



An Coimisiún um  
**Rialáil Cumarsáide**  
Commission for  
**Communications Regulation**

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# 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.
- A 1.2 Trends toward digitalisation have led society to rely more and more on ECS and ECN and as a result, the strategic significance of the sector has increased in terms of policy considerations. This development has implications for investment incentives in the sector, as does the broader uncertainty about the future trajectory of the economy in the medium to long term.
- A 1.3 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 1.4 This appendix considers the following sections in turn:
1. The Macroeconomic Outlook; and
  2. The Legal Context.

## The Macroeconomic Outlook

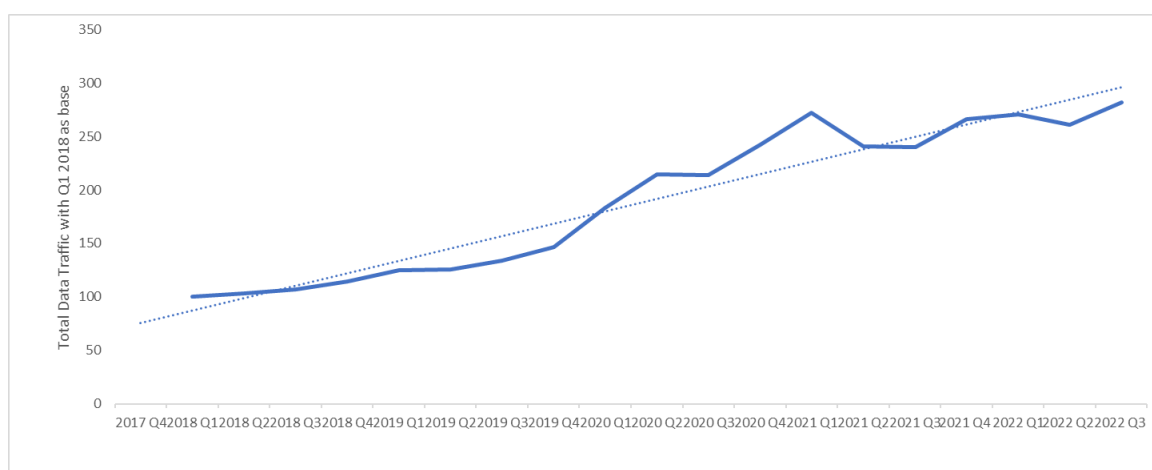
- A 1.5 The electronic communications sector is affected by developments in the wider economy. The Covid-19 pandemic rapidly accelerated digitalisation across the economy and increased the use and reliance on ECS and ECN. The profound effects of Covid-19 on the global economy, together with high inflation driven by energy costs and geopolitical unrest, means that the short-term outlook for the Irish economy is uncertain. The small, open nature of Ireland's economy also means that 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.

## The Irish Economy

A 1.6 During the Covid-19 pandemic, businesses quickly moved to remote working, education moved online, and people relied on video calls to see family and friends. Adoption of digital services increased rapidly across the country. This step change in internet activities, especially in video calls and other video-related activities, led to substantial increases in data traffic on networks.

A 1.7 Since the Covid-19 pandemic, data traffic has continued to increase, albeit, at a slower rate. As the population gradually returned to pre-Covid behaviour, e.g. returning to offices, the rate of increase in data traffic has reduced.

**Figure 1: Rate of increase in Total Data Traffic (2018-2022) Base (100)= 2018 Q1<sup>1</sup>**



A 1.8 Increases in take-up and usage of both mobile and broadband services may further incentivise investments in new technologies, such as FTTP and 5G. On the other hand, investment may be adversely affected if supply chain disruptions continue to constrain production capacity (although this has reduced in recent quarters).<sup>2</sup> Network rollout sped up in 2022 taking advantage of the partially more open supply chains, providing Ireland with the opportunity to gain economic value through low latency and high-speed networks. End users are expected to continue their use of high bandwidth services such as video streaming and video conferencing.

<sup>1</sup> ComReg Data Portal (2022)

<sup>2</sup> Central Bank of Ireland, (2022), Q4 Quarterly Bulletin

A 1.9 Additionally new technology, such as virtual reality (VR) may become increasingly popular and can take full advantage of networks offering connections with low latency and high-bandwidth. The digitisation of the Irish economy is also likely to continue apace, in line with DECC's digital strategy, bringing new and expanded digital services such as e-health and remote learning to more of the country as the rollout of high speed, low latency networks continues. However, the need for training and upskilling across the Irish economy may be required to make the most of these new technologies.

A 1.10 The Irish economy grew strongly in the first half of 2022. GDP (gross domestic product) and MDD (modified domestic demand) growth are forecast at 12.2% and 6.4% for 2022,<sup>3</sup> respectively. However, the medium-term outlook of the economy is uncertain due to high inflation, Russia's invasion of Ukraine, and rising interest rates. Investment and consumption are forecast to fall as a result of these factors. The changing geopolitical climate has caused the Central Bank to revise their economic forecasts downwards. This in turn, has provided uncertainty and a lack of confidence as consumer sentiment hit a 14-year low in September<sup>4</sup>.

**Figure 2: Changes in the Irish Central Bank forecasts of demand and inflation<sup>5</sup>**

	QB1 %			QB4%			Revision		
	2022	2023	2024	2022	2023	2024	2022	2023	2024
<b>MDD</b>	7.1	5.2	4.8	6.4	2.3	3.3	-0.7	-2.9	-1.5
<b>HICP</b>	4.5	2.4	2.1	8.0	6.3	2.8	+3.5	+3.9	+0.7
<b>HICP ex Energy</b>	3.3	2.6	2.2	5.1	4.4	2.8	+1.8	+1.8	0.6

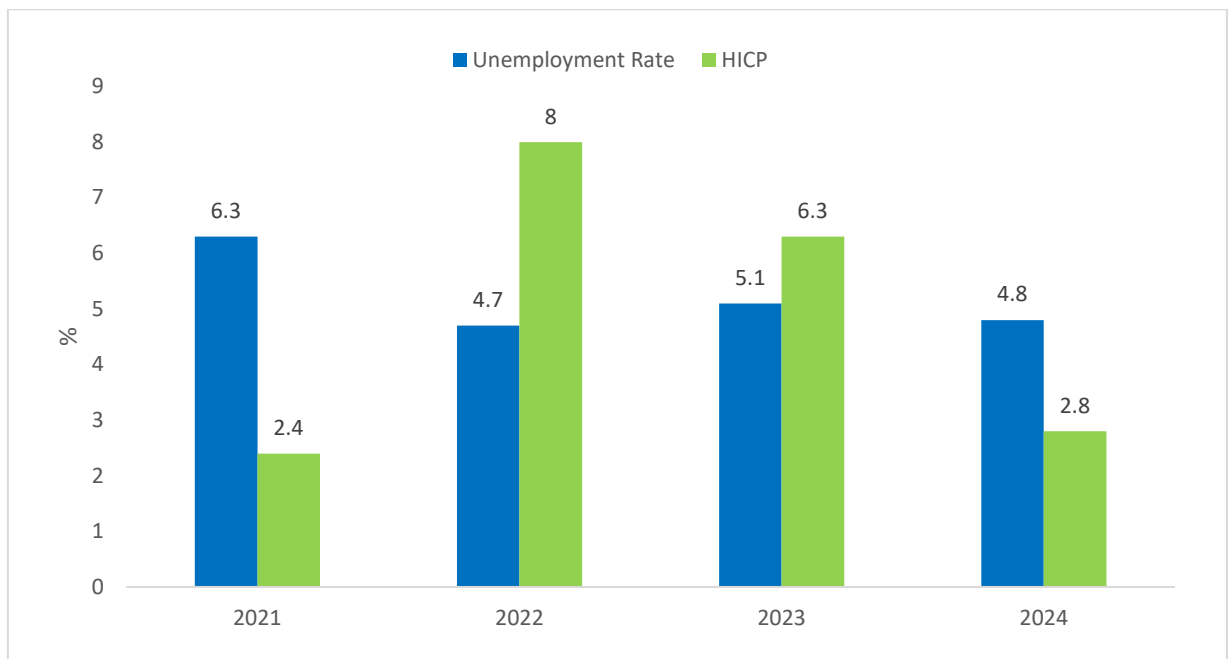
<sup>3</sup> Central Bank of Ireland, (2022), Q4 Quarterly Bulletin

<sup>4</sup> Credit Union, (2022), Consumer Sentiment Index Survey Results

<sup>5</sup> Central Bank of Ireland Quarterly Bulletins from Q1 2022 (QB1) and Q4 2022 (QB4)

A 1.1 Recent projections for demand are not as optimistic as those from before the war in Ukraine. Central bank predictions from Q4 2022 show MDD growth for 2022 that is 0.7 percentage points lower than the same prediction from Q1 2022. This revision is even steeper for 2023 (-2.9 points) and 2024 (-1.5 points). Despite these increasingly negative forecasts, the Irish economy is still predicted to grow over that period. This continuing growth is creating jobs (for October 2022 unemployment was 4.4%, down from 6.3% in June 2021)<sup>6</sup>. However, as noted above high inflationary pressures are forecast to remain until 2024.

**Figure 3: Central Bank Unemployment and Inflation forecasts**



A 1.11 The long-term impacts of the war in Ukraine and shocks to the supply side of the economy are uncertain but are dependent on how long inflation continues to outgrow GDP, hence corroding real incomes. While savings that were built up over the lockdowns in 2020 and 2021 allow consumers to absorb price shocks, those savings may not last due to high prices, especially with increased energy usage in the winter.

<sup>6</sup> CSO statistical publication (2022), Monthly Unemployment October 2022.

## International Developments and The Global Economy

A 1.12 The global economy in 2022 has been disrupted by the Russian invasion of Ukraine which has been a shock to the supply side of markets. Ireland's direct exposure to both countries for overall trade is relatively low. The telecommunications markets' direct exposure is limited, however with 5G and fibre broadband rolling out into rural Ireland, take-up from consumers may be low due to uncertainty in agriculture incomes/increasing costs and therefore unwillingness to adopt new technologies. There are also indirect effects as rising energy prices as a result of the war can additionally lead to a cost for networks. While Ireland does not source natural gas directly from Russia, wholesale global gas prices are higher than normal levels.<sup>7</sup> It is important to recognise that this broader trend across the global economy can significantly impact Ireland's ECS markets. Operators may absorb the initial rise to avoid menu costs, but, already operators are beginning to announce price increases in line with (and above) inflation.

A 1.13 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. Therefore, the downturn in the global economy along with geo-political tensions, the war in Ukraine and national security concerns may impact the ECS sector in Ireland in the medium term.

## 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.

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<sup>7</sup> Department of Finance and the Department of Public Expenditure and Reform, (2022), Budget 2023: Economic and fiscal outlook



## 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".<sup>8</sup> 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 most of the EU<sup>9,10</sup>, 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:

3. Incentivising investment in high-speed broadband networks;
4. Updating end-user rights in relation to OTTs and bundles so as to create a more level playing field;
5. Establishing rules around symmetric access to infrastructure;
6. Putting into place modified procedures for market analysis and peer-revision of remedies;
7. Having a consistent approach to spectrum management;
8. Setting common 5G goals and spectrum bands;
9. Redefining the approach to universal broadband access; and
10. 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**')<sup>11</sup>.

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<sup>8</sup> 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".

<sup>9</sup> The EECC needs to be transposed into domestic law in each member state before it is fully effective in each state – see further below.

<sup>10</sup> A number of Member States, including Ireland, have still to transpose the Code into their domestic law.

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

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'),<sup>12</sup> and is embodied via measures, such as those related to co-investment.

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.

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<sup>12</sup> 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.

## Explanatory Box 1: Background and Evolution of Legislation

Given the presence of market failures, ComReg was established by the Communications Regulation Act 2002<sup>i</sup> (“the 2002 Act”) as the successor to the Office of the Director of Telecommunications Regulation (ODTR), which had itself been established in 1997<sup>ii</sup>. 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<sup>iii</sup>:

- 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’)<sup>iv</sup>, Emergency Call Answering Services (‘ECAS’)<sup>v</sup>, the reduction of the costs of high speed broadband deployment<sup>vi</sup>, roaming<sup>vii</sup> and net neutrality<sup>viii</sup> amongst others<sup>ix</sup>. In addition, ComReg has shared powers with the Competition and Consumer Protection Commission<sup>x</sup> and some shared and complementary powers with the Data Protection Commission in respect of specific aspects of data privacy<sup>xi</sup>. 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<sup>xii</sup>, 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<sup>xiii</sup> (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.

<sup>i</sup> 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.

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

<sup>iii</sup> Section 10 of the 2002 Act.

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

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

<sup>vi</sup> 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 Deploying High Speed Public Communications Networks) Regulations 2016 (S.I. No. 391 of 2016).

<sup>vii</sup> Various EU and domestic regulations from 2007 to 2017.

<sup>viii</sup> 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.

<sup>ix</sup> 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/>

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

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

<sup>xii</sup> 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).

<sup>xiii</sup> 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 directive, this directive must be 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. Transposition of the Code in Ireland is being completed by way of both primary legislation and secondary legislation, specifically the Communications Regulation Bill 2022 (published 26 September 2022) and the European Union (European Electronic Communications Code) Regulations 2022 (S.I. No. 444 of 2022) (published 12 September 2022).<sup>13</sup> The Bill is currently going through the legislative process in the Oireachtas and is expected to be enacted sometime in early 2023. Both these pieces of legislation are then expected to be commenced on the same date.
- A 1.23 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 will 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 1.24 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.
- 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 published an opinion on 9 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.

# 1. Trends and Challenges

## Overview

A 1.29 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 1.30 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:

11. Enhanced Connectivity and New Technologies
12. The Consumer Experience
13. The Evolution of Adjacent and Related Markets
14. The Changing Future of Regulation in the Sector.

## Enhanced Connectivity and New Technologies:

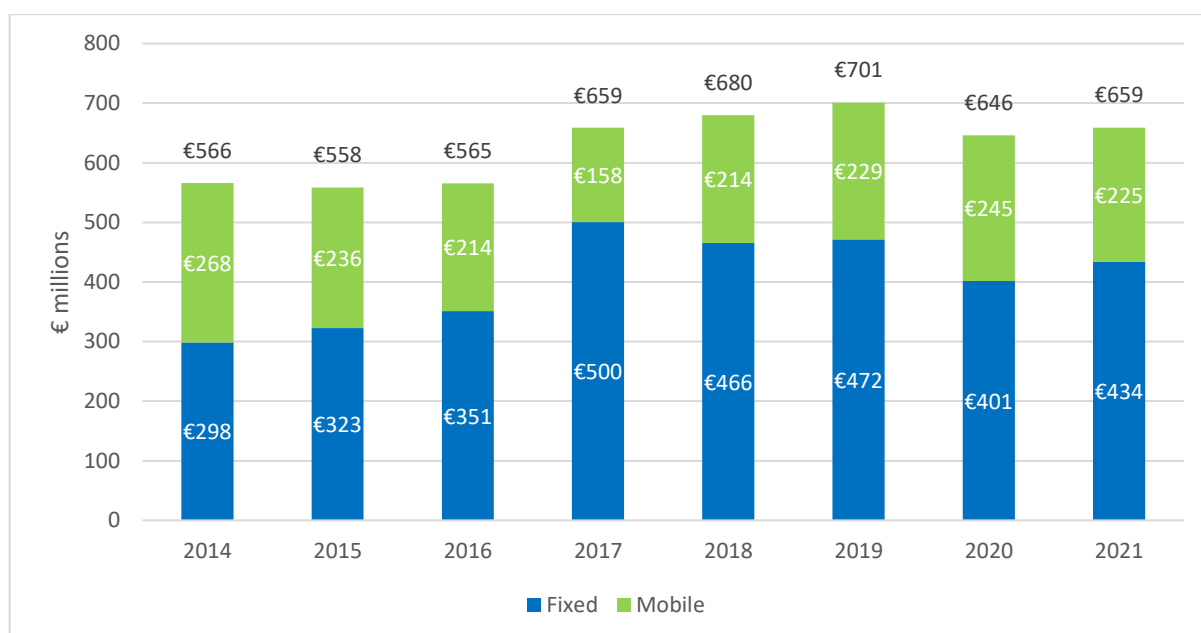
### Network Rollout

A 1.31 The increasingly important role played by faster ECN across the country will continue to shape Ireland over the coming years.

A 1.32 Between 2011 and 2021, commercial network operators have invested €6.8 billion in expanding the reach of their fixed and mobile networks (See Figure 3 below).<sup>13</sup> Commercial fixed investments by operators have centred around the rollout of fibre technologies and upgrading of existing networks (e.g. Cable networks), while copper-based networks are being phased out. The efficient migration of customers from copper based networks 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.

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<sup>13</sup> Eurostat

**Figure 4: Fixed and Mobile Investment in ECN/S (2014-2021 € millions)<sup>14</sup>**

A 1.33 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 1.34 It is also worth noting that new networks (e.g. FTTH and 5G) are more energy efficient than legacy networks (e.g. copper). 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).

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<sup>14</sup> Eurostat

A 1.35 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 where no commercial service is available. The NBP State intervention area covers 560,000 premises, 1.1 million people, 65,000 farms, 44,000 non-farm businesses, and 679 schools. Over the lifetime of this strategy, it is expected that the majority of this network rollout will have been completed.

A 1.36 Operators have commenced the rollout of 5G networks, device manufacturers have started developing and selling 5G handsets, and international bodies have clarified standards. However, widespread adoption will depend on the availability and take-up of new 5G enabled handsets and use cases.

A 1.37 Besides 5G, there are several other new technologies that aim at increasing and improving connectivity. 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. 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<sup>15</sup>), broader coverage, and lower latency than existing broadband satellite networks<sup>16</sup>. 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 1.38 Results from ComReg's Quarterly Key Data Report (**'QKDR'**)<sup>17</sup> 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.

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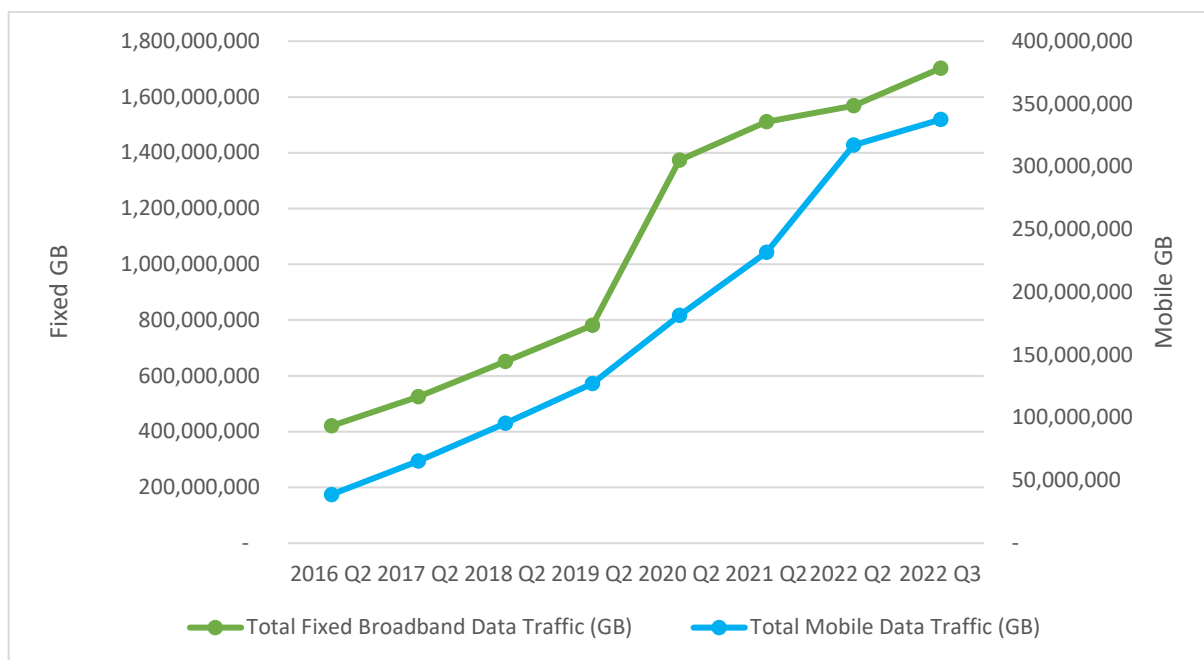
<sup>15</sup> Del Portillo, I., Cameron, B., and Crawley, E., (2018), "Technical Comparison of Three Low Earth Orbit Satellite Constellation Systems to Provide Global Broadband"

<sup>16</sup> European Commission, (2017), "Low-Earth orbit satellites: Spectrum access"

<sup>17</sup> ComReg QKDR Q3 2022, (2022)



Figure 5: Total Fixed and Mobile Data Traffic<sup>18</sup>



A 1.39 Figure 4 (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 71%) although the rate of growth has slowed since then.

A 1.40 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.

<sup>18</sup> ComReg Data Portal Q2 2022, (2022), <https://www.comreg.ie/industry/electronic-communications/data-portal/>.

A 1.41 Patterns of use have also changed. 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 activities online (e.g. streaming video content). In this regard, the reliability, resilience and security of networks is becoming increasingly important.

## The Consumer Experience

A 1.42 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 1.43 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<sup>19</sup>. In 2020, over 90% of Irish households had an internet connection at home and had been engaged in a wide range of internet activities<sup>20</sup>.

A 1.44 Covid-19 has rapidly accelerated trends towards further digitalisation, moving even more of our lives online. Digital services such as e-Government, e-learning, and cloud storage services have become increasingly popular in recent years<sup>21</sup>, online activities (including remote working) are also more important for businesses. As a result, ComReg expects that the relationship between the ECS sector and adjacent markets providing digital services will grow in importance and value.

A 1.45 The Digital Economy and Society Index ('**DESI**') 2022 report ranks Ireland as seventh in Europe in terms of integration of digital technology<sup>22</sup>, with Ireland ranking highly in indicators under e-commerce (i.e. SMEs selling online, and selling online cross-border).

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<sup>19</sup> European Commission, Digital Agenda Scoreboard Key Indicators

<sup>20</sup> Central Statistics Office, (2020), Information Society Statistics – Household

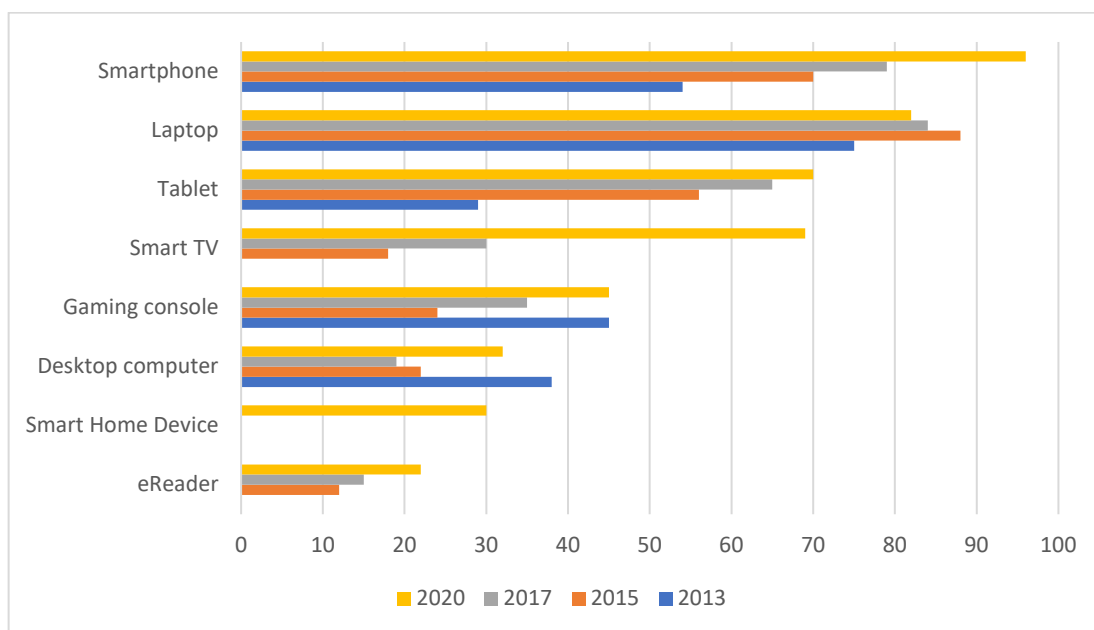
<sup>21</sup> Central Statistics Office, (2019), Information Society Statistics – Household

<sup>22</sup> European Commission, (2022), Digital Economy and Society Index (DESI) 2022: Thematic Chapters

## Continued Adoption of New Technology

A 1.46 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.

**Figure 6: Home (%) with devices connected to Fixed Broadband 2013-2020<sup>23</sup>**



A 1.47 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.

## Non-Uniformity of Experience

A 1.48 This increased adoption of technology and services has not been uniform throughout the country nor across demographics. There are differences in connectivity levels between urban and rural areas, largely due to differences in the availability of networks.

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

A 1.49 The use and take-up of ECS also varies across age groups. ComReg's Mobile Consumer Experience survey 2022<sup>24</sup> shows that a considerably higher proportion of those aged 18-34 have access to a broadband service at home compared to those over 55 (93% vs 72%). 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 1.50 A noticeable discrepancy persists in smartphone ownership, with all (100%) of mobile phone users aged 18-24 having a smartphone, compared to just 66% of those aged over 65.<sup>25</sup> Though, this has increased from less than half (47%) of those aged over 65 in 2019.<sup>26</sup>

**Figure 7: Ownership/Usage of Technologies in the Home<sup>27</sup>**

	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)			

<sup>24</sup> Mobile Consumer Experience Survey, (2022), ComReg Document 22/83

<sup>25</sup> Mobile Consumer Experience Survey, (2022), ComReg Document 22/83

<sup>26</sup> Mobile Consumer Experience Survey, (2019), ComReg Document 19/101

<sup>27</sup> 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 1.51 Consumer's confidence in choosing optimal telecom goods and services is subject to various factors. The main factor is that the electronic communications sector can create an environment that is particularly complex and difficult for consumers to make decisions in. This can lead to them not always making optimal choices when it comes to choosing ECS/ECN products and services. How operators choose to present information and choices to consumers may further distort the market.

## The Consumer Experience

A 1.52 The consumer experiences in the sector are not uniform due to the pattern of network rollout across the country as well as the varying levels of technology adoption across demographics. This non-uniform nature can cause 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 continue to draw regulatory as well as political attention over the coming period.

A 1.53 A significant number 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 issues are also a concern. Some issues with PRS persist but there has been a marked decline in the number of contacts relating to PRS.

## Related Markets and Services

A 1.54 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.

## Input Markets

A 1.55 Input markets<sup>28</sup> 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.

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<sup>28</sup> Input markets include stakeholders such as network equipment and End user (consumer and industrial) equipment vendors.

A 1.56 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 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. 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 vendors already include an eSIM in mobile handsets sold in the Irish market. In June 2022, ComReg published its response to a consultation and final strategy on eSIMs<sup>29</sup>, which sets out a work programme for mobile operators in Ireland. The strategy calls for fully online customer sign-up and switching between operators by the end of 2023, with consumers potentially being able to switch between operators in 5 minutes or less.

A 1.57 ComReg will engage with MNOs and MVNOs throughout 2023 to ensure that the full benefits of Over-the-Air (OTA) provisioning and eSIM technology are delivered.

A 1.58 Another important trend is the use of Artificial Intelligence ('AI') as an input in the ECS sector. While the implementation of AI in the ECS sector is still at an early stage<sup>30</sup> some operators have introduced AI in the form of machine learning algorithms to optimise the usage of radio resources, to minimise energy consumption as well as using chatbots to engage with customers. An Ericsson report from 2020 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%).

## Complementary Markets

A 1.59 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.

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<sup>29</sup> ComReg Document 22/48A <https://www.comreg.ie/publication/comreg-strategy-to-promote-over-the-air-provisioning-2>

<sup>30</sup> BEREC draft AI report

A 1.60 The market for consumer handsets is a complementary market that is of particular relevance for ComReg. ComReg's 2022 MCE Survey shows that 37% of respondents owned a Samsung smartphone, while 40% had an Apple iPhone<sup>31</sup>. 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 1.61 The operating system of a device is usually intrinsic to the device's brand/vendor. The handset operating system market is also of relevance for ComReg as the quality of the operating system as well as 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 1.62 Over the coming period ComReg's understanding of the traditional mobile handset may change as device manufacturers innovate and consumers continue to adopt other complementary devices such as smart watches and Virtual Reality or Augmented Reality headsets.

## Downstream markets

A 1.63 Downstream markets, such as Over-the-Top ('OTT') services<sup>32</sup>, are also considered relevant, 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 1.64 While ECS play 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 facilitated the working from home "revolution" driven by Covid-19. In 2022, users send on average 32 messages over internet based applications per day.<sup>33</sup> 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.

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<sup>31</sup> Mobile Consumer Experience Survey, (2022) , ComReg Document 22/83

<sup>32</sup> 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).

<sup>33</sup> Mobile Consumer Experience survey (2022), ComReg Document 22/83

A 1.65 Broadcasting markets have also been impacted significantly by the rise of OTT services. There are 1.5 million users of subscription-based video services in Ireland and this number is expected to grow<sup>34</sup>. A Techscape survey found that 73% of respondents use Netflix while 38% use Amazon Prime.<sup>35</sup> In response to this rising pressure from OTT services, Irish broadcasters are enhancing their online presence, offering catch-up players (used by 43%<sup>36</sup>) and live, cultural and sports content. Notably, the Covid-19 crisis also led to a temporary increase in live TV viewing.<sup>37</sup>

A 1.66 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 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.

## Climate Change, Energy and ECS

A 1.67 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 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.

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<sup>34</sup> Statista, (2022), "Video Streaming (SVoD) Ireland"

<sup>35</sup> B&A, TechScape 2022.

<sup>36</sup> B&A, TechScape 2022.

<sup>37</sup> 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. Although there was a return to pre-Covid levels by March 2021.



A 1.68 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 communication networks to data centres to ICT devices.<sup>38</sup> 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 smart meters and connectivity to ECS/ECN and smart meters.

A 1.69 Communications network infrastructure is also vulnerable to the resulting severe weather impacts of climate change. ComReg has published a study by Frontier Economics<sup>39</sup> to investigate how climate change has been affecting ECN, and to understand what providers of ECN are doing to mitigate against these affects. ComReg will review the findings from this study and may further explore any of these which could be of added benefit to the resilience of ECN in Ireland.

A 1.70 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<sup>40</sup> (the French ECS regulator) and the Radio Spectrum Policy Group<sup>41</sup> ('RSPG'). ComReg is also actively contributing to the work of an Expert Working Group on Sustainability at BEREC.

A 1.71 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.

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<sup>38</sup> 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

<sup>39</sup> <https://www.comreg.ie/publication/climate-change-and-its-effect-on-network-resilience-a-study-by-frontier-economics>

<sup>40</sup> For Example, Arcep, (2020), "Networks And The Environment", <https://en.arcep.fr/news/press-releases/view/N/Networks-And-The-Environment.html>

<sup>41</sup> RSPG, (2019), "Work Programme For 2020 And Beyond"

## The Future of Regulation in the Sector

A 1.72 The fourth and final trend identified by ComReg relates to the rate of change of regulation in the sector. 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 1.73 The European Electronic Communications Code (‘EECC’), adopted in December 2018, was adopted 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 Government has now published a National Digital Strategy<sup>42</sup>. 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.

## Legislative Changes and Developments

A 1.74 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 Act was enacted on 7 November 2022 and commenced on 29 November 2022. That legislation introduces new protections for consumers, gives them stronger rights of redress, imposes greater accountability on service providers and introduces new rules for online marketplaces. In addition, domestic legislation is currently under development for ComReg in respect of the Consumer Protection Cooperation Regulation<sup>43</sup> which builds on and enhances a previous EU Regulation that was introduced to harmonise the cooperation framework between national competent authorities in the Member States with regard to their consumer enforcement actions.
- **Cybersecurity Strategy for the Digital Decade:** ComReg has an evolving role under this EU strategy including: the Directive on Security of

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<sup>42</sup> <https://www.gov.ie/en/publication/adf42-harnessing-digital-the-digital-ireland-framework/>

<sup>43</sup> Regulation (EU) 2017/2394 of the European Parliament and of the Council of 12 December 2017 on cooperation between national authorities responsible for the enforcement of consumer protection laws and repealing Regulation (EC) No 2006/2004.

Network and Information Systems (NIS Directive and NIS 2 Directive due to be published in December and enter into force 20 days thereafter) 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. Ireland published a National Cyber Security Strategy in December 2019<sup>44</sup>, which included a specific set of security requirements for the telecommunications sector. The Telecoms Security Rules will be replaced by Electronic Communications Security Measures to be introduced under the Communications Regulation Bill 2022 and the Department of Communications conducted extensive consultation in this regard during 2022. The Bill provides for ComReg to have a significant role in enforcing these Measures. The Bill will also provide for ComReg to have a role in respect of enforcement re provisions concerning High-Risk Vendors. Developments are also expected during the course of 2023 and 2024 in respect of the EU Cybersecurity Act, a voluntary cybersecurity certification framework for ICT products, services and processes including 5G network security. The Commission introduced a proposal for a Cyber Resilience Act in September 2022 on horizontal cybersecurity requirements for products with digital elements (hardware and software). Finally, the directive on the resilience of critical entities<sup>45</sup> has now been adopted.

- **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. These proposals are still being debated at EU level, and, in the interim, ComReg's monitoring and enforcement role continues under the old Privacy Directive (Directive 2002/58/EC).
- **Market Surveillance:** ComReg is the designated Market Surveillance Authority in respect of two EU Directives - the Electromagnetic Compatibility Directive<sup>46</sup> ('EMCD') and the Radio Equipment Directive<sup>47</sup> ('RED'). The functions and powers derived from these regulatory frameworks protect product end-users from unsafe products and protect businesses from unfair competition. As the Market Surveillance Authority

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<sup>44</sup> National Cyber Security Strategy 2019-2024:

[https://www.ncsc.gov.ie/pdfs/National\\_Cyber\\_Security\\_Strategy.pdf](https://www.ncsc.gov.ie/pdfs/National_Cyber_Security_Strategy.pdf)

<sup>45</sup> Directive of the European Parliament and of the Council on the resilience of critical entities and repealing Council Directive 2008/114/EC. See here for more: EU resilience: Council adopts a directive to strengthen the resilience of critical entities - Consilium (europa.eu).

<sup>46</sup> The EMCD is transposed into Irish law by way of the European Union (Electromagnetic Compatibility) Regulations 2017 (S.I. No. 69/2017)

<sup>47</sup> The RED is transposed into Irish Law by way of the European Union (Radio Equipment) Regulations 2017 (S.I. No. 248/2017).

for the Radio Equipment Directive, ComReg is also responsible for the safety requirements of products that would normally fall under the scope of the Low Voltage Directive<sup>48</sup> ('LVD') (for which the CCPC is the Market Surveillance Authority), but which have a radio interface permanently affixed. 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. Work is ongoing on the development of new legislation to implement the EU Market Surveillance Regulation<sup>49</sup> in Ireland.

A 1.75As 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.<sup>50</sup>

A 1.76In September 2021 the EU Commission published a proposal for a Decision establishing the **2030 Policy Programme: Path to the Digital Decade**, which aims to ensure that the EU achieves its objectives and targets towards the digital transformation of society and economy in line with the EU's values. This Policy set out the concrete digital targets which the EU as a whole is expected to achieve by the end of the decade, as first delineated in the EU's Digital Compass Communication. On 14 July, the European Parliament and the Council reached a political agreement on the 2030 Policy Programme: Path to the Digital Decade. The programme now sets up a monitoring and cooperation mechanism to achieve the common objectives and targets for Europe's digital transformation set out in the **2030 Digital Compass** on skills and infrastructure, including connectivity, the digitalisation of businesses and online public services. The political agreement reached by the European Parliament and the Council is subject to formal approval by the two co-legislators. The Decision is expected to enter into force in January 2023. A new Digital Decade Board set up to facilitate the cooperation between Member States and the Commission is expected to meet in November for the first time. A first State of the Digital Decade Report is expected to be published by June 2023.

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<sup>48</sup> The LVD is transposed into Irish Law by way of the European Union (Low Voltage Electrical Equipment) Regulations 2016 (S.I. 345/2016)

<sup>49</sup> Regulation (EU) 2019/1020 of the European Parliament and of the Council of 20 June 2019 on market surveillance and compliance of products and amending Directive 2004/42/EC and Regulations (EC) No 765/2008 and (EU) No 305/2011.

<sup>50</sup> 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 Final

A 1.77 In Ireland, on 1 February 2022, the Government launched a new national digital strategy, "**Harnessing Digital – The Digital Ireland Framework**", to drive and enable the digital transition across the Irish economy and society. This high-level framework sets out a pathway to support Ireland's ambition to be a digital leader at the heart of European and global digital developments. One of the key legislative components of this strategy is the introduction of the Online Safety and Media Regulation ('**OSMR**') Bill 2022, which is expected to be enacted before the end of 2022 and which, amongst other things, will transpose the Audiovisual Media Services ('**AVMS**') Directive<sup>51</sup> in Ireland.

A 1.78 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.

A 1.79 The **DMA** was published in the OJEU on 12 October, entered into force on 1 November 2022 and will apply generally throughout the EU from 2 May 2023. 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.

A 1.80 The **DSA** was published in the OJEU on 27 October, entered into force on 16 November 2022 and will apply generally throughout the EU from 17 February 2024 (though certain provisions relating to Very Large Online Platforms will apply from the second half of 2023). The DSA sets 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.

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<sup>51</sup> Directive (EU) 2018/1808 of the European Parliament and of the Council of 14 November 2018 amending Directive 2010/13/EU on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the provision of audiovisual media services (Audiovisual Media Services Directive) in view of changing market realities.

- A 1.81 Separately, there has been a significant amount of legislative activity at the European level in relation to a wide array of issues thrown up by the development of the data economy, including the **Data Governance Act**, which was adopted in May 2022 and will apply from September 2023, a proposal for a **Data Act**, which is still being discussed in the European Parliament and proposals for a new **Artificial Intelligence Act**, which would introduce a common regulatory and legal framework for AI across the EU, and a wholesale revision of the **eIDAS Regulation**, including a new **eID** initiative.
- A 1.82 ComReg has been closely monitoring these developments. Given the need for strong collaboration in Ireland, ComReg is engaging with the Economic Regulators Network ('**ERN**') on the topics of digital regulation, in particular with colleagues from the Competition and Consumer Protection Commission ('**CCPC**'), the BAI (soon to become the Media Commission) and the Data Protection Commission ('**DPC**'), together with which it has formed a Digital Regulators' Group ('**DRG**'). Through this group, ComReg also liaises with central government on the development of appropriate regulation for the digital economy. ComReg has also contributed to the work of BEREC on these issues, with a particular focus on the DMA.
- A 1.83 ComReg will continue to monitor these developments and engage with the DRG, the ERN and relevant government departments, as necessary.