



Commission for
Communications Regulation

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Foreword

2017 marks the 20th anniversary of Ireland establishing an independent telecoms regulator. In that time, the telecommunications landscape has been transformed, with an increasingly competitive market bringing more choice, better services and lower prices for consumers.

Investment in new networks and services continued even during the severe economic downturn following the financial crisis in 2008. In that time, high-speed broadband networks covering two thirds of the population have been rolled out, 4G services have become widely available, and bundles of services – involving a selection of voice, data, TV and mobile services – have become common. Daily lives have changed as a result. More and more TV is being watched online. Social media usage is widespread, and smartphones and tablets have become the most common way for people in Ireland to communicate and to get the information they need.

There is little sign that the pace of change will slow down in coming years. The Internet of Things may transform areas of life such as transport, home security, and agriculture, by connecting objects such as cars, thermostats, cameras, alarm systems, and soil sensors so that they can operate intelligently without constant human interaction. This will place new demands on communications networks.

At the same time, there is an increasing consensus that the benefits of advanced communications should be available to as many people as possible, irrespective of geographic location. A key challenge both for policy-makers and for independent regulation is to incentivise investment in places where population density is lower, and the cost to serve each user is higher.

In a networked industry like communications, an independent regulator like ComReg is needed to ensure that communications markets operate in the interests of end-users and society. Without regulation, competition would likely be insufficient to drive the necessary investment, services would be less advanced, prices would be higher, and the rights and interests of consumers – especially vulnerable users – would not be protected.

This strategy statement examines the longer-term context, sets out our strategic intent for the next five years, and establishes more detailed strategies for the near term.

Our strategic intents are:

- **Competition** – The market delivers innovation and the greatest possible choice of wholesale and retail operators
- **Consumer Protection** – Consumers can choose and use communications services with confidence
- **Investment** – Efficient investment has enabled affordable, high-quality and widespread access to communications services and applications
- **Enforcement and Compliance** – Regulated entities comply with regulatory obligations
- **Organisation** – We are an effective and relevant regulator

ComReg, recognising the importance of providing adequately for the organisation's resourcing requirements, looks forward to executing this strategy, and making an

important contribution to achieving our vision for the sector – that **consumers and businesses in Ireland have affordable, high-quality, and widespread access to communications services and applications that support their social and economic needs.**

Gerry Fahy, Chairperson

Jeremy Godfrey, Commissioner

Kevin O'Brien, Commissioner

Executive Summary

Over the past number of decades, Irish society has become increasingly reliant on electronic communications services. Innovation is continually changing the contribution of these services to the way we communicate, work and are entertained. As such, the electronic communications sector is essential to modern life. However, in the absence of regulation, it is doubtful if electronic communications markets would evolve in a way which meets society's needs. These markets have characteristics (market failures) which mean that, if left unregulated, it is likely that investment would occur more slowly, that end-users would have less choice, and that prices would be higher.

ComReg is the regulatory authority for the electronic communications sector in Ireland. Our vision is of a sector where consumers and businesses in Ireland have affordable, high-quality, and widespread access to communications services and applications that support their social and economic needs. As an economic regulator, our role is to ensure that communications markets operate in the interests of end-users and society. This document outlines who we are as an organisation and presents our strategy for the next five years.¹

Trends and Challenges

Efficient investment in electronic communications infrastructure is imperative for future social and economic success in Ireland, and connectivity is a key driver of economic productivity and social inclusion.

In this context, we have identified five principal trends which are likely to shape the sector and pose regulatory challenges over the next five years:

- **Non-uniform end-user experiences:** Accessibility and connectivity have not evolved uniformly and the experience of end-users has not always kept pace with changes in expectations.
- **Expanding set of related markets relevant to the regulation of electronic communications:** Effective regulation requires an understanding of the complex electronic communications eco-system, especially when electronic communications is an enabler of innovation in related markets.
- **Increase in connected “things”:** While the current electronic communications eco-system focuses primarily on how people connect, the next wave of innovation is anticipated to be in relation to connected “things”.
- **Continued evolution of fixed and mobile networks:** Future electronic communications networks such as 5G networks are likely to have differing requirements.
- **Changing regulatory framework:** As part of a broader digital strategy in Europe, the regulatory framework for electronic communications introduced in 2002 (and updated in 2009) is under revision.

A fundamental challenge for ComReg is to anticipate and react appropriately to the

¹ We also regulate the postal sector. Our vision, role, mission and values encompass both the electronic communications and postal sectors, but our strategy for the postal sector is published in a separate strategy statement.

changing environment, and to ensure that our regulatory responses are timely and effective.

Strategic Framework

Through effective and relevant regulation, ComReg facilitates the development of a competitive electronic communications sector in Ireland that attracts investment, encourages innovation and empowers consumers to choose and use communications services with confidence. Our activities can be categorised into four broad areas:

- Competition
- Consumer Protection
- Investment, and
- Compliance and Enforcement.

Underpinning our ability to fulfil our role and mission is the ongoing development of, and investment in, our organisation.

This Strategy Statement details five Strategic Intentions for ComReg over the next five years.

Strategic Intentions 2017-2021		
1.	Competition	The market delivers innovation and the greatest possible choice of wholesale and retail operators
2.	Consumer Protection	Consumers can choose and use communications services with confidence
3.	Investment	Efficient investment has enabled affordable, high-quality and widespread access to communications services and applications
4.	Enforcement and Compliance	Regulated entities comply with regulatory obligations
5.	Organisation	We are an effective and relevant regulator

Strategic Intention 1: Competition

ComReg's first strategic intention is that **the market delivers innovation and the greatest possible choice of wholesale and retail operators**. Ongoing monitoring of the market is required for targeted intervention which is aimed at facilitating competition. Effective regulation of electronic communications markets requires a thorough understanding of the sector and its associated weaknesses, or market failures. ComReg has three principal ways in which competition and consumer choice can be promoted:

- **Access to markets – promoting competition via the SMP Framework:** ComReg has a commitment to encouraging the development of competition in markets which are not effectively competitive, promoting investment to the

deepest level of the network that is economically efficient, and exiting the regulation of markets which are effectively competitive.

- **Access to inputs – effective management of spectrum and numbering:** ComReg's strategy for the upcoming period is to ensure that the management of the national spectrum and numbering resources take account of the promotion of competition, and the potential impact that the assignment and allocation of these inputs may have on downstream markets.
- **Access to consumers – active switching by consumers:** Effective competition is, among other things, dependent upon the ability and willingness of consumers to switch providers in response to better deals available in the marketplace.

ComReg's strategy for the upcoming period in this latter context forms part of a wider strategy aimed at protecting consumers.

Strategic Intention 2: Consumer Protection

ComReg's second strategic intention is that **consumers can choose and use communications services with confidence**. Our consumer protection strategy emphasises the role of informed decision-making, and has three elements, broadly corresponding to the experience of a consumer navigating the market:

- **Preparing the consumer for the purchasing decision:** To effectively provide consumers with appropriate and adequate information to assist them when choosing and using electronic communications services, it is necessary that we understand their behaviours and preferences.
- **Accessing and using products and services:** ComReg monitors compliance by electronic communications and premium rate service operators with their obligations. Our strategy is designed to ensure that consumers have access to basic services and that their rights are upheld, with respect to, inter alia, switching, contracts, service use and billing.
- **Consumer complaints and redress:** For consumers to have confidence in the electronic communications sector they need to have access to a resolution process that addresses the power differential between a large operator and an individual. ComReg's strategy is to ensure that consumers have effective redress mechanisms. Over the upcoming period we will be seeking to improve minimum standards in complaints handling by operators and to develop alternative dispute resolution mechanisms, as appropriate.

ComReg aims to be an effective advocate for consumers and to provide expert input on matters affecting how markets work for consumers.

Strategic Intention 3: Investment

ComReg's third strategic intention is that **efficient investment has enabled affordable, high-quality and widespread access to communications services and applications**. Underlying all of ComReg's work is the belief that effectively competitive markets drive commercial incentives which will motivate the investments necessary to bring innovative products and services to market, and to generally improve service quality. ComReg's strategy over the upcoming period focuses on:

- **Facilitating commercial investment:** ComReg aims to ensure that competitive incentives drive commercial investment in infrastructure and services to the widest extent possible. ComReg's role in this can involve mandating the supply of wholesale inputs under the SMP regime, setting prices that allow an adequate return on investment, effectively managing the radio spectrum and good administration of the national numbering resource.
- **Creating regulatory incentives to invest where necessary:** Unregulated, electronic communications markets may not provide the right, or adequate, incentives for investment. Reliance on market-based incentives alone would also lead to non-provision of services to non-economic end-users.
- **Assisting policymakers:** Where direct State intervention is required, for example, in delivering broadband on a nationwide basis, it is ComReg's strategy to assist policymakers to design interventions that complement market realities. As such, ComReg aims to provide expert input based on its knowledge and experience of electronic communications and related markets.

Strategic Intention 4: Enforcement and Compliance

ComReg's fourth strategic intention is to ensure that **regulated entities comply with regulatory obligations**. ComReg recognises that market regulation is only effective and meaningful if regulated entities comply with obligations. As such, this strategic intention supports the three already outlined. ComReg is active in a range of different compliance environments; this is reflected in our approach at an operational level. In general terms our strategy has three elements:

- **Culture of compliance:** ComReg's view is that the optimum situation is where regulated entities are fully cognisant of their obligations, comply with them and have an internal culture of compliance. ComReg strongly encourages operators to have robust internal controls and policies intended to prevent and detect non-compliance. Where appropriate, ComReg will utilise engagement and dialogue to help foster desired behaviours.
- **Targeted compliance and enforcement:** Targeted compliance and enforcement activities involve directing resources toward activities in a way that maximises effectiveness. The different enforcement settings in which ComReg is active means that prioritisation needs to be tailored to the relevant circumstances.
- **Effective deterrence:** The effectiveness of the regulatory regime depends not only on bringing non-compliant conduct to an end but also on deterring future non-compliance. It is ComReg's strategy to ensure that we have an effective set of powers to incentivise compliance and effectively monitor and enforce. As such, ComReg will advocate for legislative amendments that will enable it to deliver on its strategy, based on its expertise and experience of regulation.

Strategic Intention 5: Organisation

The final strategic intention is to ensure that **ComReg is an effective and relevant regulator**. ComReg recognises the need to ensure that, in the context of changing technological, market and public policy circumstances, regulation continues to be effective and relevant. ComReg's view is that we cannot adopt a passive stance. Instead, we will strive to be an active and dynamic organisation that is capable of

responding to the rapidly changing environment and is positioned, in terms of expertise, robust analytics and up-to-date information, as well as resources, to address issues that affect our ability to fulfil our mission. Accomplishment of this Strategic Intention ensures a greater likelihood of success for ComReg in achieving its other four Strategic Intentions.

1. Introduction

Why telecommunications markets need regulation

- 1.1 Electronic communications products and services – such as broadband, mobile, and the plain old telephone service – make a large contribution to social and economic life. The contribution that these services make to the way we live is constantly changing as a result of innovation. Over time, we have become more reliant on electronic communications as a support for a greater proportion of our needs and wants.
- 1.2 The advent of the smartphone almost a decade ago, and the investment over the years that followed in the high capacity fixed and mobile networks necessary to support the explosion in the demand for capacity capable of transmitting ever increasing quantities of data, have clearly been transformative. 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, there is virtually no part of our lives that is not potentially affected by the ability to connect digitally.
- 1.3 However in the absence of regulation, it is doubtful whether electronic communications markets would evolve in a way which meets society's needs. There are many sources of potential market failure (see Chapter 2) and almost every country and economy in the world has established a regulator to set and enforce rules to address some or all of the possible market failures.
- 1.4 Over the past five years, many end-users in Ireland have benefited from access to new networks offering high-speed data communications both at fixed locations and on the move. On the fixed side, they have had a wider choice of providers and have been offered a wider range of service bundles including voice, internet access, TV content and mobile.
- 1.5 Regulation has been a critical factor in enabling this investment to occur. Decisions made by ComReg have created a competitive incentive to invest in new networks and to upgrade existing ones. At the same time, our decisions have enabled retail operators to compete in the fixed broadband market even if they do not have networks of their own. In the mobile market, ComReg assigned spectrum rights of use which have been used by the operators to rollout their 4G networks.
- 1.6 Without regulation it is likely that investment would have been slower to occur, end-users would have had less choice, and prices would have been higher.
- 1.7 Despite the positive results that the regulated market has delivered for many end-users, not everyone has benefited equally. The economics of network deployment mean that new services are usually deployed first in more densely populated areas. There are many parts of Ireland where high speed broadband is not available, and many locations where end-users are dissatisfied with mobile coverage. Up to a point, regulation can assist the benefits of new services to be disseminated more widely, more quickly. But even the best-regulated market cannot achieve all of society's goals and sometimes a State intervention is needed because the investment would otherwise be uncommercial.

- 1.8 ComReg is the regulatory authority for the electronic communications sector in Ireland. This strategy statement sets out our vision, role and mission and our strategy for the sector for the next five years.²

Our vision for the communications sector for the next five years

- 1.9 In setting our strategy for the next five years, ComReg has adopted a vision of the communications sector. ComReg cannot deliver the vision on its own. That will require a combination of Government policy interventions, regulatory interventions by ComReg, and of course investment by industry. Nonetheless, we consider our strategy should be guided by a vision of the outcome which we aim to help to bring about.
- 1.10 Some of the ways communications are used today would have been difficult to predict even five years ago. Similarly, looking forward, it is impossible to foresee the game-changing innovations of the next five years. What does appear certain however, is that digital connectivity will continue to grow in importance, both economically and socially.
- 1.11 Our vision is of a sector where consumers and businesses in Ireland have affordable, high-quality, and widespread access to communications services and applications that support their social and economic needs.

Our vision for the communications sector

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

Our role, mission and values

- 1.12 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 the vision of the communications sector.
- 1.13 We take a broad view of what it means for a market to operate in the interests of end-users and society, rather than basing our approach on a narrow view of economic efficiency or of market prices. For instance, we consider it desirable that the market should provide as many end-users as possible with advanced services. This reflects both the economic value of a large communications network as well as the social value of maximising opportunities to participate in the digital society. Other examples of the broader interests of society include the provision of services such as emergency calls and the adaptation of

² We also regulate the postal sector. Our vision, role, mission and values encompass both the electronic communications and postal sectors, but our strategy for the postal sector is published in a separate strategy statement.

services so that, for example, people with disabilities can participate fully in society.

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.

1.14 Our mission reflects this broad view of our role. It remains unchanged from our previous strategy statement: Through effective and relevant regulation, to 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.

1.15 In order to be effective as an economic regulator, it is important that stakeholders have confidence that we discharge our functions independently, based on good-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.

ComReg's Values

- Integrity
- Impartiality
- Effectiveness
- Excellence
- Transparency

Our strategy

1.16 Previous strategy statements have adopted a two-year horizon. We have decided on this occasion to take a longer, five-year, perspective. This enables us to focus on longer term developments and to begin developing our thinking on what the role of regulation might be in enabling innovation and in dealing with issues that might arise in future. It also allows stakeholders to plan in a similar fashion.

1.17 In the short-term, ComReg has somewhat limited discretion about the activities we undertake and our approach to them. Our functions, objectives and powers are set out in national and EU law. We reduced our staff numbers during the financial crisis and, as a result, much of our resources are devoted to activities that we are obliged by law to undertake.

1.18 However when taking a five-year view, we are able not only to consider what we will do in the short term with our current powers and resources, we are also

able to consider what enhancements to our powers might be useful in addressing both current and future issues. We can also consider what additional resources we should seek in order to enhance our work programme. In this strategy statement, we not only set out our priorities given existing powers and resources, we also highlight where we think it would be useful for our powers and resources to be expanded.

- 1.19 The tools available to us to deliver our role and mission derive from our statutory powers. These can be summarised into four main categories: setting rules to promote effective competition, upholding consumer rights, creating an environment that supports investment, and making sure that regulated entities comply with the rules. Additionally our ability to use these tools depends on our organisational capability. For each of these areas, we have developed a statement of strategic intent, and goals that support the strategic intent.

Strategic Intentions 2017-2021		
1.	Competition	The market delivers innovation and the greatest possible choice of wholesale and retail operators
2.	Consumer Protection	Consumers can choose and use communications services with confidence
3.	Investment	Efficient investment has enabled affordable, high-quality and widespread access to communications services and applications
4.	Enforcement and Compliance	Regulated entities comply with regulatory obligations
5.	Organisation	We are an effective and relevant regulator

- 1.20 In what follows, we first explain the economic and legal framework that we operate within. We then identify some of the principal trends and challenges that are likely to impact on effective and relevant regulation by ComReg over the next five years. We then set out our five statements of strategic intent in the context of our overall strategic framework. Then, chapter by chapter, in relation to each of the five strategic intentions, we set out the related goals and particular programmes of work which ComReg intends to undertake over the period 2017-2019.

2. The Economic and Legal Context

The economics of electronic communications

- 2.1 Electronic communications markets include the retail markets for broadband access, and fixed and mobile telecommunications services, as well as wholesale markets where operators sell services to one another or provide access to one another's networks.
- 2.2 There are several reasons why these markets are at risk of not operating efficiently, and in the interests of end-users and society.
- 2.3 First, private operators will not serve markets that they consider uncommercial. For example, the commercial nature of private investment means that high-quality networks may only be rolled out in areas where population densities are such that potential revenues from the end-users in those areas exceed costs. Further, the quality of basic networks may not be maintained in areas where costs are high and competition is correspondingly weak or non-existent.
- 2.4 Similarly, the price at which electronic communications services would be offered on a commercial basis may mean that some services are not affordable for certain end-users. Further, for reasons other than service availability or affordability, certain end-user groups may be unable or uninterested in adopting new technologies. However, investment decisions made on this basis may not fully take into account the economic and the social value to society as a whole of more widespread service adoption.
- 2.5 Second, there are market failures which mean that markets do not always function efficiently (see Explanatory Box 1). One such failure is that an operator might possess significant market power, i.e., the ability to operate without constraint from competitors. This can arise, for example, for historical reasons or because the relative cost of network rollout compared to potential revenues means that there are parts of the market where only one operator can profitably survive. Unchecked, significant market power can lead to high prices, poor quality of service, or the prevention of the entry of competitors in other parts of the market which are potentially competitive.
- 2.6 Even when there is no single operator with significant market power, there may be oligopolies – situations where there are too few operators for competition to function optimally. This can arise because there are significant entry costs when rolling out networks. It can also arise when operators need to make use of the radio spectrum, since spectrum is a limited resource.
- 2.7 There are other reasons why electronic communications markets might fail. For example, the products are often complex, and qualitative aspects of a service can be difficult for end-users to know or understand. An example is the purchase of the mobile phone which involves choosing a handset, a service provider and a plan, often as part of the same bundle.
- 2.8 This often leads to an asymmetry of information between operators and end-users. This may lead to an underinvestment in quality by operators and, just as problematic, it may leave end-users vulnerable to unfair treatment in the marketplace.

Explanatory Box 1: Market Failures

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. It is possible to map many of ComReg's statutory function and objectives back to an underlying market failure. The three classic market failures are: market power (or monopoly power in the extreme), externalities (related to public goods) and information asymmetry.

Market power, refers to the ability of one operator to raise prices above, or reduce quality below, that which would prevail in a competitive market. Market power may stem from two principle sources, the reluctance or inability of consumers to switch in response to a degradation of terms and conditions. This may occur because switching is difficult/costly for example, or because there are no or limited comparable alternatives available, or in other words, because the market structure is monopolistic. In electronic communications markets, both of these sources of market power are present, though it is the latter source – the monopolistic market structure – which has been the traditional focus of regulation in the sector.

The monopolistic structure of some electronic communications markets arises because of the often large sunk costs associated with establishing a physical network. This provides the motivation for the wholesale regulation of such markets. The Framework Regulations³ enable ComReg to designate certain operators as having Significant Market Power (SMP). SMP is a legal concept which characterises the extent of market power as being “a position of economic strength affording it the power to behave to an appreciable extent independently of its competitors, customers and ultimately consumers”.⁴ ComReg may then impose particular obligations on operators with SMP which may include requirements to provide network access to other operators at regulated prices and to act in a non-discriminatory manner (see Explanatory Box 2).

Externalities refer to the costs or benefits of any economic activity which are not fully felt by the economic actor undertaking the activity. Activities that generate negative externalities are undertaken more than is socially desirable, but those with positive externalities are underprovided. Intervention is thus required to promote behaviour that yield positive externalities and discourage activities with negative externalities. There are examples of both positive and negative externalities in electronic communications markets.

Interference between radio transmissions is an example of a negative externality. Here, one actor using spectrum without coordinating with others can cause harmful interference, impacting on the quality of transmissions by other operators, and reducing the overall value of spectrum. The presence of negative externalities motivates the need for spectrum management arrangements which involve the assignment and enforcement of spectrum rights.

Positive externalities are also present. At the most basic level, the more people connected to communications service the more valuable the service is to other end-users. This is sometimes referred to as a network externality and is sometimes used to motivate interventions aimed at ensuring that particular operators may interconnect.

Finally, information asymmetry refers to the situation where parties to a transaction have different information. An example of asymmetric information in the electronic communications markets can occur, for example, if a consumer does not understand the specifications or terms and conditions of products and services. Having incomplete information about a good or product makes it difficult for a consumer to determine how much they value it – essentially, it prevents the price mechanism from working effectively and may lead to consumers overpaying for a product, or not purchasing something that actually suits their needs. ComReg tackles this particular information asymmetry by requiring accurate product descriptions and quality guarantees.

- 2.9 A third characteristic of electronic communications markets is that they form part of a wider eco-system, which includes a range of related markets such as markets for content and services delivered over the internet. Much of the economic and societal value of electronic communications markets derives from their role as an enabler of innovation in these markets. There are complex dynamics to the inter-relationships among these markets and it is important that electronic communications markets do not evolve in a way which inhibits innovation.

³ The European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011, S.I. No. 333 of 2011 (“the Framework Regulations”).

⁴ Regulation 25(1) of the Framework Regulations.

- 2.10 Digital connectivity and communications are key public policy issues, and are increasingly viewed as essential for social inclusion and economic development. Given the market realities and potential market failures, the outcomes that would be yielded by an unregulated market would be unlikely to be optimal, or even adequate, from a societal perspective.
- 2.11 For these reasons, ComReg has powers to intervene to control and mitigate the adverse effects of significant market power where it occurs in electronic communications markets, ComReg has powers to intervene in markets to ensure service provision in some non-commercial circumstances and to uphold consumer rights and, ComReg has powers to manage the use of the radio spectrum.

The legal context

- 2.12 ComReg was established by the Communications Regulation Act, 2002⁵ as the successor to the Office of the Director of Telecommunications Regulation (ODTR), which had itself been established in 1996. 2017 therefore marks twenty one years of economic regulation of the communications sector in Ireland.
- 2.13 Over the last two decades the scope of the regulatory remit has changed, reflecting changes in domestic and European policy towards communications markets as well as changes in technology. ComReg's core remit now encompasses:
- The regulation of electronic communications networks and services⁶
 - The management of the radio frequency spectrum and national numbering resource⁷, and
 - The regulation of postal services.⁸
- 2.14 ComReg also has a number of additional functions, including in relation to the regulation of Premium Rate Services (PRS)⁹ and Emergency Call Answering Services (ECAS).¹⁰
- 2.15 Many of our regulatory powers derive from EU directives and regulations, and the legislation that implements them in Irish law (see the Table below¹¹). The directives that comprise the EU Electronic Communications Framework (the ECF) are detailed in Explanatory Box 2. There are also recent EU laws which,

⁵ The Communications Regulation Act, 2002 has been amended by inter alia the Communications Regulation (Amendment) Act 2007, the Communications Regulation (Premium Rate Services and Electronic Communications Infrastructure) Act 2010 and the Communications Regulation (Postal Services) Act 2011 ("the 2002 Act"). The Communications Regulation Act, 2002 has been amended by *inter alia* the Communications Regulation (Amendment) Act 2007, the Communications Regulation (Premium Rate Services and Electronic Communications Infrastructure) Act 2010 and the Communications Regulation (Postal Services) Act 2011 ("the 2002 Act").

⁶ Section 10(1)(a) of the 2002 Act.

⁷ Ibid. Section 10(1)(b).

⁸ Ibid. Section 10(1)(ba) and (c).

⁹ Ibid. Section 10(1)(cb).

¹⁰ Ibid. Section 10(1)(ca).

¹¹ For clarity, the list of powers 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/other-key-legislation/>

for example, give Regulators duties in relation to roaming¹² and net neutrality.¹³

ComReg's Powers and Functions include the following¹⁴	
Competition	<p>Powers to impose <i>ex ante</i> obligations on operators found to have significant market power, with the aim of mitigating potential competition problems.</p> <p>Powers to undertake <i>ex post</i> investigations of abuse of dominance and collusion in electronic communications markets.</p> <p>The function of managing the radio spectrum with the objective of ensuring its efficient management and use.</p> <p>Powers to ensure ease of switching of end-users between service providers.</p> <p>The function to resolve disputes between operators in respect of <i>ex ante</i> obligations.</p>
Consumer Protection	<p>Powers in relation to access, affordability and quality of universal services.</p> <p>Powers in respect of fraud and misuse in relation to numbers and services.</p> <p>Powers in respect of the security and integrity of electronic communications networks and services</p> <p>Powers in respect of data privacy.</p> <p>Powers in relation to end-user contracts and the provision of related information to end-users.</p> <p>Powers in relation to billing, roaming, net neutrality and switching.</p> <p>Powers in relation to equivalence of access and choice to disabled end-users.</p> <p>Powers in relation to assisting end-users with complaints against operators.</p> <p>Powers in relation to the provision of transparency and publication of information to end-users.</p> <p>Powers in relation to consumer protection rules in the General Authorisation.</p> <p>Powers in respect of PRS.</p>
Investment	<p>Powers in relation to designating a Universal Service Provider to ensure that all reasonable requests for certain fixed communications service are met.</p> <p>Obligation to take into account investment when considering the imposition of an <i>ex ante</i> access obligation on operators with significant market power.</p> <p>Powers to assign radio spectrum rights of use and to manage the use of telephone numbers.</p> <p>The function to resolve disputes between operators in respect of access to physical infrastructure for electronic communications networks and services.</p>
Enforcement and Compliance	<p>The function to ensure compliance with regulatory obligations and to carry out investigations.</p> <p>Powers to take civil or criminal enforcement actions.</p> <p>Powers to conduct authorised officer visits and to require persons to give evidence.</p> <p>Powers to issue Fixed Payment Notices.</p> <p>Powers to issue Directions in respect of <i>ex ante</i> obligations.</p>

2.16 In addition, ComReg has shared powers with the Competition and Consumer Protection Commission in respect of certain *ex post* competition legislation and consumer protection legislation, insofar as they apply to the electronic communications and PRS¹⁵ sector.¹⁶ ComReg has some shared and

¹² 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.

¹³ Regulations 9 and 25 of the Universal Service Regulations, 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 ("the Net Neutrality Regulations").

¹⁴ For clarity, the list of powers 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/other-key-legislation/>

¹⁵ In the case of PRS, powers are limited to consumer protection.

¹⁶ ComReg has cooperation agreements (Document 03/06 and Document 15/121) in place with the Competition and Consumer Protection Commission. The agreements are intended to facilitate co-operation in relation to (i) consumer protection and (ii) issues of competition between undertakings.

complementary powers with the Office of the Director of Data Protection Commissioner in respect of specific aspects of data privacy.¹⁷ ComReg also has a variety of other powers and functions derived from national legislation.

2.17 The 2002 Act and the Framework Regulations set out a number of statutory objectives for us to follow and 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.

2.18 When exercising our statutory powers, we make individual decisions based on the evidence, taking action in a proportionate manner having regard to our statutory objectives. Our statements of strategic intent and our strategic goals are consistent with our statutory objectives and are used to help us establish priorities.

2.19 The European Commission has recently proposed significant changes to the ECF. The Commission's proposals are discussed further in Chapter 3.

¹⁷ See Regulations 30 and 33 of European Communities (Electronic Communications Networks And Services) (Privacy and Electronic Communications) Regulations 2011.

Explanatory Box 2: The Specific Directives

The ECF is part of the ‘Telecoms Package’, adopted in 2002 and amended in 2009¹⁸ to take account of the rapid development of the sector. In addition to the Framework Directive¹⁹ itself, which among other things sets out the tasks of the national regulatory authorities (NRAs), as well as the principles underpinning their operations, the package includes four other Directives, the so called “Specific Directives” which regulate specific aspects of electronic communications.

- The Authorisation Directive²⁰ creates a legal framework to ensure the freedom to provide electronic communications networks and services throughout the European Union. This Directive introduced a system of general authorisation, instead of individual or class licences, to facilitate entry in the market and reduce administrative burdens on operators. The Authorisation Directive entitles authorised operators to negotiate interconnection with other providers in the EU and to obtain access to or interconnection from other providers. While the system of general authorisation applies to the use radio frequencies, it provides that Member States may still make the use of radio frequencies subject to the grant of individual rights with a view to ensuring, among other things, efficient use of spectrum.
- The Access Directive²¹ establishes a regulatory framework for the relationships between suppliers of networks and services. Where an operator is identified as having significant power in a given market, the NRAs may impose pro-competitive obligations regarding access and interconnection. Such obligations, depending on the circumstances, may include obligations relating to transparency, non-discrimination, accounting separation, obligations of access to, and use of, specific network facilities, or obligations relating to cost recovery and price controls.
- The Universal Service Directive²² seeks to ensure the availability of a minimum set of good-quality electronic communications services accessible to all end-users at an affordable price, while minimising market distortion. The Universal Service Directive also sets out certain consumer protection rights, for example, in relation to the receipt of information enabling consumers to understand the services to which they subscribe, pricing and tariffs, and in relation to switching service providers. The Directive also imposes corresponding obligations on operators, for example, in relation to the notification of end-users when contractual conditions are changed.
- The Directive on Privacy and Electronic Communications²³ sets out rules to ensure security in the processing of personal data, the notification of personal data breaches, and confidentiality of communications. It also bans unsolicited communications where the user has not given their consent.

Regulation (EC) No 1211/2009 establishes a Body of European Regulators for Electronic Communications (BEREC). BEREC was established to contribute towards consistent regulatory practice. It is a forum for cooperation among NRAs, and between NRAs and the Commission, in the exercise of the full range of their responsibilities under the EU regulatory framework.

The ECF is currently under review once more. In September 2016 the Commission published a proposal for a directive establishing the European Electronic Communications Code (the ECC), which is intended to replace the ECF.

¹⁸ Directive 2009/140/EC of the European Parliament and of the Council of 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.

¹⁹ Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services as amended (“the Framework Directive”) as transposed in Ireland by the Framework Regulations.

²⁰ Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services, as amended (“the Authorisation Directive”) as transposed in Ireland by the Authorisation Regulations.

²¹ Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities, as amended (“the Access Directive”), as transposed in Ireland by the Access Regulations.

²² Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users’ rights relating to electronic communications networks and services, as amended (“the Universal Service Directive”) as transposed in Ireland by the Universal Service Regulations.

²³ Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications) as transposed in Ireland by the European Communities (Electronic Communications Networks and Services)(Privacy and Electronic Communications) Regulations 2011, S.I. No. 336 of 2011 (“the Data Protection and Privacy Regulations”).

3. Trends and Challenges

- 3.1 Technological advances in electronic communications technologies – networks and devices – have had a transformative effect, both social and economic, on the lives of many Irish citizens.
- 3.2 In addition to phones, tablets and PCs, there is an expanding range of devices that connect digitally over networks. This connectivity has become central to life and commerce in 21st century Ireland. Connectivity is seen as a key driver of economic productivity and social inclusion. As a result, access to high-quality electronic communications infrastructure and services is increasingly regarded as essential. For this reason, efficient investment in electronic communications infrastructure is imperative for future social and economic success.
- 3.3 From a regulatory perspective, these trends, technological, social and economic, give rise to a number of challenges:
- While technological changes have affected expectations of **the end-user experience**, the actual experience of end-users has not evolved uniformly. For example, end-users increasingly wish to access services from their mobile devices at any time and place, both indoors and outside. While the rollout of high capacity fixed and mobile networks means that, increasingly, this is possible, it is not always so.
 - Technological change also affects the **electronic communications eco-system**. This comprises telecommunications companies offering a variety of retail and wholesale services using both networks that they own, and wholesale services provided by others. It also includes companies in related markets, such as those providing content and services over the internet. Regulators must take account of the complexity of this eco-system, including possible fluidity in the boundaries between electronic communications markets and certain related markets, and the role of electronic communications as an enabler of innovation in those markets.
 - Whereas much of the innovation arising from technological advance in electronic communications has related to how people connect, the next wave of innovation is anticipated to be in relation to connected “things” and the so called “**internet of things**”. It is uncertain at present whether this wave of innovation will create any additional requirements in terms of regulation, but what is clear is that the potential for life-style and productivity enhancement is significant and in this context, ComReg is conscious of its role in relation to the facilitation of innovation and investment.
 - Each of these trends points toward the differing requirements of the future underlying electronic communications networks in terms of capacity, speeds and other important characteristics. For example, for wireless, 5G is touted as a kind of unifying standard capable of meeting these requirements, though no standard has yet been defined. From a regulatory perspective it is unclear what the effective regulation of **evolving networks** will entail.
- 3.4 Finally, the European regulatory framework itself is changing. As part of a broader digital strategy in Europe, the regulatory framework for electronic

communications introduced in 2002, and updated in 2009, in response to evolving market and political developments, is again under revision. A challenge for ComReg is to contribute effectively to the process of **evolving regulation** and, as an institution, to itself evolve in response, ensuring that we continue to be an effective and relevant regulator.

3.5 These five factors are discussed in more detail below.

End-user Experience: The rural/urban divide and other demographic factors

3.6 Over the past 5 to 10 years, advances in electronic communication technologies have enabled people to connect in ways they never have before. From how we stay in contact with friends and family, work and conduct our business, there is virtually no part of our lives which remains untouched by innovations in digital connectivity (see Figure 1 for a breakdown of devices used at home and at work). In particular:

- In the personal sphere, just over two-thirds of Irish adults have a Facebook account while about a quarter had LinkedIn, Twitter, Google+ or Instagram accounts.²⁴ The diversity of these networks, ranging from professional or social networking to video and photo sharing, shows the range of services available. With respect to entertainment, on average Irish Netflix users spend seven hours per week using Netflix services with more than half of these users indicating that this has impacted on the amount of scheduled or live television they watch.²⁵
- In the work environment, the impact of advances in electronic communications technologies is also evident. The advent of wireless/mobile communications devices has facilitated a wide variety of working practices and patterns with people able to check emails, participate in video calls and even log onto their desktops using portable devices. Many employers now provide their staff with portable devices such as laptop computers, tablets or smartphones. In 2015, just over 40% of persons employed in Ireland were provided with a portable device by their employer, a figure well above the EU average of 20%.²⁶
- In a commercial context, online channels for commerce have created opportunities for consumers and businesses alike. In 2015, 51% of Irish people ordered goods or services online, and electronic sales accounted for 37.4% of total turnover in Irish enterprises, compared to just 17.2% across the EU as a whole.²⁷ Irish firms are capitalising on this trend; three quarters of Irish firms used a website in 2015, with almost two thirds of Irish enterprises active on social media.²⁸

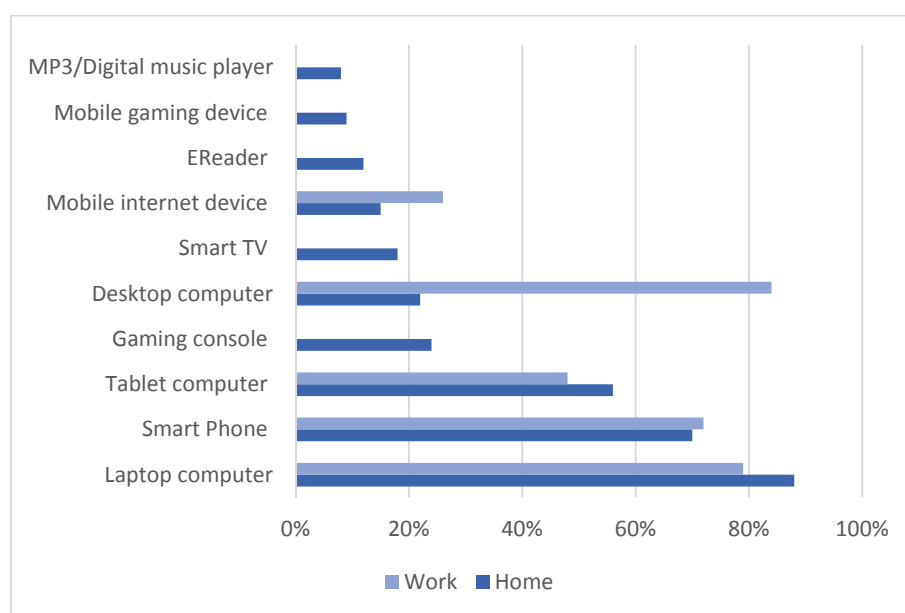
²⁴ Ipsos MRBI, Social Networking Tracker, October 2016.

²⁵ ComReg Consumer ICT Survey, ComReg 15/123a, November 2015.

²⁶ European Commission, Digital Agenda Scoreboard Key Indicators.

²⁷ European Commission, Digital Agenda Scoreboard Key Indicators.

²⁸ European Commission, Digital Agenda Scoreboard Key Indicators.

Figure 1: Home/Workplace (%) Devices Connected to Fixed Broadband²⁹

- 3.7 Although we are seeing rapid changes in communication technologies and how they can facilitate economic and social engagement, the trends are not uniform. Supply- and demand-side factors are both relevant.
- 3.8 On the supply-side, commercial realities mean that network rollout, both fixed and mobile, occurs first in areas with higher population densities. However, commercial realities also mean that rollout may not occur at all in geographic areas where the population is sparse. In relation to high speed broadband networks, the Government's National Broadband Plan is the principal intervention aimed at bridging the digital divide between urban and rural areas. The objective is to ensure every premises in Ireland will have access to a high-quality network with capacity to deliver at least 30 Mbps speed. ComReg recognises the important complementary role that private operators (using fixed and/or wireless technologies) can play in rolling out high-quality networks in rural areas where population densities, though lower relative to more urbanised areas, may still be capable of supporting a degree of commercial investment.
- 3.9 Existing mobile networks do not have an obligation to provide ubiquitous coverage or to provide services to every premises. While mobile coverage in Ireland has exceeded well over 90% of the population (as distinct from geography) for 2G and 3G for many years and the rollout of 4G networks continues, there appears to be a trend of growing dissatisfaction among end-users with the quality of coverage in certain geographic areas. In the future, improved access to applications from mobile devices will depend not only on improved coverage of mobile networks, but also on the ability of services to roam seamlessly between mobile and Wi-Fi networks so that, for instance, indoor voice coverage could take advantage of the extension of fixed broadband driven by the National Broadband Plan.
- 3.10 On the demand-side, a number of demographic and socio-economic factors are

²⁹ ComReg ICT Survey, 2015.

relevant to the take-up of innovations afforded by technological advances in electronic communications technologies. For example, age is an important factor. Figures from 2015 show that younger people are significantly more likely to use the internet; 95% of those aged 16-24 go online at least weekly, compared to just 35% of those aged over 65. Similarly, level of educational attainment also influences access to the information society, with only half of those with low education using the internet at least weekly compared to 96% of highly educated individuals.³⁰

- 3.11 From a regulatory perspective, a challenge for ComReg is to better understand the end-user experience, to be cognisant of the range of policy instruments and actors active in the area, so that it may optimise the use of regulatory tools at its disposal. In the 2014-16 strategy statement, ComReg emphasised its intention to be mindful of the needs of Ireland's rural population. ComReg's view is that such considerations will be as important over the coming strategy period.

The Electronic Communications Eco-system and Related Markets

- 3.12 An additional consequence of the technological and market advances of the last 5 to 10 years is that the set of markets relevant to the regulation of electronic communications markets has evolved. A number of trends are discernible.
- 3.13 First, there is the matter of convergence which refers to the trend whereby telecommunications services, information technology and media sectors that originally developed and operated independently of one another, are growing together and becoming dependent on one another. The process of platform convergence, whereby different communications services (TV and radio, voice telephony, online services), which previously were delivered on different platforms, and are increasingly available on a single platform, implies a change to the competitive landscape. For example, what would have been traditionally regarded as media companies are now competing with the traditional telecommunications operators. In this context, a closely related issue concerns the emergence of bundles which, alongside ECS elements, also contain non-ECS related products or services, for example, media content (see Explanatory Box 3 for further discussion).
- 3.14 A second related trend concerns Over-The-Top ('OTT') service providers. OTTs are services that use the internet for their delivery. These can range from messaging apps and social networks, to online video and subscription services (e.g. Netflix, Spotify, and digital print services). The digitisation and delivery of services over the internet has removed geographic boundaries that have traditionally existed for telephony, television and media services. The arrival of OTT operators in the eco-system surrounding electronic communications markets raises a number of issues relevant to effective regulation. Of particular interest is the issue arising in relation to the regulation of electronic communications markets where OTT services overlap or replace what we think of as traditional telecommunications services such as messaging and voice.

³⁰ Eurostat, Digital Economy and Society.

3.15 Another issue concerns the ability of network operators, who control infrastructure bottlenecks, over which OTT services are delivered, to influence competitive outcomes. This effect may occur as a consequence of unilateral action by network operators who may block or reduce the quality of certain OTT services or types of content that may compete with the operator's offerings. A similar foreclosing effect may also occur by virtue of an agreement or partnership with selected OTT service providers. While outright blocking by network operators is less common (and now prevented under the Net Neutrality Regulations, see Explanatory Box 10 in Chapter 6) we are increasingly seeing partnership arrangements between the operators and OTT service providers. For the operator these partnership arrangements with OTT service providers may provide a way of boosting data revenues to off-set a reduction in revenue from a decline in voice and other services. For the OTT service provider, partnering with an operator may be a way of helping their brand exposure in a competitive market.

Explanatory Box 3: Convergence and Bundles

Convergence in this context refers to the trend whereby telecommunications services, information technology and media sectors that originally developed and operated independently of one another, are growing together and becoming dependent on one another.

At a technical level, convergence can be thought of as any infrastructure being able to transport any type of data. On the consumer side, convergence can be thought of as the bringing together of relevant services (video, telephony, music, applications) which can be consumed regardless of the end-users device.

Bundling refers to a practice of service providers combining, or bundling, two or more services together. For the bundle provider, the benefits of bundling are that they can reduce customer churn and help retain a customer for longer. That is, the bundle may provide a level of 'stickiness' for the provider. The benefits of bundling for the consumer is that the bundle may come at a discount compared with purchasing the services individually. There is also the convenience benefit of having to pay a single bill for the services. In the electronic communications sector, we have seen the popularity of bundles increase significantly over the past 5 years, matched by a decline in the popularity of single services.

As we look towards 2021, we think there are two principal issues in relation to convergence and bundling and how they impact the market:

- Bundling affects the competitive dynamic. Bundling has benefits for both the provider and the consumer. However consumer 'stickiness' raises questions around whether there are any barriers to the consumer switching away from bundles to either individual services or to a competitors bundle. Further, the 'stickiness' of the consumer may strengthen as we see more offerings including content services.
- We may be starting to see a structural change in the market, driven by the recent trend of mergers and acquisitions by media companies of telecommunications providers, and of telecommunications providers by media companies. For example, recently we have seen Eircom purchase Setanta Sports, and Virgin Media purchase UTV Ireland. While we have seen consolidation within the telecommunications sector these new types of convergence mergers and acquisitions are likely to continue to have an effect on market structures.

Finally, convergence raises another concern in relation to competition which is that the practice of bundling may afford operators with market power in one market the opportunity to leverage sales in another market. For example they might leverage power in a broadband market to sell a group of products in a below cost manner thereby damaging competition

3.16 A third trend concerns the increasing importance of related markets where complementary products or services are sold. Complementary products or services in this context refer to markets for products or services consumed alongside electronic communications services and which can have a significant influence on the consumer's experience of the electronic communications service, e.g., end-user equipment. The end-user's experience of line speeds

(i.e. broadband download and upload speeds), for example, is influenced by the quality of the modem that the end-user has installed, though the service and modem are most often provided by the same service provider. Similarly, the quality of services experienced by end-users of mobile phones depends on a variety of factors in addition to the received strength of the transmitted mobile signal, such as the weather, local topography, and in the case of indoor use, the quality of home insulation. Another key factor however is the performance of the handset itself. It is well known that the extensive functionality built into smartphones, has come at a cost to how well they receive transmitted mobile signals. In the context of making appropriate policy and regulatory interventions in the context of a debate about mobile coverage, it is important that ComReg maintains an understanding of related markets and technologies, such as in the case of handsets for example.

- 3.17 Finally, there are input markets. Such markets include markets for network equipment which tend to be global in nature but where harmonisation and standardisation are important issues. There are also inputs relating to access to civil engineering infrastructure such as poles, ducts and sites. Following the introduction of the European Union (Reduction of Cost of Deploying High-Speed Public Communications Networks) Regulations 2016³¹ (“the Broadband Costs Regulations”) which implement the so-called “Broadband Costs Directive”³² in Ireland (see Chapter 5), ComReg has a dispute resolution role with respect to access requests to non-electronic communications infrastructure.
- 3.18 Overall, a challenge for effective regulation in electronic communications markets is one of understanding the importance of related markets and the “eco-system” of operators active in those markets, and in particular, of the potential for innovation arising in these markets. It is important that ComReg be aware that features of electronic communications markets, or the regulation of such markets, may have the potential to facilitate or inhibit the realisation of welfare gains arising in, or as a result of innovations in related markets. The story of the last decade shows that innovation arising in related markets has been at least as important in terms of the driving lifestyle and productivity enhancements as technological advances in electronic communications technologies.

The Internet of Things (IoT)

- 3.19 The concept of the internet of things (IoT) goes beyond simply the notion of the internet connecting people together to the internet connecting devices together. As part of the IoT, devices have the ability to interact with their environment, and each other, without the physical constraints of geography. A range of connected devices are already in the public domain, including smart home devices such as thermostats and cameras, as well as connected cars.
- 3.20 However, a surge in the range and scale of such devices is anticipated over the next number of years. Currently, there are 1 billion connected homes and 5

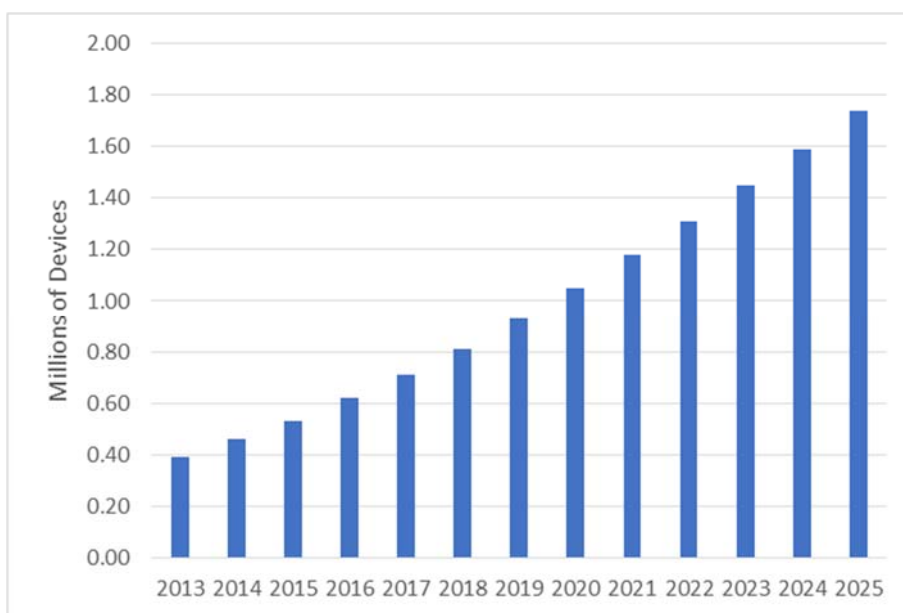
³¹ S.I. No. 391/2016.

³² Directive 2014/61/EU of the European Parliament and to the Council of 15th May 2014 concerning measures to reduce the cost of deploying high-speed electronic communications networks.

billion connected people. However, predictions point toward 20 to 30 billion connected things by 2020 (Note that these numbers of connected things exclude smartphones, tablets and computers). For Ireland the predictions are that by 2020 the number of connected devices will exceed 1 million (see Figure 2).

- 3.21 The nature and functions of these new connected devices is as yet unknown, but key areas currently benefiting from IoT services include automotive, e-health services, smart metering/smart grids, smart homes, smart cities, industry/automation and agriculture.
- 3.22 The advent of IoT will yield particular challenges for ComReg. In particular, the connectivity requirements for IoT devices are particularly wide and will require new service offerings to meet the individual requirements. In addition, the rollout of IoT devices may require significant numbering resources. Given the significant potential for life-style and productivity enhancement associated with IoT, ComReg is conscious of its role in relation to the facilitation of innovation and investment.

Figure 2: Cellular M2M device connections in Ireland 2013–2025³³



Evolving Networks

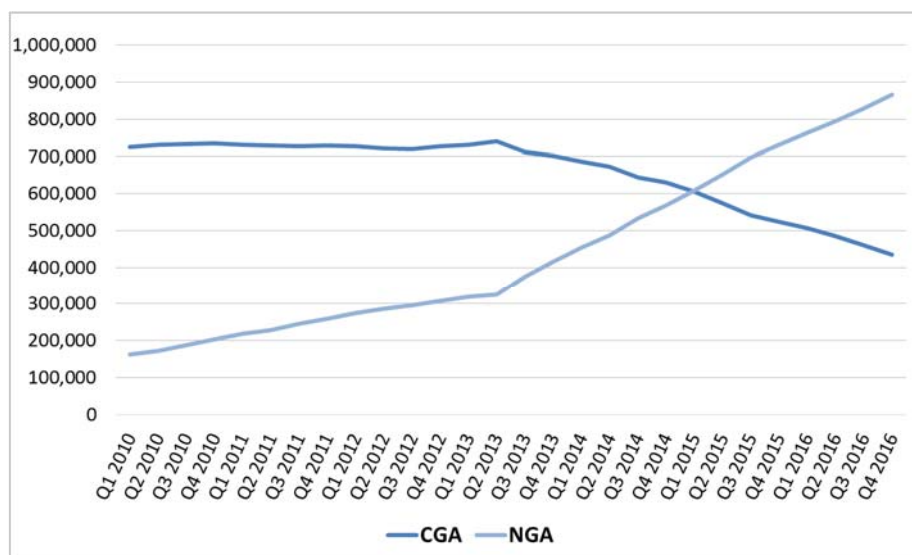
- 3.23 Over the last number of years operators have continued investing in both fixed and mobile networks (see Chapter 7 for more discussion of investment and network rollout). With respect to fixed networks we have seen Eircom upgrading its copper network to allow for the delivery of NGA services³⁴, and Virgin Media has upgraded its network to DOCIS 3.0. With respect to mobile networks, the rollout of 4G networks continues. Figure 3 illustrates that the number of subscribers on NGA networks now exceeds those on CGA networks.
- 3.24 A consequence of the growing coverage of high-speed, high-quality fixed

³³ Source: Analysis Mason, Forecast February 2016.

³⁴ Services that provide a speed of greater than 24 Mbit/s.

broadband networks is that operators will begin to look at retiring elements of the legacy network such as some or all of the copper local loop, and the use of PSTN technology to provide voice services. It is probable that the migration to all-IP networks, with voice provided over IP will accelerate over the coming five years, although it may not be complete within that timeframe.

Figure 3: NGA and CGA Subscribers³⁵



- 3.25 As we look towards 2021, we know that people and businesses will be conducting more of their daily tasks online, and at the same time a large number of new devices will require connectivity. As part of a recent consultation by ComReg on the costs and benefits of repurposing the 700MHz band³⁶ ComReg commissioned Frontier Economics to look at the likely demand for mobile data into the future. Frontier ran a number of different scenarios to look at demand and under their base case scenario they estimated that in 2035, the total data traffic carried on 3G and 4G mobile networks will reach 33 times their current levels.^{37,38} This increased use will have an impact on the capacity and capability that networks will be required to deliver and will put significant pressure on existing fixed and mobile networks to add capacity to meet end-user demand.
- 3.26 From an infrastructure perspective it seems likely that providing increased capacity will require fibre to be pushed out further towards the user. Having fibre closer to the end-user will allow network operators to deliver the capacity needed for fixed networks as well as delivering capacity for wireless networks.³⁹ With a prediction that 78% of Western Europe's internet traffic will be video in

³⁵ CGA includes CGA Bitstream, CGA SABB & LLU. NGA includes NGA Bitstream, VUA, Cable and FTTH. Source: ComReg Quarterly Key Data Report.

³⁶ See ComReg Document 15/62, 15/62a and 15/62.

³⁷ This level of growth corresponds to a Compound Average Growth Rate (CAGR) of 18% for the period. The initial period of modelling up to 2025 has a higher CAGR of 28% falling to more conservative 9% for remaining years to reflect the inherent complexities of forecasting long-term growth.

³⁸ Frontier Economics, 2015, A Cost Benefit Analysis of the Change in Use of the 700 MHz Radio Frequency Band In Ireland – A Report Prepared for ComReg, June.

³⁹ Fibre to base stations and small cells will allow wireless operators to provide the capacity for their users.

2021, high throughput networks will be required.⁴⁰

Explanatory Box 4: Predicting Future Traffic Volumes

It is instructive to look at the predictions of traffic volumes produced by Cisco and others in order to appreciate the impact of end-user demands on electronic communications networks.

For example, Cisco predicts that, globally:

- IP traffic will increase nearly threefold over the next 5 years, and will have increased nearly a hundredfold from 2005 to 2020
- Busy-hour internet traffic (or the busiest 60-minute period in a day) will grow more rapidly than average internet traffic. Busy-hour internet traffic will increase by a factor of 4.6 between 2015 and 2020, while average internet traffic will increase twofold, and
- Traffic from wireless and mobile devices will account for two-thirds of total IP traffic by 2020. By 2020, wired devices will account for 34 percent of IP traffic, while Wi-Fi and mobile devices will account for 66 percent of IP traffic.
- Mobile video will increase 9-fold between 2016 and 2021, and by 2021, video will represent 78% of total mobile data traffic.
- The average smartphone will generate 6.8 GB of traffic per month by 2021, a fourfold increase over the 2016 average of 1.6 GB per month.
- Global mobile data traffic will increase sevenfold between 2016 and 2021.

To put this growth in context, global internet traffic in 2020 will be equivalent to 95 times the volume of the entire global internet in 2005. Broadband speeds are also increasing rapidly; it is expected that broadband speeds will nearly double by 2020 reaching 47.7 Mbps. Mobile connection speeds are also increasing and will surpass 20 Mbps by 2021, up from 6.8 Mbps in 2016.

With respect to Western Europe in particular, Cisco predicts that:

- Internet video traffic will grow 4-fold from 2015 to 2020, a compound annual growth rate of 31%. IP video traffic will account for 82 percent of traffic by 2020
- Monthly IP traffic will reach 25 GB per capita by 2020, up from 10 GB per capita in 2015. Internet traffic will reach 21 GB per capita by 2020, up from 7 GB per capita in 2015, and 1 GB per month in 2008. In 2000, per capita internet traffic was 10 MB per month, and
- Mobile data traffic will grow 6-fold from 2015 to 2020, a compound annual growth rate of 45%, with non-PC devices producing 67% of total IP traffic in 2020, up from 42% 2015
- By 2021, 65% of mobile devices and connections in Western Europe will have 4G+ capability

(Source: Cisco Visual Networking Index, June 2016 and Global Mobile Data Traffic Forecast Update, 2016–2021 White Paper, February 2017)

- 3.27 Global IP traffic from non-PC devices was 42% of total IP traffic in 2015, and will be 67% of total IP traffic in 2020 (see Explanatory Box 4).⁴¹ Non-PC devices generally require some type of wireless connection between themselves and the physical network. The move towards mobile devices and user mobility will present challenges for how spectrum is managed to maximise its efficient use.
- 3.28 Network architectures may require new levels of complexity due to different requirements being placed on them. These networks will need to be capable of providing people with high capacity, while accommodating the connection of a large number of new 'things' which will have different network requirements. As end-user demands evolve and different use-cases and business models

⁴⁰Cisco Visual Networking Index, June 2016 and Global Mobile Data Traffic Forecast Update, 2016–2021 White Paper, February 2017.

⁴¹ Ibid.

become established, it is difficult to say how the underlying technology and infrastructure will evolve. While still in the specification stage, 5G is aiming to provide a flexible and adaptive operating standard that will be able to be deliver connectivity over a wide range of licensed and licence-exempt spectrum. This is an area where we will continue to monitor and research.

Evolving Regulation

- 3.29 As evidenced above, electronic communications markets are highly dynamic with new technologies and sectoral players emerging, in some cases rapidly. In order to provide effective and appropriate responses, the regulatory environment must also be dynamic and responsive. The necessity for this has been recognised at a European level. Under its Digital Single Market (DSM) strategy, the Commission has proposed a modernisation of the current EU ECF.
- 3.30 Electronic communications markets are one component of the DSM. The vision for the DSM is of a European internal market in which free movement is ensured and where the individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition, and a high level of consumer and personal data protection, irrespective of their nationality or place of residence. The DSM strategy, adopted on the 6 May 2015, includes 16 initiatives which, the Commission estimates, once implemented could contribute €415 billion per year to Europe's economy, create jobs and transform public services.⁴²
- 3.31 The Commission's ambitions for the DSM extend beyond economic benefit however. The Commission also notes that an inclusive DSM offers opportunities for citizens, provided they are equipped with the right digital skills. Enhanced use of digital technologies can improve citizens' access to information and culture, improve their job opportunities. It can promote modern open government.
- 3.32 The DSM is built on three pillars:
- **Access:** better access for consumers and businesses to digital goods and services across Europe
 - **Environment:** creating the right conditions and a level playing field for digital networks and innovative services to flourish, and,
 - **Economy and Society:** maximising the growth potential of the digital economy.

⁴² See: https://ec.europa.eu/commission/priorities/digital-single-market_en

Explanatory Box 5: The Draft Communications Code (ECC)

In September 2016 the Commission published a draft directive establishing the European Electronic Communications Code (ECC)⁴³, which is intended to replace the Framework, Access, Authorisation and Universal Services Directives that comprise the current Framework into a single recast and updated Directive. The Commission has claimed that the provisions of the ECC are intended to:

- Increase competition and predictability for investments
- Stimulate competition and reduce regulation where rival operators co-invest in very high-capacity networks
- Provide for better use of radio spectrum, including longer licence durations
- Ensure stronger consumer protection, with a particular focus on ensuring that vulnerable groups have the right to affordable internet contracts, and
- Create a safer online environment for end-users and fairer rules for all players, including, where proportionate, new online players (i.e. OTTs)

In a further proposed update to the regulatory landscape in Europe, the Commission also published its draft proposals to update the BEREC Regulation. The Commission stated its intention in this revised legislation is to reinforce both the role of NRAs and BEREC to ensure a more coordinated, harmonised application of the rules throughout the EU.

ComReg welcomes the Commission's proposal to update the Framework to reflect the technological and competitive developments in the telecoms market and supports the retention of the core regulatory objectives of the current Framework, namely, the promotion of competition, the internal market and the interests of end users. ComReg also supports the Commission's proposal to raise the profile of the specific objective of promoting connectivity, without prioritising one regulatory objective over another. However, ComReg has a number of concerns about the ECC. In particular, ComReg's preliminary opinion is that certain provisions are not justified and inappropriate, while others have the potential to reduce ComReg's flexibility to adapt to national circumstances and may not contribute to the intended outcomes. These include:

- European Commission veto power on proposed remedies
- Mandatory peer-review of spectrum management decisions by BEREC, the European Commission and other national regulatory authorities
- Setting a licence duration of at least 25 years for harmonised spectrum
- The European Commission power to adopt binding implementing acts on specific aspects of spectrum management
- Maximum harmonisation for end-user provisions
- The conversion of BEREC into an EU Agency, where the Executive Director would not be drawn from an NRA, and
- Light or no regulation in circumstances where certain co-investment criteria are met

The draft Communications Code and BEREC Regulation are now subject to the EU legislative process, which will include input from both European Parliament and Member States (through the Council). ComReg will play an active role during this process by providing expert and independent advice, as requested, and, through its membership of BEREC, to the European institutions. ComReg also recognises the challenge for itself, as an institution, to evolve in response to any changes in the regulatory framework, ensuring that we continue to be an effective and relevant regulator.

3.33 Within the environment pillar falls those DSM strategies relating to electronic communications markets. In particular, DSM strategy proposes a revision to the regulatory framework. In September 2016 the Commission published a draft directive establishing the ECC (see Explanatory Box 5 for more discussion of the draft ECC and ComReg's views). The Commission has stated that the provisions of the ECC are intended to stimulate increased competition and investment, enhance consumer protection measures and reform the institutional setting.

3.34 The draft ECC and BEREC Regulation are now subject to the EU legislative process, which will include input from both the European Parliament and

⁴³ Proposal for a Directive of the European Parliament and of the Council establishing the European Electronic Communications Code.

Member States (through the Council). ComReg will play an active role during this process by providing expert and independent advice, as requested, and, through its membership of BEREC, to the European institutions. ComReg also recognises the challenge for itself, as an institution, to evolve in response to any changes in the regulatory framework, ensuring that we continue to be an effective and relevant regulator.

4. ComReg’s Strategic Intent

- 4.1 ComReg’s role is to ensure that communications markets operate effectively 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.
- 4.2 The tools we have to deliver our role and mission can be categorised into four broad areas:
- Competition
 - Consumer Protection
 - Investment, and
 - Compliance and Enforcement.
- 4.3 Underpinning our ability to deliver is the development of our organisation. This relationship is captured in our strategic framework which is illustrated in Figure 3 below.

Figure 4: ComReg Strategic Framework



- 4.4 Given the trends identified in Chapter 3, we have developed five statements of strategic intent, describing what we hope to achieve over the next five years through the use of the tools at our disposal.

Competition

- 4.5 Setting the rules for effective competition involves setting market rules relating to market access and the conduct of operators with significant market power. It is also involves effective management of the spectrum and numbering resources as essential inputs in the supply of services in electronic communications markets. The strategic intention associated with this role is that **the market delivers innovation and the greatest possible choice of wholesale and retail operators.**

Strategic Intent 1: Competition

Setting the rules for competition

The market delivers innovation and the greatest possible choice of wholesale and retail operators

Protecting and informing consumers

- 4.6 Protecting and informing consumers involves setting rules to ensure that consumer can access basic services, that they are armed with the information they need to engage with the market with confidence. The strategic intention associated with this role is that **consumers can choose and use communications services with confidence.** Better informed end-users who are ready and able to switch providers, help drive competition.

Strategic Intent 2: Consumer Protection

Protecting and informing consumers

Consumers can choose and use communications services with confidence

Creating conditions for investment

- 4.7 Effective competition is the principal driver of efficient investment and as such ComReg seeks to create the conditions for investment primarily by promoting competition. This involves promoting efficient investment and innovation in new and enhanced infrastructures, including by ensuring that access obligations take appropriate account of the risk incurred by those making investment in infrastructure. The strategic intention associated with this role is that **efficient investment has enabled affordable, high-quality and widespread access to communications services and applications.**
- 4.8 Where additional investment is required to achieve desired market outcomes, beyond what would be delivered in an effectively competitive market, for example, in relation to consumer protection measures, such investment should be undertaken in a manner which creates minimal market distortions and does

not, for example, crowd out commercial investment. Further, creating the conditions for investment involves undertaking our regulatory functions in an appropriate and predictable fashion, thus providing regulatory certainty, increasing attractiveness of the sector to investors.

Strategic Intent 3: Investment

Creating the conditions for investment

Efficient investment has enabled affordable, high-quality and widespread access to communications services and applications

Enforcement and compliance

- 4.9 Regulatory obligations have no effect unless regulated entities comply with them. It is ComReg's function to ensure compliance by operators with obligations. Such obligations may stem directly from the legislation or from measures implemented by ComReg in the exercise of its regulatory functions. An effective compliance and enforcement strategy underpins the previous three strategic intentions. The strategic intention associated with this role is that **regulated entities comply with regulatory obligations**. A key consideration informing ComReg's strategy in relation to enforcement and compliance is that incentives to comply with obligations arise from external factors relating to the deterrent effect of the regulatory regime as well as factors internal to the regulated operator.

Strategic Intent 4: Enforcement and Compliance

Ensuring compliance with regulatory obligations

Regulated entities comply with regulatory obligations

Organisation

- 4.10 The perpetual challenge of being an effective and relevant regulator of electronic communications markets is keeping up with technological and market developments. It is clear that the electronic communications sectors and related markets are becoming more complex and that where once there may have been bright lines between different parts of the eco-system, this is increasingly not the case.

Strategic Intent 5: Organisation

Organisation

We are an effective and relevant regulator

- 4.11 To enable us to undertake our role and adapt to the changing expectations we believe we will need to continue to focus on being an effective and relevant regulator. We see the fundamental elements of that as including effective

stakeholder engagement, robust data analytics (including service quality and availability), a **deep understanding of markets**, including related markets, and **maintaining an agile, skilled and motivated workforce**. We also recognise the need for adequate resourcing to deliver on our strategy.

- 4.12 The electronic communications sector is fast moving, complex and increasingly fundamental to the functioning of Irish society and business. We recognise that we need to continually reflect on our activities and change as necessary in order to best fulfil our mission and uphold our values in the face of changing demand, changing consumer behaviour, changing technologies and a changing international environment.
- 4.13 In Chapters 5 to 9 we set out the strategic goals associated with each of these five strategic intentions.

5. Setting the Rules for Effective Competition

Introduction

- 5.1 Our guiding principle is that effectively competitive markets deliver optimal outcomes in terms of investment and price, quality, choice and innovation benefiting consumers.
- 5.2 We recognise that markets, even well-functioning ones from a competition perspective, do not always deliver outcomes which are adequate from society’s perspective. Our regulatory interventions should be designed such that they give rise to minimal market distortions.
- 5.3 ComReg recognises the difference between so called static efficiency and dynamic efficiency. Interventions aimed at promoting static efficiency mean driving prices toward cost in the short term. Dynamic efficiency on the other hand, refers to investment and innovation over time. To the extent that driving prices towards cost in the short term reduces incentives to innovate over time, there is a trade-off.
- 5.4 This trade-off is especially important in electronic communications markets where technology changes rapidly and, as a consequence, significant economic welfare gains may be available where innovation is facilitated.
- 5.5 In this context, ComReg also recognises that developments in related markets are important from a competition perspective. In particular, ComReg recognises that investment and innovation in electronic communications markets will come not only from traditional operators (in fixed and mobile markets) but also from other operators, such as OTT service providers.
- 5.6 When carrying out our functions in pursuit of this first strategic intention, ComReg will consider appropriate measures to promote competition (e.g. new entry) where objectively justified and proportionate and minimise distortions in those markets directly affected, as well as in related markets.

Strategic Intent 1:	The market delivers innovation and the greatest possible choice of wholesale and retail operators.
What does this look like?	<ul style="list-style-type: none"> • There is a choice of providers in wholesale and retail electronic communications markets • Competition is as strong as possible; with rules to mitigate harm where competition is weak • Quality of electronic communications products and services is among the highest in our peer group • There is clear evidence of: <ul style="list-style-type: none"> - Competition over time - Innovation in electronic communications and in related markets, and - Consumers exercising choice

5.7 This Chapter sets out ComReg's strategic goals associated with **setting the rules for effective competition** with the high level objective of realising electronic communications markets **which deliver innovation and the greatest possible choice of wholesale and retail operators**. As illustrated in Figure 5, ComReg's view is that regulating to drive competition involves:

- **Monitoring markets**, including related markets, such that market failures are well-understood, thus,
- Enabling **targeted intervention**,
- Aimed at **facilitating competition**.

5.8 ComReg recognises that this is a dynamic process requiring continual monitoring, updating and adjustment, and that over time, the scope of regulation should reduce.

Figure 5: Regulating to Drive Competition



Competition in Fixed and Mobile Markets

Competition on fixed networks

5.9 Two forms of competition involving fixed electronic communications networks can be distinguished: services-based competition and infrastructure-based competition. Pure services-based competition is said to occur where entrant operators utilise the incumbent's network to supply their own services, without making infrastructure investments of their own. Pure infrastructure-based competition occurs when entrants make investments in infrastructure and do not rely on inputs supplied by the SMP operator to compete for customers in downstream markets.

5.10 In practice, there are degrees of competition between these two extremes which involve service providers making certain infrastructure investments and then purchasing appropriate complementary wholesale inputs such as bitstream

access.⁴⁴ In general, over time greater or “deeper” investment is made by competing service providers in more densely populated areas than in other less densely populated areas where such investment cannot be supported by a more thinly spread subscriber base.

- 5.11 Competition based on “deeper” network investment allows entrant operators a greater degree of control of the products and services supplied over those networks as well as the price they are supplied at. Pure service level competition is regarded as being much less capable of delivering the benefits associated with robust competition as it essentially involves a reselling of the incumbent’s product. However, facilitating service level competition does enhance competition, for example, by allowing operators to offer a full bundle of services. Moreover, the promotion of service level competition, as part of a regulatory strategy to facilitate entry and expansion, allows entrant operators to establish a subscriber base and attain scale economies before making the requisite infrastructure investment necessary for infrastructure-based competition.

Explanatory Box 6: The Ladder of Investment

The reason for access regulation in the electronic communications sector is to develop competition. Effective competition drives prices down, improves quality, and delivers more choice and innovation in the marketplace. Certain industries (like electronic communications, electricity and water) have high barriers to entry such that, without regulatory incentives, entrants may be slow or unable to surmount the entry barriers and competition can be slow to emerge, if it does at all.

There are two main ways of trying to promote this competition, one is through providing competitors access to certain parts of the incumbents network (in this case Eircom), in addition to service providers supplying termination, or by providing investment, or regulatory incentives to rollout a competing network.

The ladder of investment approach proposed by Martin Cave⁴⁵ tries to encourage service-based entry and infrastructure-based entry as complements in promoting competition. This approach attempts to balance the trade-off between short-term gains from service-based competition without impeding facility-based entry in the longer term.

The ladder involves a number of ‘rungs’ which the competing providers can ‘climb’, as a competitor climbs these rungs they are required to make greater investments but this is rewarded with greater control over the network as well as being able to utilise scale and increase their operating margin. The rungs can range from pure resale of the incumbents services to local-loop unbundling which gives the competitor access to the copper pair to the home and nothing else.

- 5.12 In Ireland, Eircom is the former incumbent monopoly fixed network provider. Eircom’s network has almost ubiquitous coverage of the 2 million premises in the State. Since 2011 Eircom has also been rolling out its next generation access network, based on fibre to the cabinet (FTTC), exchange-launched VDSL (EVDSL) and fibre to the home (FTTH) technology. Eircom’s next generation access network passes 1.6 million premises, currently serving

⁴⁴ Bitstream access is a wholesale product that consists of the provision of transmission capacity in such a way as to allow Access Seekers to offer their own retail broadband service (or other value-added services) to end-users. Bitstream requires the existence of a copper or fibre access path (or hybrid of copper and fibre) but does not grant the Access Seeker control over the access path nor are they allowed to add other equipment.

⁴⁵ Cave, Martin, 2006, Encouraging Infrastructure Competition via the Ladder of Investment. Telecommunications Policy, Volume 30 (Number 3-4). pp. 223-237.

approximately 500,000 subscribers.⁴⁶

- 5.13 Eircom faces varying degrees of independent network level competition from both Virgin Media and SIRO, the latter being a joint venture between ESB Networks and Vodafone. Virgin Media's network passes 807,500⁴⁷ premises (almost all of these being homes), with 367,700⁴⁸ internet subscribers. Virgin Media's network is largely confined to the urban areas of Dublin, Cork, Galway, Limerick, and Waterford. SIRO, which commenced rollout of an NGA network in 2015, is a more recent entrant to the sector and, to date, network rollout is limited, reported to be around 36,500 homes passed.⁴⁹ SIRO has announced plans to pass 500,000 premises in 51 towns by the end of 2018.⁵⁰ There are also a number of other network operators, e.g., Magnet.
- 5.14 Eircom also faces competition from BT, Vodafone, Sky and a variety of other smaller operators (including fixed wireless operators) who have made varying levels of infrastructure investment, in large part due to the availability of wholesale access products mandated by regulation. As is to be expected, the extent of infrastructure rollout is deeper in urban areas where the population/premises densities are greater. In such areas BT and Vodafone have moved further up the ladder of investment (see Explanatory Box 6 for a discussion of the ladder of investment).

Competition on mobile networks

- 5.15 As with fixed networks there are two main forms of competition in the mobile sector. First there is network level competition between the mobile network operators (MNOs). Second, there is a form of service level competition which involves so called mobile virtual network operators (MVNOs) purchasing capacity from one of the network operators, instead of building their own mobile access network (towers, masts and associated backhaul). A key difference between the mobile and fixed network competition is that whereas the incumbent operator Eircom is required by regulation to offer wholesale access products to other service providers and thus facilitate the emergence of competition, no such regulatory measures are in place in, or have been deemed necessary, with respect to mobile networks (see Explanatory Box 7 for a discussion of the markets susceptible to ex ante regulation).
- 5.16 Another key difference with competition in mobile networks is the presence of commercial network sharing arrangements. Network sharing arrangements allow two or more network operators to share certain parts of their networks. In mobile networks, sharing arrangements can range from the sharing of passive infrastructure (such as sites, masts and antennae) to more active parts of their network including some core infrastructure. The benefits for mobile operators in sharing infrastructure is an ability to reduce costs.⁵¹ On the downside there

⁴⁶ See ComReg Quarterly Key Data Report, Q4 2016 at :

<https://www.comreg.ie/publication/irish-communications-market-quarterly-key-data-report-data-q4-2016/>

⁴⁷ See Virgin Media Consolidated Financial Statements 2016 at: <http://www.libertyglobal.com/pdf/fixed-income/Virgin-Media-December-31-2016-FINAL.pdf>

⁴⁸ See ComReg Quarterly Key Data Report, Q4 2016.

⁴⁹ See: <https://www.siliconrepublic.com/comms/siro-ftth-broadband>

⁵⁰ See: <http://siro.ie/siro-invest-e40-million-roll-6-new-towns-end-2016/>

⁵¹ 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.

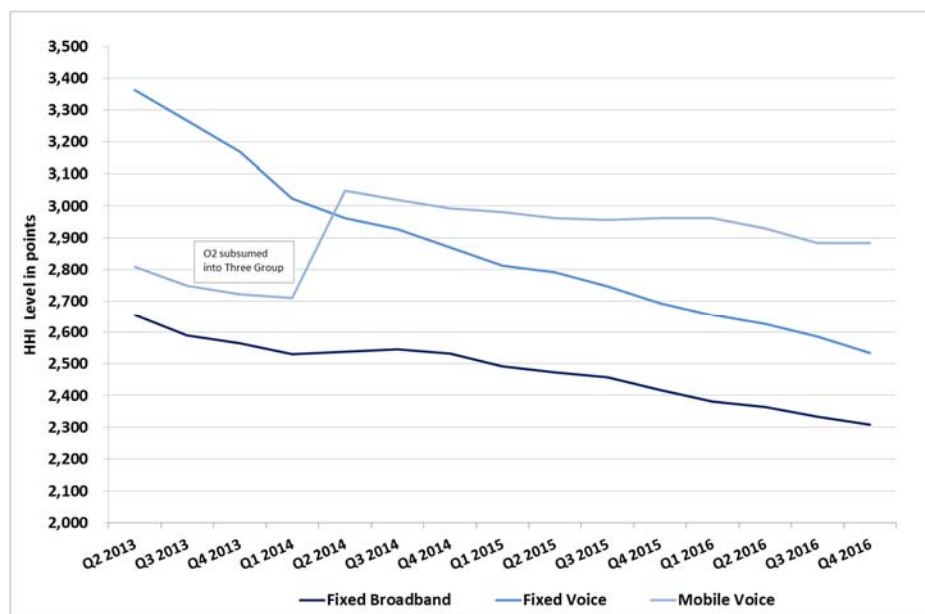
may be a diminution of competition as operators lose control over some network operations and strategic technology choices.

- 5.17 At present there are three principal MNOs offering services over mobile networks in which they have invested in themselves; Eircom, Vodafone and Three. Three and Eircom however, operate a network sharing arrangement. There are also a number of MVNOs, for example, Tesco Mobile and iD who do not have their own networks, but have instead entered into agreements with Three enabling them to supply mobile services. Other MVNOs include Virgin Media, Lycamobile and Postfone.

The state of competition in retail markets – fixed and mobile

- 5.18 Figure 6 below shows the level of market concentration in retail fixed broadband, fixed voice and mobile voice markets. With respect to the fixed markets, the gradual decline in retail market concentration which is consistent with a much longer term trend, for voice and broadband, is indicative of increased competition in these markets. The caveat is that, at the moment, there is limited facilities based competition outside of the most urban areas.⁵²

Figure 6: Retail Concentration (HHI), Q2 2013 – Q2 2016⁵³



- 5.19 The figure illustrates a different story on the mobile side. The jump in the measure of market concentration corresponds to the acquisition by Three of O2 in mid-2014. Up until the merger, the long term trend in retail mobile markets had been one of decreasing concentration. The principal consequence of mobile merger was to eliminate a network level competitor. The package of remedies accepted by the European Commission involved the creation of two MVNOs. Furthermore, while one network sharing arrangement was terminated as a consequence of the merger, another network share was amended and strengthened. The ultimate impact on competition in mobile markets remains to

⁵² One exception to this characterisation is the leased lines market where facilities based competition has emerged even outside the most urban areas.

⁵³ Source: ComReg Quarterly Key Data Report.

be seen.

Monitoring Markets

- 5.20 To effectively regulate electronic communications markets, it is important to have an understanding of how well markets are working, where the market failures are, and how different markets - fixed, mobile and related markets – affect one another.
- 5.21 ComReg devotes substantial resources to conducting market analysis required by the regulatory framework. The purpose of this market analysis is to determine whether any operator has significant market power and if so how any competition problems might be remedied. The European Commission has made recommendations as to which markets are to be analysed and for the methodology to be used.
- 5.22 However market power is not the only reason that markets may not work well or deliver outcomes which society deems adequate. Markets may not work well, or as expected, due to the presence of, for example, asymmetries of information, externalities or even behavioural biases, as well as due to the fundamental uncommercial nature of supplying certain markets or market segments.
- 5.23 We consider it important for ComReg to complement market analysis under the regulatory framework with monitoring the effectiveness of competition in other markets within the electronic communications eco-system. This can include electronic communications markets that are no longer recommended for market analysis (such as wholesale access to mobile networks⁵⁴), markets involving the supply of essential inputs (such as access to poles, ducts and cell sites), markets for products that are commonly bundled with ECS (such as media content), and markets for products that critically affect the end-user's experience of ECS (such as mobile handsets).
- 5.24 In this context ComReg considers it would be desirable for the **effectiveness of competition to be regularly monitored across communications markets, including fixed and mobile, and related markets.**
- 5.25 This activity would complement the analysis of markets under the Access Regulations. It would provide context for the use of our regulatory powers in recommended markets. Further, it would help us identify where we might consider discretionary use of our existing powers, such as conducting market analysis of non-recommended markets under the regulatory framework.
- 5.26 The activity would also help us to identify the potential for market failures in electronic communications markets that may cause problems in other markets, and vice versa. In particular, it would enable us to know whether innovation in

Goal 1:

Effectiveness of competition regularly monitored across communications markets, including fixed and mobile, and related markets.

⁵⁴ See Explanatory Box 7 for a discussion of the Commission's recommendations on markets susceptible to ex ante regulation.

related markets was being enabled or inhibited by characteristics of electronic communications markets. This could identify whether the regulatory regime needs to be enhanced so that these issues can be addressed.

- 5.27 This would also guide our priorities in considering what further regulatory action to consider, or what additional powers we might need. (In this regard, we note that in some other jurisdictions, such as the UK, the powers under the ECF are complemented by powers under national competition law to address market failures that arise from market characteristics other than significant market power.) Unlike market analysis under the Access Regulations, this type of assessment would not lead directly to the imposition of regulatory obligations, so that the initial assessments could be conducted at a higher-level with more detailed assessment being conducted where needed.
- 5.28 This type of activity, is not mandated by the legal framework. Despite its importance, it therefore has to be a lower priority pending ComReg securing sufficient staff to resource the task. The scope of the monitoring activity will be determined by resource availability and by the degree of linkage between the markets being monitored and the core electronic communications markets that we are bound to regulate.
- 5.29 In the context of this goal therefore, over the coming period:
- **Market Monitoring:** ComReg will initiate, once resources are available, a programme of work which will aim to develop our understanding of competition in fixed, mobile and related markets. This programme of work will complement the deeper market assessments that are carried out in the context of the SMP Framework (see below) and will be used to inform ComReg's activities across the breadth of its functions.
 - **Market Investigation powers:** ComReg will study the experience of other jurisdictions in using market investigation-type powers which allow agencies to carry out detailed market examinations and impose remedial measures where competition is not working well, and will advocate for such powers in Ireland if we consider them appropriate.

- 5.30 This leads to the motivation for ComReg's second goal. Specifically, it is ComReg's goal that **regulation of electronic communications markets is targeted at mitigating market failure and preventing harm**. A developed understanding of why markets may not be working well for end-users will allow ComReg to better target regulatory interventions across the breadth of its functions. Moreover, in this context, an understanding of related markets will facilitate an awareness of the potential that the regulation of electronic communications markets has to inhibit innovation and the realisation of welfare gains.

Goal 2:

Regulation of electronic communications markets targeted at mitigating market failure and preventing harm.

Promoting Competition and Consumer Choice

- 5.31 There are three principal ways in which ComReg may promote competition and

consumer choice in electronic communications markets:

- Promoting competition via the SMP Framework
- Ensuring that the management of the national spectrum and numbering resource takes account of the potential impact that the assignment and allocation of these essential inputs may have on downstream markets, and
- Ensuring customer mobility (i.e. that customers are willing and able to switch in response to better deals in the marketplace).

5.32 While the first two types of intervention are primarily supply-side interventions related to the availability of those inputs necessary to enter and compete in markets, the latter is a demand-side intervention whose purpose is to ensure the user is free to take advantage of the choices available in the marketplace should such choices materialise (for example, in the event of entry).

Goal 3:

Our work seeks to promote effective competition and facilitate consumer choice within the Single Market.

5.33 Across each of these categories of activity, ComReg seeks to **promote effective competition and facilitate consumer choice within the Single Market**. As noted in Chapter 2, from an economic perspective, the notion of a single market goes hand in hand with the objective to promote competition. By facilitating entry and expansion in national and regional markets, competition is enhanced and users enjoy the associated benefits in terms of price, choice and quality.

Market Access: The SMP Framework

5.34 The ability to enter markets and grow market share by competing on the merits is fundamental to the notion of effective competition. ComReg's strategic goal in relation to promoting effective competition through the SMP Framework is that **regulation mitigates market power and facilitates market entry and expansion where feasible in wholesale and retail electronic communications markets**.

5.35 Under the regulatory framework, where an operator is identified as having significant power in a given market, ComReg may impose on such an operator a range of pro-competitive 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. In this context it is important that access seekers enjoy an adequate quality of service in supply of wholesale inputs by the SMP operator. Within the SMP Framework, ComReg currently regulates nine markets (see Explanatory Box 7).

Goal 4:

Regulation mitigates market power and facilitates market entry and expansion where feasible in wholesale and retail electronic communications markets.

5.36 In examining whether electronic communications markets warrant SMP

regulation it is often necessary to distinguish between retail (or downstream) markets where operators sell services to consumers, and wholesale (or upstream markets) where operators sell wholesale inputs to other operators, which they then, in turn, use to deliver retail services to consumers (and/or wholesale services to other operators). ComReg's objectives are to only impose regulation to address those markets where competition is not likely to be effective and, in doing so, to address competition concerns by imposing regulatory obligations at the most upstream level possible. In practice this typically involves regulation aimed at addressing bottlenecks at the wholesale rather than the retail level. Where wholesale regulation delivers effective competition in downstream retail markets, ComReg will exit regulation of those retail markets. ComReg will also exit regulation of wholesale markets where effective competition develops.

Explanatory Box 7: Markets Susceptible to Ex Ante Regulation

ComReg is responsible for assessing whether certain Electronic Communications markets in Ireland are effectively competitive in accordance with the ECF as transposed into national law. These markets have changed over time and are identified in various European Commission recommendations. The current recommendation is the 2014 Recommendation on Relevant Products and Service Markets⁵⁵ (the "2014 Recommendation") and it identifies five markets as being susceptible to ex ante regulation.

- Market 1: Wholesale call termination on individual public telephone networks provided at a fixed location
- Market 2: Wholesale voice call termination on individual mobile networks
- Market 3a: Wholesale local access provided at a fixed location
- Market 3b: Wholesale central access provided at a fixed location for mass-market products; and
- Market 4: Wholesale high-quality access provided at a fixed location.

ComReg's analyses of the markets identified in the 2014 Recommendation are currently under way. Therefore, the existing decisions are based on markets identified in the previous Commission recommendation from 2007. ComReg, subject to certain conditions being satisfied, may also regulate markets not identified by the Commission as being susceptible to ex ante regulation. ComReg regulates a number of markets on this basis.

The markets that ComReg currently regulates based on a finding of SMP are:*

- Wholesale Call Termination on Individual Public Telephone Networks Provided at a Fixed Location (01/2014)
- Wholesale Voice Call Termination on Individual Mobile Networks (02/2014)
- Wholesale local access provided at a fixed location (03a/2014)
- Wholesale central access provided at a fixed location for mass-market products (03b/2014)
- Wholesale high-quality access provided at a fixed location (04/2014)
- Retail Access to The Public Telephone Network at a Fixed Location (01/2007)
- Wholesale Fixed Access and Call Origination on the Public Telephone Network Provided at a Fixed Location (02/2007)
- Broadcasting Market A – Wholesale Access to National Terrestrial Broadcast Transmission Services (18/2003)
- Broadcasting Market B – Wholesale Access to DTT Multiplexing Services (18/2003)

* The naming convention notes the market number and the year of the relevant recommendation. For instance, (02/2014) refers to Market 2 of the 2014 Recommendation.

5.37 Where SMP regulation is necessary however, ComReg will continue to focus on the imposition of obligations that encourage both infrastructure and service based competition as they are complementary and support the 'ladder of

⁵⁵ The Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services.

investment' principle (see Explanatory Box 6). ComReg's regulatory approach will, however, seek to facilitate opportunities that enable greater infrastructure based competition, where appropriate, as this ultimately enables the development of more effective and sustainable competition. In this respect, where appropriate we will continue to seek to impose obligations that enable operators to gain effective access to SMP operator's passive infrastructure network assets, including access to ducts, poles, dark fibre and other necessary associated facilities.

- 5.38 Eircom has been designated as having SMP across a range of wholesale markets, as well as in some retail access markets. ComReg has imposed a range of regulatory obligations on Eircom designed to promote competition by enabling other operators to compete on a level playing field with Eircom. However, despite the imposition of these regulatory obligations, ComReg has concerns that, given Eircom's vertically integrated structure (whereby it competes at both the retail and wholesale levels) and its SMP position in certain markets, that it has both the ability and the incentive to engage in behaviours that discriminate against competing operators.
- 5.39 It is our view that while de-regulation of retail and downstream wholesale markets is desirable this process depends to a large extent on the effectiveness of regulation in upstream markets. We have in the recent past imposed proportionate remedies in wholesale markets which we believe will increase the chances of this happening. As an example we are currently proposing to mandate the increased use of Equivalence of Inputs whereby Eircom must use the same IT systems to supply its Retail arm and its Wholesale customers. We are also proposing a more detailed specification of obligations governing operators' access to Eircom's passive infrastructure, including its ducts, poles and other physical network assets.
- 5.40 In relation to this goal, over the coming period:
- **Market Analysis:** ComReg is required to periodically update its assessment of markets. ComReg devotes substantial resources to this activity and is currently analysing the markets set out in the Commission's 2014 Recommendation. Markets 1 and 2 are wholesale fixed voice call termination and mobile voice call termination markets and ComReg expects to issue a public consultation on an updated analysis of these termination markets in 2017. Markets 3a and 3b are wholesale local access and wholesale central access markets. ComReg published a public consultation on these markets in 2016 and expects to make a final determination in 2017. Market 4 relates to wholesale high-quality access and ComReg issued a public consultation on its analysis in 2016, and a decision is also expected to issue in 2017.
 - **Legacy Networks:** The remedies imposed on Eircom include an obligation not to withdraw access to facilities once granted without ComReg's consent.⁵⁶ If Eircom wishes to migrate to an all-IP network, this would likely

⁵⁶ See also Chapter 7 for a discussion of ComReg's strategy in relation to investment by Eircom, the designated USP, in the legacy copper network.

involve withdrawal of or changes to certain wholesale (and retail) products and services. ComReg has already published a call for inputs on the implications of copper withdrawal⁵⁷ in which we highlighted the need to ensure that there is no adverse impact on competition and that consumer rights are upheld during the transition. In July 2016 Eircom wrote to ComReg requesting prior approval for the retirement of legacy networks and services. ComReg is of the view that consideration of these issues is timely and necessary and has requested that Eircom undertake an analysis and an impact assessment, including plans and timelines, of the withdrawal of legacy services. When ComReg has a better understanding of Eircom's plans and is in receipt of its analysis, ComReg plans to commence a wide engagement with all relevant stakeholders, including a potential public consultation, in order to develop an approval process that considers all of the issues and the implications of any request for approval. This engagement will include consideration of, inter alia, the criteria which should be applied in assessing any application from Eircom for consent to withdraw wholesale access.

- **Eircom's Vertically Integrated Structure:** As noted above, ComReg has concerns that, given Eircom's vertically integrated structure and its SMP position in certain related markets that it has both the ability and the incentive to engage in behaviours that discriminate against competing operators. In our previous strategy statement published in 2014, we noted that Eircom had embarked on a programme it called "Wholesale Reform" with the objective of institutionalising compliance with its regulatory obligations. We signalled that the effectiveness of this programme could make a difference to the detail of remedies that we considered necessary to impose and to whether structural remedies such as functional separation would need to be considered. We stated that we would conduct a review of the effectiveness of the programme once it had been in place for a sufficient length of time. In this context in 2016 ComReg therefore began a review of Eircom's regulatory governance from an operational and structural perspective with the objective of establishing whether its regulatory governance arrangements and practices are and can be sufficiently robust to the extent that they demonstrate and ensure ongoing compliance with regulatory obligations. The outcome of the review will assist ComReg in identifying whether any further actions are required.

5.41 Finally, outside the SMP Framework, ComReg has a role in facilitating access to physical infrastructure for the purpose of providing electronic communications under Section 57 of the 2002 Act and also under the Broadband Cost Reduction Regulations.⁵⁸

5.42 Section 57 of the 2002 Act sets out a network operator's right to negotiate an agreement to share physical infrastructure with a physical infrastructure provider for the purpose of providing electronic communications services. ComReg's role under Section 57 of the 2002 Act is to :

⁵⁷ See ComReg Document No. 16/01.

⁵⁸ The European Union (Reduction of Cost of Deploying High-Speed Public Communications Networks) Regulations 2016 (S.I. 319 of 2016)

- Specify the period for completion of negotiations, and
 - To act as the dispute settlement body in the event of a dispute arising in relation to the negotiation of physical infrastructure sharing. ComReg has published its process to handle disputes arising in relation to Section 57 of the 2002 Act.⁵⁹
- 5.43 The Broadband Cost Reduction Regulations became effective on 20 July 2016 and their primary purpose is to put in place a framework of rights and obligations for network operators aimed at facilitating and reducing the cost of deploying high-speed public communications networks ultimately to the benefit of businesses and consumers. The Broadband Cost Reduction Regulations are of relevance to public communications network operators (such as broadband network providers) and utilities networks operators (i.e. those operating in the gas, electricity, water, rail, road, ports and airports sectors).
- 5.44 ComReg has three functions under the Broadband Cost Reduction Regulations, namely:
- The function of ensuring compliance with the Broadband Cost Reduction Regulations.
 - The functions of the national dispute settlement body in the event of disputes arising between network operators in relation to the Broadband Cost Reduction Regulations. ComReg has published its process to handle disputes arising in relation to the Broadband Cost Reduction Regulations⁶⁰, and
 - The functions of a “Single Information Point” (SIP) to facilitate access to information regarding statutory permits for civil works required to develop elements of a high-speed public communications networks. The SIP is published on the ComReg website.⁶¹

Access to Essential Inputs: Spectrum and Numbering Resource

Spectrum

- 5.45 Radio spectrum, as a medium over which data can be transmitted, is an essential input in the supply of electronic communications services which are radio based. Most communications networks, 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 demand for radio spectrum continues to grow, driven by society’s ever-increasing requirements in terms of access to data intensive services while on the move (see Explanatory Box 8 for more discussion). In this context it is ComReg’s goal that **spectrum management**

Goal 5:

Spectrum management for electronic communications markets takes account, inter alia, of the promotion of competition.

⁵⁹ ComReg, 2012, Resolution procedures developed taking account of Section 57 of the Communications Regulation Act 2002, 12/108, October.

⁶⁰ ComReg, 2016, Broadband Cost Reduction Regulations - Dispute Process, 16/77r, September.

⁶¹ See <https://www.comreg.ie/industry/electronic-communications/single-information-point-bcrr/single-information-point-sip/>

for electronic communications markets takes account of, inter alia, the promotion of competition.

- 5.46 Radio spectrum is a scarce resource having many different potential uses and end-users. Broadly speaking, spectrum management is the process of regulating the use of radio frequencies to promote its efficient use in the interests of society. Radio spectrum management involves a consideration of a broad range of factors (e.g. administrative, regulatory, social, economic and technical). In particular, spectrum management involves spectrum **allocation** and **assignment**, as well as the monitoring, compliance and enforcement of licence conditions and equipment standards.
- 5.47 Spectrum allocation refers to the designation of given frequency bands for use by one or more types of radio communications services, where appropriate, under specified conditions. This identifies the services that could potentially use a radio frequency band and is an important activity in international harmonisation process, as discussed later in Chapter 7. ComReg's radio frequency plan for Ireland⁶² sets out Ireland's radio spectrum allocations and this plan is updated regularly in line with developments at an international level.
- 5.48 Spectrum assignment refers to those spectrum management activities which involve the issue of, 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 this authorisation may take the form of either a licence or a licence exemption under the Wireless Telegraphy Acts, 1926-2009. The majority of ComReg's spectrum management work relates to the licensing of spectrum. For example, (a) determining the precise nature of spectrum rights (e.g. technical conditions, geographic dimension, licence duration, licence conditions etc.), (b) designing and implementing awards of spectrum rights, and (c) granting rights of use/licences on foot of same.
- 5.49 In relation to the assignment of spectrum rights for electronic communications services, ComReg determines the appropriate spectrum assignment approach on a case by case basis in light of specific facts and circumstances that arise. Notwithstanding this, ComReg⁶³:
- Notes the clear benefits that auctions offer for the award of spectrum rights of use in bands harmonised for fixed/mobile wireless broadband services, and observes that both Irish and international spectrum management experience support the continued appropriate use of auctions generally, and
 - Considers that in competitions for spectrum rights (and, in particular, auctions), spectrum competition caps are an important tool by which to safeguard and promote competition – both for spectrum rights and downstream competition.

⁶² ComReg Document 13/118R.

⁶³ See Chapter 7 of ComReg's Spectrum Management Strategy for 2016 to 2018 (Document 16/50) for ComReg's current thinking on a number of topical spectrum management issues, including the use of auctions for awarding spectrum rights of use for ECS and competition caps on spectrum.

Explanatory Box 8: Ever-increasing Demand for Mobile Data Services

Since 2012, data usage on the mobile networks has increased significantly. While mobile voice services have increased by over 10% in the period Q1 2012 to Q1 2016, mobile data usage has increased by over 500%. Further, as of Q1 2016, the average traffic per smartphone user reached 2.7 GB of data per month, while the average traffic per dedicated mobile broadband subscriber was 7.4 GB of data per month. This represents a 69% year-on-year increase for smartphone usage and a 7% year-on-year increase for mobile broadband usage. In the same period in 2012, the average traffic per smartphone user was 300 MBs of data per month and 2.8 GBs per month for mobile broadband per month.

These increases are likely due to a number of factors including:

- increased 3G and 4G network capability and coverage
- increased smartphone penetration - currently around 84% of all mobile subscriptions (excluding dedicated mobile broadband and M2M)
- rising mobile data caps, and "all you can eat" plans, and
- the increasing use of video and over-the-top (OTT) applications

User demand for mobile data is expected to further increase due to increased penetration and capability of devices (particularly 4G smartphones). A 2015 report for ComReg by Frontier Economics conservatively estimated that, between 2015 and 2035, user demand for mobile data will increase 33 times.

Future mobile data traffic is expected to grow significantly due to mainly, though not only, the developments in the mobile smartphones, which is linked to the increasing consumption of mobile internet and smart apps by end-users. With increased penetration and use of smartphones, it appears that end-users increasingly expect to access mobile internet/video services at any time and place similar to the service enjoyed with voice calls in terms of nationwide access. In addition it appears that smartphone end-users increasingly expect to access mobile internet/video services with service levels similar to those enjoyed in the home / Wi-Fi hotspot in terms of data speeds and reliability.

To meet these expectations, the delivered speeds and capacity of dedicated mobile networks will need to continue to evolve over time, and the deployment of technology advances, such as carrier aggregation, will increasingly be required

(Source: Radio Spectrum Management Strategy Statement 2016-2018⁶⁴)

5.50 Over the coming period, related to this goal ComReg intends to undertake the following:

- **Spectrum Leases:** ComReg intends to establish a framework for spectrum leases. Spectrum transfers and/or leases is a spectrum management tool that, along with other measures, can increase the efficient use of spectrum rights. Spectrum transfers in the Radio Spectrum Policy Programme (RSPP)⁶⁵ bands in Ireland is provided for the Wireless Telegraphy (Transfer of Spectrum Rights of Use) Regulations 2014 ("the Transfer Regulations") and Regulation 19 of the Framework Regulations.⁶⁶
- **Spectrum Award Design:** ComReg will ensure that award process(es) to assign spectrum rights of use are appropriately designed in light of prevailing circumstances including relevant legislation and policy goals.
- **Release of harmonised spectrum that can be used for mobile, nomadic, and fixed wireless broadband services:** ComReg intends to

⁶⁴ ComReg, 2016, Radio Spectrum Management Strategy Statement 2016-2018, Document 16/50, June.

⁶⁵ Decision 243/2012/EU of the European Parliament and of the Council of 14 March 2012 establishing a multi-annual radio spectrum policy programme (RSPP). This Decision is intended to create a roadmap contributing to the internal market for wireless technologies and services, particularly in line with the Europe 2020 initiative and the Digital Agenda for Europe.

⁶⁶ ComReg notes that the transfer of spectrum rights in the harmonised bands, in Ireland and elsewhere in Europe, has primarily occurred in the context of broader corporate control transactions (i.e. mergers or acquisitions such as between MNOs). The Transfer Regulations do not, however, apply to spectrum transfers forming part of a merger or acquisition which is required to be notified to the Competition and Consumer Protection Commission or to the European Commission.

complete the award process for the 3.6 GHz band by Q3 2017, and to significantly progress the award process(es) for the 700 MHz, 1.4 GHz, 2.3 GHz and/or 2.6 GHz bands over the coming two years.

- **Release of other spectrum:** ComReg will continue to make available and assign radio spectrum in a timely manner to support the diverse range of actual and potential spectrum users.
- **Expiry of spectrum rights:** ComReg will continue to consider the expiry of existing radio spectrum rights significantly in advance of licence expiry, and set out ComReg's spectrum assignment proposals in relation to same.

Numbers

5.51 Access to numbers is essential to the functioning of electronic communications markets. ComReg regulates the telecommunications sector in Ireland in accordance with EU and domestic legislation and 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. In this context, it is ComReg's goal that **number management facilitates competition**. Any new conditions of use that support competition and innovation nevertheless need to ensure that consumers remain protected against number misuse.

Goal 6:

Number management facilitates competition.

5.52 Numbers are likely to remain the most common universal identifiers between now and 2021 and well beyond. Numbers are trusted because they are coordinated at national level (by NRAs) and international level (by the ITU).

5.53 Two trends are likely to be relevant to effective regulation over the period to 2021. First, with respect to the IoT, many machines will need numbers. No ideal global solution currently exists for international mobile to mobile (M2M) communications services. Second, emerging business models will need to be considered. OTT services and apps that use numbers will undoubtedly proliferate over the period to 2021. Traditional mobile operator networks and business models will evolve too. Services such as 'Wi-Fi calling', native or otherwise, will likely become commonplace. Handset providers may leverage reprogrammable SIMs to move further up the mobile value chain. The numbering and interoperability framework needs to adapt to cater for these new models. There may also be implications for the wholesale interconnection framework and a need to cater for more complex end-user switching scenarios.

5.54 Related to this goal, ComReg will be undertaking the following:

- **Numbering Plan:** Provide an ongoing numbering plan management function to make sufficient numbers available on an equivalent and transparent basis to all service providers that need them.
- **Numbering Conditions:** Update the Numbering Conditions of Use and Applications Process in 2017 and at least every 2 years thereafter, to

support new market and technology developments (e.g. new FMC products, M2M, OTT, eSIM), while also ensuring consumers remain protected.

- **Numbering for Mobile, OTT and M2M:** Conduct a full review of numbering for mobile, OTT and M2M services in 2017, with the aim to support innovative new services (particularly international M2M services) but without requiring any number changes for existing mobile end-users.

Demand-side Factors: Switching

5.55 Effective competition in electronic communications markets depends not just on supply-side considerations relating to the ease of entry to markets or the availability of essential inputs. Effective competition also depends on demand-side factors, and principally the ability and willingness of customers to switch suppliers in response to a better deal in the marketplace. If end-users are for some reason immobile, new operators will not be able to build a customer base and existing operators will have no incentive to compete by offering better financial terms, improved quality or innovative products.

Goal 7:

There are low barriers to consumers exercising their choice.

5.56 Consumer immobility can be thought of in terms of barriers to exercising choice. Such barriers may arise for a wide variety of reasons, for example:

- Due to the presence of restrictive contracts
- Because services are purchased as part of bundles
- Because the information necessary for decision-making is costly to acquire (or simply unavailable), or
- Because information is difficult to understand or assimilate.

5.57 These considerations are all significant in the context of electronic communications markets. In the context of promoting competition, it is therefore one of ComReg's strategic goals to ensure that **there are low barriers to consumers exercising their choice**. ComReg's second high level strategic intention to protect and inform end-users, and the associated strategic goals and specific programmes of work are discussed in detail in the next chapter.

6. Protecting and Informing Consumers

Introduction

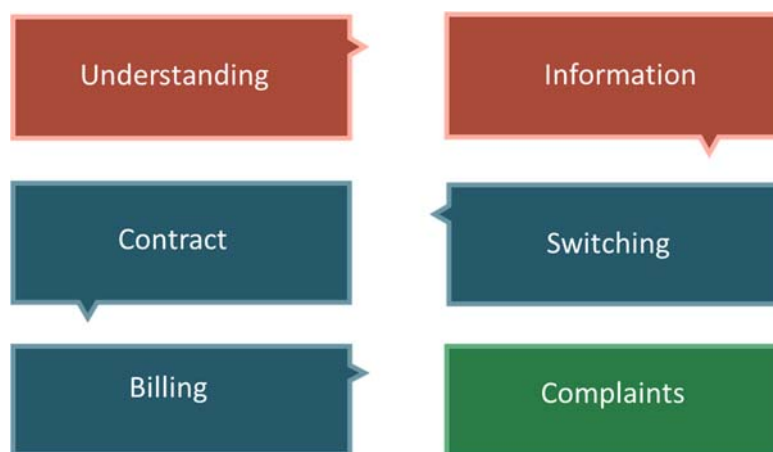
- 6.1 Effective competition should maximise benefits for consumers. However, markets, even well-functioning ones, do not always deliver outcomes which are optimal from society's perspective. Market power is only one potential driver of market failure and poor consumer outcomes. Additionally, interventions to address market power in wholesale supply markets for example, may not address potential issues for all consumer segments in retail markets.
- 6.2 There are issues for consumers in electronic communications markets which do not necessarily arise from competitive conditions. For example, lack of access to basic services, consumer inertia due to switching difficulties, lack of transparent or comparable information, including, in respect of quality of service, can prevent consumers from making and acting on fully informed choices. Issues may also arise in respect of service providers not upholding consumers' rights or not providing adequate complaints and redress mechanisms when problems arise. Enhanced consumer rights, among other things, aim to ensure ease and speed of switching service provider. Furthermore, while all consumers may at times be vulnerable to detriment, some consumers may be particularly vulnerable.
- 6.3 The ability of consumers to exercise choice in the marketplace is essential to the functioning of a competitive market. Evolving consumer protection legislation aims to redress the information and power imbalance for consumers when undertaking purchasing decisions. Empowered consumers, as the engine of competitive markets, can play a vital role in improving economic performance and driving innovation.

Strategic Intent 2:	Consumers can choose and use communications services with confidence.
What does this look like?	<ul style="list-style-type: none"> • Essential and basic services are available for all as technology changes • Vulnerable users are protected • Consumers are empowered through clear and adequate information and effective redress • Consumers are treated fairly by ECS and Premium Rate Services (PRS) providers • Consumers get the service they contract and pay for

- 6.4 This Chapter sets out ComReg's 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**. We can think of the consumer navigation of the market, or "journey", and ComReg's role therein, in three broad phases, shown in Figure 7 below:

- Before the purchasing decision is made when the consumer is attempting to develop an **understanding** and assimilates **information**
- This leads the consumer to purchase, which may involve **switching** current suppliers, and enter a **contract** for services for which they are ultimately **billed**, and
- Finally, in the event that the product or service does not meet expectations, the customer may have a **complaints** experience.

Figure 7: The Consumer Journey



Common Consumer Issues

- 6.5 On the whole, electronic communications markets continue to deliver choice and value for consumers. Take-up of services continue to grow, including growth of IP based /OTT services which drives demand for higher speed fixed and mobile services. And, consumers are increasingly purchasing bundles. Significant numbers of consumers continue however to have issues with providers.
- 6.6 Consumers may contact ComReg’s consumer line with issues relating to both ECS and PRS Providers.⁶⁷ In relation to the breakdown of ECS issues raised: billing, contractual and service issues have been and remain the main issues raised by consumers (see Figure 8). However, other categories, in particular in relation to PRS service issues and switching are clearly also issues.
- 6.7 There are some sub-trends which are notable. The number of issues raised by consumers relating to billing, encompassing issues such as overcharging, and disputed charges, have been increasing. In contrast, contractual issues, which encompass issues relating to terms and conditions, and contractual cancellation penalties, have been decreasing. PRS remains a significant issue and increasing concern in terms of the number of issues raised by consumers.
- 6.8 Not all issues raised by consumers give rise to a formal complaint. If a consumer has not raised their issue with a service provider ComReg advises the

⁶⁷ ComReg reports consumer line statistics on a quarterly basis. Available at: www.comreg.ie/publications/

consumer to lodge a formal complaint with the service provider and we log this as a query (and the contact is logged as such). However, if the complaint is not resolved within 10 working days the consumer may revert to ComReg and we can then raise the complaint with the service provider (and the status of the contact is changed from query to complaint on our internal system). Figure 9, below, shows the relative volumes of queries versus complaints.

Figure 8: Breakdown of Issues Logged (Queries/Complaints), 2011 - 2016⁶⁸

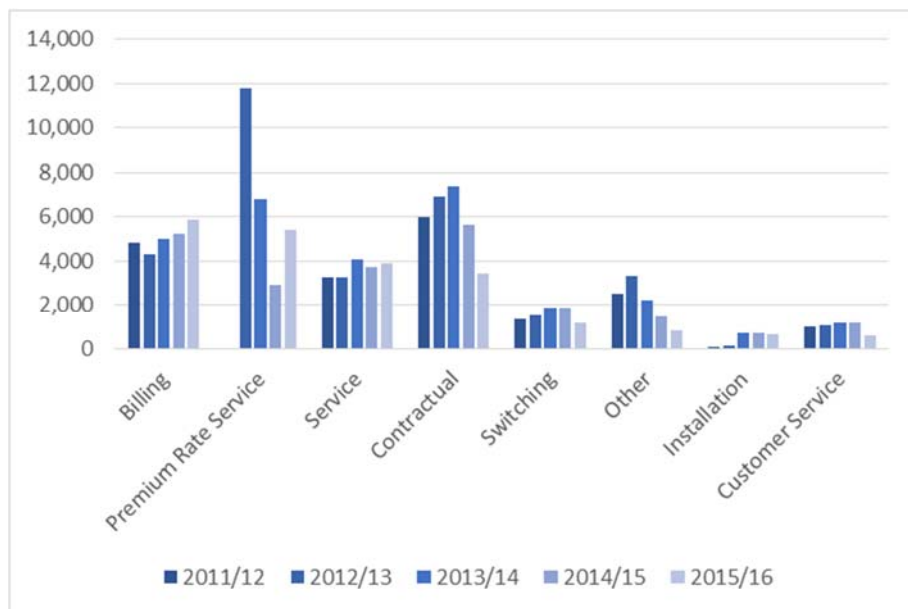
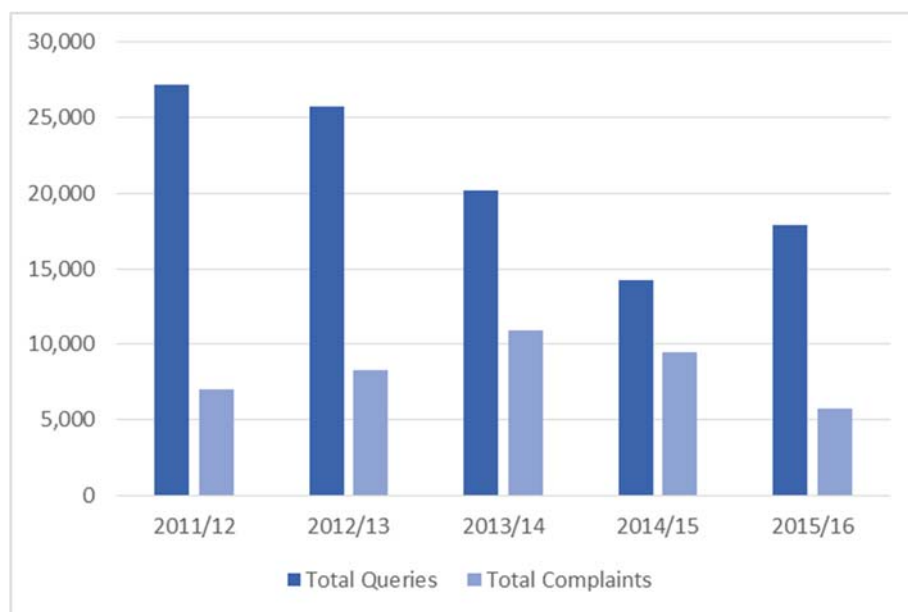


Figure 9: Queries/Complaints Total ECS and PRS combined, 2011 - 2016⁶⁹



⁶⁸ Source: ComReg.

⁶⁹ Source: ComReg.

The Consumer Journey

Preparing the consumer for the decision

6.9 Telecommunications products and services can be complex products. This complexity is increasing as, for example, services are bundled in new and varied ways. In this context, decision-making can be difficult for consumers meaning that markets may not function effectively. A compounding factor which ComReg recognises is that consumers do not always make “economically rational” decisions (see Explanatory Box 9) and choose the best quality product for the lowest price. In this context, it is our goal that **ComReg understands evolving consumer needs, preferences, behaviours and perceptions**. We believe this is essential if we are to know what influences consumer decision-making, and therefore make effective regulatory interventions. In this context, ComReg will continue to conduct regular consumer research. This work should complement the proposed market assessments discussed in the previous chapter (see the discussion in relation to Goal 1) as well as the independent research programmes at the ESRI that ComReg is involved in. However, ComReg also has more targeted and issue-specific ways of engaging with and understanding consumer needs, preferences, behaviours and perceptions.

Goal 8:

ComReg understands evolving consumer needs, preferences, behaviours and perceptions.

6.10 The principal ways that we gain insights into consumers’ preferences and experiences in respect of electronic communications which are evolving is through:

- **Research:** ComReg conducts regular market surveys to understand the changing preferences, behaviours and perceptions of consumers. We also conduct market surveys in the context of particular regulatory activities. Over the coming period ComReg intends to develop this work in the context of an overall data strategy (see Chapter 9).
- **Advisory panels:** ComReg host panels periodically to gain insights into consumer issues including issues for people with disabilities.
- **Queries and complaints data:** ComReg analyses this data received from consumers to get an insight into consumer trends and issues arising.

6.11 Imperfect information is a particularly pertinent issue with challenges, including, rapidly evolving technologies, complex pricing models including bundles and detailed legal contracts. Without adequate guidance or support, consumers could feel unable to make an informed choice, and may postpone making a decision, possibly indefinitely. Therefore, key to enabling the consumer to make informed choices is that **all consumers, including vulnerable users, have access to clear and adequate information that facilitates informed choice**. Often we can see products or services presented

Goal 9:

All consumers, including vulnerable users, have access to clear and adequate information that facilitates informed choice.

in ways that may not accurately represent or can mislead the consumer. We have the ability to set rules around the ways certain products and services are presented to the consumer. Having sufficient information in a form that is useful and comparable and accurately represents the product or service should help enable the consumer to make an informed decision.

Explanatory Box 9: Consumer Behaviour

Traditionally, consumers have been viewed as “rational economic” actors, who have full information about a particular transaction, interpret this information accurately and make the decision which will maximise their personal welfare. However, it has been increasingly recognised that consumers’ decision making processes are more complex than this. An increasing amount of work is being undertaken into the biases inherent in consumers’ behaviour that can yield suboptimal outcomes.

Research by the ESRI suggests that there are features specific to the telecommunication market that pose particular challenges to consumers in terms of decision making;

- ECS products or services are often complex by nature, a problem compounded by the fact that ECS services are often purchased with complementary technologies (e.g., handsets) and services (e.g. content). This decision making process is further complicated by the consumers’ uncertainty about future levels of usage.
- The value of the service is unrelated in many ways to the quality of the product or the provider, but is rather determined by the uses to which the user puts the technology
- The rate of technological change means purchase decisions are made without the consumer having tested the product.
- The availability of internet access on a range of devices means that consumers make multiple and varied decision on a daily basis about what content to consume and when. They have to predict this decision making at the point of purchase.

These market characteristics make it difficult for consumers to make rational decisions increasing the possibility of suboptimal results.

The possibility that persistent consumer biases may be yielding suboptimal outcomes may necessitate the development of appropriate remedies and may also undermine the effectiveness of current interventions. In particular, it has generally been implicitly believed that consumers can assimilate information accurately and that the provision of additional data facilitates more accurate decision making.

However, this assumption is undermined by the ESRI Price Lab research which found that consumers are unable to make good purchasing decisions when descriptions of products force them to think about too many things at once.⁷⁰ Once consumers have to weigh up more than two or three factors at the same time, they struggle to identify good deals. This is of particular interest in telecommunications as the increasingly complex nature of bundles will make it even more difficult for consumers to compare options.

The findings of the Price Lab study suggest that consumers can benefit if product ranges and descriptions are kept simple. The report also notes that independent price comparison sites which integrate information can help consumers struggling with the volume or complexity of product information; we currently have a price comparison tool on our website: www.comreg.ie/price-comparison/

Behavioural economics is an ongoing area of research which is providing insights into the nature and behaviour of consumers and will continue to inform us.

6.12 Related to this goal over the coming period, some of the work we are doing in relation to providing improved access to information, for the purposes of enabling consumers to make informed choices when products and offers are becoming more complicated, is as follows:

- **Website:** Our website is a key tool for engaging with consumers (as well as other stakeholders). In 2016, our website was entirely updated and consolidated and is now highly accessible on all devices, including screen

⁷⁰ Lunn, Pete et al, 2016, PRICE Lab: An Investigation of Consumers’ Capabilities with Complex Products, ESRI.

readers and other resources for those with accessibility requirements. Our website hosts a price comparison tool to facilitate decision-making by consumer and other end-users (<https://www.comreg.ie/price-comparison/>).

- **Price comparison:** During 2017, ComReg intends to introduce a new price comparison tool that encompasses the following:
 - The triple and quad play bundles in the market
 - Transparency with respect to the cost of terminal equipment, in particular, upfront costs when entering into a contract for a communications service, and
 - More accurate estimation of usage for example by offering the ability to download an app on your smartphone and/or upload a bill.
- **Publishing of Consumer Line Statistics:** In Q3 2015, ComReg commenced publishing quarterly statistics in respect of issues raised by consumers who contacted the consumer line. These publications assist consumers in understating the kinds of issues being experienced. ComReg plans to provide further granularity in these reports in the future.
- **Code of Practice for Complaint Handling:** ComReg is currently consulting on setting minimum requirements for service providers' codes of practice for complaint handling. ComReg is planning to subsequently initiate an awareness campaign so that consumers are better informed in relation to codes of practice and the process involved in seeking redress.
- **Net Neutrality:** New Net Neutrality legislation⁷¹ has transparency requirements in respect of contracts (including in relation to speeds) and we will be ensuring that these requirements are met by service providers (see Explanatory Box 10 for a discussion of Net Neutrality and the related concept of "zero-rating").

⁷¹ 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 ("the Net Neutrality Regulations").

Explanatory Box 10: Net Neutrality and Zero-rating

Net neutrality

Net neutrality is the concept that all classes of traffic should be treated equally. That is, an ISP should not block or restrict access to particular type(s) or class(es) of traffic based on where they come from. For example, an ISP should not be able to block or restrict Netflix traffic in favour of traffic from Amazon Prime. Neither should an ISP be able to prevent a user from visiting a particular website or using a particular service.

Net neutrality is seen as a founding principle of the internet. Net neutrality allows new applications and services to be developed and delivered over the internet while competing on their merits as a service without restriction.

Net Neutrality Regulations⁷² have been adopted which prohibit ISPs from blocking or slowing down of internet traffic except where necessary.

Zero-rating has come into focus with these regulations as zero-rating can be viewed as a form of discrimination based on who is sending or receiving the traffic. The regulations allow for zero-rating in certain circumstances.

Zero-rating

'Zero-rating' is when an internet service provider (ISP) applies a price of zero to the data traffic associated with a particular application or class of applications (and the data does not count towards any data cap in place on the internet access service). For example, an ISP may not charge a user for the data used to access a specific music streaming application or all music streaming applications.

Zero-rating is more prevalent for mobile offerings and can offer the consumer benefits in allowing them to consume certain types of data (video, music, social media) without eating into their data allowance or incurring excess data charges.

While zero-rating may offer some benefits for consumers there have been concerns around raised in relation to the practice on competition and net neutrality grounds. From a competition point of view, the concern is that the practice of zero-rating may enable network operators to pick winners by tilting the playing field in favour of particular OTT service providers. A zero-rated OTT service provider would have an advantage over rivals whose end-users would have to pay data charges to use.

6.13 As discussed previously, there appears to be a trend of growing dissatisfaction among end-users with the quality of coverage in certain geographic areas. Indeed, mobile coverage is an issue of national importance as highlighted by its inclusion as a priority in the programme for Government, and the formation of a Mobile Phone and Broadband Taskforce. For its part, ComReg has initiated a work stream to better understand the factors affecting the mobile consumer experience. Over the coming period we intend to:

- **Handset Testing:** ComReg intends to provide information on handset sensitivity due to antenna performance and network coverage, allowing consumers to make informed choices about the level of signal they can expect from different handsets.
- **Consumer Perceptions:** Undertake market research aimed at developing a better understanding of consumers' experience of mobile coverage.
- **Coverage Information:** ComReg intends to generate and publish online a composite national coverage map, which will help consumers choose the network provider that best meets their needs for where they live and work. The aim is to publish the map in 2018.

⁷² Ibid.

Accessing and using products and services

6.14 Empowered with clear and adequate information, the next phase of the customer journey, involves the decision to purchase, access and use products and services. In this context, it is ComReg's goal that **Consumer rights throughout their journey are upheld by their service providers.**

Goal 10:

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

6.15 The basic consumer protection measures are the universal service, access to emergency calling services and measures to ensure equivalence in access and choice for disabled end-users. Universal service is the provision of a defined minimum set of services to all end-users at an appropriate quality and an affordable price. The universal service which assures reasonable access to an electronic communications network and currently primarily a voice service at a fixed location⁷³ is a safety net ensuring that all Irish citizens have access to basic electronic communications services (see Explanatory Box 11 for more discussion).

6.16 In addition to these basic rights, consumers also enjoy protections in relation to:

- Purchasing and providing consent
- Switching
- The contract
- Using the service
- The bill, and
- Complaint redress.

6.17 The switching process for consumers can be difficult, in particular, during migration to new advanced networks, as the consumer has to deal with both the provider they are leaving and the provider they are moving to. When switching, terms in a consumer's existing contract can mean that, if within the minimum term or if there has not been a contract change, a consumer may need to give a notice period. Further, time to switch between services can lead to a person being without any service for a period of time. This process can become even more difficult when we look at bundled services which include non-ECS services.

⁷³ There are also obligations in place in respect of payphones and printed directories.

Explanatory Box 11: Essential and Basic Services

The purpose of Universal Service is to ensure that basic fixed line telephone services are available at an affordable price. The scope of universal service is defined by the 2002 EU Directive which was implemented in Ireland by the European Communities (Electronic Communications Networks and Services) (Universal Service and User's Rights) Regulations 2003 – S.I. No.308 of 2003 (as amended).

Universal Service Obligations (USO)

Eircom is the current designated 'Universal Service Provider' (USP) and has a number of obligations regarding the provision of certain services.

- Provision of a telephone line: Eircom must meet every 'reasonable' request for a phone line. 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.
- Provision of public payphones: Eircom must provide payphones throughout the State to meet the reasonable needs of end-users in terms of geographical coverage, accessibility and the quality of services. Payphones that are covered under the USO are those available on the street and in other public areas available to the public at all times.
- Provision of directory services: Eircom must provide consumers with a printed phone book, free of charge. This may be provided by Eircom on an opt-in basis. Every user has the right, through their service provider, to an entry in the telephone directory.
- Retail price cap: The existing price cap was imposed on Eircom from October 2007 and provides a safeguard on PSTN and ISDN BR 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.

In addition to the Universal Service, consumers are also entitled to access emergency call answering services. All providers of publicly available telecommunication services must provide free access to emergency services.

- 6.18 Once a consumer has initiated the switching process, the contract needs to set out clearly the service offerings associated with the price plan. Contracts will often contain a level of detail on the terms and conditions of the service which the customer may claim to be unaware of when they decided to purchase the product or service. There is a requirement in law that sets out the minimum information that Service Providers must communicate to consumers in a contract.
- 6.19 Consumers need to be treated fairly in accordance with their consumer rights also during any migration period. Importantly, end-users must be notified of any changes to the contractual terms and conditions that would apply to any new or replacement services. Consumers must give informed consent to any new contracts, as relevant.
- 6.20 While it is important that contracts fairly represent the product or service, it is just as important that consumers have appropriate rights when the product or service does not meet expectations. For example, a mobile service may not meet a consumer's expectations if the consumer did not have accurate information about coverage at the locations where they live, work and travel. In this context, ComReg recognises that it is much easier for consumers to enter a contract than it is to exit when expectations are not being met. ComReg welcomes initiatives such as one mobile operator's offer of a no-quibble option to cancel contracts and return handsets within 30 days in order to give consumers a chance to experience the service before they commit. On the other hand, contract provisions such as long notice periods as mentioned above can have the effect of preventing consumers exercising their choice which can

dampen the competitive dynamic in the industry.

6.21 Another component of the consumer experience concerns the bill. The bill that a consumer receives should accurately represent the products and services that the consumer agreed to contract for and purchase. Often, a consumer can be billed for services that they are not receiving, or the bill includes other charges that they were unaware of at the time of entering the contract or even incorrect charges, or the consumer faces usage charges, for example, for calls to certain non-geographic numbers, where there is poor tariff transparency.

6.22 In relation to his goal, ComReg will undertake the following:

- **Monitoring compliance:** ComReg will continue to monitor compliance of service providers with obligations including in relation to access to emergency services, universal service, number portability, switching, contracts, billing, net neutrality and roaming.
- **Non-geographic numbering:** ComReg will complete its review of non-geographic numbers in 2017, to ensure reasonable prices for both consumers and businesses and also to ensure that pricing is clear to callers. This may require a supporting consumer information campaign into 2018 and other tariff transparency measures.
- **Net-neutrality monitoring:** In light of the new requirements on service providers in respect of net neutrality, ComReg is implementing a monitoring and compliance programme in respect of elements including traffic management practices and consumer contracts, in accordance with our powers.
- **Roaming:** ComReg will continue to monitor compliance of mobile service providers with the implementation of the amended Roaming Regulations.⁷⁴

Consumer Complaints and Redress

6.23 As just discussed, the consumer journey has a number of steps and throughout this process there is potential for consumers and providers to disagree on:

- Whether the customer agreed to purchase a service⁷⁵
- What was agreed, or
- The quality of the product or services that has been provided, and/or
- How much they are being charged.

Goal 11:

Consumers have effective redress mechanisms.

6.24 For consumers to have confidence in the process they need to have a resolution process that addresses the power differential between that of a large operator and them as an individual. In this context it is ComReg's goal that **consumers**

⁷⁴ 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.

⁷⁵ This is a particular issue in respect of PRS.

have effective redress mechanisms. In all instances the consumer must raise the matter with their Service Provider in advance of contacting ComReg. All ECS Providers are obliged in law to have a Code of Practice for complaints handling in order to communicate how they deal with disputes and what steps a consumer must follow. If the consumer has not had their complaint resolved within 10 days they can then contact ComReg. ComReg offers a service to consumers who can contact the consumer line by phone, email and text.

6.25 In this context, ComReg over the coming period will be pursuing the following:

- **Complaints:** ComReg is obliged to ensure that complaints and redress procedures for end-users of Electronic Communications Providers, as outlined in Regulation 27 of the Users' Rights Regulations are implemented. ComReg is aware that some codes of practice fall short of ComReg's view of appropriate minimum standards. ComReg is currently seeking to improve the minimum standards in codes of practice for complaints handling and bring about change which will standardise commitments, for example response times, across all Electronic Communications Providers, as well as encouraging a more systematic approach to the requirements of codes of practice in general.
- **Alternative Dispute Resolution (ADR):** We consider ComReg best placed to deal with ECS and PRS disputes. In 2015 there was new law introduced in respect of alternative dispute resolution for consumer disputes (S.I. No 343 of 2015). In 2017, we will consult ComReg's complaint handling process and this will encompass relevant ADR aspects.

Communication and Engagement

6.26 We engage with end-users in a variety of ways. These include direct contact with individual end-users by phone and email, the provision of information through 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 surveys. We keep the mix of engagement channels under review to ensure continuing effectiveness.

Goal 12:

ComReg is an effective advocate for consumers.

6.27 In order to promote the interests of end-users, we can look both to our own regulatory powers and to the possibility of using our influence with other regulatory bodies and with industry. We aim to be an **effective advocate for consumers**. For instance, in the past, we have worked with the Advertising Standards Authority of Ireland to assist them to set rules relating to claims made by telecom service providers. We have also worked with the industry to influence them to voluntarily provide certain services, including services for people with disabilities.

7. Creating the Conditions for Investment

- 7.1 As previously discussed, central to ComReg’s view of regulation is the principle that well-functioning markets deliver optimal outcomes in terms of prices, quality, choice and innovation. This principle extends to the level of investment made by operators. That is, well-functioning markets drive commercial incentives which can be relied on to ensure that private operators capitalise on technological advances and make the investments necessary to bring innovative products and services to market, and generally improve service quality.
- 7.2 However, ComReg recognises that unregulated electronic communications markets may not function well enough to provide the right incentives for investment. In addition, even the best regulated markets may not deliver outcomes which are optimal or adequate. In particular, market-based incentives alone may not lead operators in electronic communications markets to make the investments necessary to deliver services to non-economic end-users.

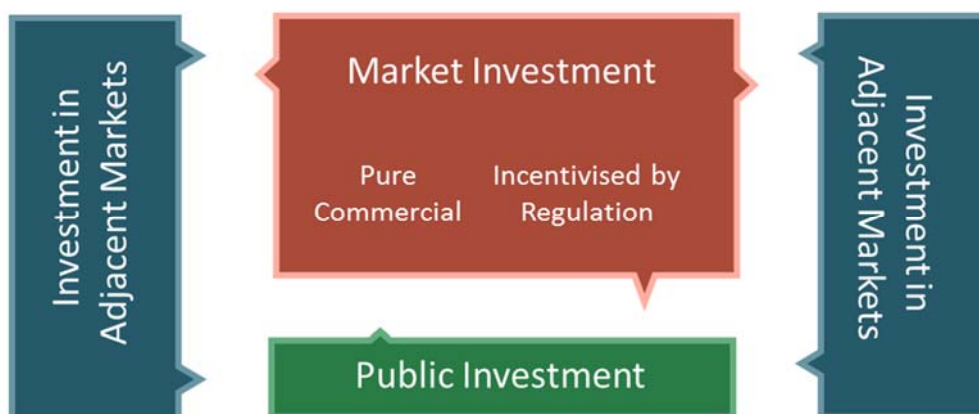
Strategic Intent 3:	Efficient investment has enabled affordable, high-quality and widespread access to communications services and applications
What does this look like?	<ul style="list-style-type: none"> • Infrastructure coverage that enables all end-users to participate in the digital society • Competing infrastructure providers where economically feasible • Wholesale ECS services that meet market demand • A sector that is attractive to investors

- 7.3 This chapter sets out ComReg’s strategic goals associated with creating the conditions for investment with the high-level strategic intention of ensuring that efficient investment has enabled affordable, high-quality and widespread access to communications services and applications. ComReg recognises that, at a fundamental level, creating the conditions for investment is as much about regulatory certainty as it is about shaping operator incentives.
- 7.4 In one sense, all investment made in electronic communications markets is affected by ComReg’s presence, but the impact of our presence varies. It is useful to distinguish the different settings in which investment occurs (see Figure 10):
- **Commercial investment:** There is investment that is purely commercial in nature. ComReg’s principal role in this context is to facilitate investment by fostering regulatory certainty, lowering barriers to entry and ensuring the availability of the necessary inputs as much as possible. This can involve mandating the supply of wholesale inputs under the SMP regime, setting prices that allow an adequate return on investment, effectively managing the radio spectrum and good administration of the national numbering resource.

- **Incentivised investment:** Some investment occurs as a direct result of market intervention by ComReg. For example, all publicly accessible telephone service providers are required to invest to ensure uninterrupted access to the emergency call answering service.
- **State intervention:** Some investment that occurs in the context of a direct intervention by the State in the marketplace, e.g., the National Broadband Plan. While such investment may in practice involve a private dimension, it would not occur without direct financial involvement by a public body. Even though ComReg is not directly involved in such situations, it still has a role to play in advising and supporting the State so that interventions support the effective functioning of the market.

7.5 Finally there is investment that occurs, not directly in electronic communications markets, but in related markets. The manner in which ComReg undertakes its role in respect to electronic communications markets may affect incentives to invest in certain related markets and vice versa.

Figure 10: Areas of Investment



The Pattern of Private Sector Investment

- 7.6 Private investment in the electronic communications sector increased over the period 2009 to 2015, as shown in Figure 11. Over this seven year period, total investment amounted to €3.79 billion. The peak in 2012 corresponds to ComReg's Multi-Band Spectrum Award. During that year, €482 million of the total investment of €804 million was attributable to radio spectrum.
- 7.7 Figure 12 shows the trend from 2009 to 2014 in investment as a percentage of overall industry revenue, for Ireland and the EU 27 average. In 2014, €37.1 billion was invested in the EU's electronic communications infrastructure, including €566 million invested in Ireland. This equates to 14.8% of total revenue in the Irish electronic communications sector in that year, which exceeds the EU average of 12.4% for that year. It is noticeable that investment as a proportion of total revenue has exceeded the EU average since 2012, likely reflecting positive economic sentiment associated with the recovery of the Irish

economy.⁷⁶

Figure 11: Investment in ECS/ECN (Ireland, € million)⁷⁷

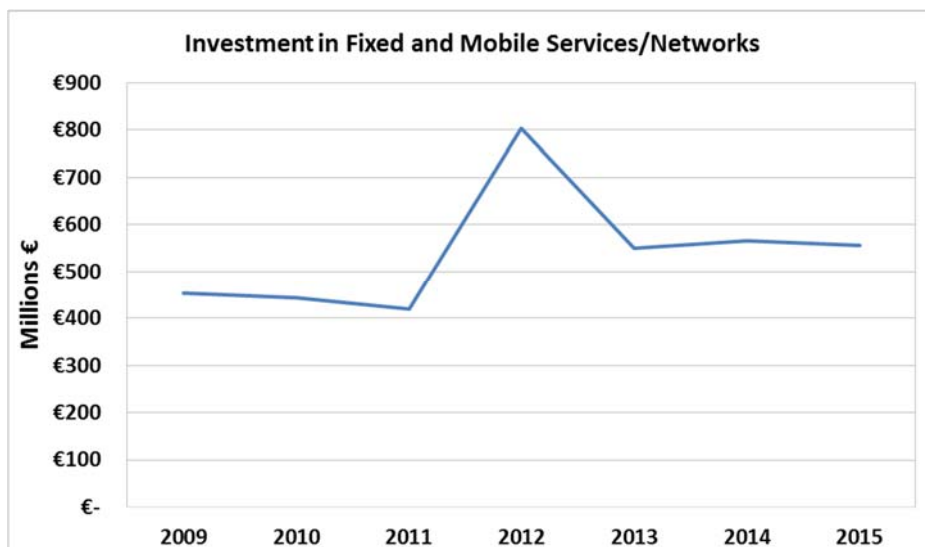
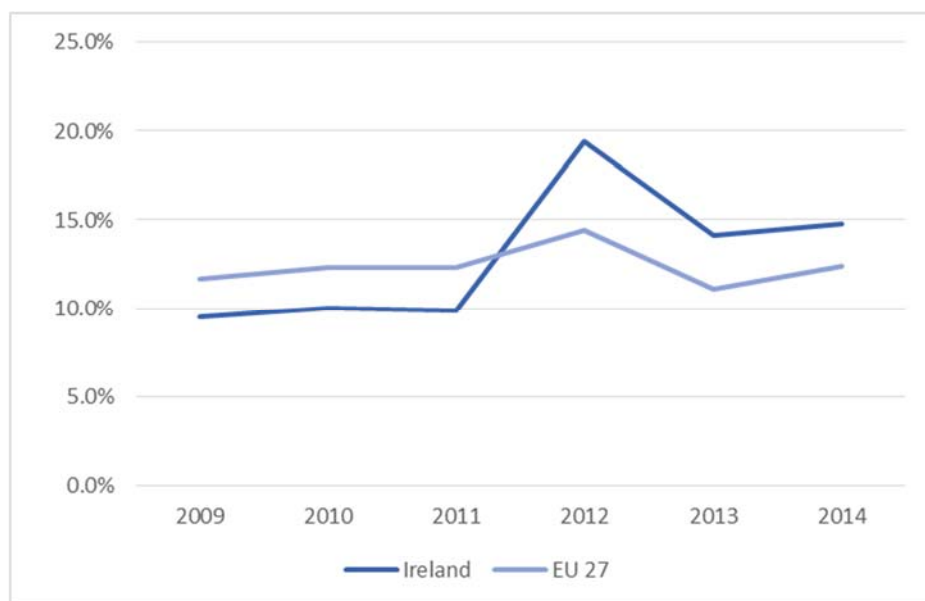


Figure 12: Investment in ECS/ECN (Ireland/EU average as % of turnover)⁷⁸



7.8 Operators have invested in both fixed and mobile networks. In fixed networks we have seen Eircom upgrading its copper network to allow for the delivery of NGA services⁷⁹, Virgin Media has upgraded its network to DOCIS 3.0 and SIRO has begun rolling out its FTTH network making use of existing ESB infrastructure. Over the period 2011 to 2016, there has been a marked increase in download speeds driven by the rollout of VDSL, cable and fibre technologies (see Figure 3, Chapter 3, for the number of NGA and CGA subscriptions

⁷⁶ European Commission, Digital Agenda Scoreboard Key Indicators.

⁷⁷ ComReg Quarterly Key Data Report.

⁷⁸ European Commission, Digital Agenda Scoreboard Key Indicators.

⁷⁹ Services that provide a download speed of greater than 24 Mbit/s.

between 2010 and 2016). By the end of 2016, 70% of addresses in Ireland had access to a high speed broadband service (30Mbps or greater).

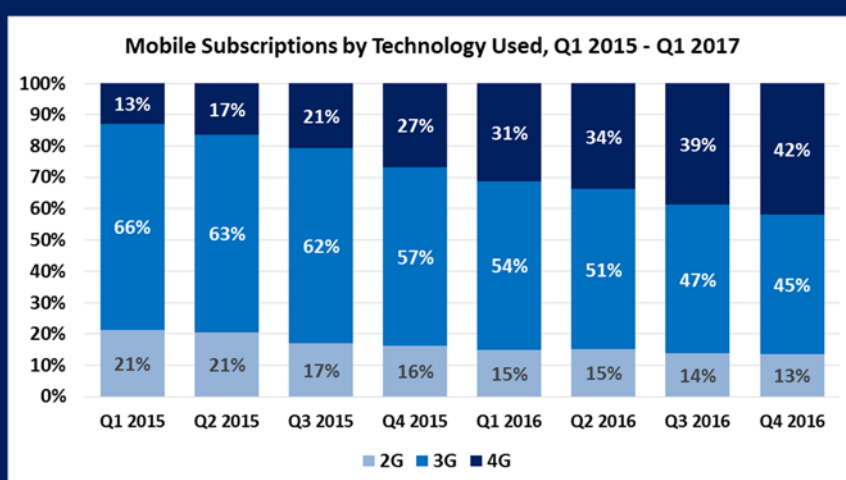
Explanatory Box 12: The 2012 Multi-Band Spectrum Auction

In 2012, ComReg completed the Multi-Band Spectrum Award (MBSA) process to release 140 MHz of paired spectrum in the 800 MHz, 900 MHz and 1800 MHz bands.

The MBSA successfully assigned all the long term spectrum rights of use in each of these bands to 2030, with an additional 150 MHz being assigned, almost doubling the amount of paired spectrum assigned (particularly in the sub 1 GHz bands) and thereby facilitating the subsequent provision of new and improved services to consumers.

The MBSA auction allowed mobile operators to expand 3G coverage and rollout new 4G services. These rollout figures are reflected in the graph below which shows a strong increase in 4G subscriptions through late 2014 to the end of 2016.

It should be noted that while older technologies such as 2G and 3G will likely get phased out over the longer term, 4G is not a replacement technology, in the sense that 4G subscriptions includes access to 3G and 2G, and 3G includes access to 2G.



(Source: ComReg Quarterly Key Data Report)

7.9 With respect to mobile networks, whilst MNOs do not have an obligation to provide ubiquitous coverage or to provide services to every premises:

- All MNOs claim nationwide outdoor population coverage for the existing 2G services (i.e. voice and text)
- 3G outdoor coverage is generally available for more than 90-95% of the population⁸⁰, and
- With respect to 4G, Vodafone⁸¹ claims over 90% population coverage in every county of Ireland, Eircom⁸² claims 95% population coverage and Three⁸³ is investing €300m in upgrading its network.

7.10 While the rollout of 4G services is still ongoing in Ireland, it is ahead of those in

⁸⁰ For example, Meteor claims nationwide 3G coverage with 99% population coverage network including dual carrier HSPA+ for 80% population. Second Quarter and Six Months Results Announcement to 31 December 2016, 27 January 2017

⁸¹ See www.vodafone.ie/network/ (30 March 2017).

⁸² Second Quarter and Six Months Results Announcement to 31 December 2016, 27 January 2017

⁸³ <http://www.three.ie/explore/about-three/> (30 March 2017)

other EU Member States at 93.7% of households compared to 84.4% in 2016.⁸⁴ This early rollout was in part enabled by our 2012 Multi-Band Spectrum Auction, which doubled the amount of spectrum available for mobile services operating below 2 GHz (see Explanatory Box 12). This paved the way for operators to launch new and advanced services.

Facilitating Commercial Investment

Access to Markets: The SMP Framework

7.11 Electronic communications markets which are effectively competitive deliver optimal outcomes in terms of prices, quality, choice and innovation. As discussed, this principle extends to the level of investment made by operators in the sense that competitive incentives should drive operators to make the requisite investments necessary to bring innovative products and services to market, and generally improve service quality. This

Goal 13:

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

motivates ComReg's first strategic goal relating to investment which is that **competitive incentives facilitate efficient commercial investment in infrastructure and services to the widest extent possible**. This means that when regulating, ComReg will employ measures aimed at driving, and safeguarding, the competitive market process as the best and principal means of ensuring that operators invest: the greater the scope for driving competition, the greater will be the extent of commercial investment made by private operators.

7.12 As discussed in Chapter 5, ComReg may impose obligations on SMP operators relating to cost recovery and price controls, including obligations for cost orientation, in relation to specific interconnection and/or access products. In such situations, the lack of effective competition means that the operator concerned may:

- Have incentives to sustain prices at an excessively high level, or
- Have incentives to apply a price squeeze, to the detriment of end-users.

7.13 In line with the regulatory framework, ComReg recognises that it is appropriate that **regulation allows for a reasonable rate of return, including for both wholesale and retail operators**. In particular, the method of cost recovery should be appropriate to the circumstances taking account of the need to promote efficiency and effective competition and maximise consumer benefits

Goal 14:

Regulation allows for a reasonable rate of return, including for both wholesale and retail operators.

7.14 In the context of these two goals relating to market access:

⁸⁴ The EU Digital Economy and Society Index (DESI) for 2016, DESI Components, Indicator 1b2 4G coverage

- **Access and related remedies in markets where Significant Market Power (SMP) is found:** ComReg will also encourage investments by other authorised 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, taking into account any risks specific to a particular new investment network project. As discussed in Chapter 5, ComReg will revise relevant access obligations as appropriate.

Access to Essential Inputs: Spectrum

7.15 It is ComReg's goal that **the management of spectrum facilitates efficient investment.**

Goal 15:

The management of spectrum and numbers facilitates efficient investment.

- 7.16 With respect to the management of radio spectrum, there are international and domestic considerations. The international harmonisation process for radio spectrum is a key driver of investment in the sector as it facilitates economies of scale in the manufacture of radio equipment (which lowers both the cost of deploying wireless networks and the cost of wireless devices for consumers). Importantly, from an investment perspective, the international harmonisation process is a key factor determining the technology roadmaps adopted by suppliers of radio equipment, many of whom are global in nature.
- 7.17 International harmonisation for radio spectrum involves many aspects such as 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 ITU, EC, RSPG and CEPT. Harmonisation activities focus on advancing the use of radio spectrum, e.g., via technologies such as 5G⁸⁵, and ComReg, together with the Department of Communications, Climate Action and Environment (DCCAE), 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.
- 7.18 At domestic level, participation in the international harmonisation process assists ComReg in actively taking into account and acting upon relevant developments in a timely manner in the exercise of its spectrum management functions in Ireland. At a practical level, investment in radio spectrum is incentivised via the actions ComReg takes to assign spectrum, as discussed in Chapter 4 above, and the conditions attached to spectrum rights of use. In this regard:

⁸⁵ There is currently extensive work under way in the International Telecommunications Union (the ITU), the Conference of European Post and Telecommunications Administrations (CEPT), the European Commission including the Radio Spectrum Policy Group and the Radio Spectrum Committee to (i) define the standards for 5G and (ii) ensure a harmonisation framework is in place to facilitate the rollout of 5G services in 2020.

- ComReg where appropriate, favours and promotes the application of technology- and service-neutrality in line with the relevant harmonisation measures, and
- ComReg is cognisant that collaboration, such as the sharing of network infrastructure and/or the sharing of spectrum between two or more wireless operators in the provision of wireless/mobile service can incentivise investment.⁸⁶

7.19 Over the coming period, related to this goal ComReg intends:

- **5G Technology:** ComReg will develop and promote Ireland's position in relation to the spectrum management aspects of 5G technology and its candidate bands as it evolves.
- **Licence Conditions:** For future spectrum awards, such as that for the 700 MHz band, ComReg will consider the role that could be played by licence conditions (including coverage conditions) in promoting investment, either directly or by enhancing competitive incentives to invest.
- **Regulatory Certainty:** ComReg publishes information on current licensing, usage, its spectrum priorities and future plans. Subject to the protection of confidential information in line with ComReg's guidelines (as set out in Document 05/24), ComReg publishes information on existing licencees' spectrum assignments and usage because, among other things, this can increase the efficient use of spectrum by better informing consumers and other interested parties (such as actual and potential spectrum users). As is our practice, ComReg will continue to publish its forward-looking strategy for managing the radio spectrum, which among other things sets out ComReg's envisaged spectrum actions. ComReg's most recent two year statement was published in June 2016.⁸⁷
- **Test and Trial:** Continue to promote Test and Trial Ireland and the benefits of using Ireland as a location to test or trial wireless products and services in a real world environment.

Regulatory Incentives

Universal Service Obligations

7.20 The Universal Service Regime allows for ComReg to intervene if universal services are not being delivered by the market. It is ComReg's goal, as necessary, and maintaining the principle of technological neutrality, to **implement a USO to ensure that basic services are delivered, as appropriate.** In the current context of the transition to new networks, ComReg

Goal 16:

Implement a USO to ensure that basic services are delivered, as appropriate.

⁸⁶ ComReg is also aware that the benefits and drawbacks of any particular collaboration will depend on the specifics and context of the arrangement. While, ComReg does not hold a firm view on spectrum rights sharing (or pooling) or network sharing, ComReg would look more favourably on agreements that would not unduly restrict competition and would deliver demonstrable benefits that are shared with end-users.

⁸⁷ See: www.comreg.ie/publication/radio-spectrum-management-strategy-statement-2016-2018-design/

is cognisant of the need to avoid unnecessary investment in legacy networks.

- 7.21 The Universal Service Directive and the Regulations place primary responsibility on ComReg, as the independent electronic communications regulator for Ireland, to safeguard and ensure the provision of a minimum set of telecommunications services in the State. ComReg may designate an undertaking, or undertakings, to satisfy any reasonable request to provide, at a fixed location, a connection to the public communications network and a publicly available telephone service over the network connection that allows for originating and receiving of national and international calls. The connection must be capable of supporting voice, facsimile and data communications at data rates that are sufficient to permit functional internet access. These requirements are referred collectively as access at a fixed location (AFL USO).
- 7.22 In July 2016, Eircom was designated as the Universal Service Provider (USP) for the period 29 July 2016 – 30 June 2021⁸⁸ meaning that Eircom must satisfy any reasonable end-user request for AFL USO. ComReg has modified the definition of “reasonable access request” and introduced new reasonable access thresholds (which take account of the presence of Alternative Infrastructures). The Decision is intended to lessen Eircom’s obligations as the USP to satisfy end-user requests for AFL USO in those parts of the State where there is alternative infrastructure/service providers.
- 7.23 The Decision supports a transition by the USP, as relevant, to being the provider of last resort. During the transition period when alternative networks are being deployed, ComReg’s objective is to ensure that reasonable requests for access at a fixed location are met, but without requiring unnecessary investment in the USP’s legacy copper network and without inhibiting the retirement of that network, once an alternative is available.
- 7.24 In the context of this goal, over the coming period, ComReg intends to:
- **USO Net Cost:** The provision of a universal service may result in the USP(s) providing designated services at a net cost. The European Communities (Electronic Communications Networks and Services) (Universal Service and Users’ Rights) Regulations 2011 (“the Universal Service Regulations”) allow a USP to seek funding for the net costs of meeting the universal service obligation (“USO”). On 31 May 2011, ComReg issued Decision No. D04/11 in relation to the principles and methodologies to be used in calculating the net cost for the provision of the universal service by the USP. The Decision sets out how the net cost, for all USOs, will be calculated and how the existence of an unfair burden will be determined. If ComReg finds that a net cost is an unfair burden, the requirement for a sharing mechanism is triggered and any net cost is apportioned among providers of electronic communications networks and services. We received applications from Eircom, for funding for the provision of the universal service for relevant the periods since commencing 2009-2010. We have determined that for 2009-2010 the net cost did not

⁸⁸ “Universal Service Requirements Provision of access at a fixed location (AFL USO)” Response to Consultation and Decision, published on 29 July 2016, Reference Number: 16/65. Decision Number: D05/16 (“the Decision”).

represent an unfair burden on Eircom. In Q2 2017, we will be consulting on our preliminary views regarding our assessment of a number of Eircom's applications. Accordingly, for each of these applications, we will verify if there is a net cost, what it is, and determine whether or not it is an unfair burden on Eircom. If an unfair burden is found we will complete the necessary work to establish an industry universal service sharing mechanism.

- **Review AFL USO:** Electronic communications markets are likely to change significantly as a result of the NBP. ComReg does not anticipate that this will be fully implemented before the end of the AFL USO 5 year designation period, and we anticipate that the full effect will not be realised during the current designation period. We will, however, carefully monitor and review these developments in order to evaluate what impact it may have on the provision of basic electronic communications services in the State. The most immediately foreseeable event is the NBP contract award. Accordingly, we will begin a review 3 months after the DCCAE has concluded the NBP contract award process. On foot of this review, we will decide if we need to commence a new consultation process in relation to AFL USO in the State and we will publish an information notice regarding this.
- **High-speed Broadband:** High-speed broadband is not currently a mandatory component of the USO under national and EU law. In the context of the NBP, we have decided not to use USO Functional Internet Access (FIA) requirements as a mechanism to guarantee access to broadband connections, at this time. However, we foresee that USO requirements might play a role in ensuring universal availability of affordable higher-speed broadband outside the NBP intervention area in the future. The DCCAE is monitoring the commercial rollout plans of operators to ensure that services are delivered in line with commitments made by operators. In the meantime, we are continuing to collect and analyse information about usage patterns and planned and actual commercial broadband deployments. It is anticipated that as new networks are rolled out, either commercially or as a result of the NBP, general access to broadband will increase and the minimum data rate specified under USO will be far exceeded. We will re-examine the issue of fast broadband FIA requirements and whether to designate one or more USPs to deliver them.

Mobile Coverage

- 7.25 It is ComReg's goal that **mobile coverage obligations are used to promote investment where proportionate**. Mobile coverage is an issue of national importance as highlighted by its inclusion as a priority in the Programme for Government, and the formation of a mobile phone and broadband taskforce, whose objective it is to provide immediate solutions to the broadband/phone coverage deficit, and to investigate how to provide better services for consumers including better use of State assets.

Goal 17:

Mobile coverage obligations are used to promote investment where proportionate.

- 7.26 Despite the improvements in the rollout of 3G and 4G mobile services in Ireland, there is a perception that the mobile retail consumer experience has deteriorated. In its Radio Spectrum Management Strategy, ComReg observes that there may be many factors contributing to this experience and that there are various means of addressing this matter. As discussed in Chapter 6 ComReg has initiated a work stream to better understand these factors.
- 7.27 As noted previously, mobile coverage in Ireland, which has exceeded well over 90% of the population (as distinct from geography) for 2G and 3G for many years, and where 4G services are circa the 90% population level, is essentially a product of competitive forces which have promoted service deployment via innovation and investment.
- 7.28 ComReg recognises that competitive forces, left to their own devices, will deliver services to a certain level and quality. However coverage beyond this level towards ubiquitous coverage is unlikely to be provided due to the uncommercial nature of network rollout in some geographic areas. Further, Ireland's geographic and demographic characteristics present challenges for network rollout, particularly into sparsely populated rural areas.⁸⁹
- 7.29 If society is demanding a more extensive coverage of services than can realistically be provided through commercial means, then ComReg observes that there are certain regulatory tools available that could be used to incentivise infrastructure rollout into areas currently considered uncommercial. However, incentivising or requiring coverage in areas currently considered uncommercial will require the deployment of infrastructure and costs will be incurred, and this requires careful consideration.
- 7.30 The aim of such tools would be to fill any gap between societal demands and commercial viability in respect of wireless coverage. The regulatory tools potentially available to ComReg primarily relate to the spectrum rights of use for future awards. In the coming period, ComReg will:
- **Coverage and rollout obligations:** ComReg will consider the use of coverage and/or rollout obligations to ensure the efficient use of radio spectrum, and to promote the interests of end-users generally. In this regard, ComReg observes that the propagation characteristics of the 700 MHz band are favourable to wide area coverage, and that the use of coverage and/or a targeted coverage and rollout obligation to enhance coverage may be appropriate for this spectrum band, and
 - **Collaboration mechanisms:** ComReg will also examine the use of licence obligations to promote cost-effective collaboration mechanisms (such as site/infrastructure sharing) to facilitate infrastructure deployment to the benefit of end-users.
- 7.31 Finally, it should be noted that the consideration of such obligations and the

⁸⁹ Ireland has a low population density of 67 persons per Km² compared to an EU average of 117 persons per Km². Further, Ireland has a high percentage of rural areas with a rural population density of 26 persons per Km². Rural areas account for 96.8% of total land area compared to 87.6% for all EU areas. The urban population (comprising 62 per cent of the total population) reside on just 2.4 per cent of the total land area. Including smaller rural towns and villages increases the population to 69.1% of the population living on just 3.1 % of the land area. In addition, 76% of land area is covered by farmlands and forest, with Ireland having the largest farmland utilisation in the EU. (Urban Area refers to towns with a total population of 1,500 or more. Rural Area refers to the population outside of Urban areas and includes the population of towns with a population of less than 1,500 persons.)

appropriate assignment mechanisms is a matter that needs to be determined on a case by case basis for each award in light of the particular facts and circumstances arising in relation to the spectrum award.

Network Resilience, Reliability and Security (NRRS)

7.32 As a society, our economic and social activities are growing increasingly dependent on the proper functioning of electronic communications systems. However, such systems are vulnerable to equipment malfunction, human error, malicious attack, weather events and incidents in other sectors (e.g. electricity outages). Accordingly, network resilience, reliability and security (NRRS) is an area that is becoming more important.

7.33 There are many aspects to NRRS which do not fall within ComReg's remit. Such aspects include data privacy and the protection of IT systems from cyber-attack. A variety of public bodies currently have a role in NRRS (see Explanatory Box 13).

Explanatory Box 13: Multi-agency Involvement in NRRS

A range of agencies beyond ComReg have responsibility in relation to network resilience, reliability and security. The relevant stakeholders 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. Details of the current agencies are below:

ComReg

- Receives reports from operators on network failures above a certain threshold
- Reports severe incidents to European Union Agency for Network and Information Security

European Union Agency for Network and Information (ENISA)

- Provides supports to the EU and the Member States in enhancing and strengthening their capability and preparedness to prevent, detect and respond to network and information security problems and incidents

Department of Communications, Climate Action and Environment (DCCA)

- Operate as lead Government Department for emergency situations relating to ICT
- Runs the National Cyber Security Centre (NCSC), which contains the Computer Security Incident Response Team. This is focused initially on the State sector and also acts as a national point of contact.
- Carries out emergency response planning with Gardaí, HSE and Local Authorities
- Published National Cyber Security Strategy identifies Critical Network Infrastructure and Critical Information Infrastructure as key components requiring ongoing protection.

Office of the Data Protection Commissioner (ODPC)

- The ODPC is responsible for upholding the rights of individuals as set out in the Acts, and enforcing the obligations upon data controllers

Gardaí

- Criminal Investigation through Garda Bureau of Fraud Investigation

Defence Forces

- Secures its own network and cooperates with NCSC in learning.

- 7.34 As an economic regulator, we consider whether there is a risk of market failure which could cause operators to underinvest in NRRS. One potential failure is that end-users do not have the information or technical skills to differentiate between operators according to the way that the operators manage risks around NRRS. Thus investments in NRRS may not improve the competitiveness of individual operators' offerings. There is also 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. This is an area where ComReg intends to develop with the goal of ensuring that **there are incentives, including regulatory incentives, where there is a risk of market failure, to invest in security, reliability, and capability.**
- 7.35 As a first step, ComReg intends to focus on systemic risks, since underinvestment in mitigating these risks has the greatest potential consequences for end-users and society. Specifically:
- **Systemic risks to electronic communications systems:** We plan to commission a study to identify systemic risks that could have a widespread impact – such as a prolonged inability of many people to access important communications services. The study will also identify whether there are arrangements in place to assure proper management of those risks, and the extent to which ComReg or other public bodies have the necessary powers and the resources.

Goal 18:

There are incentives, including regulatory incentives, where there is a risk of market failure, to invest in security, reliability, and capability.

State Intervention

- 7.36 Governments across Europe have recognised the socio-economic benefits of widespread connectivity, in particular broadband, and its importance for economic success and social inclusion. The achievement of these socio-economic benefits depend on the provision of widespread and affordable access to high-speed infrastructure and services.
- 7.37 Private investment in networks will only be undertaken where it is possible to make a reasonable rate of return. There are numerous factors which affect the likely return on investment. On the cost side, geographic factors and population density are important. On the demand-side, likely up-take, or consumers' willingness to pay for services are important. This means that private investment alone will not be able to deliver high-speed infrastructure and

Goal 19:

Where necessary assist policymakers to design state interventions that complement the market and regulation.

services to all consumers in Ireland.

- 7.38 It is at the intersection between commercial investment and those parts of the country that would not be served on the basis of commercial incentives alone that Governments have stepped in to bridge the funding gap. Public investment in networks has the benefit of providing connectivity to those who otherwise may not, but this investment has the potential to distort competition and provide a competitive advantage to those receiving the funding.
- 7.39 Public investment in networks needs to meet State Aid guidelines, and under those guidelines measures need to be put in place to ensure any distortion is minimised. Typically these measures are put in place in the design phase of the intervention and contain measures such as the network being open access, technology neutral or provided on a wholesale only basis.
- 7.40 As experts in the area ComReg may be called upon to assist, where necessary, by DCCAIE or another party in relation to these types of public initiatives. With respect to public investment, ComReg's strategic goal is to, **where necessary, assist policymakers to design state interventions that complement the market and regulation.** Related to this goal:
- **National Broadband Plan:** ComReg is not responsible for the NBP, but it does have a role in the NBP process. The European State Aid Guidelines recognise that as national regulatory authority (NRA) ComReg has "gained technical knowledge and expertise due to the crucial role assigned to them by sectoral regulation. They are best placed to support public authorities with regard to the State aid schemes and should be consulted when target areas are being identified. NRAs should also be consulted with regard to determining the wholesale access prices and conditions and solving disputes between access seekers and the subsidised infrastructure operator."⁹⁰ ComReg may be in a position to provide industry specific technical advice where appropriate. In this regard it has seconded a number of staff members to DCCAIE in order to provide such assistance.
- 7.41 In particular the NBP may, over time, have implications for regulation, while from a shorter term perspective, regulation and the future of regulation may have implications for the tender process for the NBP. In the interests of providing as much clarity as possible regarding the regulatory framework, ComReg has, without prejudging the outcome of future ComReg consultations, sought to provide regulatory clarity to stakeholders where possible. ComReg will continue to work with stakeholders in this regard.

⁹⁰ Communication from the Commission — EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks (2013/C 25/01).

Explanatory Box 14: Public Investment in Networks

Metropolitan area network (MAN) ⁹¹

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 are capable of delivering virtually unlimited bandwidth to 94 towns and cities throughout regional Ireland.

The MANs were funded with support from EU structural funds. In 2009, enet were awarded a 15 year contract to run the MANs on behalf of the Government.

National broadband scheme (NBS) ⁹²

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 DCCA. 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) ⁹³

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. The NBP aims to achieve a minimum of 30Mbps download and 6Mbps upload to all premises that will not be able to access such services through commercial investment alone. Approximately 542,000 premises, accounting for 990,000 citizens (21% of national population) are included in the Government's plan.

⁹¹ See: www.dccae.gov.ie/communications/en-ie/Broadband/Pages/Metroplian-Area-Networks.aspx

⁹² See: www.dccae.gov.ie/communications/en-ie/Broadband/Pages/National-Broadband-Scheme.aspx

⁹³ See: www.dccae.gov.ie/en-ie/communications/topics/Broadband/national-broadband-plan/Pages/National-Broadband-Plan.aspx

⁹⁴ See press release of April 4 2017 at www.dccae.gov.ie/en-ie/news-and-media/press-releases/Pages/Naughten-finalizes-the-Broadband-Intervention-Map-.aspx

8. Ensuring Compliance with Regulatory Obligations

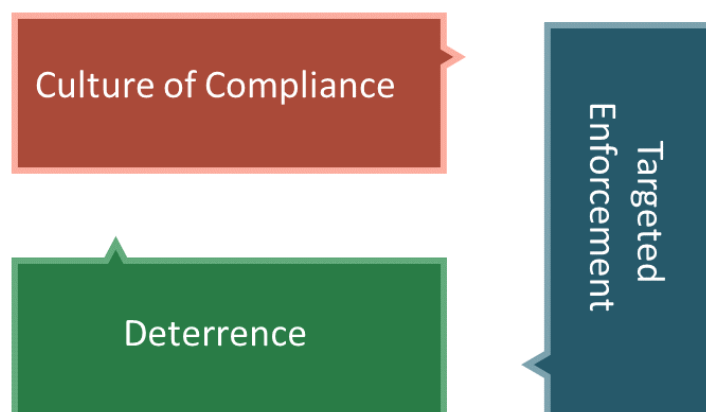
- 8.1 It is one of ComReg's statutory functions to ensure compliance by regulated undertakings with regulatory obligations. Such obligations may stem directly from legislation or from measures implemented by ComReg in exercise of its regulatory functions. In relation to this function ComReg monitors compliance with obligations and may carry out investigations and pursue, depending on the circumstances, different enforcement options.
- 8.2 Market regulation is only effective and meaningful to the extent that regulated entities comply with their regulatory obligations. In this sense, this strategic intention supports the previous three strategic intentions. 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 obligations**.

Strategic Intent 4:	Regulated entities comply with regulatory obligations.
What does this look like?	<ul style="list-style-type: none"> • 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

- 8.3 A key consideration informing ComReg's strategy is the fact that there is a variety of different compliance environments in which ComReg is active. ComReg performs a variety of monitoring and enforcement roles such as compliance with spectrum licensing conditions, compliance by operators with obligations imposed by ComReg and compliance by operators with obligations imposed by statute, in both a retail and wholesale context. In general terms however, it is useful to think of the elements 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.
 - **Targeted Compliance and Enforcement:** Targeted compliance and enforcement activities involve directing resources toward activities - such as active monitoring, investigations, and in the event of a finding of non-compliance, the pursuit of an appropriate enforcement action – in a way that maximises the effectiveness of the regime in totality.
 - **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.

- 8.4 An effective strategy involving targeted compliance and enforcement activities having effective deterrence properties, promotes a culture of compliance within regulated entities.
- 8.5 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. Before moving on to a discussion of the elements it is useful to briefly review the different enforcement settings.

Figure 13: Optimal Enforcement



Different Enforcement Settings

- 8.6 In relation to electronic communications markets, ComReg has three principal areas of responsibility in respect of compliance and enforcement:
- Spectrum
 - Wholesale regulation, and
 - Consumer protection

Compliance and enforcement in the context of spectrum management

- 8.7 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 licencees and the general public, and take appropriate enforcement action.
- 8.8 With respect to unauthorised use of spectrum, typical issues that arise include the unlicensed use of the radio spectrum for broadcasting, non-renewal of wireless telegraphy licences, and the use of equipment that is not fit for use within the EU.

8.9 ComReg undertakes a proactive series of monitoring activities, including but not limited to, drive testing of the mobile networks to assess coverage requirements, testing to ensure compliance by licencees with non-ionizing radiation limits, and regular inspections of radio sites and installations.

Compliance and enforcement in the context of wholesale regulation

8.10 ComReg may impose obligations on undertakings where they are found to have Significant Market Power (SMP). The obligations are wholesale remedies to competition problems identified in the regulated markets and are aimed at promoting efficiency, sustainable competition, efficient investment and innovation and to give the maximum benefit to end-users and include:

- Obligations to provide network access
- Obligations to have in place price controls such as cost orientation and cost accounting
- Obligations to act in a non-discriminatory manner, and
- Obligations to publish certain information.

8.11 It is only when the SMP operators fully comply with their obligations that the identified competition problems are mitigated. In the short-term, partial compliance may be sufficient to encourage market entry. But access seekers' confidence to continue to invest can be undermined if, for instance, they discover later that they have been treated in a discriminatory fashion or that there has not been full transparency as required by the regulatory regime, or that their access requests have been unnecessarily delayed. For this reason every episode of non-compliance has potential to seriously damage competition – especially if it is an episode that has not been prevented, detected or remedied by the SMP operator's own internal compliance processes.

8.12 ComReg is responsible for monitoring and enforcing compliance with such regulatory obligations. In addition to the SMP obligations there are various obligations monitored and enforced by ComReg arising under the ECF and under the 2002 Act. ComReg is responsible for monitoring and enforcing compliance with such regulatory obligations. ComReg also has a role in relation to disputes.⁹⁵

8.13 There are several reasons for opening investigations. These include own initiative monitoring of compliance by undertakings with existing obligations, investigations initiated based on information coming to the attention of ComReg through such mechanisms as complaints from undertakings. There are also formal requests from undertakings for ComReg to utilise its dispute resolution powers.

Compliance and enforcement in the context of consumer protection

8.14 ComReg is responsible for monitoring and enforcing compliance by undertakings in electronic communications markets as well as premium rate service providers with a variety of consumer protection provisions. The principal

⁹⁵ 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.

consumer protection laws arise from the ECF which protect end-users and subscribers noting particularly the provisions of the Universal Service Regulations and the Data Protection and Privacy Regulations regarding unsolicited calls as well as, the 2002 Act and obligations on all undertakings contained in the General Authorisation⁹⁶, in addition to the Consumer Rights Regulations⁹⁷ and the Unfair Contract Terms Regulations.⁹⁸

8.15 Broadly speaking, the principal consumer protection provisions relate to:

- Obligations on the USP to provide access at a fixed location as well as certain quality of service requirements
- Obligations on ECS undertakings in relation roaming, net neutrality, number portability, switching, transparency, contracts and billing, and
- Obligations on PRS providers.

8.16 There are several reasons for opening investigations. ComReg monitors trends in contacts received from the general public made via ComReg's consumer care team and ComReg's website. ComReg investigates complaints and trends, and makes an assessment to determine their validity. ComReg may also open own initiative investigations to monitor the general conformance to obligations falling within ComReg's remit. Some of the key issues that arise in this context, and as discussed in Chapter 6, relate to billing issues, contract terms, informed consent to bill/provide PRS service. The Net Neutrality Regulations and Roaming Regulations⁹⁹ present new and additional areas for focus.

Culture of Compliance

8.17 ComReg's view is that the optimum situation is where regulated entities are fully cognisant of their obligations, comply with them and have an internal culture of compliance. In this context it is ComReg's goal that **regulated entities are pro-active in ensuring their own compliance**. ComReg strongly encourages operators to have robust internal controls and policies intended to prevent and detect non-compliance.

Goal 20:

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

8.18 Regulated entities, particularly those subject to obligations aimed at ensuring non-discrimination may choose to put in place, operational and governance measures with the 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.

⁹⁶ Regulation 8(1) of the Authorisation Regulations provides that ComReg may specify conditions to be attached to a general authorisation.

⁹⁷ European Union (Consumer Information, Cancellation and Other Rights) Regulations 2013 (S.I. No. 484/2013).

⁹⁸ 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).

- 8.19 Operators should consider, inter alia, the following practices for promoting a culture of compliance:
- Support and commitment from senior management for internal compliance programs
 - A clear and enforced policy on compliance, including appropriate disciplinary procedures, prohibiting non-complaint 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 at all levels of the company on compliance programs.
- 8.20 Where appropriate, ComReg will utilise engagement and dialogue to help foster the desired behaviours within chosen sectors of industry. This can be of particular relevance in the spectrum compliance area.

Targeted Compliance and Enforcement Activities

- 8.21 As ComReg has limited resources it must prioritise the cases that it investigates. In this context therefore, it is ComReg's goal that **compliance and enforcement activities are targeted and prioritised appropriately**. The different enforcement settings in which ComReg operates means that a prioritisation strategy needs to be tailored to the relevant circumstances.

Goal 21:

Compliance and enforcement activities are targeted and prioritised appropriately.

- 8.22 In the spectrum management context, cases are prioritised based on the severity of the interference and the nature of the service affected. The highest priority is reserved for cases of interference involving an imminent threat to safety-of-life and serious interference caused to emergency services, air traffic control and maritime traffic control which seriously hampers radio communications, e.g., interference which significantly disrupts communications for Air Traffic Control or the Emergency Services. The next level of priority is reserved for cases of interference that renders a licensed channel unusable or has a detrimental effect on the economic interests of a licensee. Cases involving less severe interference that is a nuisance, occasional or minor are afforded lower priority.
- 8.23 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 for enforcement if they are transparently reported, proactively and effectively

remedied, and the failure of controls which led to the breach is also addressed, in a context of a continually improving control environment. However ComReg will also take into account the severity of the breach when deciding whether to prioritise enforcement action.

- 8.24 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 exercise choice 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 the consumer journey and on monitoring compliance with contract obligations, billing, switching, net neutrality and seeking redress. We have a particularly low degree of tolerance for breaches of obligations to ensure access to emergency call answering service because of the obvious importance of emergency calling. In the context of PRS ensuring that clear informed consent is provided is a key concern.

Effective Deterrence

- 8.25 Regulatory breaches harm consumers, firms and industry. Strong regulation is thus critical to the economy in general. The availability of robust enforcement powers is, in turn, crucial to the efficacy of regulation. Effective powers of enforcement and sanction ensure that regulatory action acts as a genuine deterrent, both to the party being punished and to other regulated parties. In this context it is ComReg's goal that **we have an effective set of powers to incentivise compliance and effectively monitor and enforce.**
- Goal 22:**
We have an effective set of powers to incentivise compliance and effectively monitor and enforce.
- 8.26 ComReg is very active in regulatory enforcement through its engagement with industry and in bringing civil and criminal enforcement actions where engagement has failed or is inappropriate. Where necessary, ComReg's enforcement programme targets serious breaches, which are sometimes deliberate and often affect large numbers of customers and end-users. Service providers often profit significantly, and unjustly, from breaking the law. Some of ComReg's enforcement activities, as discussed above also concern matters where there is a possible threat to public safety and security.
- 8.27 When seeking civil penalties for breaches of obligations that damage competition, ComReg will use the approach taken by competition authorities in many jurisdictions of relating the size of the penalty sought to the size of the market affected by the breach. This approach should increase the deterrent effect of the current regime.
- 8.28 However, ComReg is often hampered by the limits of the regime within which it operates. Improvements to its enforcement powers (both criminal and civil) would facilitate ComReg in maximising its limited resources.
- 8.29 ComReg has advocated for changes to the enforcement regime in which it operates. In 2012, ComReg made a joint submission, with the CER, Competition Authority and the Irish Medicines Board, to the Law Reform

Commission making the case for enhanced enforcement powers and penalties. In 2016 ComReg made a second submission to Law Reform Commission making similar arguments in relation to the necessity for the enforcement regime to embody a significant element of deterrence, especially in the context of high value dynamic markets, such as electronic communications markets, where timely and effective intervention is critical to maximising societal welfare.

8.30 ComReg considers that the current enforcement regime could be improved in three main areas:

- **Provide for administrative sanctions:** It would greatly facilitate effective regulation of the electronic communications sector if ComReg could directly impose civil financial sanctions (administrative fines) in appropriate circumstances. In contrast to court imposed financial sanctions, administrative fines can be applied immediately and thus act as a greater deterrent against breaking the law. Administrative fines enable the regulator's expertise, including its knowledge of the relevant facts and particular sectors, to be fully and proportionately utilised.
- **Increase the level of financial penalties:** Potential fines must be sufficiently high to act as a strong deterrent. We will continue to advocate for an increase in the maximum fine that may be imposed for criminal offences, following conviction on indictment. This was reduced in 2011 to a maximum fine of only €500,000, which is too low to have a significant deterrent effect in the context of the scale of many of the operators in the telecommunications sector. We consider that the previous provision for fines of up to 10% of turnover or €5 million, whichever is the higher, would be more appropriate.
- **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.

8.31 ComReg recognises that different compliance and enforcement strategies may have a more effective deterrent effect depending on the setting. For example, compliance and enforcement strategies which attempt to leverage reputational effects may be effective. This kind of strategy is more effective in a setting where the influence of consumer behaviour is important, in particular where there are opportunities to switch.

8.32 Over the coming period, ComReg will continue to advocate, based on its expertise and experience of regulation in the electronic communications sector for legislative amendments that will enable it to deliver on its strategy.

9. Being an Effective and Relevant Regulator

- 9.1 Underlying all activities in ComReg is the principle that well-functioning markets deliver optimal outcomes in terms of prices, quality, choice and innovation. ComReg recognises that, due to the presence of market failures and the uncommercial nature of providing certain services, unregulated communications markets may not deliver outcomes which are either optimal or adequate from society's perspective. The strategic intentions, associated goals and specific initiatives set out in the previous four chapters are all grounded on this principle.
- 9.2 ComReg recognises that, in the context of changing technological, market and public policy circumstances, ComReg cannot adopt a passive stance. Instead, to ensure continued effective and relevant regulation, it will strive to be an active and dynamic organisation that is capable of responding to the rapidly changing environment and is positioned, in terms of expertise, robust analytics and up-to-date information, to address issues that affect our ability to fulfil our mission.

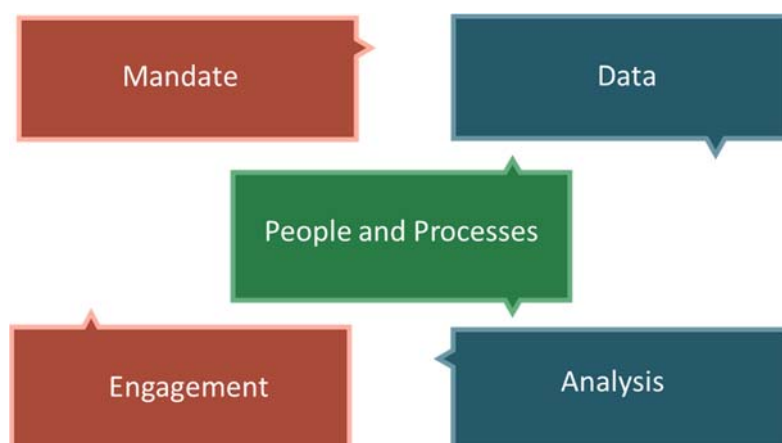
Strategic Intent 5:	ComReg is an effective and relevant regulator
What does this look like?	<ul style="list-style-type: none"> • Interventions are in response to demonstrable harm or well-defined public policy objectives • Interventions are effective and proportionate to the market failure or public policy objective in question • We are regarded as a thought-leader and our views are valued by others, both domestically and internationally • We are seen as providing a high level of public value

- 9.3 This Chapter sets out goals associated with being **an effective and relevant regulator**. Figure 14 below illustrates the relationships between five key drivers of organisational success:
- **Data** (or market intelligence): ComReg requires access to high-quality, timely and appropriate data so that it can continue to develop a deep understanding of the sector.
 - **Analysis** (robust analytics): ComReg must have the capacity to undertake appropriate data analytics.
 - **Engagement** (and thought leadership): ComReg needs to engage proactively, expertly and persuasively with stakeholders, both domestic and international.
 - **Mandate**: ComReg should be able to leverage its expertise in the sector and contribute positively to public policy discussions, both domestic and international, which may impact on ComReg's ability to deliver on its mission.

- **People and processes:** Underpinning the above four key drivers of organisational success is the requirement that ComReg is adequately staffed by an agile, skilled and motivated workforce who are expert in their fields, and are supported by efficient organisational processes.

9.4 This is a foundational relationship in the sense that success under these five 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 14: Ensuring Effective and Relevant Regulation



9.5 Finally, this Chapter also addresses the question of staff resources. In common with other public bodies, ComReg reduced its staff numbers as a consequence of the financial crisis, with staff falling from 124 to 115 FTEs. In order to deliver new regulatory functions and improve the timeliness and effectiveness of existing ones, ComReg will look to ensure that staffing levels, over the next 5 years, are adequate. We are seeking the necessary Ministerial consents to increase staff numbers to the level we consider necessary to deliver the strategy set out in this statement. ComReg believes that the benefits that would flow to end-users and society from adequate staffing levels would outweigh the associated costs by an order of magnitude.

Data and Analysis

9.6 Access to high-quality, timely and appropriate data is key to ComReg's work. ComReg gathers information from a wide range of industry players, using regulatory powers where appropriate. This data is supplemented with information from other sources including survey data.

9.7 Data in ComReg is utilised in a number key ways. For example:

- **Regulatory decision-making:** ComReg collects and analyses data in the context of regulatory decision-making. For example, large quantities of data are collected for the purposes of carrying out market reviews. Data is also collected for other regulatory purposes including, for example, the carrying out of regulatory impact assessments. ComReg has a responsibility to ensure that regulatory decisions arise from timely, objectively justified analysis based on high-quality, 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 and with obligations imposed by statute. Data is collected for these purposes in a number of ways. For example, ComReg has deployed a remote monitoring system which gathers and stores spectrum usage data which informs ComReg's spectrum management activities. In the consumer protection area ComReg monitors trends in complaints from the general public. This information is used to assist in the prioritisation and allocation of resources.
- **Informing industry and end-users:** ComReg collects data for the purposes of providing information to consumers and other end-users. For example, ComReg collects information from operators on the prices of broadband, mobile and fixed line services, as well as bundles of such services. This information is collated and made available via ComReg's website, www.comreg.ie/price-comparison. ComReg also collects statistical information on the Irish electronic communications market and benchmark data from other countries. This data is published in the Quarterly Key Data Report and made available on ComReg's data portal, www.comreg.ie/industry/electronic-communications/data-portal.

9.8 To be an effective and relevant regulator, ComReg requires timely access to up-to-date information on trends and developments in the sector. In addition to data on subscribers, products sold, prices and network coverage, ComReg needs to understand how end-users and industry are likely to respond to the challenges posed by emerging technologies. For instance, in order to adequately protect consumers, ComReg needs to understand their changing expectations, behaviours and preferences (see also Chapter 6).

9.9 In particular, ComReg recognises that qualitative aspects of the consumer experience are increasingly important. Consumers and other end-users are not just concerned with price, they are also concerned other qualitative aspects of their connectivity experience. Similarly, ComReg needs to understand the incentives facing industry operators. In this context, collecting and analysing appropriate information helps us to identify future challenges, opportunities and threats, and in particular, likely sources

Goal 23:

Robust data analytics, including service quality and availability, are based on the timely delivery of reliable data which is collected efficiently, regularly and handled properly.

of market failure, and to formulate and implement responses which will best facilitate the achievement of our strategic intentions. In this respect, it is ComReg's goal that **robust data analytics, including service quality and availability, are based on the timely provision of reliable data which is collected efficiently, regularly and handled properly.**

9.10 Although most of the data collection and analysis that ComReg undertakes relates directly to markets within the electronic communications sector, ComReg recognises that the sector does not operate within a vacuum and, as such, that we must be cognisant of the wider socio-economic environment within which we operate (see the discussion of related markets in Chapter 5).

9.11 Maintaining an awareness of, and insight into, the broader environment is necessary for ComReg to operate effectively and efficiently over time; in particular, it is necessary to allow for appropriate preparation for both opportunities and challenges. ComReg's market intelligence goal is by **making use of a wide range of data, including market data and consumer insights, we have a deep understanding of markets, including those related to the markets we regulate, and are able to identify consumer benefits and harm and market failures.**

Goal 24:

Making use of a wide range of data, including market data and consumer insights, we have a deep understanding of markets, including those related to the markets we regulate, and are able to identify consumer benefits and harm and market failures.

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

- **Data strategy:** Data governance and data analytics are priority competencies which ComReg must continue to develop, adopting, where resources permit, best-practice solutions to meet its needs. Data integrity and data security form cornerstones of how ComReg governs data within its control. In 2016, ComReg reviewed its approach to data. The review highlighted the need for the continued development of data warehousing capabilities as part of a broader data governance strategy. The identification and adoption of suitable data analysis techniques and tools is important to ComReg's continuing efforts to engage with increasingly complex market data.
- **Quarterly Key Data Report (QKDR):** We intend to enhance the process for collecting, publishing, and providing information on key market metrics. ComReg intends to review its Quarterly Key Data Report (QKDR) publication which provides performance metrics on a range of indicators related to the electronic communications market. In the context of our broader data strategy, and working with operators and other key stakeholders, ComReg intends to carry out a review of its QKDR to ensure that it remains fit-for-purpose both in terms of the key trends that it monitors, how data is collected from operators and made publicly available. ComReg also intends to review how it collects other data from operators, including for market analysis purposes. The efficient and effective collection of data, including the processes and procedures which underpin it, can have mutual benefits for both industry stakeholders and ComReg.
- **Independent research:** ComReg recognises the importance of original research in providing insights into the particular features of the Irish consumer and the Irish electronic communications market. For example, a better understanding of how Irish consumers make decisions will assist ComReg in developing appropriate and targeted interventions to ensure that they will have the optimal experience and that their rights are protected. It is for that reason that we are working on a number of projects with the Economic and Social Research Institute (ESRI). Collaborating with a

research institution such as the ESRI provides ComReg with access to data sources and quantitative techniques which may not have been available to us otherwise, and facilitates conversations with experts whose perspectives may differ from our own.

Engagement

- 9.13 ComReg has a wide range of stakeholders ranging from individual consumers and their representative groups, through electronic communication operators and their industry representative groups, to domestic government stakeholders and international bodies such as the ITU, RSPG, BEREC and the European Commission. One of ComReg's organisational values is transparency and we see honest engagement with all stakeholders as highly beneficial. In this context, it is ComReg's goal that **we are proactive on engagement with a range of stakeholders**. We work to continue to nurture and enhance our reputation as a centre of excellence and as a credible source of unbiased, high-quality information. Our staff members are subject matter experts and we aim to be seen as thought leaders and to use our knowledge and expertise to contribute to public discourse and to policy discussions. However, the independence and objectivity of ComReg is always assured.
- 9.14 ComReg recognises the need to tailor its communication to different stakeholder groups. Thus engagement takes a number of forms. For instance:
- **Formal consultation:** In the context of regulatory decision-making, stakeholders have the opportunity to provide evidence and feedback and express opinions on developing regulatory measures and proposed regulatory decisions through the formal consultation process. By allowing time for stakeholders to formally express their opinions, this process facilitates more rigorous evidence based decision-making, knowledge sharing and a greater buy-in from all industry members. ComReg has developed Consultation Guidelines to facilitate effective engagement.
 - **Advisory panels:** ComReg periodically hosts panels to gain insights into consumer issues including issues for end-users with accessibility requirements.
 - **Industry forums:** ComReg hosts a number of industry stakeholder forums. The main objective of these forums is to facilitate the development of new regulated wholesale products and changes to existing products. These forums also provide the industry with the opportunity to communicate on topical issues.
 - **Website:** As previously noted, ComReg's view is that its website (www.comreg.ie) is a key tool for engaging with a range of stakeholders including industry and consumers. A vast amount of information about who we are, what do we, our legal basis and the structure of ComReg is available, along with an archive of publications, decisions and consultations.

Goal 25:

We are proactive on engagement with a range of stakeholders.

- In 2016, the website was entirely updated. ComReg will ensure that the content on its website is up-to-date and may be easily be used by its stakeholders. The site now conforms to the W3C/WAI's Web Content Accessibility Guide 1.0, Conformance Level AA. The increased accessibility of the website has simplified interaction with ComReg and improved services to stakeholders. ComReg recognises that the transposition of the EU Directive on "accessibility of the websites and mobile applications of public sector bodies" will occur within the lifetime of this strategy.
- **Oireachtas Committees:** ComReg is obliged to appear before Dáil Committees when requested. ComReg believes that such appearances are an important part of its engagement strategy with one of its key stakeholders, Oireachtas Éireann.

9.15 ComReg operates within a legislative framework, as discussed in Chapter 2. However, that legislative framework is subject to review and periodic amendment to reflect changing technological, economic and social factors. In this context it is ComReg's goal to ensure that **the**

Goal 26:

The legislative mandate evolves to enable us to deliver strategy.

legislative mandate evolves to enable us to deliver strategy. This may involve advocating domestically for changes in legislation and, as discussed in Chapter 7, for changes in compliance and enforcement activities where we believe that law reform and legislative revision in respect of existing powers and the development of additional powers are required for the achievement of our goals.

9.16 ComReg also contributes to regulatory policy discussions and inputs to regulatory decision making in an international setting. The nature of the electronic communications sector requires international collaboration and harmonised approaches. ComReg manages and develops Irish regulatory input into the negotiation of European and international policy, standards, and legislation. This international collaboration facilitates the development of an open and competitive environment in which innovation, creativity and competition can thrive. We meet with, and have active and leadership roles, in a range of international bodies, including the Body of European Regulators for Electronic Communications (BEREC), the Radio Spectrum Policy Group (RSPG) and the European Conference of Postal and Telecommunications Administration (CEPT).

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

- **Communications strategy:** It is imperative that ComReg's stakeholders understand the nature of and rationale for our work. In order to achieve this objective, ComReg takes a strategic approach to communicating with its stakeholders, and uses a range of tools and techniques including its website and social media feeds. ComReg will ensure that its Communications Strategy is flexible enough to deal with the changing demands and needs of consumers and the electronic communications sector.

- **Mobile and Broadband Taskforce:** ComReg is currently working with two Government departments as part of the work of this important taskforce. We will be engaging with stakeholders as appropriate to implement the actions and outputs of the Taskforce to enhance mobile coverage and broadband availability throughout the country (see Chapter 6).
- **The New Draft Directive:** As previously noted (see Chapter 3 for discussion), in September 2016 the Commission published a draft Electronic Communications Code (ECC) which is intended to replace the current regulatory framework. In a further proposal, the Commission has also stated its intention to reinforce both the role of NRAs and BEREC to ensure a more coordinated, harmonised application of the rules throughout the EU. While ComReg generally welcomes the Commission's proposals, we have concerns that a number of aspects of the proposals may have the effect of reducing ComReg's flexibility to adapt to national circumstances and may inhibit the effectiveness of regulation in the sector. The draft ECC and BEREC Regulations are now subject to the EU legislative process and ComReg intends to play an active role during this process by providing expert and independent advice, as requested, and, through its membership of BEREC, to the European institutions.

9.18 ComReg is committed to appropriate and necessary engagement with all of its stakeholders. We will continue to engage with our stakeholders on a regular basis in order to be able to respond to their changing needs.

People and Processes

9.19 ComReg's ability to deliver this strategy depends on its staff. ComReg employs a professional workforce, comprising accountants, economists, engineers, lawyers, and public policy specialists. The staff at ComReg work on cross-disciplinary teams which promote knowledge spillovers, and stimulate innovative ways of viewing issues and developing ideas.

Goal 27:

We maintain an agile, skilled and motivated organisation.

9.20 During the period of the financial crisis, in common with other public bodies, ComReg reduced its permanent staff. This strategy statement calls for ComReg to undertake a number of new activities in areas such as net neutrality, the mobile consumer experience, and monitoring of ECS and related markets. In addition it calls for us to increase our compliance and enforcement activities and to conduct activities such as different SMP analysis and different spectrum assignment exercises faster and/or in overlapping timescales. In order to do this, ComReg will require an increase in its permanent headcount and we shall seek the necessary consents for this to happen.

9.21 ComReg works continually to enhance the skills, knowledge and capacity of its staff, to ensure that they remain up-to-date and relevant. This is important in a sector as dynamic as electronic communications, and also contributes to staff satisfaction and staff retention. In this context, it is ComReg's goal that **we maintain an agile, skilled and motivated organisation.**

9.22 ComReg's HR policies and systems have received external recognition

including:

- Continuous professional development accreditation by Engineers Ireland, the Association of Chartered Certified Accountants (ACCA) and the Institute of Certified Public Accountants in Ireland (CPA)
- Gold Standard Award 2010 from NSAI (National Standards Authority of Ireland), and
- Various awards from the Irish Institute of Training and Development (IITD) and the National Irish Safety Organisation (NISO).

9.23 We have an externally recognised mentoring programme which has received excellent feedback and is regarded as a relevant and empowering initiative by both mentors and mentees. We will continue to run and refresh this as we focus on retention and engagement initiatives. We want employees to be proactive in developing both themselves and the business, and to contribute to the internal dialogue on how to get the best results for our customers.

9.24 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. We 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, we must be flexible enough to adapt to a continuously changing sector. In this context it is ComReg's goal that **we have efficient and effective processes and systems.**

Goal 28:

We have efficient and effective processes and systems.

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

- **Code of Practice for the Governance of State Bodies:** There is a requirement on all public bodies to meet the highest standards in governance. The Department of Public Expenditure and Reform (DPER) published in August 2016 the Code of Practice for the Governance of State Bodies which sets out the business and financial reporting requirements to be observed by State bodies. We intend to carry out a review of this Code and, where appropriate, implement the requirements relevant to ComReg by July 2017.
- **Internal processes:** The anticipated changes in the regulatory environment mean we will need to look at the way the Corporate Services Division supports other divisions. In particular, we plan to carry out a review of our financial and non-financial reporting processes to determine if they will continue to be appropriate and relevant to the divisions. We will also examine our risk management processes to ensure they are compliant with best practice and assist our decision-making processes. As a general matter, we will seek to further automate our processes to improve efficiencies within the organisation and assist in delivering a better service to stakeholders.

9.26 As stated earlier, ComReg will continue to develop its data governance

strategies and data analysis capabilities in order to be able to engage with the scale and complexity of data needed to perform its functions and attain its goals. This will include the enhancement of data analysis tools and skills to support our professionals in delivering on this strategy and their potential. Administrative processes will also continue to be examined and the use of IT systems to enhance efficiency evaluated to drive process improvements.

- 9.27 As communications technology and the use of the internet develop, delivering ComReg's mandate is becoming more complex and there is a greater requirement for human capital to ensure it is delivered. Equally, the scale of the benefits from timely and effective delivery of our mandate is increasing.
- 9.28 In this context, ComReg staffing requirements take account of:
- Striking an appropriate balance between in-house resources and outsourcing
 - The benefits of delivering existing functions more quickly and effectively, and
 - New functions that will be added to our mandate as a result of developments in European law, and national policy initiatives.
- 9.29 Against a backdrop of a high performing Irish economy where unemployment is expected to continue to fall, talent is at the forefront of the agenda. We are competing for this talent with large private sector organisations - including telecoms firms - who are less constrained regarding remuneration. In this environment, we intend to focus on retaining our existing talent pool as we recruit to meet our staffing requirements. We will ensure that our new and existing staff are developed, trained and empowered in an environment conducive to achieving maximum potential.

Resources

- 9.30 ComReg's ability to deliver this strategy depends on its available resources. As electronic communications become evermore more important to economic and social life, effective regulation of the sector is essential to ensuring that communications markets operate in the interests of end-users and society. In this context, it is ComReg's goal to ensure that **we have sufficient resources to fulfil our organisational strategy**.
- Goal 29:**

We have sufficient resources to fulfil our organisational strategy
- 9.31 As discussed in chapter 7, over the last seven years, €3.79 billion – equivalent to €9 million every working day – has been invested in fixed and mobile networks, enabling high-speed data communications both at fixed locations and on the move. Regulation has been a critical factor in enabling this investment to occur. Given the importance of communications markets and the scale of the benefits that flow from timely and effective regulation, the downside risk of an under-resourced regulator is considerable. By contrast, the cost of ensuring that the regulator is properly resourced is an order of magnitude less than the benefits that can be expected to flow.

- 9.32 Subject to obtaining the necessary consents, ComReg intends to increase its staff numbers over the next five years.
- 9.33 In this context, ComReg has reviewed its manpower requirements for the next five years. The review takes account of:
- Opportunities to reduce manpower needs through IT-enabled business change
 - Striking an appropriate balance between in-house resources and outsourcing
 - The benefits of delivering existing functions more quickly and effectively, especially in relation to wholesale regulation and spectrum management activities, and
 - New functions that have recently been added, as well as further functions that are likely to be added, to our mandate as a result of developments in European law, and national policy initiatives.
- 9.34 This Strategy Statement sets out a challenging programme of activities for ComReg over the coming years. The benefits, both direct and indirect, that could be expected to accrue to society are substantial. Such benefits clearly outweigh the incremental resource increase required to enable ComReg to maximise the effectiveness of regulation and deliver on that programme.