling service (via the ComReg Consumer Line), in 2018 we introduced Formal Dispute Resolution Procedures for ECN / ECS complaints[63] that have been unresolved for 40 working days after lodging a complaint with a service provider. In this case, a consumer may apply to ComReg to adjudicate on a dispute.

5.46 Relating to this goal, over the period our work will include the following:

◉ **Code of Practice for Complaint Handling**: ComReg considers that consumer complaints should be resolved quickly and effectively. In order to achieve this, over the coming period we plan to undertake the following complementary activities:

a Increase awareness of the Code of Practice for Complaint Handling.

b Monitor compliance with the minimum standards defined for service providers' Code of Practice for Complaint Handling.

c Make the necessary enhancements and interventions in relation to the minimum standards for the Code of Practice for Complaint Handling to improve service provider resolution timeframes and consumers' dispute resolution experiences.

d Seek additional powers where relevant in relation to consumer protections and the enforcement of those protections.

◉ **Formal Dispute Resolution**: we plan to continue our work in the area of Formal Dispute Resolution.

Communication and Engagement

5.47 Communication and Engagement with consumers is critical to ensure consumers know their rights at all stages of the Consumer Journey. In this context, we aim to be **an effective advocate for consumers**.

5.48 Our communication and engagement activities include direct contact with individual consumers by phone and email, through outreach events, the provision of information on our website and on social media, and indirect engagement through the media. We also engage through contacts with representative bodies, and we gather information about end-user needs through market research. To promote the interests of consumers, we also seek to use our influence with other regulatory bodies and with industry. We keep this mix of engagement channels under review to ensure continuing effectiveness.

Goal 2.9

ComReg is an effective advocate for consumers.

5.49 We also engage with representative bodies and relevant public bodies through our Consumer Advisory Panel ('**CAP**') and our participation in the Mobile Phone and Broadband Taskforce. In addition, we also engage with DECC, other public bodies and sectoral regulators regarding matters relevant to consumers (including vulnerable and disabled consumers) through bilateral meetings and relevant committees.

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63 ComReg document 18/104 D14/18

5.50 In 2020 we introduced our consumer brand, '**ComReg Connects**', to help ensure consumers and the general public can identify ComReg as a brand at the forefront of consumer protection, capturing the essence of who we are and what we stand for.

5.51 ComReg is committed to continue to provide 'trusted advice and support'. We will continue to do this through transparent communication that uses easy to understand language throughout our engagement with consumers and the public.

5.52 Our consumer website **ComReg.ie/consumer** offers consumer information and news to better inform consumers of issues and developments in the market. Over the coming period we plan to further enhance our website to make it more informative, ensuring that information and guidance is provided in a succinct and consumer friendly manner.

5.53 In addition to the information available to consumers on our website, we also offer a variety of consumer tools, including:

- an independent service for consumers to check the outdoor coverage of mobile service providers (**coveragemap.comreg.ie**)

- a comparison tool to compare prices and other aspects of communication products and offers (**comreg.ie/compare**)

- a Premium Rate Service checker (**servicechecker.comreg.ie**)

5.54 Over the coming period we also intend to undertake initiatives relating to this goal:

- **Consumer Communications strategy**: ComReg takes a strategic approach to communicating with consumers and the public, and uses a range of tools and techniques, including campaigns, that are topic specific, to enhance consumer knowledge and awareness and to address information gaps. ComReg will continue to develop the range of communication channels to meet the changing demands and needs of consumers and the ECS sector. We are cognisant of behavioural bias and other related issues which serve to misinform or lead consumers to make poor decisions. We will use our competency in this area to assist in making the information we provide helpful for consumers.

- **Consumer Outreach Events**: When it is safe to do, we intend to recommence participating at outreach events and meet consumers face to face, most likely in early 2022. In the meantime, we intend to host webinars that will address consumer topics of interest, building on our webinar held in 2020 on 'The evolving Customer Care Challenge'.

- **Website**: We will continue to improve comreg.ie/consumer and offer a range of tools that offer independent information to users.

- **Brand Roll out**: We will evolve our communication language and the various consumer tools hosted on our consumer website to reflect our ComReg Connects brand values.

6

Connectivity & Network Resilience

6. Connectivity & Network Resilience

Introduction

6.1 This Chapter sets out ComReg's goals associated with connectivity and network resilience and the high-level objective of ensuring that **end-users have widespread access to high-quality and secure communications** networks, services, and applications. By 'connectivity' ComReg means having access to the necessary ECN to allow for the use of various services and applications. For ComReg, the connectivity of end-users is not about pitting one network technology against another, but rather the widespread, continuous, and high-quality connectivity of end-users.

6.2 The EECC includes a new objective that ComReg, Government and BEREC shall pursue: *promote connectivity and access to, and take-up of, very high capacity networks including fixed, mobile, and wireless networks, by all citizens and businesses of the Union*. In pursuit of this objective, the EECC also restates the need for a balance between providing adequate incentives to invest in VHCN and the need for regulation.

6.3 Today, the connectivity of end-users has become essential to ensuring social and digital inclusion. It is ComReg's view that end-users can only fully participate in society and the wider economy when their connectivity needs are met. As we become increasingly reliant on digital services, the importance of widespread, continuous, and high-quality connectivity increases.

Strategic Intent 3:

End-Users have widespread access to high-quality and secure communications networks, services, and applications.

What does this look like?

- Widespread availability of ECS and ECN's allows for digital inclusion by all consumers:
  - By 2026, universal coverage of fixed VHCNs is within sight.
  - By 2024, outdoor mobile voice coverage exceeds 99% of the population and outdoor mobile data coverage at speeds greater than 30 Mbps exceeds 85% of the population rising to greater than 95% of the population by the end of 2028[64].
- Connectivity challenges are addressed and indoor mobile voice services (via mobile connections or Wi-Fi calling) are available to all.
- Networks are secure and can withstand shocks
- EU Objectives for 'Connectivity' of end-users are met

6.4 As our reliance has grown, so too has our dependence on our ECN / ECS and our expectations of what our ECN can and should be able to do. In addition, our acceptance of network outages or inadequate services has diminished. ComReg recognises that some end-users are poorly served and cannot use the range of digital services that others take for granted.

These end-users may suffer from a lack of a reliable fixed network, mobile network, wireless network, or other communications solution at home, at work or on the move.

6.5 ComReg recognises that some of these end-users may suffer from a lack of multiple different reliable networks at the same time (e.g. poor fixed broadband and poor mobile telephony). In addition, some end-users may suffer from poorer services intermittently, due to a range of factors beyond their control. It is also recognised that ensuring everyone can access online and digital services, regardless of where they live or how connect to these services, will be key to driving participation in the digital economy and society.

6.6 Until recently, much of the focus around connectivity and end-user experience centred around the availability of networks and advertised download speed. The growth in remote working has shifted the focus towards other important dimensions of the experience, such as overall QoS, latency, network capacity and security. Our networks and services are also vulnerable to issues such as equipment malfunction, human error, malicious and cyber-attacks, severe weather events and external incidents (e.g. electricity outages). Accordingly, network resilience, reliability, and security ('**NRRS**') is an area that is becoming more important. ComReg's role in this area is to have a holistic understanding of the nature of the various connectivity deficits facing the country.

6.7 Where ComReg has regulatory powers to address these issues, ComReg seeks to use these in a manner that complements its other regulatory powers. Where others (e.g. DECC) have powers, ComReg seeks to support them in that role and act as a knowledgeable regulator, making informed contributions to policy discussions and debate. In some cases, a multi-agency approach is required to address issues relating to connectivity and network resilience (e.g. cyber security, the Mobile and Broadband Taskforce). Figure 9 below sets out the strategic framework relating to this strategic intent.

Figure 9: Strategic Framework
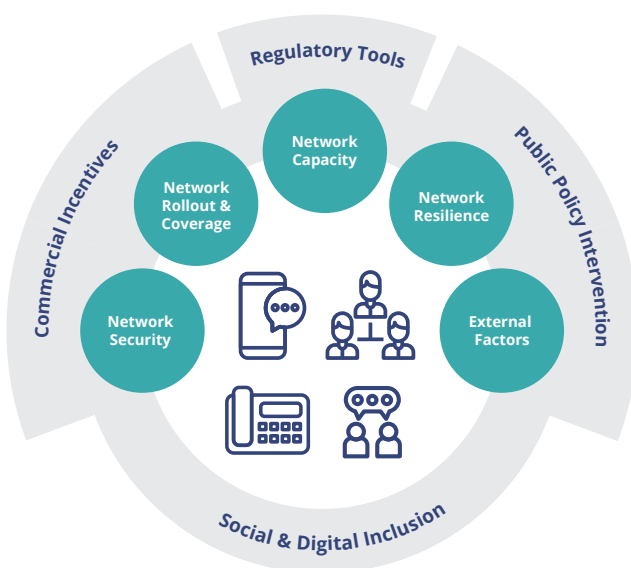
64 This assumes the necessary licences are issued with a commencement date of 1 December 2021

The Essential Nature of Connectivity

Digital Inclusion and Network Coverage

6.8 As noted previously, to fully participate in the economy and society in an efficient way, it is now often essential for an end-user to use digital services (e.g. e-banking, paperless billing, public services, taxation matters). In some areas, where the commercial and economic drivers are not strong enough to drive the investment in high-quality, reliable, and resilient networks, end-users are left relying on networks that cannot fulfil their needs.

6.9 The rise of remote working has placed a greater emphasis on the need for high-quality, reliable, and resilient ECN. Connectivity has been essential for individual remote workers, but also for Irish enterprise to continue operations. This emphasis on remote working will continue to grow over the next five years, as our expectations of our networks evolve. In January 2021 the Government published its Remote Working Strategy, focusing on the development and investment needed to maximise the benefits of remote working. Widespread access to high-quality and secure communications networks, services and applications will be key to unlocking the potential of the Remote Working Strategy.

6.10 The onset of the Covid-19 pandemic has given added impetus to end-user expectations and need for high-quality, reliable, and resilient ECN. Fixed data traffic volumes grew by 64% in 2020, compared to an average annual growth rate of 24% between 2017 and 2019. Fixed and mobile data traffic volumes are now significantly greater than pre-Covid-19 base levels.

6.11 However, there are parts of Ireland that are underserved by high-quality and reliable ECS ECN resulting in some end-users being digitally excluded. Ireland's population density of 70.9 people per km² is considerably lower than the EU average[65] of 118 people per km². However, in rural areas, the population density is only 27 people per km². As population density decreases, the distance between premises increases, increasing the cost of deploying ECN.

6.12 For ComReg, ensuring all end-users have access to connectivity is not about pitting one network technology against another, but rather the widespread, continuous, and high-quality connectivity of end-users, regardless of the underlying technologies.

6.13 To date, commercial and regulatory levers have driven the rollout of fixed VHCN to 1.47 million premises (households and businesses) across the country. Over the next decade, these commercial and regulatory drivers will likely drive the rollout of VHCN further into rural areas, covering 1.7 million premises. The rollout by National Broadband Ireland, covering 540k premises, will supply VHCN services to the most remote parts of Ireland. ComReg considers that the commercial investment in fibre and mobile network rollout and public investment through the NBP puts us withing touching distance of ubiquitous coverage of high quality fixed and mobile networks by 2026.

6.14 In 2018, ComReg published the results of a connectivity study which considered how best to meet consumers' mobile connectivity needs[66], estimating future mobile connectivity network costings and the implications for spectrum awards and coverage obligations.

These reports provided an analysis of the challenges, solutions and actions to improve connectivity, including the use of Wi-Fi and native Wi-Fi[67] to support indoor mobile

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65 See https://ec.europa.eu/eurostat/databrowser/view/tps00003/default/table?lang=en

66 ComReg Documents 18/103, 18/103a, 18/103b, 18/103c, 18/103d

67 Where consumers have had issues with indoor mobile connectivity, ComReg has advocated for the use of Wi-Fi and Native Wi-Fi calling over a fixed broadband network. Native Wi-Fi calling is a service for smartphones providing the ability to make and receive phone calls over an internet connection with sufficient download speed and latency. ComReg has previously noted that in most instances, native Wi-Fi calling is likely to be the most effective mechanism to improve indoor reception issues.

connectivity and the need for significantly more cell sites than exist today to achieve very high levels of 30Mbps mobile broadband coverage on a geographic basis. In addition, the reports highlight that policy or regulatory interventions that could be used to secure more extensive coverage outcomes would require careful planning, and an extensive exercise to determine the costs and benefits to society.

6.15 In March 2021, the EC presented a vision for Europe's digital transformation by 2030, called Europe's Digital Decade[68], which builds on the Commission's digital strategy of February 2020, as set out in Explanatory Box 2 below. The EU's digital strategy aims to make this transformation work for consumers, while helping to achieve a climate-neutral Europe by 2050.

Explanatory Box 2: European Commission – Europe's Digital Decade

This vision for the EU's Digital Decade evolves four pillars, each including targets and milestones for 2030:

- Secure, performant and sustainable digital infrastructures: By 2030, all EU households should have gigabit connectivity and all populated areas should be covered by 5G; the production of cutting-edge and sustainable semiconductors in Europe should be 20% of world production; 10,000 climate neutral highly secure edge nodes should be deployed; and Europe should have its first quantum computer.

- Digital transformation of businesses: By 2030, 3/4 companies should use cloud computing services, big data, and AI; more than 90% SMEs should reach at least basic level of digital intensity.

- Digitalisation of public services: By 2030, all key public services should be available online; all citizens will have access to their e-medical records; and 80% citizens should use an e-ID solution.

- Digitally skilled citizens: By 2030, at least 80% of all adults should have basic digital skills, and there should be 20 million employed ICT specialists in the EU – while more women should take up such jobs.

The EC note that digital technologies will be the key differentiating factor in a successful transition to a sustainable economy and society after the Covid-19 pandemic ends.

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68   Europe's Digital Decade: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_983

Network Resilience, Reliability and Security (NRRS)

6.16 As reliance on ECS / ECN has grown, it has become critical that end-users can have a reasonable level of assurance as to the continuity and security of the ECS / ECN being provided, regardless of the underlying network technologies.

6.17 Network and service outages can cause significant disruption to end-users resulting in economic, financial, and societal losses. While ComReg recognises that 'force majeure' events can and will happen, resulting in an unavoidable temporary loss of service, it is essential that all reasonable precautions and processes are in place to ensure continuity of supply.

It is therefore essential that adequate precautions and investments are made to ensure continuity and availability of networks and the services provided over these networks.

Essential Digital Infrastructure

6.18 As noted above, ComReg views connectivity in a holistic way, recognising that there are a variety of networks, technologies, and solutions available to people to help fulfil their connectivity needs. In addition to fixed and mobile networks, there are other networks, such as wireless networks and satellite broadband networks, that can help offer connectivity to end-users.

6.19 It is ComReg's view that for consumers and businesses around the country, it is the quality and reliability of ECS/ECN that matters, rather than the means of delivery. Ensuring the widespread availability of these high-quality and reliable services is the focus of ComReg's strategy. In this context it is ComReg's goal that **telecommunications networks, technologies, and solutions allow end-users to fully participate in all aspects of society.**

6.20 The EECC includes a new objective to promote connectivity and access to, and take-up of, very high capacity networks (VHCN). In pursuit of this objective, the EECC also restates the need for a balance between providing adequate incentives to invest in VHCN and the need for regulation.

Goal 3.1

Telecommunications networks, technologies and solutions allow end-users to fully participate in all aspects of society.

6.3.1 To aid economic recovery in the EU following the Covid-19 pandemic, the EC published a Recommendation[69] calling on Member States to boost investment in VHCN and 5G. The recommendation sets out guidance for developing best practices aimed at reducing the cost of deploying VHCN and ensuring timely and investment-friendly access to 5G radio spectrum, in order to help foster connectivity as a crucial asset for European competitiveness, sustainability and future digital services. The recommendation calls on NRA, BEREC, RSPG and the EC to work together to develop and implement a "Connectivity Toolbox" as a matter of urgency. The Recommendation also sets out a number of key areas for consideration:

- Streamlining permit granting procedures

- Improving transparency through the single information point

- Expanding the right of access to existing physical infrastructure,

- Dispute resolution mechanisms,

- Reducing the environmental footprint of networks, and

- Incentives for 5G investment.

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69   EC Recommendation C(2020) 6270 of the 18th of September 2020.

6.21 On 25 March 2021, Member States, agreed on the Connectivity Toolbox[70], pursuant to the EC Recommendation. The Connectivity Toolbox consists of a set of best practices to allow and encourage the roll out VHCNs.

6.22 Over the coming period ComReg will undertake the following tasks:

- **Connectivity Toolbox**: ComReg will consider the relevant best practices that fall within its remit and explore with relevant stakeholders the feasibility and need for the application of these best practices in the Irish context. ComReg will also assist in preparing a report on the status of the implementation of the Toolbox to be submitted to the EC by 30th April 2022.

- **Geographic Mapping of Networks**: In accordance with Article 22 of the EECC, ComReg will compile and publish a map of each broadband network in Ireland, including forecast coverage. These maps can then be used by consumers, industry, and policy formulation by Government. Internally, these maps will help inform ongoing ComReg projects (e.g. Market Analyses, USO Designations etc.).

- **Monitor network and technology developments**: Over the coming period it is expected there will continue to be developments and innovations[71] in network technologies that will enhance the end-user experience. It is ComReg's aim to monitor these innovations and facilitate their use where appropriate.

Digital Divide: ComReg will continue to monitor the emergence of digital divides in various ECS markets and in adjacent markets. These insights will help give us a holistic understanding of the connectivity challenges facing end-users and help inform various policy and regulatory decisions made by ComReg.

Supporting Interventions

Goal 3.2

Utilising the regulatory toolkit, ComReg's activities promote connectivity and/or incentivise infrastructure rollout.

6.23 ComReg recognises that competitive forces, if left to their own devices, will deliver ECS/ECN to a certain level and quality. However, achieving high-quality connectivity beyond this level is unlikely to be provided due to the uncommercial nature of network rollout in some geographic areas.

6.24 ComReg and Government have a range of regulatory tools available to incentivise infrastructure deployment into areas currently unserved by commercial networks. In this context it is ComReg's goal that **utilising the regulatory toolkit, ComReg's activities promote connectivity and/or incentivise infrastructure rollout**.

6.25 ComReg recognises that while its toolkit does include a number of useful and effective tools to enhance connectivity, it also has its limitations in addressing the connectivity problems facing some end-users. Where other public bodies have policy or legislative roles relating to the ECS sector and adjacent markets, ComReg seeks to engage positively with such bodies and contribute to the wider policy setting with DECC and other Government departments.

State Aid and Universal Service

6.26 Where the commercial and regulatory levers are insufficient to deploy networks, public funding is bridging the gap to serve remote areas. The EU State Aid guidelines ensure that

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70 https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=75185

71 Such developments and innovations are likely to include the rollout of 5G, Low Earth Orbiting satellite broadband, ViLTE (Video over LTE), DOCSIS 4.0 and Small Cells

such funding does not distort competition in the market. Over the last 15 years the Irish Government has invested in ECN through various schemes (See Explanatory Box 3 below), including the awarding of the NBP to National Broadband Ireland.

6.27 While not responsible for the NBP, ComReg does provide technical advice to DECC on the NBP and has seconded staff to DECC to provide such assistance. ComReg recognises that the NBI rollout, over time, may have implications for regulation. At all times ComReg will consider the impact of the NBI rollout on the state of competition in the relevant retail and wholesale markets.

6.28 As discussed in Chapter 5, the purpose of Universal Service is to ensure consumers have access at an affordable price to an available internet access service and to voice communications services, including the underlying connection, at a fixed location. As new networks get rolled out and the NBI rollout advances, the role of a Universal Service and having access to adequate broadband comes into focus. There is ongoing liaison between ComReg and DECC on Adequate Broadband internet access under the EECC and ComReg will keep stakeholders informed as appropriate on this matter.

Explanatory Box 3: Public Investment in Networks

Metropolitan area network (MAN)

The MANs are publicly owned fibre optic networks that allow wholesale and open access to all telecommunication operators. A MAN consists of telecoms ducting and fibre optic cable laid in a ring formation in a metropolitan area and is capable of delivering virtually unlimited bandwidth to 94 towns and cities throughout regional Ireland. In 2004, enet was awarded a 15-year contract to manage the 28 MANs built under Phase I of the MANs infrastructure programme on behalf of the state. In 2009, enet was awarded a second 15-year contract to manage the 60 MANs (covering 66 towns) built under Phase II of the MANs infrastructure programme. Both of these contracts have been extended to 2030 in line with the provisions of the contracts.

National broadband scheme (NBS)

The NBS was co-funded by the European Regional Development Fund (ERDF), and designed to deliver basic, affordable broadband to target areas across the country in which services were insufficient.
Three won the contract and rolled out the NBS scheme on behalf of the DECC. Under EU State Aid rules, this intervention was for a limited duration. The NBS ended following a 68-month operational period in August 2014. Three continue to provide broadband coverage throughout NBS areas on a commercial basis. The Government contributed €79.8 million towards the NBS.

National Broadband Plan (NBP) and National Broadband Ireland (NBI)

The National Broadband Plan is a Government initiative with the aim to connect all of Ireland's communities by dealing with the broadband connectivity challenge in rural areas. Rollout of the NBP was awarded to National Broadband Ireland in 2019.The NBP aims to achieve a minimum of 30Mbps download to all premises that will not be able to access such services through commercial investment alone. Approximately 540,000 premises are included in the Governments plan.

Mobile Coverage

6.29 As noted previously, ComReg is in the process of completing the second multi-band spectrum award (**MBSA2**) which will see the release of 470 MHz of harmonised spectrum rights in the 700 MHz Duplex, 2.1 GHz, 2.3 GHz and 2.6 GHz Bands[72]. This includes licences conditions to ensure that within three years of licence issue that, outdoor mobile voice coverage exceeds 99% of the population and outdoor mobile data coverage at speeds greater than 30 Mbps exceeds 85% of the population rising to greater than 95% of the population within seven years of licence issue.

6.30 ComReg has previously indicated there may be a case, in the public interest, for more interventionist measures to provide coverage in locations where it would not be commercially viable. However, there are significant policy issues to be addressed, including whether such measures are value for money, how target locations might be chosen, and how any initiative would comply with EU State Aid rules. While it would not be appropriate for ComReg to make policy choices, it can provide expert input to inform consideration of possible mechanisms to secure coverage outcomes beyond market-driven levels.

6.31 Meeting the future needs of Irish consumers accessing data hungry applications from mobile devices will likely require not only the improved coverage of mobile networks, but also the ability of consumers and services to move seamlessly between mobile and fixed broadband networks when making a call or using data services. The rollout of fixed networks by commercial operators and NBI and the availability of additional spectrum through future spectrum awards are key enablers to meet this challenge.

6.32 As set out in Chapter 5, ComReg has an outdoor mobile coverage map on its website to allow consumers to check operator coverage and expected signal levels at locations around the country. Over the coming period we will

further enhance this map with new features. We are also exploring the publication of a fixed broadband network map, in line with Article 22 in the EECC.

6.33 Over the coming period ComReg will also continue to engage with the Mobile Phone and Broadband Taskforce to provide solutions to the broadband/phone coverage deficit, and to investigate how to provide better services for consumers including better use of State assets.

Fixed Network rollout

6.34 The Broadband Cost Reduction Regulations ('**BCRR**') came into effect in 2016 with the primary purpose of facilitating and reducing the cost of deploying high-speed public ECN, ultimately to the benefit of businesses and consumers. To date, the BCRR have not been used by Irish operators to any great extent.

6.35 ComReg has three functions under the BCRR, namely:

- Ensuring compliance with the BCRR;

- Acting as national dispute settlement body in the event of disputes arising between network operators in relation to the BCRR[73]; and

- Providing a Single Information Point[74] ('**SIP**') to facilitate access to information regarding statutory permits for civil works required to develop elements of a high-speed public ECN.

6.36 ComReg is currently considering whether an enhanced SIP would promote a greater use of the BCRR. However, ComReg notes that the experience of other Member States expressed in the preparation of the Connectivity Toolbox indicates that a fully integrated SIP can involve considerable outlay (both financial and manpower). ComReg has not been made aware of any interest from operators for such an enhanced SIP. We are therefore unsure if the extra effort would justify the cost. Over the coming period ComReg will consider the Connectivity Toolbox best practices that are

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72   See https://www.comreg.ie/industry/radio-spectrum/spectrum-awards/proposed-multi-band-spectrum-award/

73   ComReg's Disputes Handling Process is available on its website – ComReg Doc 16/77r

74   See https://ec.europa.eu/eurostat/databrowser/view/tps00003/default/table?lang=en

relevant to the SIP and explore with relevant stakeholders the feasibility and need for the application of these best practices in the Irish context.

6.37 The EECC also sets out new provisions relating to co-investment in VHCN. Articles 76 and 79 of the EECC set out arrangements for co-investment agreements between an SMP operator and another operator to build a VHCN or mobile base station, exempting such investments from SMP-type access remedies. The EECC sets down further conditions to be considered by ComReg (e.g. risk sharing and continued access for access seekers) before allowing such co-investment arrangements. Article 79 sets out new powers for the NRA to make access and co-investment offers made by an SMP provider binding, in-lieu of imposing SMP obligations. ComReg will consider any such proposals from industry regarding such co-investment should they arise.

Network Security & Resilience

6.38 The resilience of an ECS or ECN[75] relates to the ability of that ECN to return to its normal state following a disruptive incident. The resilience of a network can be affected in its core and in its distribution and access sections, all of which can then impact the network operator, its customers, and other providers of ECS and/or ECN who rely on wholesale access or interconnection.

6.39 The interconnectivity and interoperability of networks has become increasingly important, particularly having regard to the overall resilience of networks and assurances around the continuity of services. Resilience is an issue not just for individual networks and services but also because of the increased potential for

problems arising from the interdependence of networks and services. This includes, for example, the interrelationship between mobile and fixed networks.

6.40 ComReg considers whether there is a risk of market failure which could cause operators to underinvest in the security and resilience of networks and services. There is a potential market failure with respect to systemic risks – risks that could affect the whole industry. Investments in mitigating systemic risk would benefit all end-users, not just the customers of the operator making the investment. On the other hand, if all operators are exposed to the same systemic risk, then there will be no competitive disadvantage if the risk crystallises – so there is a reduced commercial incentive to mitigate it.

6.41 Public ECS / ECN are required[76] to manage the integrity and security of their networks and services. They are also required to take appropriate measures to manage risks to the security of such network or services. Such a risk-based approach should lead operators to prevent, resist, mitigate and recover from threats to security and resilience of networks and services they provide.

6.42 Operators are required to notify ComReg in the event of a breach of security or loss of integrity that has a significant impact on the operation of their networks or services[77]. Where such reports are received, ComReg notifies DECC, the European Network and Information Security Agency ('**ENISA**') and the public.

6.43 To ensure that network security and resilience is effectively managed, operators should have a comprehensive understanding of all relevant risks to which they are exposed and analyse those risks. In this context, it is ComReg's goal that operators have **appropriate risk-based procedures in place to manage network security and resilience**.

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75 ComReg's activities in respect of the resilience of ECS and ECN is limited to Reg 23 & 24 of the Framework Directive and Article 40 & 41 of the EECC

76   Under Regulation 23 of the Framework Regulations

77   See ComReg Document 14/02a and ComReg Document 19/98

6.44 One of the threats to the security and resilience of ECS and ECN is a cyber-attack. As a consequence of the threat of cyber-attacks in Ireland, ComReg collaborates with Ireland's National Cyber Security Centre ('**NCSC**'), part of DECC, which is the lead agency for Ireland within the Cyber domain.

Goal 3.3

Operators have appropriate risk-based procedures in place to manage network security and resilience.

6.45 There are many aspects to network security and resilience which do not fall within ComReg's remit, including data privacy and the protection of IT systems from cyber-attack. A number of other public bodies also have a role in network security and resilience, including DECC, ENISA, Office of the Data Protection Commissioner ('**ODPC**'), Gardaí and the Defence Forces. The relevant agencies vary according to the issue at hand and its potential impact. Effective engagement with these stakeholders is necessary to ensure appropriate oversight and consistency and to avoid the duplication of activities. In the context of this goal, over the coming period, ComReg intends to undertake the following projects:

◉ **Collaboration**: ComReg will continue to work with relevant stakeholders where matters of network resilience and security have an impact. ComReg will continue its collaboration with the NCSC, in addition to assisting with the implementation of measures of the NCSC's National Cyber Security Strategy 2019 – 2024[78] where ComReg were asked to assist.

◉ **Network Resilience Project**: ComReg is currently engaging in an assessment of the risk management practices of ECS/ECN providers. The project focuses on issues in the different components of ECS/ECN network elements, for both fixed and mobile networks and services.

◉ **Network Resilience Forum**: ComReg will seek to establish a Network Resilience Forum among the ECN providers, to share and discuss best practice. The work of the Network Resilience Project will be used in the analysis of network incidents to identify if there are any systemic risks.

◉ **Network Operations Annual Report**: ComReg will continue to publish an annual network operations report relating to its activities.

◉ **ENISA Report**: ComReg will continue to report incidents to ENISA on an annual basis, in line with its statutory obligations.

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78   The National Cyber Security Strategy 2019 – 2024

7

Compliance & Enforcement

7. Compliance and Enforcement

Strategic Intent 4: **Regulated entities comply with regulatory requirements.**

What does this look like?

- Regulated entities are at all times fully cognisant of their obligations and comply with them.
- Regulated entities are deterred from contravening their obligations.
- There is an institutionalised culture of compliance in regulated entities.

Overview

7.1 Regulation is only effective when regulated entities comply with their regulatory obligations. In this regard, ComReg's strategic intention relating to compliance and enforcement supports and underpins the effectiveness of the previous three strategic intentions. ComReg's statutory functions in respect of compliance and enforcement can be divided into two categories: to ensure regulated entities comply with their regulatory obligations and to ensure that the radio spectrum is managed in an efficient and effective manner.

7.2 This Chapter sets out ComReg's strategic goals associated with enforcing compliance with regulatory obligations with the high-level objective of ensuring that **regulated entities comply with regulatory requirements**.

7.3 It useful to think of an enforcement strategy in the following terms:

- ◉ **Culture of Compliance:** The first best situation is where regulated entities comply voluntarily with their obligations and have an internal culture of compliance;

- ◉ **Active Monitoring:** Using a variety of information and data sources, the monitoring of regulatory obligations ensures markets develop properly;

- ◉ **Targeted Enforcement:** Resources are directed toward enforcement activities in a way that maximises the effectiveness of the regime; and,

- ◉ **Effective Deterrence**: The effectiveness of the regime depends not only on bringing non-compliant conduct to an end but also on its impact in terms of deterring future non-compliance.

7.4 In principle, the elements of the strategy form a virtuous circle where regulated entities come into compliance with respect to targeted conducts, allowing the regulator to refocus compliance and enforcement activities, and so on.

Figure 10: Optimal Enforcement

Different Enforcment Settings

7.5 In relation to the electronic communications sector, ComReg has three principal areas of responsibility in respect of compliance and enforcement:

- Spectrum management,
- Wholesale (SMP) regulation, and
- Consumer protection.

Compliance and enforcement in the context of spectrum management

7.6 ComReg has a statutory function to manage the radio frequency spectrum in Ireland. This includes:

- Monitoring and supervising compliance with conditions attached to spectrum rights of use (e.g. the general authorisation and licence conditions);
- Monitoring the use of the radio spectrum to detect unauthorised use and taking appropriate enforcement action; and
- Investigating instances of interference reported by licensees and the general public, and taking appropriate enforcement action.

7.7 With respect to unauthorised use of spectrum, typical issues that arise include the unlicensed use of the radio spectrum, non-renewal of licences, and the use of equipment that is not compliant with the relevant legislation for which ComReg is the designated Market Surveillance Authority.[79][80]

7.8 ComReg also undertakes a proactive series of monitoring activities, including drive testing of mobile networks to assess compliance with coverage obligations as well as conducting surveys to ensure compliance with non-ionising radiation limits.

Compliance and enforcement in the context of wholesale regulation

7.9 ComReg may impose ex-ante obligations on undertakings where they are found to have SMP. These ex-ante obligations are remedies to competition problems identified in the regulated markets. ComReg is responsible for monitoring and enforcing compliance with such SMP obligations.

7.10 It is only when an SMP operator complies with the full suite of ex-ante obligations that the identified competition problems are mitigated.

While partial compliance may be sufficient to encourage market entry, access seekers' confidence to continue to invest may continue to be undermined if, for instance, they discover they have been treated in a discriminatory fashion or that access requests have been unnecessarily delayed. For this reason, every instance of non-compliance has the potential to seriously damage competition.

7.11 In addition to the SMP obligations there are various obligations monitored and enforced by ComReg arising under the EU regulatory framework for electronic communications and under national legislation. ComReg also has a role in relation to disputes between undertakings in the sector[81].

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79 The European Union (Radio Equipment) Regulations 2017 S.I 248 of 2017.

80 European Communities (Electromagnetic Compatibility) Regulations 2017, S.I 69 of 2017.

81 Disputes may arise under Regulation 31 of the Framework Regulations, Section 57 of the 2002 Act, and Regulations 4, 5, 6, 7, 8 and 9 of the Broadband Cost Regulations.

Compliance and enforcement in the context of consumer protection

7.12 ComReg is responsible for monitoring and enforcing compliance by ECN / ECS service providers and PRS providers with a variety of consumer protection provisions. The principal consumer protection laws include the end-user provisions of the EECC, the Privacy Regulations, the 2002 Act, the PRS Act[82], the Consumer Rights Regulations[83], the Unfair Contract Terms Regulations[84] and obligations on undertakings pursuant to their General Authorisation.

7.13 There are several reasons for opening investigations relating to consumer protection. ComReg investigates complaints and emerging trends arising from contacts to the Consumer Line and website and makes an assessment to determine their validity. ComReg may also open own initiative investigations to monitor and assess the general conformance to regulatory obligations. As discussed in Chapter 5, key issues relate to billing issues, contract terms, and informed consent to bill/provide PRS service. In addition to the new provisions of the EECC, ComReg also monitors compliance with the Net Neutrality Regulations, Roaming Regulations[85] and Intra-EU Calls Regulations.

Culture of Compliance

7.14 ComReg's view is regulated entities should be fully cognisant of their obligations, comply with them and have an internal culture of compliance. It is therefore ComReg's goal that **regulated entities are pro-active in ensuring their own compliance**.ComReg encourages operators to have robust internal controls to prevent and detect non-compliance.

7.15 Regulated entities, particularly those subject to obligations aimed at ensuring non-discrimination, may choose to put in place operational and governance measures with the specific purpose of promoting principles of compliance at all organisational levels. When implemented effectively, such measures can ensure compliance, and reduce the need for regulatory intervention and thereby promote effective and sustainable competition.

7.16 ComReg considers the following industry practices are essential for promoting a culture of compliance:

◎ Support and commitment from senior management for internal compliance programmes;

◎ A clear and enforced policy on compliance, including appropriate disciplinary procedures, prohibiting non-compliant behaviours at all levels;

◎ Oversight of compliance programs by a separate monitoring body such as an internal audit committee, represented at a senior level with adequate resources, independence and authority;

◎ Risk-based internal controls, designed to ensure compliance that are regularly reviewed and maintained;

◎ Systematic, effective, and documented monitoring of internal controls; and

◎ Regular communication, guidance, and training on compliance programs at all levels of an organisation.

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82 Communications Regulation (Premium Rate Services and Electronic Communications Infrastructure) Act 2010

83 European Union (Consumer Information, Cancellation and Other Rights) Regulations 2013 (S.I. No. 484/2013)

84 The European Communities (Unfair Terms in Consumer Contracts) Regulations 1995 (S.I. No. 37 of 1995), as amended. Note, in particular amendments by European Communities (Unfair Terms in Consumer Contracts) (Amendment) Regulations 2014 (S.I. No. 336 of 2014).

85 ComReg Doc 21/20

7.17 ComReg considers that having an effective, proportionate, and dissuasive regulatory enforcement regime will help foster an awareness of the need for an appropriate culture of compliance within industry. A consequence of a poor culture of compliance may be that undertakings adopt internal interpretations of regulatory obligations that diverge from the intended meaning and purpose. Such interpretations may enhance an undertaking's commercial interest to the detriment of other stakeholders or competition and may put the undertaking at risk of non-compliance.

7.18 ComReg offers detailed information on applicable regulations (e.g. through public Consultation, Response to Consultation, Decision Instrument or guidance documents and in publication of enforcement decisions). An important purpose of providing guidance on the meaning and effect of regulatory obligations is to facilitate the identification of practices that are likely to be non-compliant. In this context, ComReg will monitor the practices and behaviours of undertakings and take enforcement action, where appropriate.

7.19 In addition, where appropriate, ComReg offers guidance on its enforcement powers and practices to ensure industry have a comprehensive understanding of their regulatory obligations and adhere accordingly. ComReg will consider whether it is appropriate to publish further information and guidance on certain aspects of its compliance investigation practices and methodologies, after the EECC has been transposed into Irish law. In addition, ComReg will utilise engagement and dialogue to help foster the desired behaviours within industry, where necessary.

7.20 The EECC introduces new regulations and also brings new operators into the scope of ComReg's jurisdiction (e.g. providers of OTT services). On a case-by-case basis it may be necessary to engage directly with undertakings to ensure they are fully aware of the relevant obligations. ComReg will publish any guidelines explicitly required under the EECC.

Eircom's Regulatory Governance Model

7.21 In 2018, ComReg entered into a Settlement Agreement ('**SA**') with Eircom. As part of that SA, the parties agreed to a set of commitments ('RGM undertakings') which, when fully implemented, will result in the establishment and operation of an enhanced Regulatory Governance Model ('**RGM**') in Eircom.

7.22 Since the 2018 Agreement, ComReg has continued to observe and evaluate the functioning and effectiveness of the RGM. ComReg continues to have some concerns around the state of competition and the culture of compliance within Eircom in the presence of the enhanced RGM. Over the coming period ComReg will continue to review the effectiveness of the RGM and Settlement Agreement and consider if more regulatory action is required.

Goal 4.1

Regulated entities are pro-active in ensuring their own compliance.

7.23 The Performance Agreement ('**PA**'), which is an annex to the SA, sets out a number of Milestones relating to key RGM undertakings. ComReg and Eircom had agreed, by way of an amendment to the SA, that the delivery date for Milestone 4 ('**M4**') would be pushed back from September 30th 2020 to 31st March 2021 after ComReg raised concerns with Eircom's 30th September 2020 M4 submission. ComReg has recently completed its review of the most recent M4 submission and will communicate further in this regard.

Active Monitoring

7.24 ComReg actively monitors the markets it regulates to ensure they function in a way that is consistent with the legal and regulatory obligations imposed in those markets. ComReg does this in a number of ways:

- regular and timely collection of relevant market data and information

- direct monitoring of regulatory obligations (e.g. wholesale pricing tariffs)

- the review of price lists and product documentation

- engagement with industry, either directly or through various fora

- the monitoring of queries and complaints to ComReg's consumer care line

- the monitoring of online fora and social media

- engagement with other public and regulatory bodies (e.g. the CCPC)

7.25 ComReg continuously observes and monitors operator activities in the market. Where an area of potential concern is identified, ComReg will investigate.

Targeted Enforcement

7.26 ComReg's compliance and enforcement activities in the different enforcement settings are underpinned by internal processes (including evidence gathering, report writing and legal review) and firmly rooted in the legal and regulatory regime. ComReg's investigations are often complicated or multifaceted and must be conducted in a manner that is impartial and procedurally correct. This combination of complexity and a desire to respect due process means that investigations may take time to complete.

In this context, it is ComReg's goal that **ComReg's compliance and enforcement activities are conducted using fair and objective processes and are targeted and prioritised appropriately**.

7.27 In anticipation of ComReg getting the necessary enforcement powers (e.g. powers to impose administrative financial sanctions), ComReg will continue to evolve its enforcement practices and methodologies. In addition, ComReg will

consider whether it is appropriate to publish further information and guidance on certain aspects of its compliance investigation practices and methodologies, after the EECC has been transposed into Irish law.

7.28 The different enforcement settings in which ComReg operates mean that a prioritisation approach needs to be tailored to the relevant circumstances.

7.29 In the spectrum management context, in 2020 ComReg introduced a revised process for radio frequency interference ('**RFI**') complaints[86]. This revised approach endeavours to direct ComReg resources to the cases of harmful interference that have the greatest impact on the complainant's ability to provide services. ComReg aims to respond to cases which are exceptional in nature immediately and prioritise RFI related complaints accordingly, with clearly defined complaint response times[87].

Goal 4.2

ComReg's compliance and enforcement activities are conducted using fair and objective processes and are targeted and prioritised appropriately.

7.30 In wholesale regulation, enforcement is prioritised in cases where an SMP operator's behaviour has greatest potential to harm competition – both directly and by reducing the confidence of other operators in the effectiveness and predictability of the regulatory regime. Breaches which come to light as a result of a SMP operator's own internal control system may be of a lower priority if they are transparently reported, proactively and effectively remedied, and the failure of controls which led to the breach is also addressed. However, ComReg will also take into account the severity of the breach when deciding whether to prioritise enforcement action.

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86   ComReg Doc 19/108 and ComReg Doc 20/62

87   Further detail on Radio Interference Investigations can be found on our website here: https://www.comreg.ie/industry/radio-spectrum/spectrum-compliance/radio-interference/

7.31 In the consumer protection context, cases may be prioritised using an assessment of the importance of the obligation concerned in ensuring that end-users are able to choose and use communications services with confidence. This assessment may be informed by trends in complaints received from the general public made via ComReg's consumer team and ComReg's website.

There is a focus on ensuring price, choice and quality are protected with a focus on monitoring compliance with contract obligations, billing, switching, net neutrality and seeking redress. ComReg regards with particular severity any breaches of obligations intended to ensure access to ECAS because of the obvious importance of emergency calling. In the context of PRS, ensuring clear informed consent is provided is a key concern.

Effective Deterrence

7.32 ComReg uses its existing enforcement powers to bring criminal and civil actions against non-compliant ECN / ECS and PRS service providers. Regulatory breaches harm consumers, firms, industry, and competition generally. Effective enforcement powers and sanctions ensure that regulatory actions act as a genuine deterrent, both to the party being punished and to other regulated parties in the market. In this context it is **ComReg's goal that ComReg has an effective set of powers to incentivise compliance and effectively monitor and enforce**.

7.33 In February 2021, ComReg published guidance on its approach to the calculation of financial penalties for the purpose of enforcement of breaches of the Access Regulations[88]. Where an SMP operator has failed to comply with an SMP obligation, ComReg will notify the operator of the findings and give the operator an opportunity to respond or to remedy the non-compliance.

If ComReg remains of the opinion that the operator has not complied with its obligations, ComReg may apply to the High Court for orders including that the operator pay a financial penalty. ComReg may make a recommendation to the High Court on the appropriate financial penalty. ComReg's guidance sets out the guidelines on how ComReg will decide on the amount that the penalty should be, and recommend that to the High Court for its consideration. As enforcement practices and methodologies evolve, we will consider whether it is appropriate to publish further guidance relating to breaches of the Access Regulations.

Goal 4.3

ComReg has an effective set of powers to incentivise compliance and effectively monitor and enforce.

7.34 ComReg's current enforcement legislation requires ComReg to apply to court for orders to impose civil financial sanctions. For ComReg to be an effective regulator, it must have proper and sufficient enforcement powers that have the necessary deterrent effect. Improvements to ComReg's enforcement powers (both criminal and civil) would facilitate effective deterrence and, where appropriate, allow ComReg to take effective action.

As the sector evolves, ComReg continues to seek enhanced powers to meet current and future challenges in delivering on its statutory and regulatory remit. ComReg's enforcement regime could be improved in three main areas:

◉ **Administrative Financial Sanctions**: The ability for ComReg itself to impose Administrative Financial Sanctions in appropriate circumstances would greatly facilitate effective regulation of the sector.

◉ **Criminal Fines**: ComReg plans to continue to advocate for an increase in the maximum fine that may be imposed for criminal offences, following conviction on indictment. We consider that potential criminal fines that are sufficiently high can act as a strong deterrent.

◉ **Standardised Powers**: Regulatory powers, and in particular, certain inspection, investigation, and enforcement powers, should be as standardised as possible across all regulatory bodies. This would improve the efficiency and effectiveness of regulation and help promote legal certainty.

7.35 Since 2012, ComReg has made a number of submissions to the Law Reform Commission on the necessity for the enforcement regime to embody effective deterrence mechanisms.

7.36 Over the coming period, ComReg will continue to advocate for the legislative changes that are essential to ensure the enforcement regimes in the ECN / ECS and PRS sectors embodies the effective deterrence mechanisms necessary for ComReg to delivery on its mandate. Government recognise that for ComReg to be an effective and robust regulator it must have greater enforcement powers and be able to impose Administrative Financial Sanctions, in line with enforcement regimes in other EU Member States[89]. This is an issue that continues to be identified as a high priority in the 2020 Programme for Government and by the Oireachtas Joint Committee on Transport and Communications Networks. DECC is committed to ensuring that ComReg has the best, most appropriate and most effective powers available to it. Any final decisions/actions in this regard will, of course, be a matter for the Minister and, ultimately, the Oireachtas.

ComReg has also identified the need to ensure that it has the full tool kit of enforcement powers in addition to seeking improvements in respect of appeals and information gathering powers.

Ex-Post Competition Law

7.37 Following the introduction of the Communications Regulation (Amendment) Act 2007, ComReg was given the additional function of investigating ex-post competition law breaches in the ECS sector[90], and shares this responsibility with the CCPC. ComReg has the power to carry out an investigation pursuant to a complaint or on ComReg's own initiative. Such investigations must be carried out on an ex-post basis, (i.e. after the fact) where the purported anti-competitive behaviour must either have occurred or be ongoing. The investigation can also occur in markets where ex-ante regulation applies.

7.38 ComReg will be provided with new competition powers resulting from the transposition of the ECN+ Directive by way of the Competition (Amendment) Bill currently undergoing pre legislative scrutiny. The Bill proposes to ensure that competition authorities have independence, sufficient resources, and appropriate power of enforcement, including the ability to issue administrative financial sanctions. These enforcement powers would apply to prohibitions on undertakings from engaging in anti-competitive agreements and practices and the abuse of a dominant position. The Bill also provides for leniency programmes, which Ireland does not currently have.

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89 As set out in the 2020 Programme for Government, '*Our Shared Future*'.

90 Further details in relation to ComReg's role under competition law and the investigation of such complaints is set out in its Guidance Notice on Competition Complaints. Guidance on the Submission of Competition Complaints relating to the Electronic Communications Sector, Information Notice, ComReg Document 10/110, December 2010

8

ComReg's Organisation

8. ComReg's Organisation

Overview

8.1 ComReg operates in a challenging and rapidly evolving environment, both in terms of the markets ComReg regulates and the policy context.

ComReg strives to be an active and agile organisation, capable of responding to the rapidly changing environment and addressing issues that affect ComReg's ability to fulfil its Mission in a timely manner.

8.2 This Chapter sets out goals associated with being **an effective, agile, and relevant regulator**. ComReg's ability to deliver on its Mission is determined by four key drivers of organisational success:

◉ An Informed Regulator with a deep understanding of the sector;

◉ Proactive Stakeholder Engagement;

◉ Our Evolving Mandate; and

◉ Our People and processes.

8.3 Success under these headings contributes to a greater likelihood of success for ComReg in achieving its strategic intentions set out in the previous chapters, and ultimately, its mission.

Figure 11: Ensuring effective and relevant regulation

Strategic Intent 5:

ComReg is an effective, agile, and relevant regulator

What does this look like?

- ComReg is regarded as a thought leader and ComReg's views are valued by others, both domestically and internationally.
- ComReg provides a high level of public value.

ComReg as an informed regulator

8.4 For ComReg to be an informed regulator, it must have access to high-quality and reliable data in a timely manner and a skilled staff who can undertake analysis to produce high-quality research and insights. ComReg uses data and information from a wide range of sources in a number of ways. For example:

- **Regulatory decision-making:** ComReg has a responsibility to ensure that regulatory decisions arise from timely, objectively justified analysis based on high-quality and accurate data.

- **Monitoring, compliance and enforcement**: ComReg performs a variety of monitoring and enforcement roles such as compliance with spectrum licensing conditions, with obligations imposed by ComReg or statute.

- **Informing industry and end-users**: ComReg collects data and statistical information to provide information to consumers and industry. This statistical data is made available on ComReg's website.

8.5 ComReg also needs to have a comprehensive understanding of the incentives facing industry operators. In this context, we collect information to help identify market trends and likely sources of market failure which help facilitate the achievement of ComReg's strategic intentions. In this respect, it is **ComReg's goal that ComReg has a deep understanding of the markets ComReg regulates and related markets.**

Goal 5.1

ComReg has a deep understanding of the markets ComReg regulates and related markets.

8.6 Where timely and accurate data can be collected from ECS / ECN providers and relevant OTT providers, ComReg aims to minimise the burden on those who must source and gather such data. Where necessary, ComReg may use its legal powers under the Act and/or statutory instruments to gather data and information from industry. Insofar as is possible, ComReg tries to tailor its use of these legal powers and work with industry to collect data on a voluntary basis.

8.7 ComReg's second goal related to data is therefore that **the regular and timely delivery of reliable and accurate data supports robust evidence-based decision-making, effective market monitoring and informed action.**

8.8 In addition to data gathered directly from ECS / ECN providers and relevant OTT providers, ComReg seeks to supplement its data requirements using insights gathered from a variety of sources, including consumer research through market research, research undertaken by others (e.g. the Economic and Social Research Institute) and data acquired by ComReg from specialist third parties.

8.9 In line with Ireland's Open Data Strategy 2017 – 2022, ComReg is engaging in a process to identify appropriate data sets for publication in Open Data format. ComReg has adopted an *"Open by Default"* approach to data, ensuring that data collected as part of its regulatory duties will be considered for publication as Open Data, subject to any necessary restrictions (e.g. due to confidentiality). Over the coming period ComReg will review its internal catalogue with a view to making more of its data sets open.

8.10 ComReg's Data Portal hosts data relating to its Quarterly Key Data Report ('**QKDR**'). ComReg has re-balanced its publication of data such that an increased volume of raw data and charts are now presented on the Data Portal itself, with the QKDR also revised to only present key metrics. Over the coming period, as the volume of data published openly grows, the Data Portal will become a significant source of data relating to the ECS sector.

Goal 5.2

The regular and timely delivery of reliable and accurate data supports robust evidence-based decision-making, effective market monitoring and informed action.

8.11 Related to these two goals, over the coming period ComReg plans a number of key initiatives:

- **Data strategy**: ComReg will continue to develop its data management strategies and data analysis capabilities in order to be able to engage with the scale and complexity of data needed to perform its functions.

- **Open Data and Publicly Available Data**: ComReg will continue to identify further opportunities to share information on key metrics and ensure that relevant data is released under its 'Open by Default' standard.

- **Market Intelligence ('MI') Data Project**: The aim of the MI Data Project is to have a stable data request for operators and minimise additional ad-hoc data requests and to ensure the timely availability of granular information. Over the coming period datasets to be reviewed include data on the Leased Lines market and the Mobile Market.

- **ComReg Research**: In 2021 ComReg will undertake research relating to the experience of mobile phone users. In 2022 ComReg will undertake a similar project relating to broadband market and the impact of the NBP.

- **Third Party Independent research**: ComReg will continue to support the work of others, such as the ESRI and CERRE. Engaging with these researchers gives ComReg access to new data sources and techniques not otherwise available to the organisation.

Stakeholder Engagement & Advocacy

8.12 ComReg has a wide range of stakeholders ranging from individual consumers and their representative groups, through electronic and postal communication operators and their industry representative groups, to domestic government stakeholders and international bodies such as the ITU, the RSPG, the European Regulators Group for Postal Services ('**ERGP**'), Ofcom UK, BEREC and the European Commission. One of ComReg's organisational values is transparency, and it sees honest engagement with all stakeholders as highly beneficial. In this context, it is ComReg's goal that **ComReg is proactive on engagement with a range of stakeholders**.

Goal 5.3

ComReg is proactive on engagement with a range of stakeholders.

8.13 The onset of the Covid-19 pandemic has challenged ComReg to rethink how to engage with its stakeholders. Over the coming period ComReg will aim to re-engage with stakeholders in the traditional way, while also harnessing the advantages of the many new engagement tools that have emerged during the pandemic.

8.14 Where appropriate, ComReg acts as a knowledgeable and informed regulator, seeking to represent, educate, advocate, and inform others about the ECS sector, developments in telecommunications technologies and evolving relationship between the sector and adjacent sectors. We do this through a number of channels, including research and documents we publish, participation at various fora (e.g. the Mobile and Broadband Taskforce) and attendance at Oireachtas Committee hearings.

8.15 In addition, ComReg collaborates with other regulatory bodies in Ireland through the Economic Regulators Network ('**ERN**'). ComReg values participation in the ERN as it allows for knowledge sharing, better regulatory responses to cross-cutting matters (such as digital markets) and acts as a forum to develop collective contributions to policy debates.

Engagement with Industry

8.16 ComReg recognises the need to tailor its communication to different stakeholder groups. Our engagement takes a number of forms, including:

◉ Formal consultation;

◉ Industry and stakeholder forums;

◉ Our Industry Websites; and

◉ Oireachtas Committees.

8.17 Over the coming period, ComReg plans a number of key industry initiatives:

◉ **Communications strategy**: ComReg will ensure that its Communications Strategy is flexible and adaptable to meet the changing demands and needs of all its stakeholders in the sector.

◉ **Mobile and Broadband Taskforce**: The 2020 Programme for Government includes a commitment to renew the mandate of the Mobile and Broadband Taskforce. Over the coming period ComReg will continue to support the work of the Taskforce.

◉ **Public Stakeholder Events**: ComReg intends to hold its national conference when public health advice allows, most likely in early 2022.

Engagement with Consumers and the general public

8.18 As set out in Chapter 5, Consumer engagement is critical to ensure consumers know their rights, including new consumer rights set out in the EECC. Our engagement with consumers includes contact by phone and email, through the provision of information on our website

and on social media, and wider engagement through the media and press releases.

8.19 In 2020 we introduced our consumer brand, '**ComReg Connects**', to help ensure consumers and the general public can identify ComReg as a brand at the forefront of consumer protection, capturing the essence of who we are and what we stand for.

8.20 ComReg is committed to continue to provide 'trusted advice and support'. We will continue to do this through transparent communication that uses easy to understand language throughout our engagement with consumers and the public.

ComReg Connects
Trusted Advice and Support

8.21 In addition, we offer several tools to assist consumers in choosing and using communication services with confidence. Further details on our Consumer engagement including a consumer conference and webinars and other outreach activities can be found in Chapter 5.

International Activities

8.22 The nature of the ECS sector requires international collaboration and harmonised approaches. This international collaboration facilitates the development of an open and competitive environment in which innovation, creativity and competition can thrive. ComReg contributes to regulatory policy discussions and inputs to regulatory decision making in an international setting. ComReg manages and develops Irish regulatory input to the development of European and international policy, standards, and legislation.

8.23 ComReg continuously engages with a range of regulatory bodies at an international level, including through BEREC, with Ofcom UK, the Organisation for Economic Co-operation and Development (**OECD**), the RSPG and the CEPT. In some instances, ComReg has taken

leadership roles in these bodies, in recognition of its standing as an expert-led and knowledge-driven regulator.

Goal 5.4

ComReg contributes to and learns from international best practice.

8.24 ComReg seeks to contribute to and learn from the best practices of others and devotes considerable resources to understanding the regulatory analyses and decisions made by its international colleagues.

As a small island nation in the EU, Ireland and ComReg can learn a lot from colleagues in other countries, but also share expertise with others when ComReg has greater knowledge or experience in the area of interest. In this context, it is ComReg's goal that **ComReg contributes to and learns from international best practice.**

Our Mandate and Role

8.25 As a statutory body, ComReg operates within a defined legislative framework. For ComReg to be an effective and relevant regulator, it must operate in an appropriate legal context and have proper and sufficient powers to regulate effectively.

8.26 In this context it is ComReg's goal to ensure that **it actively engages with the evolution of the market, including adjacent and related markets, and to ensure that ComReg's legislative mandate evolves to enable it to deliver effectively.**

8.27 ComReg continues to engage with DECC regarding transposition of the EECC and the evolution of its functions and powers. Over the coming period, ComReg will continue to advocate for the legislative changes that are essential to ensure the enforcement regime in the ECS sector includes the effective deterrence mechanisms.

The 2020 Programme for Government recognises that for ComReg to be an effective and robust regulator it must have enhanced enforcement powers including the power to impose administrative financial sanctions, as other regulators and EU member states can. In addition, the Competition Amendment Bill transposing the ECN+ Directive will enhance ComReg's competition enforcement powers.

Goal 5.5

ComReg actively engages with the evolution of the market, including adjacent and related markets, and ensures the legislative mandate evolves to enable ComReg to deliver effectively.

8.28 The Consumer Rights Bill transposes a number of relevant EU Directives and updates various provisions on consumer rights and remedies in relation to contracts for the supply of non-digital services, unfair contract terms, and information and cancellation rights. National legislation is also being developed for ComReg in respect of the Consumer Protection Cooperation Regulation.

Regulating for the Digital Age

8.29 The growing focus of regulation has been on digital services and the need for digital platform regulation. Digital platforms generally rely on the generation, collection, processing, analysis, and exploitation of data to operate and improve their service offerings.

The EC has put forward proposals to address issues arising in digital markets and digital platforms (see Explanatory Box 4 below).

8.30 ComReg has engaged with the ERN on the topic of digital regulation. ComReg has also continued to contribute to the work of BEREC, in particular, contributing to the drafting of BEREC's Response to the EC's Public Consultations on the Digital Services Act Package[91].

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91 https://berec.europa.eu/eng/document_register/subject_matter/berec/others/9411-berec-response-to-the-public consultation-on-the-digital-services-act-package-and-the-new-competition-tool

8.31 ComReg has an evolving role under the EU Cybersecurity Strategy for the Digital Decade including: the proposed Directives on Security of Network and Information Systems (NIS and NIS 2 Directives) and for Critical Infrastructure Protection in respect of the inclusion of electronic communications as an essential service and the related digital infrastructure sector.

8.32 ComReg's role in respect of electronic privacy is evolving with the development of the proposed EU e-Privacy Regulation, while in the interim ComReg's monitoring and enforcement role continues under the 2002 Privacy and Electronic Communications Directive.

8.33 ComReg's market surveillance function has also been transformed by the rapid emergence of IoT and 5G devices. ComReg's broadened remit in this area is to be further addressed by the EU "Goods Package", anticipated in 2022.

8.34 ComReg has a number of activities planned relating to Goal 5.5:

◎ **eIDAS**: The EU Electronic Identification and Trust Services for Electronic Transactions in the Internal Market Regulations (the 'eIDAS' Regulation) sets out rules for electronic identification and creates a European internal market for electronic Trust Services. DECC propose to assign ComReg the role of Supervisory Body to oversee providers of trust services in Ireland. ComReg is also to undertake the obligation to maintain and publish 'trusted lists' which include information related to the qualified trust service providers established in Ireland.

◎ **Free Flow of Data Regulation**: The Free Flow of Non-Personal Data Regulation is a regulation to remove unjustified barriers to the movement of non-personal data in the EU and thus to assist in unlocking the potential of Europe's Data Economy. ComReg is engaging with DECC regarding taking a number of roles under this Regulation in Ireland.

Explanatory Box 4: Emerging European Commission Proposals

DSA / DMA Proposals

In December 2020, the EC proposed a new Digital Services Act ('DSA') and Digital Markets Act ('DMA'), with two main goals:

- Create a safer digital space to protect the fundamental rights of all users of digital services; and

- Establish a level playing field to foster innovation, growth, and competitiveness.

New rules set out in the DSA and DMA concern online intermediaries, platforms, and gatekeepers. These platforms can function as bottlenecks between businesses and consumers for important digital services. As our society and economy become more digitalised, a situation where a few large platforms control important ecosystems in the digital economy has emerged, with the power to act as private rule-makers. These rules, however, sometimes result in unfair conditions for businesses using these platforms and less choice for consumers.

EU Commission data strategy – DGA

The proposal for a Data Governance Act ('DGA'), announced on 25 November 2020 is the first of a series of regulatory initiatives laid out in the EC's February 2020 data strategy. The DGA aims to facilitate the voluntary sharing of both personal and non-personal data between data holders and data users across the EU. The act also intends to enable the creation of neutral providers of data sharing services (data intermediaries).

Our Organisation

8.35 Unless ComReg has the people, expertise, and processes to carry out its functions, it cannot deliver for consumers. The quality of ComReg's people is a key part its ability to achieve its Mission over the next five years.

8.36 ComReg competes for talent with a large private sector, who are less constrained regarding remuneration and staff propositions. To sustain an environment where talent is nurtured, ComReg invests in measures to enhance staff engagement, diversity, and wellbeing. Combined with an emphasis on development and empowerment ComReg strives to create a values-based culture where people thrive and do their best work. In this context, it is ComReg's goal that **ComReg has sufficient resources to fulfil its organisational strategy.**

Goal 5.6

ComReg has sufficient resources to fulfil its organisational strategy.

8.37 Over the coming period, ComReg will continue to focus on supporting and retaining its existing talent pool as it recruits additional staff to fulfil its Mission and evolving mandate. As new functions are added to its mandate, ComReg will continue to strike an appropriate balance between in-house resources and outsourcing.

8.38 As part of ComReg's resource planning process, ComReg analysed its evolving regulatory mandate and the skillset required to deliver on its remit up to the end of 2022. Based on this planning, ComReg has received permission to recruit an additional 30 staff to fulfil resourcing needs up to the end of 2022. As ComReg's mandate evolves, further additional resources will likely be required. ComReg is currently discussing its role regarding the eIDAS and Free Flow of Data Regulation with DECC, including resourcing and financing matters.

8.39 It is important in a sector as dynamic as electronic communications that ComReg continually seeks to enhance the skills, knowledge, and capacity of its staff, to ensure that the organisation remains up-to-date and relevant.

This also contributes to staff satisfaction and staff retention, which can be a challenge for a public sector organisation like ComReg. In this context, it is ComReg's goal that **ComReg maintains an agile, skilled, and motivated organisation**.

8.40 The ability to deliver on ComReg's objective to be an agile, skilled, and motivated organisation is largely contingent on the competence and ability of our staff and leaders. ComReg invests in enabling our staff to develop their technical and professional skills through be-spoke development initiatives, coaching, peer to peer learning, technical and professional training, and the option to partake in formal education.

Goal 5.7

ComReg maintains an agile, skilled, and motivated organisation.

8.41 ComReg's success as an organisation also depends on the structures within which its staff work as well as the systems and processes that support them. ComReg recognises the necessity of being responsive and having the flexibility as an organisation to react to unanticipated situations. ComReg must be structured so that decisions are made in a timely, transparent, replicable, and robust manner and that all processes run effectively, efficiently, and reliably. However, ComReg must be flexible enough to adapt to a continuously changing sector.

In this context it is ComReg's goal that in line with best practice, **ComReg has efficient and effective policies, processes, and systems**.

8.42 As a named public body under the Official Languages Act 2003, ComReg is obliged to provide a range of services as Gaeilge. ComReg's second Irish Language Scheme commenced on 21 December 2020 and includes a number of commitments to ensure services as Gaeilge are provided to anyone who wishes to carry out their business with ComReg through Irish. The Scheme has been confirmed by the Minister for Tourism, Culture, Arts, Gaeltacht, Sport and Media. It shall remain in force for a period of 3 years.

Goal 5.8

In line with best practice, ComReg has efficient and effective policies, processes, and systems.

8.43 At all times, ComReg seeks to be an organisation that values environmental sustainability. ComReg has undertaken a number of green initiatives in recent years to lower the carbon footprint of its offices and activities, in line with best practice. In addition, in 2019 ComReg issued a Call for Inputs[92] to better understand the relationship between connectivity and decarbonisation. The learnings from that Call for Inputs helps to shape a number of key projects and commitments in this strategy.

8.44 ComReg has a number of obligations under the Disability Act 2005. In line with these obligations, ComReg ensures that the public areas of its building are accessible to people with disabilities and that its public services are accessible to people with disabilities.

8.45 ComReg also has obligations under the Irish Human Rights and Equality Commission Act 2014. ComReg is committed to meeting its statutory obligations under the Human Rights and Equality Commission Act 2014. The Act establishes a positive duty on public bodies to promote equality, prevent discrimination and protect the human rights of its staff and all of those with whom it engages including staff, service users and stakeholders alike. ComReg has put in place measures to ensure that consideration is given to human rights and equality in the development of policies, procedures, engagement with stakeholders and the discharge of all of ComReg's statutory functions. The Public Sector Equality and Human Rights Duty ("the Duty") finds expression both internally in a range of HR and staff policies and externally in the manner in which ComReg deals with consumers and other stakeholders.

The Duty is also reflected in ComReg's Consumer Charter. In addition, ComReg has in place a host of policies and procedures to ensure that all ComReg's services are accessible to as wide a range of users as possible.

8.46 Over the coming period, ComReg plans a number of key initiatives:

◉ **Carbon Footprint**: ComReg will continue to put in place necessary measures, where possible, in order to reduce its Carbon Footprint, in line with the government Climate Action Plan and other initiatives.

◉ **Flexible and Remote Working**: ComReg sees many benefits in offering staff the ability to work from home. These benefits extend beyond enhanced staff engagement and employee value proposition to a positive impact on emissions and the overall environment. ComReg is in the process of delivering a change project which will identify the best way to deliver this blended approach to work.

◉ **Irish Language Scheme 2020 - 2023**: ComReg will ensure the availability of staff who can speak Irish in its consumer services division to assist with all consumer queries and complaints as Gaeilge.

◉ **Internal processes**: As a general matter, ComReg will seek to further automate its processes to improve efficiencies within the organisation and assist in delivering a better service to stakeholders. Where new policies and processes are put forward by Government, ComReg aims to implement such policies in a timely and efficient manner.

Glossary

Glossary

BCRR	Broadband Cost Reduction Regulations
BEREC	Body of European Regulators for Electronic Communications
CAP	Consumer Advisory Panel
CCPC	Competition and Consumer Protection Commission
CEPT	European Conference of Postal and Telecommunications Administrations
CERRE	Centre on Regulation in Europe
ComReg	Commission for Communications Regulation
DC	Dedicated Capacity
DECC	Department of the Environment, Climate and Communications
DGA	Data Governance Act
DMA	Digital Markets Act
DSA	Digital Services Act
EC	European Commission
ECAS	Emergency Call Answering Service
ECN	Electronic Communications Network
ECS	Electronic Communications Service
EECC	European Electronic Communications Code
eIDAS	Electronic Identification, Authentication and Trust Services
ENISA	European Network and Information Security Agency
ERGP	European Regulators Group for Postal Services
ERN	Economic Regulators Network
eSIM	Embedded-SIM, a form of SIM card directly integrated in a device
ESRI	The Economic and Social Research Institute
EU	European Union
FACO	Fixed Access Call Origination
FTTC	Fibre to the Cabinet
FTTH	Fibre to the Home
GHz	Gigahertz, a unit of frequency
HHI	Herfindahl-Hirschman Index
IoT	Internet of Things
ISDN BR/BRA	Integrated services digital network basic rate/basic rate access
ISDN	Integrated services digital network
ITU	International Telecommunication Union
LEO	Low Earth orbit
M2M	Machine-To-Machine, referring to wired or wireless communication between devices

MAN	Metropolitan area network
Mbps	Megabits per second, a measure of internet bandwidth or speed
MBSA1	First Multi-Band Spectrum Award, 2012
MBSA2	Second Multi-Band Spectrum Award, 2021
MHz	Megahertz, a unit of frequency
MI	Market Intelligence
MNO	Mobile Network Operator
MVNO	Mobile Virtual Network Operator
NBI	National Broadband Ireland
NBP	National Broadband Plan
NBS	National Broadband Scheme
NCSC	National Cyber Security Centre
NGN	Non-Geographic Numbering
NIS1 or NIS Directive	Directive on Security of Network and Information Systems
NIS2 or NIS2 Directive	Revised Directive on Security of Network and Information Systems
NRA	National Regulatory Authority
NRRS	Network Resilience, Reliability and Security
ODPC	Office of the Data Protection Commissioner
OECD	Organisation for Economic Cooperation and Development
OTA	Over-The-Air, referring to wireless transmissions or connections through a network
OTT	Over-The-Top, referring to streaming services or content delivered via an internet connection
PIA	Physical Infrastructure Access
PRS	Premium Rate Services
PSTN	Public Switched Telephone Network
QKDR	ComReg's Quarterly Key Data Report
QoS	Quality of Service
RFI	Radio frequency interference
RGM	Regulatory Governance Model
RSPG	Radio Spectrum Policy Group
SIP	Single Information Point
SMP	Significant Market Power
USO	Universal Service Obligation
USP	Universal Service Provider
VHCN	Very High Capacity network
WACC	Weighted Average Cost of Capital
WCA	Wholesale Central Access
WHQA	Wholesale High Quality Access
WLA	Wholesale Local Access

Annex: Electronic Communications Strategy Statement 2021 to 2023

Legal Disclaimer

Introduction

1.1 This document accompanies ComReg's Electronic Communications Strategy Statement 2021-2023 (ComReg Document 21/70) and contains two appendices:

◉ **Appendix 1 – The Economic and Legal Context**, including:

◉ The Macroeconomic Outlook;

◉ The Economics of Electronic Communications; and,

◉ The Legal Context

◉ **Appendix 2 – Trends and Challenges**, including an analysis of the following four key trends:

◉ Enhanced Connectivity and New Technologies

◉ The Consumer Experience

◉ The Evolution of Adjacent and Related Markets

◉ The Changing Future of Regulation in the Sector

1.2 This document should only be read in conjunction with ComReg Document 21/70. It is important to note that this document does not necessarily set out the Commission's final or definitive position on particular matters.

Annex: 1 The Economic and Legal Context

Annex 1: The Economic and Legal Context

Overview

A 1.1 This appendix considers the broad policy context, encompassing economic and legal dimensions, in which ComReg forms its strategy for regulation of the electronic communications sector.

While trends toward digitalisation have led society to rely more and more on ECS and ECN, this trend has accelerated with the experience of Covid-19. The strategic significance of the sector has increased in terms of policy considerations. These developments have implications for investment incentives in the sector, as do the broader macroeconomic impacts of Covid-19 and the uncertainty about the future trajectory of the economy in the medium to long term.

A 1.2 The economic characteristics of the electronic communications sector remain such that market failures arise. The rationale for regulation, while evolving, is as relevant as ever.

A 1.3 This appendix considers the following sections in turn:

- The Macroeconomic Outlook;

- The Economics of Electronic Communications; and,

- The Legal Context.

The Macroeconomic Outlook

A 1.4 The electronic communications sector is affected by developments in the wider economy. The Covid-19 pandemic has rapidly accelerated digitalisation across the economy and has increased the use and reliance on ECS and ECN. The profound effects of Covid-19 on the global economy, which continue to unfold and develop, mean that the short-term outlook for the Irish economy is uncertain. The small, open nature of Ireland's economy also means that other international developments can significantly impact the economy. These circumstances have the potential to impact the markets ComReg regulates and monitors and the various stakeholders who engage with these markets.

Covid-19 and The Irish Economy

A 1.5 Digitalisation and connectivity have been essential for the continuity of economic and social activity during the Covid-19 pandemic. Businesses quickly moved to remote working, education moved online, and people have relied on video calls to see family and friends.

Adoption of digital services has increased rapidly across the country. This step change in internet activities, especially in video calls and other video-related activities, has led to substantial increases in data traffic on networks.

Figure 1: Year-on-Year percentage increase in Total Data Traffic (2017-2020)[1]
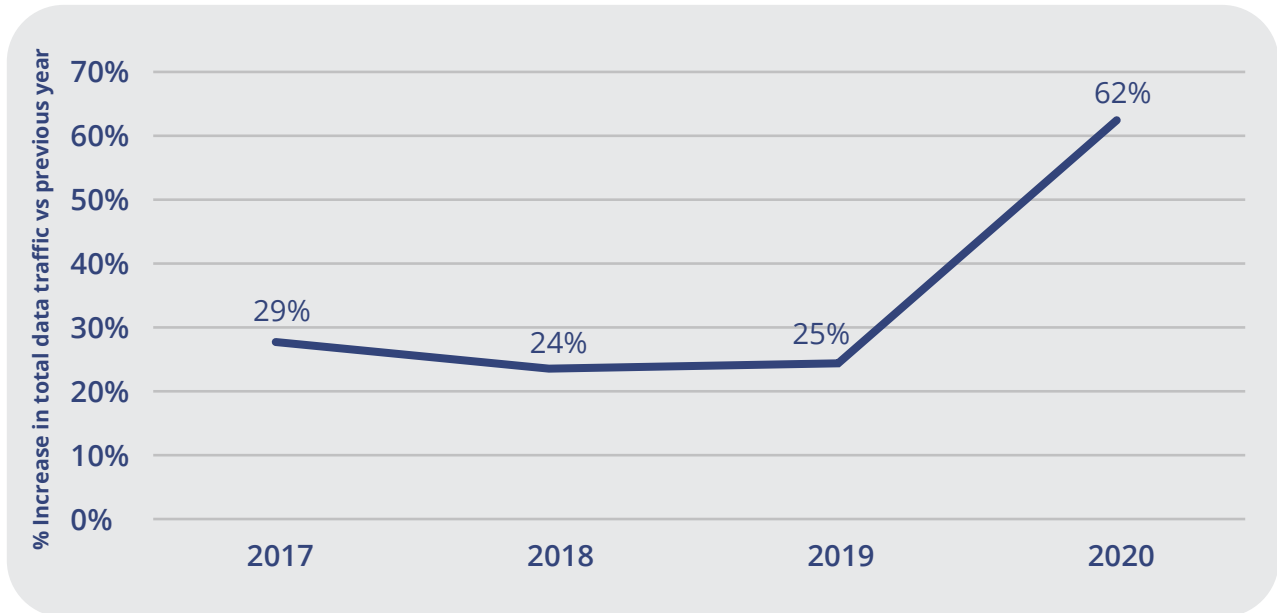

Figure 1 above shows the rate of growth of total data traffic in fixed and mobile networks has more than doubled compared to pre-pandemic years.

A 1.6 Covid-19 will have medium-run (and possibly long-run) implications for both demand and supply-side drivers within Irish markets including ECS. Sustained increases in both mobile and broadband traffic may further incentivise investments in new technologies that are more reliable and bring faster speeds, such as fibre and 5G. On the other hand, investment may be adversely affected if supply chain disruptions due to post-Covid-19 restrictions constrain production capacity[2]. The launch of new network devices (including 5G compatible smartphones) and services may be postponed. Users may not renew their mobile plans if they still foresee themselves spending the majority of their time indoors with adequate broadband for Wi-Fi calling/texting.
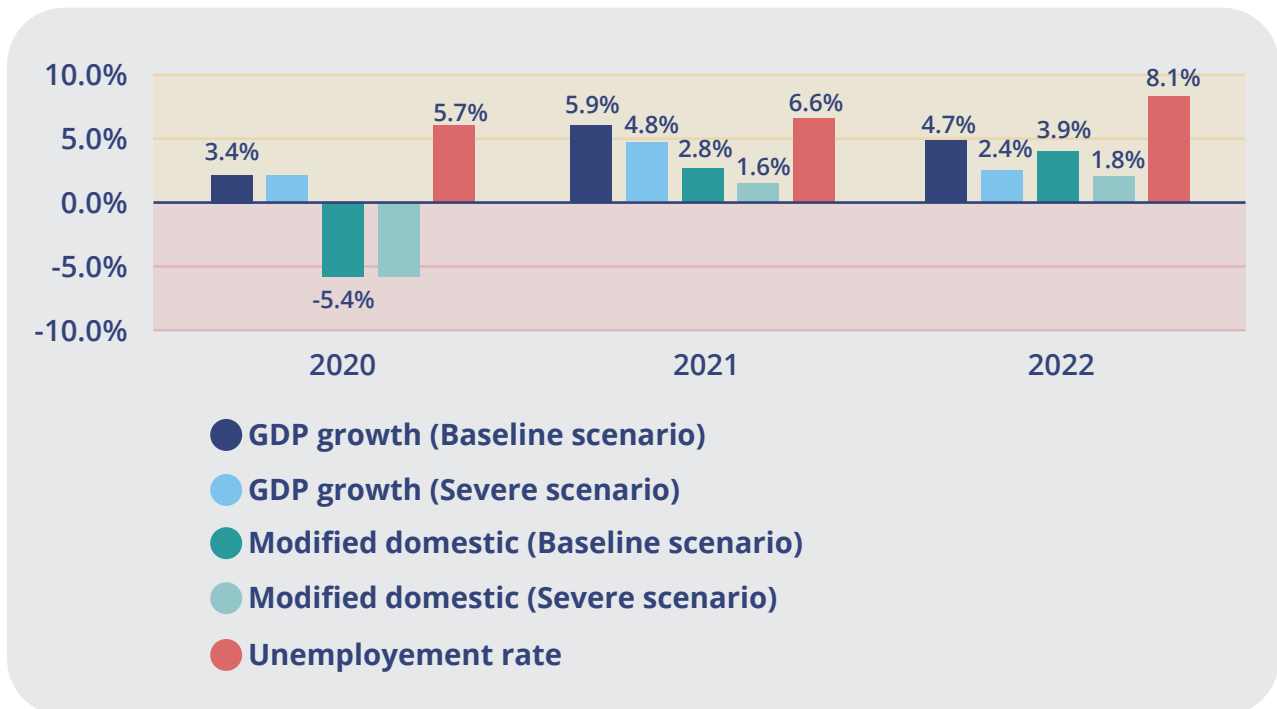
A 1.7 The macroeconomic implications of Covid-19 are also uncertain. The Central Bank estimates that GDP will grow by 5.9% and 4.7% in 2021 and 2022, respectively[3]. The Central Bank projections also account for a "severe" scenario, in which sustained restrictions dampen economic activity until successful medical treatments are in place. This scenario foresees a weaker economic recovery, as shown in Figure 2 below. Although economic growth is expected, the uncertainty surrounding Covid-19 means that the trajectory is not clear.

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1   ComReg QKDR Q4 2020, (2021), ComReg Document 21/20

2   Central Bank of Ireland, (2020), Q2 Quarterly Bulletin

3   Central Bank of Ireland, (2021), Q2 Quarterly Bulletin

Figure 2: Central Bank Economic Outlook Forecast[4]

- GDP growth (Baseline scenario)
- GDP growth (Severe scenario)
- Modified domestic (Baseline scenario)
- Modified domestic (Severe scenario)
- Unemployement rate

A 1.8 The longer-term impacts on growth will depend on the extent of scarring effects on the productive capacity of the domestic and global economy, among other factors.

International Developments and The Global Economy

A 1.9 The EU-UK trade deal[5] has important implications due to the small, open nature of the Irish economy. While the agreement has averted the threat of a 'No Deal' scenario, the new economic relationship introduces some new frictions to this trading relationship that may have repercussions for ECS markets. ComReg is actively monitoring the implications of Brexit on the electronic communications sector and has issued consumer guidance and information[6].

A 1.10 Broader trends in the global economy are also of relevance to the sector. Many ECS providers in Ireland operate as part of wider groups of companies, providing services in a number of countries. Investments in ECS in Ireland can depend on the domestic and international performance of these companies. Potential exists for geo-political tensions in the medium term, such as a perceived rise of nationalism within trade and immigration matters, and national security concerns. While global trade is projected to rebound in 2021 following the impact of Covid-19 on 2020 levels[7], trade volumes may grow at a slower pace.

A 1.11 Further uncertainty in the international taxation or business environment would likely adversely affect Ireland in particular. There have been attempts at the EU level to reform how digital multinational corporations ('**MNCs**') are taxed[8].

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4 Central Bank of Ireland, (2021), Q2 Quarterly Bulletin

5 The EU-UK Trade and Co-operation Agreement took effect on 1 January 2021

6 See ComReg's website: https://www.comreg.ie/consumer-information/brexit/

7 World Trade Organization, (2020), PRESS/862 PRESS RELEASE

8 European Commission, (2018), Fair Taxation of the Digital Economy - Council Directive Proposals

The Economics of Electronic Communications

A 1.12 The economic characteristics of ECS markets are fundamental to the dynamics in the sector. The commercial nature of private investment may mean that high-quality networks are only rolled out in areas where population densities are such that potential revenues from the end-users in those areas exceed costs. Furthermore, the quality of basic networks may not be maintained in areas where costs are high and competition is correspondingly weak. The commercial price of ECS may also be unaffordable for certain end-users who wish to purchase these services.

Market Failures

A 1.13 Market failures impede the ability of the normal competitive process to yield welfare optimal outcomes. The objective of economic regulation is to attempt to correct or compensate for the presence of market failures through appropriate interventions. Many of ComReg's statutory functions and objectives map back to an underlying market failure, examples of which are detailed in Table 1 below.

Table 1: Market Failures in the ECS Sector

Market Power

Market power refers to the ability of one operator to profitably raise prices above, or reduce quality below, that which would prevail in a competitive market. Market power may stem from the reluctance or the inability of consumers to switch in response to a degradation of quality, escalating prices (for the same good), or changes in product/service terms and conditions. This may occur, for example, because switching is difficult or costly, or because limited or no comparable alternatives exist in the market.

Externalities

Externalities are the costs or benefits of an economic activity which are not fully incorporated into the decision process of the economic actor undertaking the activity. Intervention is thus required to promote behaviours that yield positive externalities and discourage activities with negative externalities.

For example, a consumer's decision to join a network positively affects their own welfare, but as he/she joins, the network becomes larger and more connected, which further increases the welfare of other end-users on the same network (positive network externalities).

Information Asymmetry

Information asymmetry refers to the situation where parties to a transaction have different information. Asymmetric information can occur in ECS markets if, for example, a consumer does not understand the specifications or terms and conditions of a product/service they purchase.

Consumers who have difficulty in obtaining and assimilating product/service information are typically more susceptible to adverse market practices e.g. deliberate misinformation from an ECS supplier.

Behavioural Bias

A behavioural bias is an irrational assumption or belief that may lead an invidual to make a sub-optimal decision. The ECS sector is characterized by complex products, fast-changing technology, and a dynamic service-provision environment – all of which make it sensitive to behavioural biases. Operators who understand behavioural biases may be able to extract additional revenue to the detriment of consumer welfare.

The Legal Context

A 1.14 Given the potential for market failures, ComReg's remit and powers allow it to intervene in various ECS markets (as appropriate) to help ensure these markets operate efficiently in the interests of society and end-users. While these fundamental rationales remain unchanged, as technologies and markets evolve, so too does the practical application of regulation. A key factor in this process is the evolution of the legal framework.

The European Electronic Communications Code

A 1.15 On 17 December 2018, the European Parliament adopted the European Electronic Communications Code ('**EECC**') or simply "the Code"[9]. The Code is considered as a central piece of legislation to achieve Europe's Gigabit society and ensure full participation of all EU citizens in the digital economy and society.

A 1.16 The EECC, which is now in force across the EU[10], replaces the old suite of directives that comprised the EU Common Regulatory Framework for electronic communications (discussed in Explanatory Box 1: Background and Evolution of Legislation below). The EECC updates the main pillars of regulation in the sector, such as access regulation and consumer protection.

A 1.17 The EECC was created to provide a new legislative framework for ECS markets in Europe that allows for closer harmonization between the different markets across the European Union, and thus facilitates the move towards the Digital Single Market. The EECC places particular emphasis on the following:

◉ Incentivising investment in high-speed broadband networks;

◉ Updating end-user rights in relation to OTTs and bundles so as to create a more level playing field;

◉ Establishing rules around symmetric access to infrastructure;

◉ Putting into place modified procedures for market analysis and peer-revision of remedies;

◉ Having a consistent approach to spectrum management;

◉ Setting common 5G goals and spectrum bands;

◉ Redefining the approach to universal broadband access; and

◉ Addressing some governance issues related to the autonomy of National Regulatory Authorities ('**NRAs**') and the functioning of the Body of European Regulators for Electronic Communications ('**BEREC**')[11].

A 1.18 The EECC has four stated objectives - promoting competition; contributing to the development of the internal market; promoting the interests of EU citizens; and promoting the widespread access to, and take-up of, very high capacity networks (both fixed and wireless), for all end-users on the basis of reasonable price and choice. The fourth objective is new, relating to the connectivity of end-users through the promotion of investment in Very High Capacity Networks ('**VHCN**')[12], and is embodied via measures, such as those related to co-investment.

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9 Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the "European Electronic Communications Code (Recast) Text with EEA relevance".

10 The EECC needs to be transposed into domestic law in each member state before it is fully effective in each state – see further below.

11 Further information on BEREC can be found on its website: https://berec.europa.eu/

12 The first three objectives, promoting competition, contributing to the development of the internal market and promoting the interests of EU citizens are existing objectives under the existing EU Common Regulatory Framework.

A 1.19 As such, for ComReg and Ireland generally, this means supporting the rollout of the highest capacity networks that are economically sustainable in a given area, while at the same time aiming for convergence in the network capacity available in different areas. This emphasis on connectivity in the EECC is reflected in our strategy, with the inclusion of a new strategic intent. Moreover, this objective broadly aligns with our vision for the electronic communications sector, that consumers and businesses in Ireland have affordable, high-quality, and widespread access to secure communications services and applications that support their social and economic needs.

A 1.20 With the advent of the EECC, ComReg will likely have a number of new functions and objectives, additional to those contained in the previous Common Regulatory Framework, including, for example, in relation to connectivity.

Explanatory Box 1: Background and Evolution of Legislation

Given the presence of market failures, ComReg was established by the Communications Regulation Act 2002[i] ("the 2002 Act") as the successor to the Office of the Director of Telecommunications Regulation (ODTR), which had itself been established in 1997[ii]. Over the last two decades the scope of our regulatory remit has changed, reflecting changes in domestic and European policy towards communications markets as well as changes in technology. Today, ComReg's core remit encompasses[iii]:

• The regulation of electronic communications networks and services;

• The management of the radio frequency spectrum and national numbering resource; and

• The regulation of postal services

ComReg also has a number of additional functions, including the regulation of Premium Rate Services ('PRS')[iv] , Emergency Call Answering Services ('ECAS')[v] , the reduction of the costs of high speed broadband deployment[vi] , roaming[vii] and net neutrality[viii] amongst others[ix]. In addition, ComReg has shared powers with the Competition and Consumer Protection Commission[x] and some shared and complementary powers with the Data Protection Commission in respect of specific aspects of data privacy[xi]. ComReg also has a variety of other powers and functions derived from national legislation.

Since 2002, electronic communications in EU member states have been regulated pursuant to a Common Regulatory Framework comprised of five principal directives[xii], The Framework Directive, The Authorisation Directive, The Access Directive, The Universal Service Directive, and The Privacy Directive. These directives were implemented in Ireland by way of a suite of domestic regulations made in 2003 and replaced in 2011, following the adoption by the EU in 2009 of two amending directives[xiii] (the Better Regulation Directive and the Citizens' Rights Directive).

The 2002 Act and the Framework Regulations set out a number of statutory objectives for ComReg to follow, which include:

• Promoting the interests of end-users of communications services

• Promoting investment and innovation

- Promoting competition, and

- Ensuring efficient management and use of the radio spectrum.

The EECC, which is now in force, replaces the old suite of directives that comprised the EU Common Regulatory Framework for electronic communications.

i   The Communications Regulation Act 2002 has been amended by, inter alia, the Digital Hub Development Agency Act 2003, the Broadcasting (Amendment) Act 2007, the Communications Regulation (Amendment) Act 2007, the Broadcasting Act 2009, the Communications Regulation (Premium Rate Services and Electronic Communications Infrastructure) Act 2010, the Ministers and Secretaries (Amendment) Act 2011, the Communications Regulation (Postal Services) Act 2011, the Protected Disclosures Act 2014, the Competition and Consumer Protection Act 2014, the Freedom of Information Act 2014, the Communications Regulation (Postal Services) (Amendment) Act 2015, and the Communications Regulation (Postal Services) (Amendment) Act 2017.

ii   By section 2 of the Telecommunications (Miscellaneous Provisions) Act 1996, which entered into force on 10 March 1997.

iii   Section 10 of the 2002 Act.

iv   Section 10(1)(cb) of the 2002 Act, inserted by the Communications Regulation (Premium Rate Services and Electronic Communications Infrastructure) Act 2010.

v   Section 10(1)(ca) of the 2002 Act, inserted by the Communications Regulation (Amendment) Act 2007.

vi   Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks; European Union (Reduction of Cost of ix Deploying High Speed Public Communications Networks) Regulations 2016 (S.I. No. 391 of 2016).

vii   Various EU and domestic regulations from 2007 to 2017.

viii   See, e.g., Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services and Regulation (EU) No. 531/2012 on roaming on public mobile communications networks within the Union.

ix   For clarity, the list of powers and functions outlined here is not intended to be an exhaustive list. For more detail on ComReg's functions and powers, please see ComReg's website - https://www.comreg.ie/about/legislation/

x   In respect of certain ex post competition legislation and consumer protection legislation, insofar as they apply to the electronic communications and PRS sector.

xi   European Communities (Electronic Communications Networks and Services) (Privacy and Electronic Communications) Regulations 2011, S.I. No. 336 of 2011

xii   Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 (Framework Directive), Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 (Authorisation Directive), Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 (Access Directive), Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 (Universal Service Directive).Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 (Privacy Directive).

xiii   Directive 2009/140/EC of the European Parliament and of the Council on 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services and Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009 amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws

Transposition

A 1.21   As the new Code is being introduced across the EU by way of a single new directive, this directive is being transposed into the national law of each Member State, and this process of transposition is entirely for each individual Member State to undertake. In Ireland, the primary responsibility for transposition of the new Code into domestic Irish law lies with the Department of the Environment, Climate and Communications.

('**DECC**'). The transposition process to date has included extensive and ongoing engagement with relevant key stakeholders, including ComReg, industry, the Office of the Data Protection Commissioner, other Government Departments and the European Commission.

A 1.22   The Code was to be transposed by Member States by 21 December 2020. ComReg understands that the Code is now likely to be

transposed into national law later in 2021[13]. In the interim, electronic communications providers must continue to comply with their obligations, ComReg continues to regulate the electronic communications sector under its existing powers, and ensure redress mechanisms for customers continue unchanged until new legislation is introduced.

The Communications Regulation Act 2002 continues in force (without further change/ amendment), and the suite of 2011 Electronic Communications Regulations continue in force until further legislation is introduced, which amends or repeals them.

A 1.23 ComReg's Regulatory Guidance on the End-User Rights of the European Electronic Communications Code was first published on 10 November 2020 and the first update was published on 23 December 2020. On 4 December 2020, DECC published draft regulations in respect of the end-user rights provisions of the Code.

A 1.24 In respect of the likely timing of transposition, DECC has most recently stated:

The Department has decided that the transposition of the enforcement provisions of the Code should be given effect to through primary legislation. However, it remains the Department's intention that much of the transposition will still be effected by way of statutory instrument... The Department is currently preparing Heads of Bill for a General Scheme for the proposed primary legislation. Where the General Scheme has been approved by Government, it is the intention of the Department to hold a public consultation on the Scheme. The remainder of the statutory instrument will also be consulted upon at this time. It is anticipated that this will be possible over the summer period[14].

A 1.25 Full transposition of the new Code will provide regulatory certainty for business and citizens from a solid regulatory framework as a foundation to build trust, increase investment and rollout of digital infrastructure, and enable opportunity for citizens and society. Delivery of digital legislation to complete the Digital Single Market Strategy will enable ComReg to contribute to the delivery of the National Digital Strategy.

A 1.26 By 21 December 2025, and every five years thereafter, the Commission shall review the functioning of the EECC and report to the European Parliament and to the Council. Those reviews shall evaluate in particular the market implications and whether the ex-ante and other intervention powers pursuant to the EECC are sufficient to enable national regulatory authorities to address uncompetitive oligopolistic market structures and to ensure that competition in the electronic communications sector continues to thrive to the benefit of end-users.

A 1.27 In addition, by 21 December 2025, and every five years thereafter, the Commission shall review the scope of universal service, in particular with a view to proposing to the European Parliament and to the Council that the scope be changed or redefined. Furthermore, BEREC will publish an opinion by 21 December 2021 and will publish further opinions every three years thereafter, on the national implementation and functioning of the General Authorisation, and on their impact on the functioning of the internal market.

A 1.28 ComReg's various activities take account of the EECC, insofar as possible, and its strategy, vision, programme and activities set out in this Strategy Statement take into account the various provisions of the EECC. ComReg is mindful of the key features of the EECC and how they impact ongoing work streams.

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13 The Department's most recent current communications in relation to the Code can be found at its website, here: www.gov.ie/en/publication/339a9-european-electronic-communications-code-eecc/

14 See footnote 13 above.
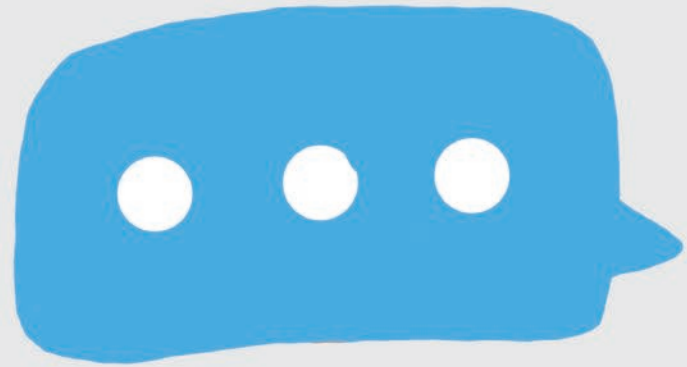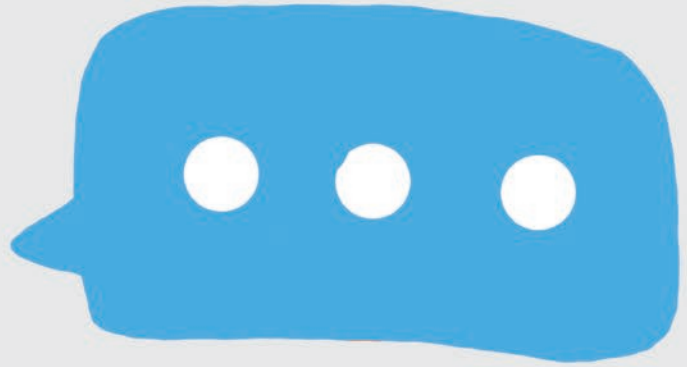
**Annex: 2 Trends
and Challenges**

Annex 2: Trends and Challenges

Overview

A 2.1   The electronic communications sector is shaped by different social, economic, legislative, and technological forces. These forces become trends over time and drive the sector's development. Some have a positive impact on markets and act as catalysts for the advancement of communication technology and the value it can bring to Irish society; others present challenges that require industry innovation or government regulation so that they do not inhibit the proper functioning of the market.

A 2.2   ComReg analyses the various factors influencing the development of the electronic communications sector and its ecosystem. ComReg has identified four main trends which are likely to shape the sector, and which may pose regulatory challenges in the coming period. These are:

- ◉ Enhanced Connectivity and New Technologies

- ◉ The Consumer Experience

- ◉ The Evolution of Adjacent and Related Markets

- ◉ The Changing Future of Regulation in the Sector.

Enhanced Connectivity and New Technologies:

Fixed Network Rollout

A 2.3   The increasingly important role played by faster ECN across the country will continue to shape Ireland over the coming 5 years.

A 2.4   Between 2011 and 2019, commercial network operators have invested €5.5 billion in expanding the reach of their fixed and mobile networks (See Figure 3 below)[15]. Commercial fixed investments by operators have centred around the rollout of fibre network technologies and upgrading of existing networks (e.g. Cable networks), while copper-based networks are being phased out. In March 2021, Eircom published a 'white paper' on its proposal to switch off its legacy copper network. The efficient migration of customers from the copper network will require engagement and consultation with various stakeholders and will need to be undertaken in a manner that safeguards competition and the rights of end-users. With these investments, for example, by Q4 2020, 42.5% of total fixed broadband subscriptions advertised download speeds exceeding 100Mbps, compared with only 21.6% in Q4 2016[16].

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15   Eurostat

16   Prior to Q1 2019, ComReg collected information from operators relating to advertised download speed. Since Q1 2019, sold download speed information has been collected from operators. There are minor differences in the definitions of advertised and sold speeds.

Figure 3: Fixed and Mobile Investment in ECN/S (2011-2019)[17]
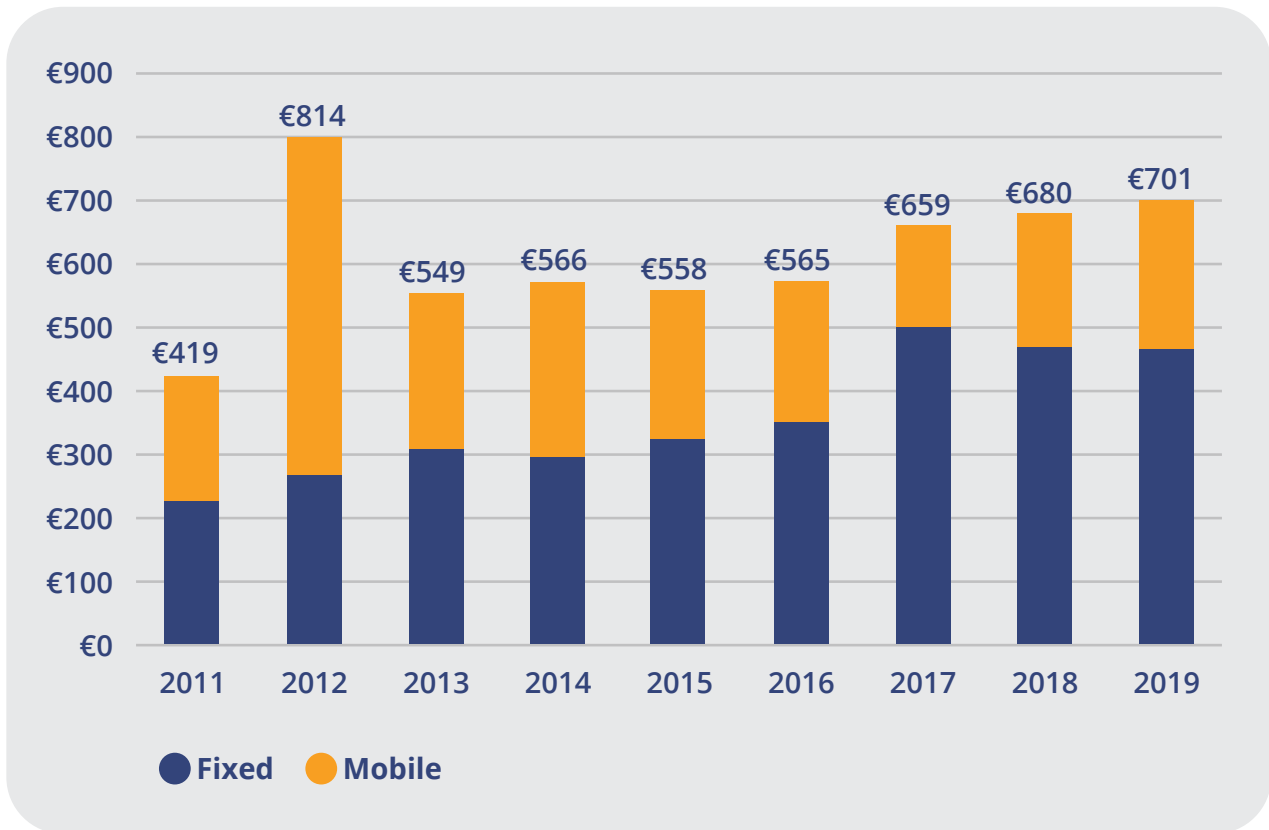
A 2.5 New networks with faster download speeds, lower latency and increased bandwidth can impact consumer experience and take-up of services available over these networks (e.g. TV services) and of products and services available in adjacent markets (e.g. better mobile handsets). However, as networks improve, consumers are likely to become more reliant on their ECS and ECN. This increased reliance on ECS and ECN can also lead to increased demand and higher expectations of the services provided. ComReg expects this trend to continue, especially with the likely widespread adoption of fibre and 5G networks in the future.

A 2.6 It is also worth noting that new networks (e.g. FTTH and 5G) are more energy efficient than legacy networks. These new networks can also play a role in creating a more sustainable economy, realising the benefits of remote working, e-Health, e-Banking and helping to manage demands on electricity networks (e.g. through smart-grids).

The National Broadband Plan

A 2.7 Despite the advances in network rollout so far, the geography and population distribution in Ireland can present challenges for the rollout of both fixed and wireless networks. Ireland's population density is lower than the EU average[18] and is highly concentrated around cities, with 63% of the population in urban areas[19]. The commercial realities of network rollout mean that network rollout may not occur in geographic areas where the population is sparse.

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17 Eurostat

18 70 people per square kilometre vs 111 people per square kilometre. - "Population Density (people per sq. km of land area)", World Bank.

19 Central Statistics Office, (2016), "Infographic Census 2016".

A 2.8 The National Broadband Plan ('**NBP**') is the government's initiative to ensure the availability of high-speed fibre to the home ('**FTTH**') broadband services to all premises in Ireland through investment from commercial enterprises as well as intervention from the State in parts of the country where there are no private investment plans. The contract for the NBP was awarded and signed on the 19th of November 2019. The successful tender was led by Granahan McCourt and was followed with the incorporation of an Irish registered company called National Broadband Ireland ('**NBI**').

A 2.9 The State intervention area covers 538,000 premises, 1.1 million people, over 54,000 farms, 44,000 non-farm businesses, and 695 schools. Over the lifetime of this Medium-term Strategy, it is expected that the majority of this network rollout will have been completed.

5G Technology and other network developments

A 2.10 Until recently, 5G was a nascent development at the periphery of the global electronic communications sector. However, as the necessary spectrum bands have been assigned, operators have commenced the rollout of networks, device manufacturers have started developing and selling 5G handsets, and international bodies have clarified standards.

A 2.11 In June 2017, ComReg granted 3.6 GHz licenses to five operators following a spectrum auction. Mobile operators in Ireland have begun to roll out 5G services. However, widespread adoption will depend on the availability and take-up of new 5G enabled handsets and use cases.

A 2.12 Growth in the use of 5G and other developments in mobile networks can have implications for service offerings and competitive dynamics in the sector in future, as seen in Explanatory Box 2 below.

A 2.13 Besides 5G, there are several other new technologies that aim at increasing and improving connectivity. Two of them are Wi-Fi 6 and Low Earth Orbit ('**LEO**') Satellites.

A 2.14 Wi-Fi 6 is the next generation Wi-Fi technology currently being deployed, capable of delivering reliant, fast, widespread, and traffic-heavy connectivity. Integrating 5G network technology with Wi-Fi 6 technology will allow operators to optimise traffic across access networks and provide efficient indoor-outdoor coverage. Offloading to Wi-Fi can provide cost savings for mobile operators delivering 5G without affecting quality. Used together, these technologies can support large deployments of Internet of Things ('**IoT**') devices and facilitate use cases like connected vehicles and smart cities where there will be a mix of fixed and mobile devices. Some service providers across Europe started to offer Wi-Fi 6 in Europe in 2019[20]. Manufacturers have also released Wi-Fi 6-compatible devices and/or routers.

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20 For example, Swisscom and Telefonica have launched Wi-Fi 6, 10 Gbps gateways and repeaters in Europe in late 2019. ("Swisscom Launches First Wi-Fi 6, 10 Gpbs Gateway and Repeater in Europe, Powered by SoftAtHome Software

Explanatory Box 2: 5G Networks and Non-Ionising Radiation (NIR)

Mobile technologies and services have evolved steadily over the past three decades and continue to do so. Ireland's first "2G" mobile network was launched in 1993. In those early days, users were limited to voice calls, though within a few years they could also send and receive text messages. The early 2000s saw the first 3G networks and with them the first mobile internet services. These were followed by 4G networks in the early 2010s which offered faster mobile internet services.

5G is the next generation of mobile technology. The coming decade should see the rollout of 5G networks across Europe and indeed most of the world. 5G will operate alongside other technologies to provide still faster data speeds and better connectivity. 5G is also a technology which would enable connectivity between wireless devices. This should support the expected massive growth in the number of wireless devices such as in machine-to-machine (M2M) communications and the Internet of Things (IoT).

Compliance with limits on non-ionising radiation (NIR) is a requirement of all licences and the general authorisation irrespective of the technology used or the service been provided. As part of its spectrum management function, every year ComReg measures NIR levels in public areas at a minimum of 80 different sites, located throughout Ireland. These are chosen based on demographic and geographic factors.

To date, over 1400 sites have been surveyed and NIR levels at all sites have been found, without exception, to fall well below the international limits for public exposure set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

ComReg does not have any role in relation to the health effects of Non-Ionising Radiation (NIR), occupational exposure to NIR, the limits that should apply, or planning matters, and does not make decisions in relation to the location or installation of telecommunications masts. These matters are dealt with by other public bodies, including:

- **Dept of Environment, Climate and Communications (DECC)** – responsible for setting policy relating to the health effects of NIR

- **Environmental Protection Agency (EPA)** – provision of independent expert advice on exposure to NIR and the monitoring of scientific/technological developments likely to impact on public exposure to NIR

- **Local Authorities** – responsible for the siting of telecommunications masts and equipment

- **Health and Safety Authority (HSA)** – regulates exposure to NIR in the workplace

The EPA note that the effects of RF EMF (Radiofrequency Electromagnetic fields), including the frequencies used and envisaged for 5G, have been subject to significant research. The ICNIRP issues guidelines to limit exposure to EMF and protect workers and the public from potential harmful effects. The ICNIRP guidelines are endorsed by the World Health Organization (WHO) and the European Commission. No health effects have been shown at levels below the ICNIRP guidelines for members of the public, as such no consequences for public health are expected from exposure to 5G.

Explanatory Box 3: Emerging Technologies

OpenRAN

Radio Access Networks ('RAN') are used to connect devices to a mobile network. RAN vendors such as Ericsson, Nokia and Huawei supply hardware and software to telecoms operators. In a traditional RAN, hardware and software are coupled, and are not interoperable between vendors. Thus, operators may be heavily reliant on their chosen vendor. However, Open RAN aims to disaggregate mobile base stations by standardising open interoperable interfaces between the radio and signal processing elements, with the aim of increasing supply chain diversity, lowering costs and increasing innovation.[i] This could enable operators to avail of multivendor deployments, reducing dependence on individual vendors and enabling a more competitive vendor market.[ii]

While operators typically rely on a limited number of RAN vendors operating in a concentrated market, the introduction of Open RAN could reduce barriers to entry for new vendors to introduce their own services and allow operators to customise their network, creating a more agile RAN.

Software Defined Networks & Network Function Virtualisation

Technological developments may allow new network management possibilities that enable a single physical network to support a number of virtual networks with different performance characteristics.[iii] Two key technical developments that make this possible are Software Defined Networks ('SDN') and Network Function Virtualisation ('NFV'). NFV decouples network functions from proprietary hardware appliances so they can run in software. SDN transfers network functions from the hardware to the software layer and is complementary to NFV for network management.[iv] These developments effectively allow for the creation of separate networks that share one physical infrastructure, with each network designed to meet its own specific requirements. This could allow operators to provide services with different performance characteristics to different customers using the same physical network. This may be particularly useful given that different types of use cases for mobile networks in the future may have different requirements in terms of download speed, reliability or latency. Services can be targeted at particular sectors (verticals), opening up opportunities for new business models.

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i   O-Ran Alliance, (2020), "O-RAN Specifications"
ii   O-Ran Alliance, (2018), "O-RAN: Towards an Open and Smart RAN", White Paper
iii BEREC, (2018), Study on Implication of 5G Deployment on Future Business Models, A report by DotEcon Ltd and Axon Partners Group
iv   OECD, (2019), The Road to 5G Networks: Experience to Date and Future Developments

A 2.15 In the last few years, there has been a resurging interest in LEO satellites to offer ECS. These satellites typically orbit earth at a lower altitude than existing broadband satellites (from 180km to 2,000km) and have the potential to offer higher capacity (up to 23.7 Tbps[21]), broader coverage, and lower latency than existing broadband satellite networks[22]. Because of their altitude, there must be a full constellation of satellites that communicate with each other and with devices on the Earth in order for service to be provided. These constellations will allow for broadband network coverage in areas where the rollout of fixed networks is not commercially viable.

It is possible that the future use cases of LEO satellites will focus on either niche applications or in helping reach universal broadband coverage in remote areas, rather than directly competing with traditional broadband services. Nonetheless, their retail potential of offering an alternative version of current services cannot be ignored.

Demand on Networks

A 2.16 Results from ComReg's Quarterly Key Data Report ('**QKDR**')[23] in Figure 4 below show the increasing volumes of fixed and mobile data traffic in recent years, with particular increases arising in 2020, following the emergence of Covid-19.

Figure 4: Total Fixed and Mobile Data Traffic[24]

● **Total Fixed Broadband Data Traffic (GB)**
● **Total Mobile Data Traffic (GB)**

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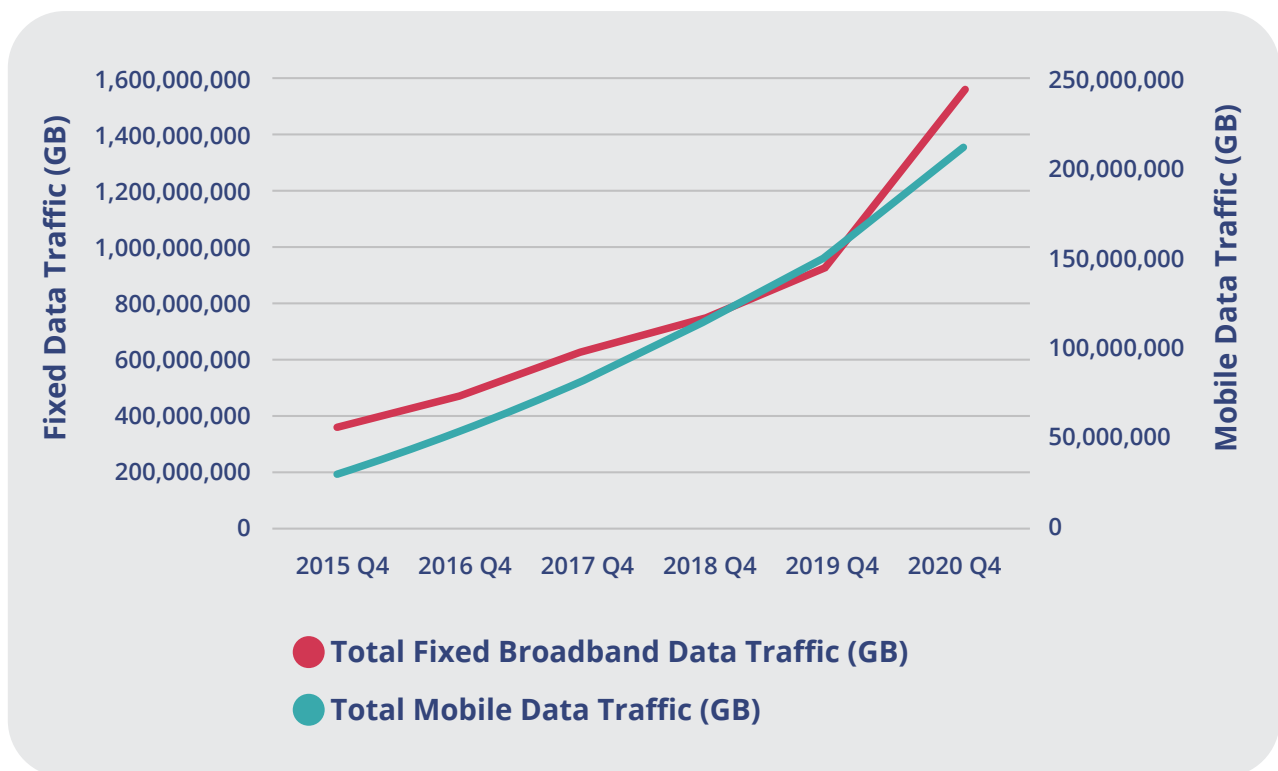
21 Del Portillo, I., Cameron, B., and Crawley, E., (2018), "Technical Comparison of Three Low Earth Orbit Satellite Constellation Systems to Provide Global Broadband"

22 European Commission, (2017), "Low-Earth orbit satellites: Spectrum access"

23 ComReg QKDR Q4 2020, (2021), ComReg Document 21/20

24 ComReg QKDR Q4 2020, (2021), ComReg Document 21/20

A 2.17 Figure 1 (above) shows the year-on-year percentage increase in total data traffic on fixed and mobile networks. The figure shows a reasonably constant level of growth of total data traffic of around 24-29% in the years preceding the pandemic when the rate of growth more than doubled (rising to 62%).

A 2.18 Increasing demands for data are expected to continue. In the future, meeting the needs of Irish consumers accessing data-hungry applications (such as video streaming and social media) from mobile devices will require not only the improved coverage of mobile networks, but also the ability of consumers and services to roam seamlessly between mobile and fixed broadband networks. The National Broadband Plan and the availability of additional spectrum through future spectrum awards are key enablers to meet this challenge.

A 2.19 Patterns of use are also changing. ECN and ECS are increasingly being relied upon for crucial economic activities, such as working from home. In this context, the quality of service (e.g. reliability) may be even more important than when doing other activites online (e.g. streaming video content). In this regard, the reliability, resilience and security of networks is becoming increasingly important.

Network Security and Resilience

A 2.20 A key consideration regarding networks and connectivity is the increasing need of improving their security and resilience. The growing number of connected devices and the exponential increase in data that IoT and other technologies function on add an extra layer of vulnerability to networks. In addition, the increase in the number of devices accessing a network and the growing reliance of consumers on ECN increases the potential threat of malicious attacks and security risks. Other risks to network security and reliability include climate change and weather events,

such as floods and storms. Network reliability and security has advanced with each technology. One of these challenges is that communications are no longer confined to individuals but have come to include communications between devices as well as within vertical industries. This brings about new business models with a broad range of security needs. Additionally, the more online life becomes, the more sensitive the information transferred becomes and the higher the risk and potential for damage from a cyberattack are. ComReg works with other organisations to protect consumers from scams and other malicious attacks by increasing awareness of these security issues.

The Consumer Experience

A 2.21 Related to the trend of increased and improved connectivity is the changing user experience and expectations of Irish consumers. As part of this trend, ComReg notes the growing reliance on connectivity, the increased adoption and usage of new technologies and the persisting non-uniform end-user experience.

Growing Reliance on Connectivity

A 2.22 Over the last 10 years, the development of networks and the adoption of new technologies have enabled people to connect in ways they had never done before. There is virtually no part of our lives which remains untouched by innovations in digital connectivity. In 2019, over 90% of Irish households had an internet connection at home and had been engaged in a wide range of internet activities.

A 2.23 Covid-19 has rapidly accelerated trends towards further digitalisation, moving even more of our lives online. In November 2020, 76% of online users estimated that their household use of broadband had increased since March[27].

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25 European Commission, Digital Agenda Scoreboard Key Indicators

26 Central Statistics Office, (2019), Information Society Statistics – Household

27 Comreg, (2021), 'Impact of Covid-19 on consumer use and perception of telecommunications services - 4th Survey Q4 2020,' ComReg Document 21/06

Seven in ten workers believe that they will be working more from home after the crisis than they did before and agree that the traditional way of conducting voice-based conference calls will change to video-based conference calls[28]. Moreover, the January 2021 National Remote Working Strategy[29] published by the Department of Enterprise, Trade and Employment ('**DETE**') underlines the enduring nature of these developments, proposing a range of actions which will promote remote working beyond Covid-19.

A 2.24   Other digital services such as e-Government, e-learning, and cloud storage services are becoming increasingly popular in recent years[30], and Covid-19 may further accelerate adoption of new online services (e.g. e-Health)[31]. Online activities (including remote working) are also becoming more important for businesses. Over the next decade it is likely that public services, such as health, education and public administration will depend heavily on widespread, reliable, secure and resilient ECS/ECN to deliver services to consumers and businesses. As a result, ComReg expects the relationship between the ECS sector and these key adjacent markets will grow in importance and value.

A 2.25   The Digital Economy and Society Index ('**DESI**') 2020 report ranks Ireland as first in Europe in terms of integration of digital technology[32], with Ireland leading Europe in all three indicators under e-commerce (i.e. SMEs selling online, e-commerce turnover and selling online cross-border). Irish companies also rank relatively high in the report on the use of big data, cloud services and social media.

Figure 5: Home (%) with devices connected to Fixed Broadband 2013-2020[33]

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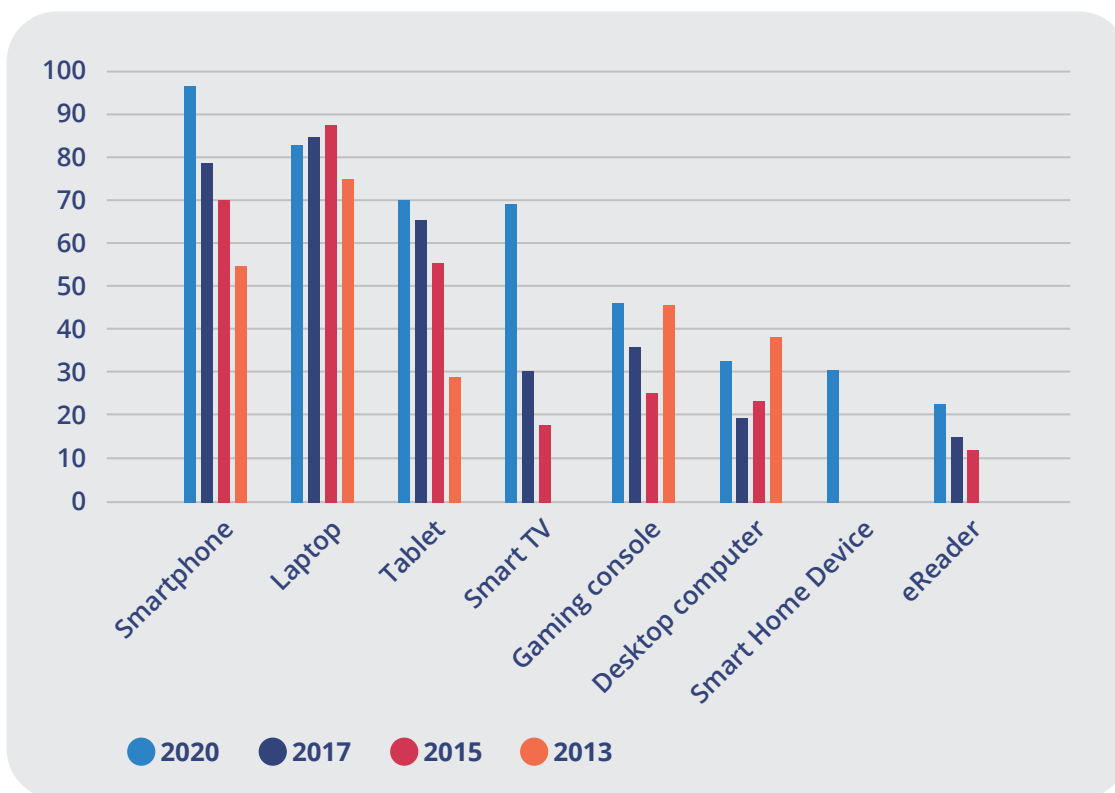
28   Ericsson, (2020), Ericsson Mobility Report 2020

29   Department of Enterprise, Trade and Employment, (2021). "Making Remote Work: National Remote Working Strategy"

30   Central Statistics Office, (2019), Information Society Statistics – Household 20

31   Ericsson, (2020), Ericsson Mobility Report 2020

32   European Commission, (2020), Digital Economy and Society Index (DESI) 2020: Thematic Chapters

33   ComReg Connectivity Survey, (2021), ComReg Document 21/30 and ComReg Ireland Communicates Survey, (2017), ComReg Document 18/23a

Continued Adoption of New Technology

A 2.26 Along with the growing reliance on connectivity, consumers continue to adopt new technologies. As shown in Figure 5 below, smartphones are now used in nearly every home, and the use of tablets continues to increase while laptops are used in more than 80% of homes. Smart TV's are now present in more than two thirds of homes while nearly one in three households use a smart home device.

A 2.27 While new technologies continue to be adopted, consumers expect this trend to continue. Figure 6 below shows the current and anticipated use of various technologies in 2025 by online users.

Figure 6: Current and Anticipated Future Technology Use[34]

	Past Use - 2017	Current Use - December 2020	Anticipated Future Use (in 2025)	
	%	%	%	
Petrol/ Diesel based Car	84	77	46	▼
Tablet/ iPad	65	65	60	
TV Streaming Box	13	43	44	
Smart Watch/ Wearable Fitness Tracker	9	40	44	▲
Smart Speaker	-	29	37	▲
Apple/ Android Pay	7	25	35	▲
Smart Home Thermostat	4	12	35	▲
Hybrid Car	4	5	36	▲
Other Smart Home Devices	3	21	35	▲
Fully Electric Car	-	N/A	21	
Sem-Autonomous Car	-	N/A	12	

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34 ComReg Technology Survey (2021), ComReg Doc 21/32b, Digital Services & Online Safety Survey, (2021), ComReg Document 21/09 and ComReg Ireland Communicates Survey, (2017), ComReg Document 18/23a

A 2.28 The continued growth in the use of IoT devices anticipated over the coming years will be driven by improved functionality, the growing availability of high capacity fixed networks, and the development of 5G networks. ComReg recognises that the availability and adoption of many emerging technologies may not be uniform – it will likely be led by younger consumers, living in urban areas, where disposable incomes are higher and faster access networks are available.

Non-Uniformity of Experience

A 2.29 This increased adoption of technology and services has not been uniform throughout the country nor across demographics. As mentioned above, there are differences in connectivity levels between urban and rural areas, largely due to differences in the availability of networks. In addition, there are other areas where commercial rollout will be slower and there will likely remain a need for ex-ante regulation.

A 2.30 In March 2021, the Irish Government published '*Our Rural Future*', its plan to transform rural Ireland over the next five years. Amongst other things, the Plan highlights the role that our telecommunications networks will play in promoting remote working and revitalising the rural economy.

A 2.31 The use and take-up of ECS also varies across age groups. ComReg's Connectivity Survey 2020[35] shows that a considerably higher proportion of those aged 18-34 have access to a fixed broadband service at home compared to those over 55 (86% vs 58%). Younger cohorts also use a wider variety of online services on a daily basis, such as email, video content, online banking, online shopping and have adopted new technologies, such as smart watches or smartphone payments. See Figure 7 below for a breakdown in technology ownership and usage by age.

A 2.32 A noticeable discrepancy persists in smartphone ownership, with nearly all (99%) of mobile phone users aged 18-24 having a smartphone, compared to just 59% of those aged over 65[36]. Though, this has increased from less than half (47%) of those aged over 65 in 2019[37].

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35   Mobile Consumer Experience Survey, (2019), ComReg Document 19/101

36   Behaviour & Attitudes, (2020), "Techscape 2020"

37   Mobile Consumer Experience Survey, (2019), ComReg Document 19/101

Figure 7: Ownership/Usage of Technologies in the Home[38]

	18-34	35-54	55+
	%	%	%
Access to Fixed Broadband at home	86	81	58
Access to a home phone service	25	39	49
Access to a mobile phone	97	98	91
Watch TV on a(n) Tablet/ iPad	11	9	1
Watch TV on a Smart TV	76	75	48
Watch TV on a smartphone	21	14	5
Use Netflix	62	46	18
Daily use of Email*	92	91	81
Daily use of Messaging apps*	90	86	74
Daily use of Video content*	76	64	39
Daily use of Online banking*	51	40	31
Daily use of Online shopping*	25	22	7
Smart watch/wearable fitness tracker**	46	43	32
Apple pay or Android pay**	40	26	14

*Results from ComReg's Digital Services & Online Safety survey (Online)
*Results from ComReg's Technology Survey 2021 (Online)

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38   ComReg Connectivity Survey, (2021), ComReg Document 21/30, ComReg Digital Services & Online Safety Survey, (2021), ComReg Document 21/09 and ComReg's Technology Survey, (2021), ComReg Document 21/32b

Consumer Behaviours

A 2.33 Consumers' confidence in choosing optimal telecom goods and services is subject to various factors. The nature of the electronic communications sector creates an environment that is particularly complex and difficult for consumers to make decisions in. Because of these industry characteristics, consumers may not always make the best choices and operators may choose to further distort the market by choosing carefully how they present information and choices to consumers in order to increase profits.

The Consumer Experience

A 2.34 The pattern of network rollout across the country as well as the varying levels of technology adoption across demographics mean that consumer experiences in the sector are not uniform. These developments imply new, or more sharply drawn, digital divides. Given the increasing reliance on connectivity in daily life, these varying levels of digital inclusion are potentially more acute and socially divisive than ever before, and will therefore draw regulatory as well as political attention over the coming period.

A 2.35 As set out in the Strategy Statement, a significant numbers of consumers continue to experience issues when availing of ECN / ECS and PRS. Billing, contractual and service issues have been and remain the main ECN / ECS issues raised by consumers, while number portability and switching concerns have increased significantly more recently. Issues with PRS persist in particular in respect of subscribing, representing a significant percentage of total contacts received.

A 2.36 ComReg also notes the results from the 2020 CXi Survey[39] for Ireland showing the Communications sector to be a poor at delivering customer experience, when compared to other sectors of the economy.

Related Markets and Services

A 2.37 A third trend identified is that of how changing dynamics in related markets can influence the electronic communications sector. As these related markets evolve, lines between markets get blurred and change the industry's structure and competitive landscape. ComReg considers input markets, complementary markets and downstream markets under this trend.

Figure 8: Related Markets and Services
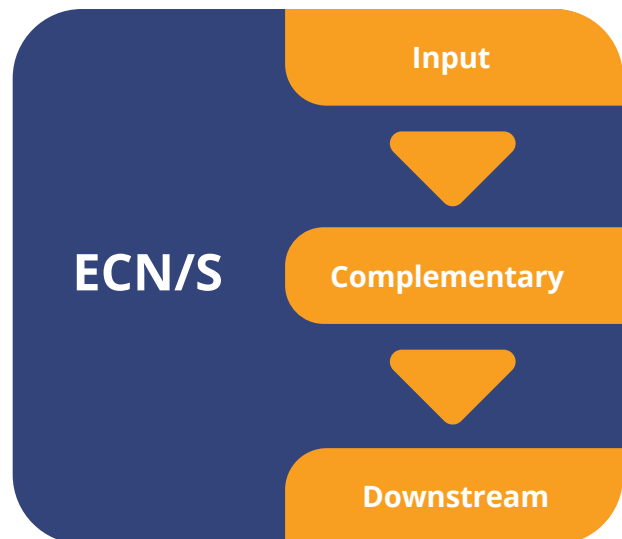
Input Markets

A 2.38 Input markets include areas such as network equipment manufacturers which create the equipment to facilitate the use of ECS. Input markets affect the sector in various ways, such as the cost of network rollout, quality of service and security. Two developments are considered in the context of input markets, eSims and Artificial Intelligence.

A 2.39 The embedded Sim (**eSim**) is the most recent iteration of the Sim card technology which allows for over-the-air provisioning of network services without the need of a physical card. It is resistant to physical shocks, vibrations and humidity, and has a long lifespan. The eSim is therefore suitable

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39   https://thecxcompany.com/wp-content/uploads/2020/10/2020-CX-Report.pdf

for large scale M2M deployments such as in the car industry, where physically changing Sims would not be economically feasible. It is also suitable for various consumer device uses such as mobile handsets and wearables.

Because of these characteristics and the potential use cases it offers, eSims have the potential of changing the competitive landscape in the mobile, M2M, and related markets. For example, in the M2M case, eSims may significantly reduce switching costs in cases where there are many connected devices in a system. Intermediaries may even take on the challenge of finding the best offers for businesses and managing their subscriptions.

For consumers, eSims may enable multi-device subscriptions.

A 2.40 The full potential and development of eSims will depend on the standards adopted by industry. There are currently no operators in Ireland offering eSims. However, a number of device manufacturuers already include an eSim in mobile handsets sold in the Irish market. ComReg continues to monitor this space and any developments in it.

A 2.41 Another important trend is the use of Artificial Intelligence ('**AI**') as an input in the ECS sector. As discussed in Explanatory Box 4 below, AI is being used in the sector in a variety of ways, from optimising the use of radio resources to reducing operation costs via customer services chatbots.

Explanatory Box 4: Artificial Intelligence

According to the European Commission (EC), AI "refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals".[i] AI systems can be purely software based (e.g. image analysis software, search engines, translation tools, facial recognition technologies) or embedded in hardware devices (e.g. drones, IoT devices, advanced robots, autonomous vehicles).

In the ECS sector, Artificial Intelligence is already used for a range of functions. Operators have introduced machine learning algorithms to optimise the usage of radio resources to minimise energy consumption[ii] as well as using chatbots to engage with customers. An Ericsson report which surveyed 132 telecoms service providers globally found that more than half of operators expected to have adopted AI by the end of 2020, with a further 19% looking to adopt by 2023. The main areas where operators are seeing the benefits of AI are through service quality management (17%) and operational cost savings (16%).[iii]

Although the use of AI can bring significant benefits across sectors and is expected to increase considerably, it is also associated with a number of concerns, including regarding bias, opacity, safety, liability and ethics. For example, AI systems can learn from data to improve. However, if the data used contains an inadvertent bias or is incomplete, this may lead to bias being embedded within AI systems and deployed at scale.[iv] The EC is expected to propose a regulatory framework on AI in 2021.

Given the increasing role played by digitalisation in society and the foundational nature of ECS services, it is imperative that ComReg, at a minimum, maintains an awareness of these developments and keeps on open dialogue with other sectoral regulators. In this regard, ComReg will continue to work collaboratively with the Economic Regulators Network (ERN) on issues relating to developments in European digital legislation and the implications for Irish digital policy and regulation.

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i   European Commission, (2017), "Artificial Intelligence for Europe"
ii ComReg Document 20/27
iii Ericsson, (2018), "Employing AI techniques to enhance returns on 5G network investments"
iv McKinsey Global Institute, (2019), "Tackling bias in artificial intelligence (and in humans)"

Complementary Markets

A 2.42 Complementary markets (e.g., handsets or IoT devices) are important to consider as they affect the quality of experience of using ECS services, including coverage and security.

A 2.43 A complementary market of relevance to ComReg is the market for consumer handsets. ComReg's 2019 MCE Survey shows that 40% of respondents owned a Samsung smartphone, while 32% had an Apple iPhone[40]. Over the coming years, ComReg expects that these handsets will play a key role, alongside fibre and 5G networks, in advancing people's use, experience and reliance on ECS.

A 2.44 Related to the brand of a handset itself, is the operating system of a device. These markets are relevant because the quality of the operating system and the handset may influence the consumer experience. A user might perceive download speeds to be slower than they are paying for, their network coverage worse, and their overall ease of use different simply because their device has a smaller antenna, a different look and feel, or a poor-quality screen.

A 2.45 Over the coming period ComReg's understanding of the traditional mobile handset may change as device manufacturers innovate and consumers begin to adopt other complementary devices such as smart watches and Virtual Reality or Augmented Reality headsets.

Downstream markets

A 2.46 Downstream markets, such as Over-the-Top ('**OTT**') services[41], are also considered, as consumer demand for ECN/S is ultimately driven by consumers' desire to participate in these downstream markets (e.g. to communicate with friends, family, colleagues or to be entertained).

A 2.47 While ECS plays a fundamental role, OTTs offer a range of services to consumers to enable them to communicate, work, learn and be entertained. For example, the availability of video conferencing and team virtual collaboration applications have facilitated the working from home "revolution" driven by Covid-19. By December 2020, 82% of online users use OTT messaging apps at least daily while 59% view video content daily[42]. The rise of these messaging, voice and video calling OTT services has impacted network traffic and revenues of traditional telecoms operators and this is expected to continue.

A 2.48 Broadcasting markets have also been impacted significantly by the rise of OTT services. There are 1.2 million users of subscription-based video services in Ireland and this number is expected to grow[43]. ComReg's Connectivity Survey 2021 found that 40% of respondents use Netflix while 13% use Amazon Prime.[44] In response to this rising pressure from OTT services, Irish broadcasters are enhancing their online presence, offering catch-up players (used by 20%[45]) and live, cultural and sports content. Notably, Sky and Virgin Media have launched OTT video services NowTV and VirginMedia Player, respectively. Eir has also launched an online offer partnered with AppleTV. Notably, the Covid-19 crisis also led to a temporary increase in live TV viewing.[46]

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40 Mobile Consumer Experience Survey, (2017) , ComReg Document 17/100a

41 OTT services refer to communication services provided over the internet, including sending messages (via platforms such as WhatsApp), making calls (via applications such as Zoom), and watching TV (via streaming services such as Netflix).

42 Digital Services & Online Safety Survey, (2021), ComReg Document 21/09

43 Statista, (2020), "Video Streaming (SVoD) Ireland"

44 ComReg Connectivity Survey 2021, ComReg Document 21/30

45 ComReg Connectivity Survey 2021, ComReg Document 21/30

46 See TAM Ireland's monthly TV Overviews https://www.tamireland.ie/category/viewing-trends/. TAM Ireland data show an 11% increase in live TV viewing between March 2019 and March 2020. March 2021 data show a 12% decrease compared with March 2020 data, suggesting a return to pre-COVID-19 levels of TV viewing.

A 2.49 Although a wide array of benefits have been created by digitalisation, it is becoming increasingly clear that the digital economy poses a wide range of challenges. Governments, regulators and wider society are becoming increasingly aware of the potential harms associated with the digital economy, including concerns relating to the market power of digital platforms, harmful content online, privacy and security, among others. ComReg's Digital Services & Online Safety Survey in December 2020 found that two-thirds of online users report becoming more conscious of their privacy online in the last year and 57% recognise the challenge of harmful content online[47].

A 2.50 There has been a notable development in the regulatory environment of the broadcasting and online service markets. In January 2020, the Online Safety and Media Regulation Bill was published[48]. The proposed Bill seeks to provide for the establishment of a Media Commission (including an Online Safety Commissioner) which would replace the Broadcasting Authority of Ireland ('**BAI**').[49] The Media Commission's powers will be extended to policing content uploaded on social media websites.

This will allow them to address issues such as children's access to harmful content and adult material by enforcing policies such as requiring parental controls and age verification tools on websites. The Bill proposes investigatory and compliance powers for the Media Commission, including administrative financial sanctions.

The Future of Regulation in the Sector

A 2.51 The final key trend identified relates to the rate of change of regulation in the sector. With the recent formation of a new government and a new European Commission (EC), a range of developments in the regulation of the ECS and related sectors will arise during the course of this strategy statement. The EC has made 'A European Green Deal' and 'Making Europe fit for the digital age' two of its key pillars for its current mandate. Both of these pillars have implications for the development of regulation in the ECS and related sectors.

A 2.52 The European Electronic Communications Code ('**EECC**'), adopted in December 2018, was created to provide a new legislative framework for ECS markets in Europe that allows for closer harmonization between the different markets across the European Union, and thus facilitates the move towards the Digital Single Market.

At the same time, the 2020 Programme for Government has committed to the publication of a National Digital Strategy and to bolster ComReg's enforcement powers. A number of the key developments that will take place in relation to the regulation of the sector (and related markets) are discussed in detail below.

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47   Digital Services & Online Safety Survey, (2021), ComReg Document 21/09

48   Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media, (2020). Online Safety and Media Regulation Bill https://www.gov.ie/en/publication/d8e4c-online-safety-and-media-regulation-bill/

49   Online Safety and Media Regulation Bill

Legislative Changes and Developments

A 2.53　Over the coming period there will be a number of legislative changes and developments that will impact ComReg's role and mandate. ComReg, in its preparation of this ECS Strategy, has considered the impact of these legislative developments. Throughout the document, where appropriate, ComReg has sought to address these developments.

◉　**Consumer Protection mandate**: The EU has been developing its New Consumer Agenda, which contributes to the development of ComReg's mandate under Irish Law. The Consumer Rights Bill is now in the government's Spring Legislative Programme to transpose the relevant EU Directives, and to update and consolidate the statutory provisions on consumer rights and remedies in relation to contracts for the supply of non-digital services, unfair contract terms, and information and cancellation rights. National legislation is also being developed for ComReg in respect of the Consumer Protection Cooperation Regulation.

◉　**Cybersecurity Strategy for the Digital Decade**: ComReg has an evolving role under this EU strategy including: the Directive on Security of Network and Information Systems (NIS Directive and proposed NIS 2 Directive) both in respect of the inclusion of electronic communications as an essential service and the related digital infrastructure sector; the Telecoms Security Rules resulting from the 2019 EU Recommendation 2335; and the legislative proposal for additional measures on critical infrastructure protection. ComReg seeks to ensure effective and efficient legislative development to enable compliance by telecom operators and digital businesses to protect the infrastructure for delivery of their essential services.

◉　**Broadband Cost Reduction**: ComReg is participating in the delivery of the toolbox of best practices resulting from the review of the Broadband Cost Reduction Regulation. ComReg foresees a continued role in this area as the requirements evolve.

◉　**Privacy and Electronic Communications**: ComReg's role in respect of electronic privacy is evolving and ComReg has a continued input into the development and subsequent implementation of the proposed EU E-Privacy Regulation and EU proposed derogation from the Privacy and Electronic Communications Directive 2002/58/EC (Irish S.I. No. 336 of 2011). These proposals are still being debated at EU level, and, in the interim, ComReg's monitoring and enforcement role continues under the old Directive (2002/58/EC).

◉　**Market Surveillance**: ComReg is the designated Market Surveillance Authority in respect of two EU Directives - the Electromagnetic Compatibility Directive[50] ('**EMCD**') and the Radio Equipment Directive[51] ('**RED**'). As the Market Surveillance Authority for the Radio Equipment Directive, ComReg is also responsible for the safety requirements of the Low Voltage Directive[52] ('**LVD**'), as they apply to radio equipment.

The purpose of market surveillance is to prevent non-compliant products from entering the market, anywhere in the EU, and to seek out and remove non-compliant products which have entered the market. The new EU "Goods Package" Regulation (EU) 2019/1020 on market surveillance and compliance of products applies from 16 July 2021.

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[50]　The EMCD is transposed into Irish law by way of the European Union (Electromagnetic Compatibility) Regulations 2017 (S.I. No. 69/2017)

[51]　The RED is transposed into Irish Law by way of the European Union (Radio Equipment) Regulations 2017 (S.I. No. 248/2017).

[52]　The LVD is transposed into Irish Law by way of the European Union (Low Voltage Electrical Equipment) Regulations 2016 (S.I. 345/2016)

New EU Proposals and Expected Future Proposals

The EU Regulation will bring in a number of important changes that will drive ComReg's evolving role as a Market Surveillance Authority including:

- A requirement for an EU-based economic operator responsible for certain compliance tasks for products that fall under the regimes listed (broadly, the CE marking regimes).

- Responsibilities for fulfilment service providers in respect of products that fall under the legislation listed and are handled by them where there is no other EU-based economic operator with responsibility for compliance.

- A minimum set of powers that Member States must provide to their market surveillance authorities.

- A requirement for Member States to lay down rules for penalties for breaches of legislation to the extent they have not already done so.

- The ability for Member States to authorise their market surveillance authorities to "the totality of the costs of their activities with respect to instances of non-compliance" from the relevant economic operator in certain circumstances.

- Provisions to increase the exchange of market surveillance related information between market surveillance authorities, including the establishment of a Union Product Compliance Network that will be composed of representatives from each Member State.

- Provisions to increase cooperation between customs authorities and market surveillance authorities, including specific details on the release for free circulation of products, suspension of release for free circulation and refusal to release for free circulation.

A 2.54 As noted above, the EC has made 'Making Europe fit for the digital age' a key pillar of its current mandate. To achieve this, its digital strategy sets out a number of initiatives related to the ECS sector. It proposes an update of the Broadband Cost Reduction Regulation, an Updated Action Plan on 5G (and 6G), a new Radio Spectrum Policy programme and an initiative on 5G Corridors.[53]

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53 Communication From The Commission To The European Parliament, The European Council, The Council, The European Economic And Social Committee And The Committee Of The Regions, Shaping Europe's Digital Future, 19.2.2020 COM(2020) 67 Fina

A 2.55 Although a wide array of benefits have been created by digitalisation, it is becoming increasingly clear that the digital economy poses a wide range of challenges. In December 2020, the EC published the Digital Services Act ('**DSA**') and Digital Markets Act ('**DMA**') legislative proposals. The DMA will establish an ex-ante regulatory framework for specific digital platforms designated as "Gatekeepers". These gatekeepers will be subject to a set of obligations and prohibitions which seeks to ensure contestable and fair markets in the digital sector. The DSA will set out "uniform rules for a safe, predictable and trusted online environment." These rules aim to better protect consumers online and foster innovation, growth, and competitiveness in the single market.

A 2.56 ComReg has been closely monitoring these developments. Given the need for strong collaboration in Ireland, ComReg is engaging with the Economic Regulators Network ('**ERN**'), in particular with colleagues from the Competition and Consumer Protection Commission ('**CCPC**') and the BAI on the topics of digital regulation. ComReg has also contributed to the work of BEREC on these issues, with a particular focus on the DMA. Parallels have been drawn between the DMA proposal and the ex-ante regulatory framework applied in the ECS sector. As such, ComReg's experience in the ECS sector may be relevant as the debate on these proposals evolves.

A 2.57 A legislative proposal on AI is also expected in 2021. ComReg will continue to monitor these developments and engage with the ERN and relevant government departments, as necessary.

Climate Change, Energy and ECS

A 2.58 Responding to Climate Change has become a key priority at both European and national level. There is also increasing awareness and attention being placed on the relationship between the ECS sector and climate change. On one hand, the ECS sector can be an enabler for decarbonisation, enabling greenhouse gas emission ('**GHGE**') reductions across sectors of the economy, from remote working to smart agriculture, to smart meters, among others. On the other hand, the digitalisation of the economy and ever greater use of ECS services could potentially increase the carbon footprint of the sector itself and increase e-waste.

A 2.59 The EC has emphasised the importance of a sustainable digital sector. It will consider measures to improve the circular economy performance of the digital sector as well as its energy efficiency, ranging from ECS networks to data centres to ICT devices[54]. Over the next decade a symbiotic relationship between ECS/ECN and energy markets is likely to emerge, as efficient management of the electricity grid will rely on connectivity to ECS/ECN and smart meters.

A 2.60 In addition to assessing the need for more transparency on the environmental impact of ECS and more stringent measures when deploying new networks, the importance of the circular nature of devices has been highlighted in the Circular Economy Action Plan. Internationally, a number of regulatory bodies in the ECS sector have begun taking action on this topic, including Arcep[55] (the French ECS regulator) and the Radio Spectrum Policy Group[56] ('**RSPG**'). ComReg is also actively contributing to the work of a newly formed expert networking group on Sustainability at BEREC.

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[54] Communication From The Commission To The European Parliament, The European Council, The Council, The European Economic And Social Committee And The Committee Of The Regions. The European Green Deal COM/2019/640 Final

[55] For Example, Arcep, (2020), "Networks And The Environment", Https://En.Arcep.Fr/News/Press-Releases/View/N/Networks-And-The-Environment.Html

[56] RSPG, (2019), "Work Programme For 2020 And Beyond"

A 2.61 Given the breadth of initiatives that will be pursued to assess and address the carbon footprint of the ECS sector in the coming years, this is a key trend which ComReg will need to monitor.

Explanatory Box 5: Call for Inputs - Connectivity and Decarbonisation

In December 2019, ComReg published a Call for Inputs on Connectivity and Decarbonisation.[i] The purpose of the Call for Inputs was to enable ComReg to better understand the electronic communications sector's relationship with climate change, including how the sector can assist in facilitating decarbonisation across the economy, how the sector can reduce its own carbon footprint and how it can adapt to a changing environment.

ComReg received seven responses to the Call for Inputs which were subsequently published.[ii] The Call for Inputs and the responses received highlighted that the ECS sector can be an enabler for GHGE reductions across a variety of sectors of the economy, such as transport, electricity, industry and agriculture. Notably, respondents from beyond the ECS sector (e.g. energy, agriculture) emphasised the reliance they will place on connectivity to deliver reductions in GHGE in the coming years.

At the same time, ECS operators highlighted their ongoing efforts to estimate and reduce the GHGE associated with their operations. Several operators noted their documented targets and future plans to decarbonise and highlighted the environmental benefits associated with the transition to fibre, from copper networks.

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i   ComReg Document 19/126
ii   ComReg Document 20/27