3

Competition & Investment

3. Competition and Investment

Introduction

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

3.2 ComReg's regulatory actions play a key role in continuing to facilitate competition and in encouraging efficient investment across Ireland (see Figure 3 below). ComReg's guiding principle here is that when markets are effectively competitive, consumers and society benefit from optimal outcomes in terms of investment, price, quality and choice.

Figure 3: Regulation enables Competition and Investment

3.3 The tools that ComReg has at its disposal to promote effective competition and facilitate investment include: setting the regulated cost of capital for electronic communications and broadcasting markets, sending appropriate build-or-buy signals to encourage deeper network competition, as well as the allocation and assignment of spectrum and numbering resources.

3.4 To date, ComReg's decisions have created and maintained a competitive incentive for operators to invest in new networks and to upgrade existing ones. However, the ECS sector is continuing to evolve, which means that regulating this market is a dynamic process. ComReg is meeting this challenge through continuous monitoring, updating and adjustment of its approach. The scope of such regulation should reduce over the long term as sustainable competition becomes entrenched.

Strategic Intent 1:

A competitive sector that delivers efficient investment, innovation, and choice.

What does this look like?

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

Fixed and Mobile Markets

3.5 Ireland's retail ECS markets are national in nature with multiple Service Providers offering a range of ECS that are often bundled with services sold in adjacent related markets (e.g. TV broadcasting).

3.6 The degree of competition in the retail ECS markets depends primarily on the nature of competition in the upstream wholesale markets that underpin the retail ECS sector. The upstream wholesale market itself depends on the ability of operators to deploy and sustain competing networks. While the level of network competition is changing as new technologies are deployed, the geographic scope of network competition is likely to be limited to more densely populated areas over the next five years. Population density is the key driver of average network deployment costs; in denser areas it is more economical to deploy networks with the cost per premises/ person covered being lower than in less densely populated areas.

ECN / ECS and the competitive landscape of Ireland

3.7 As noted above, the more densely populated regions of Ireland have benefited from investment in networks driven by competitive forces, resulting in these areas being well-served by ECN. In some of these well-served areas. competitive forces may be strong enough such that *ex-ante* regulatory intervention is no longer required.

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

3.9 In those areas of Ireland that are either remote or that have a very low population density, some ECN / ECS services are still not available. Of particular note are the c.560,000 premises identified in the National Broadband Plan ('**NBP**') that did not have access to a quality broadband service (with download speeds greater than 30Mbps). The Irish Government, through state-aid intervention via NBI, is investing in providing 'FTTH' broadband access for these (primarily rural) premises that will provide broadband services with speeds in excess of 500Mbps.

3.10 Mobile and wireless network operators have also typically focussed network rollout in areas of greater population density and then later expanded network coverage along transport infrastructure routes and into more sparsely populated areas, although not as quickly nor with the same density as in more populous areas.

3.11 Developments in related markets are also important. Investment and innovation are expected to come not only from traditional ECN / ECS operators in fixed and mobile markets, but also from other operators, including Number Independent Interpersonal Communications Services ("**NIICS**"), more commonly known as Over The Top ("**OTT**") service providers[10]. Innovations in other markets (e.g. digital markets and mobile handset markets) can also often lead to changes in the competitive dynamics of the sector.

Competition on fixed networks

3.12 Competition involving fixed networks can be thought of as a continuum between service-based competition and infrastructure-based competition[11]. Pure service-based competition is where entrant operators utilise or resell the network of another operator to supply their own services, without making infrastructure investments of their own. Pure infrastructure-based competition is when operators rely entirely on their own infrastructure and not on inputs supplied by other operators. In practice, the majority of operators are somewhere in between, using a mix of their own infrastructure and rental access to others' networks. In addition, some operators will decide to only offer services on a wholesale basis to other operators, and not to enter into retail markets at all.

3.13 Over the last decade or so, Eircom has been upgrading its legacy copper network with fibre technology. Initially these upgrades were largely fibre to the cabinet ('FTTC') technology but increasingly Eircom has been deploying FTTH over both its legacy copper and FTTC networks. Eircom's fibre network (FTTC and FTTH) now passes about 2 million premises, serving approximately 840,000 subscribers[12].

3.14 Eircom is facing increasing infrastructure competition from a number of other operators across parts of Ireland:

- Virgin Media's network passes 965,000 premises with 382,600 broadband subscribers in mainly urban areas (Q4 2022). Its network is mainly a Data Over Cable Service Interface Specification ('**DOCSIS**') network which, in 2020, was upgraded to DOCSIS 3.1, allowing it to deliver speeds on par with FTTH networks. In late 2021 Virgin Media also began upgrading its DOCSIS network with FTTH14F. Virgin Media is in the process of entering the wholesale market and opening up its network to other operators[13].

10 In this document, where ComReg refers to OTT service providers, this includes Number Independent Interpersonal Communications Services ("NIICS")
11 In many cases, an operator may use a variety of wholesale products in different areas to provide national coverage. This could include rolling out their own network assets in one area (e.g. FTTH), investing in network backhaul to avail of wholesale unbundled products (e.g. Virtual Unbundled Access) in another area, and buying wholesale bitstream products in another part of the country. In addition, some operators decide to offer only wholesale services, or business-only services (e.g. connections with dedicated capacity).
12 Eircom Group Results for the third quarter FY22 to 30 September 2022
13 Liberty Global Full Year 2022 Results

- SIRO is continuing to deploy its FTTH network which has now passed about 475,000 premises and counting. SIRO's network covers smaller urban areas that are mostly outside of the Virgin Media footprint[14].
- NBI is committed to deploying FTTH to pass 560,000 premises in rural areas with poor ECN coverage. To date NBI has passed c.120,000 premises[15].

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

3.16 By Q4 2022, 89.3% of all fixed broadband subscriptions were at least 30Mbps, by sold download speed[16]. On the basis of the proposed NBI rollout and the various rollout plan announcements, it is possible that the vast majority of households and businesses in Ireland will have access to high-speed broadband by the end of 2026 (30Mbps or greater download speeds).

Competition on mobile networks

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

Table 2 – Competition in the Retail Mobile Market[17]

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

14 https://siro.ie/. Accessed on 15th March 2022
15 NBI.ie Accessed on 15th March 2022
16 ComReg QKDR Q4 2022,
17 Cubic Telecom is headquartered in Ireland, but does not operate as an MVNO in Ireland, and relies instead on roaming agreements for its Irish connectivity

3.18 Network sharing arrangements between two or more network operators are also a factor when considering network-level competition. The main potential benefit for mobile operators from network sharing is the reduction of cost[18] and more efficient use of spectrum. On the downside, there may be a risk of a diminution of competition if operators lose control over some network operations and strategic technology choices.

3.19 The rollout of 5G services in Ireland is well underway with the mobile operators having launched their 5G services between 2019 and 2021. Although 72% of all households in Ireland are covered by a 5G network, rural areas have yet to see significant 5G deployments with 35% of rural households covered by a 5G network[19]. The capacity and coverage of 5G networks will improve as spectrum in the Multi Band Spectrum Award 2 ('**MBSA2**') is released[20]. On the 19 January 2023 ComReg completed MBSA2 and issued Liberalised Use Licences to each of the four Winning Bidders (Eircom, Imagine, Three and Vodafone). Each of these licences came into effect on 20 January 2023 and will expire on 13 February 2042. Completion of the MBSA2 award has released 470 MHz of harmonised spectrum rights in the 700 MHz Duplex, 2.1 GHz, 2.3 GHz and 2.6 GHz Bands. This represents a 46% increase in the harmonised spectrum assigned for the provision of wireless broadband services. The release of the 700 MHz band in particular is likely to improve both urban and rural 5G coverage.

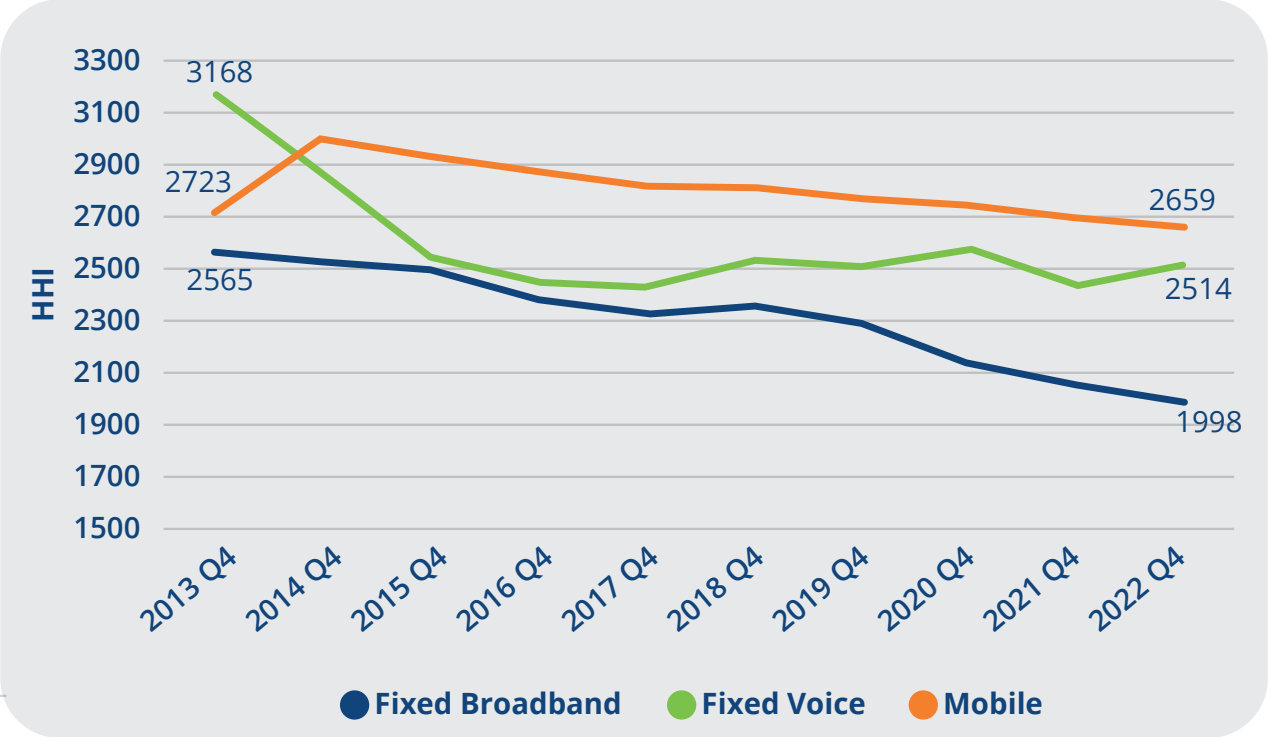
3.20 In addition, the investments made in mobile networks, to date, have allowed mobile voice and data networks (such as 4G) to be rolled out to areas currently underserved by fixed networks. All MNOs now claim to have at least 98% 4G population coverage. While Ireland ranks above average among EU Member States in terms of 4G population coverage,[21] there are still geographic areas unserved by 4G networks, primarily due to these areas not being economically viable to serve.

The state of competition in retail markets

3.21 Figure 4 below shows the level of market concentration in retail fixed broadband, fixed voice, and mobile markets (excluding mobile broadband and M2M). The graph uses the Herfindahl-Hirschman Index ('**HHI**')[22]. The higher the market's concentration (suggestive of weaker competition), the higher the HHI.

18 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.
19 DESI https://digital-agenda-data.eu, 2022 data
20 For complete details of this award please see ComReg's website: https://www.comreg.ie/industry/radio-spectrum/spectrum-awards/proposed-multi-band-spectrum-award/
21 DESI - Connectivity
22 This is a common measure of market concentration used to analyse market structure. It is calculated by squaring the market share of each firm competing in a market and summing the resulting numbers. The higher the number the more concentrated the market, with a pure monopoly having a HHI of 10,000. A market split exactly five ways would have a HHI of 2,000

Figure 4: Retail Concentration (HHI), 2013 – 2022[23]



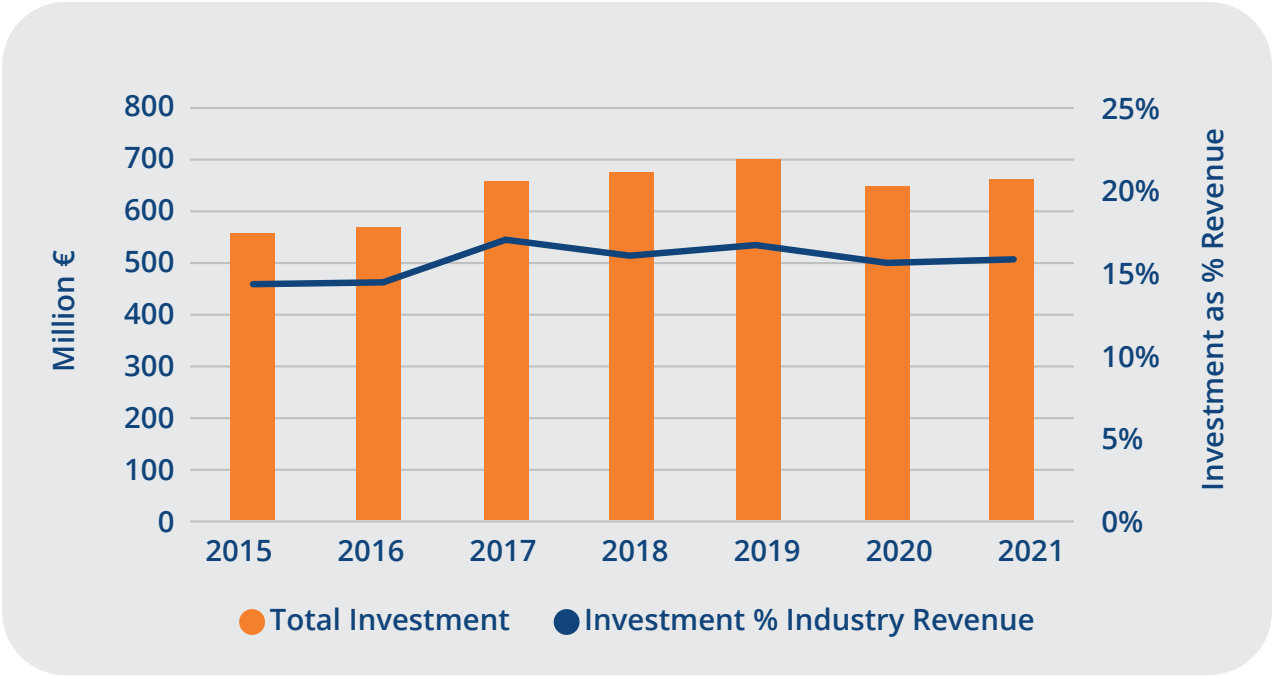
3.22 In the broadband market, the continued decline in retail market concentration is indicative of increased retail competition as increasing levels of infrastructure-based competition take hold. The fixed voice market has also seen a decline in retail market concentration since 2013, however, this trend does not appear to have continued up to 2022. The Irish mobile market has been a three MNO market since the merger of Hutchison 3G and Telefónica O2 in 2014. Although a number of MVNOs and sub-brands provide additional competitive pressure, this market remains the most heavily concentrated market within the sector.

Investment in ECN / ECS

3.23 Private investment in the sector increased over the period 2015 to 2021, totalling €4.5 billion (see Figure 5 below). The trend depicts steady or slightly increasing investment as a percentage of overall industry revenue, averaging approximately 16% over the period.

23 ComReg QKDR Q4 2022,

Figure 5: Investment in ECN / ECS (Ireland, € million)[24]



Competition & Investment

Retail Competition

3.24 ComReg's goal regarding retail competition is that there should be effective and sustainable competition in retail ECS markets.

Goal 1.1

There is effective and sustainable competition in retail ECS markets.

3.25 ComReg's approach to the regulation of retail ECS markets continues to be the imposition of upstream wholesale access obligations, where one or more downstream retail markets are unlikely to become effectively and sustainably competitive without some regulatory intervention.

3.26 Through ComReg's use of regulatory tools which identify and address market failures, Ireland has seen a steady decline in regulation of retail ECS markets over the last decade.

3.27 ComReg considers it important to monitor the effectiveness of competition not only in the regulated markets themselves, but also in other related markets within the wider ECN / ECS eco-system. By doing so ComReg can build an understanding of why markets may not be working well for end-users. This allows ComReg to target regulatory interventions across the breadth of its functions.

3.28 ComReg has a number of projects underway/planned that will enable a better understanding of markets in the wider ECN/ ECS eco-system. These include:

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

24 Eurostat and ComReg Quarterly Key Data Report

- **Monitoring key related/adjacent Markets** – ComReg will continue to monitor key related/ adjacent markets as these have the potential to have disruptive effects on ECS markets.
- **Monitor the evolution of network demand** - ComReg will continue to monitor how network demand evolves as new technologies, new networks and new use cases (for both consumers and enterprise) emerge.

Wholesale Markets and Access Regulation

3.29 Wholesale access markets can be subject to a variety of market failures. These market failures can produce persistent bottlenecks and barriers to entry which can undermine effective retail competition and dampen incentives to investments in ECS/ECN. Therefore, ComReg's goal in the context of wholesale market regulation is that **there is effective and sustainable competition as far as is possible in wholesale markets, in the light of persistent bottlenecks and barriers to entry.**

Goal 1.2

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

3.30 One key market failure that is of particular importance is when an operator might possess Significant Market Power, i.e., the ability to operate without constraint from competitors. When left unchecked, SMP can lead to high prices, poor quality of service, delayed or loss of investment/innovation or the slower entry or expansion of competitors in ECS markets.

3.31 ComReg has a number of regulatory tools at its disposal to address market failures and other issues that may arise in wholesale markets, to ensure these markets deliver innovation and choice to consumers. These tools include:

- Access obligations via the SMP Framework,
- Ex-Post Competition Law, and
- Provisions in the EECC to encourage efficient investment

3.32 The above toolkit is complemented by ComReg's other tools used to enhance connectivity and its various consumer protection, dispute resolution, and enforcement powers.

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

Access Regulation – the SMP Framework

3.34 Where an operator is identified as having SMP, ComReg may impose a range of regulatory obligations, including those relating to access, pricing, non-discrimination, and transparency.

3.35 Where SMP regulation is implemented, ComReg focuses on imposing obligations that encourage both infrastructure and service-based competition by enabling new entrants and smaller operators to compete on a level playing field with the SMP operator. ComReg's favours greater infrastructure-based competition as this enables the development of more effective and sustainable competition and greater levels of investment in ECS/ECN.

3.36 ComReg is required to undertake a review of various regulated markets every five years. ComReg plans to continue to monitor the various markets set out in Table 3 below and to undertake market reviews where necessary. In addition, ComReg can bring forward a formal market analysis in the case of a significant change - such as merger or acquisition that could fundamentally alter the nature of competition in relevant wholesale and downstream markets. Market analysis in these cases would seek to re-assess competition and look for any potential market failures.

3.37 As noted in Table 3 below, ComReg has not previously conducted a review of the market for Physical Infrastructure Access ('**PIA**') in its own right, mandating instead access to Eircom's duct and poles as a remedy for Wholesale Local Access ('**WLA**'). In 2023 ComReg expects to complete its review of the market for PIA.

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

Table 3: Completed/Proposed Market Reviews

Market	Current Review	Indicative Review Completion Date
Retail Access to the Public Telephone Network at a Fixed Location and Wholesale Fixed Access and Call Origination (RFTS and FACO markets)	Last reviewed 2014/2015	2022
In February 2022, ComReg further consulted on a proposal to fully de-regulate the retail access market and the wholesale market.[25] This culminated with a June 2022 decision (D05/22) to fully de-regulate these markets.		
Fixed and Mobile Termination	2019 (updated in 2020)	2023
The review of Fixed and Mobile Termination markets is ongoing, with ComReg publishing a consultation in Q4 2022 (ComReg doc 22/87) in which it proposed to remove regulation from these markets. In February 2023, ComReg notified its draft decision to the EC (ComReg doc 23/17) with the EC having no comments on this. A final decision was adopted and published in April 2023 (ComReg doc 23/33).		
Physical Infrastructure Access (PIA)	-	2023
The review of the PIA market is ongoing, with ComReg publishing a consultation in January 2023 (ComReg doc 23/04) in which it proposed to regulate this market. A final decision on this review will be adopted at least in parallel with the WLA and WCA markets in Q4 2023.		
Wholesale Local Access and Wholesale Central Access (WLA and WCA)	2018	2023
In line with the commitment given in its 2018 Decision, in January 2021 ComReg consulted on a proposed further de-regulation of the WCA market. A final decision was adopted in November 2021 (D10/21). A full market review of the WLA and WCA markets is underway, with ComReg publishing a consultation in January 2023 (ComReg doc 23/03) in which it proposed to fully de-regulate the WCA market and partially regulate the WLA market. A final decision will be adopted 2023 in parallel with the PIA review above.		
Wholesale High Quality Access and Dedicated Capacity (WHQA/DC)	2020	2025
ComReg is continuing to collect data, as part of its ongoing monitoring of this market. This should enable a timely review of this market as part of the next market review 5-year cycle. A consultation on this market review is expected in Q4 2023.		
Wholesale Broadcasting transmission and distribution services	2021	2026
In February 2021 ComReg updated its 2013 decision on the Broadcasting Transmission Services markets (ComReg doc 21/14), which continues to regulate RTÉ / 2RN. ComReg will continue to monitor developments in these markets, including the evolution of retail broadcasting		

25 This followed an earlier consultation in June 2020 and a subsequent draft decision notified to the European Commission in June 2021. The European Commission issued a withdrawal decision with respect to ComReg's June 2021 draft decision.

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

- **Symmetric Access Obligations (Article 61 of the EECC)** - Obligations to provide 'symmetric' access to local facilities to avoid 'inefficient' duplication of network assets. ComReg may impose access to wiring, cables, and associated facilities inside buildings or up to the first concentration or distribution point.
- **Wholesale-only operators (Article 80 of the EECC)** – To date no wholesale-only operator has been found to have SMP in a regulated wholesale market in Ireland. However, such operators are a key consideration in assessing SMP in various wholesale markets.

Timely withdrawal of regulation

3.40 ComReg will seek to withdraw wholesale regulation where it has either delivered effective competition in downstream retail markets or where effective competition has developed in wholesale markets. ComReg's goal in this regard is that **sustainable and effective competition can allow for the timely withdrawal of regulation.**

Goal 1.3

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

3.41 While the withdrawal of regulation from retail and downstream markets is desirable, this process depends on the effectiveness of regulation in upstream markets. ComReg has recently imposed proportionate remedies in wholesale markets which we believe will increase the likelihood of this occurring. ComReg has also deregulated some wholesale markets[26] where sustainable and effective competition can be found.

3.42 The EECC provides that ComReg should remove regulation in a way that minimises disruption and must ensure that regulation does not continue for longer than necessary.

3.43 ComReg intends to continue to monitor regulated markets to ensure remedies are effective in addressing market failures and where possible to remove regulations where no longer necessary.

Investment and Regulatory Certainty

3.44 ComReg recognises that unregulated ECN / ECS may not provide the right incentives for investment. ComReg will therefore continue to employ measures aimed at driving and safeguarding the competitive market process.

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

3.46 Therefore, the first of ComReg's two goals regarding investment and regulatory certainty is that competitive incentives facilitate efficient commercial investment in new and existing infrastructure and services to the widest extent possible.

26 ComReg deregulated the Urban WCA Market in 2018 (D10/18) and 2021 (D10/21), the Zone B MI WHQA Market in 2020 (D03/20), and the RFTS and FACO markets in June 2022

Goal 1.4

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

3.47 As newer fixed (e.g. fibre) and mobile (e.g. 5G) networks get rolled out, other older ECN and technologies will diminish in their use and importance, eventually leading to their eventual retirement and withdrawal.

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

- Encouraging investment in VHCN by the network operators. It is important that regulated access prices are not set so low that investment that would otherwise be commercially viable is choked off;
- Encouraging viable investment in own infrastructure by those who purchase access from other networks, particularly those who use regulated access to Eircom's network;
- Ensuring that regulated prices reflect efficient practice and that excessive recovery by the SMP operator does not happen;
- Ensuring that wholesale prices do not lead to price squeezes;
- Wholesale prices do not lead to excessive end user prices; and
- Wholesale prices ensure a timely and efficient migration to new infrastructure over time.

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

3.50 ComReg will continue to analyse the relevant competitive conditions and monitor the costs associated with Eircom's FTTH network while noting that a review of the wholesale pricing of Eircom's FTTH network will be well flagged in advance with industry and that the imposition of cost-orientated pricing is not inevitable. Setting the most appropriate investment signals, especially the appropriate build or buy signals, will continue to be a critical part of ComReg's regulatory pricing policy.

3.51 ComReg will continue to encourage investment at the deepest level of the network that makes economic sense. In this regard, ComReg considers that there is an opportunity to encourage investment using regulated access to already existing passive infrastructure such as ducts and poles (PIA). This will require the provision of functional and efficient access to passive infrastructure at prices that set the appropriate incentives for all players.

3.52 ComReg will also monitor access by NBI to Eircom's physical infrastructure to help contribute to the successful and timely rollout of the NBP. Where additional investment is required to achieve desired market outcomes, beyond what would be delivered in an effectively competitive market, such investment should be undertaken in a manner which creates minimal market distortions and does not crowd out commercial investment.

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

3.54 In many regulated ECS markets, ComReg imposes price control obligations, including the obligation to charge cost-oriented wholesale prices. Setting such a cost-oriented wholesale price includes a reasonable rate of return on investment and an estimated Weighted Average Cost of Capital ('**WACC**'). ComReg ensures that the regulated WACC is set at a level that is appropriate to promote efficient and timely investments and promotes innovation in ECN / ECS and broadcasting transmission infrastructure and services in Ireland.

3.55 Therefore, ComReg's second of its two goals regarding investment and regulatory certainty is to ensure that **regulatory certainty, including certainty on wholesale pricing and the rate of return, facilitates timely investment decisions**. In particular, the choice of wholesale pricing regime and cost recovery should be appropriate to the circumstances and should consider the need to promote efficiency and effective competition and maximise consumer benefits.

3.56 In the context of these two goals regarding investment and regulatory certainty, ComReg intends to do the following:

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

Goal 1.5

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

- **Reasonable Rate of Return**: ComReg will also encourage investments by other operators in downstream markets by mandating and enforcing appropriate access to inputs controlled by the SMP operator on fair, transparent and non-discriminatory terms. In order to encourage investments by the SMP operator, including in next generation networks, ComReg shall take into account the investment made by the operator, and allow a reasonable rate of return on adequate capital employed.
- **Cost of Capital**: ComReg updated the WACC applicable to Fixed & Mobile Telecommunications and Broadcasting in June 2022[27]. ComReg will recalculate the WACC on an annual basis using updated parameters. The recalculated WACC values will then be used when price controls are amended or updated as part of any subsequent ComReg decision. Where prices have been previously set by ComReg (including in the form of maximum prices), for a defined future period, a subsequent change in the WACC will not automatically lead to any change in those prices.

Legacy Networks

3.57 The EECC's Connectivity objective aims to foster investments in VHCN across the EU. ComReg recognises that to deliver widespread VHCN, it may be necessary for network operators to migrate away from legacy networks over time.

27 ComReg Document 22/47

3.58 ComReg is supportive of VHCN network rollout and the transition from legacy networks. ComReg recognises that VHCN networks have several benefits over non-VHCN and legacy networks, including faster download speeds, network reliability and lower energy consumption.

3.59 In March 2021, Eircom published what it termed a 'white paper' on transitioning away from its legacy copper network to a VHCN network based on Eircom's FTTP network. ComReg considers that such a transition has the potential to deliver high-quality and reliable connectivity to end-users across the country who are currently using Eircom's copper and FTTC networks.

3.60 ComReg notes that while the migration away from legacy networks is ultimately the responsibility of the industry, it will require an eircom-led Industry programme overseen by ComReg in order to ensure an efficiently managed transition as well as protection of competition and end-users (including vulnerable end-users) at all stages of the process.

3.61 In May 2021, ComReg set out its view[28] on its role overseeing the transition of regulated services to new VHCN and the related impact on regulated services and competition generally. ComReg set out that its approach to these issues will also be guided by the relevant regulations including the provisions of the EECC (transposed in Q1 2023 and awaiting a commencement order) regarding the decommissioning or replacement process for legacy networks (Article 81 and Regulation 63). This includes that the transition must happen in a predictable and transparent manner for all stakeholders, with adequate notice periods. The EECC requires ComReg to ensure that migrations from legacy copper networks subject to SMP obligations carry transparent timetables and conditions, and that end-users can continue to access broadband and telephony products.

3.62 ComReg issued a public consultation document on 25 March 2022. Consideration of the responses received from Industry stakeholders and individual respondents is ongoing with a notification to the European Commission under Article 32 of the EECC, planned in Q2 2023 followed by a Decision thereafter.

3.63 In the meantime, existing regulatory obligations imposed on Eircom (e.g. Universal Service Obligation ('**USO**') and obligations not to withdraw services) remain in place. ComReg's current understanding from Eircom is that the transition from the copper network will begin in the next five years.

Spectrum and Numbering

3.64 Radio spectrum is a scarce resource having a diverse range of uses and end-users. It is an essential input in the supply of wireless/radio-based ECN / ECS as most ECN, even fixed networks, contain at least some wireless segments. Therefore, the availability of spectrum is necessary for the entry and expansion of many operators in the electronic communications markets. The growing demand for radio spectrum is driven by society's ever-increasing use of data-intensive services while on the move and away from the office and home.

3.65 Likewise, access to numbers is essential to the functioning of electronic communications markets. As a finite national resource, ComReg seeks to ensure that there is always an adequate supply of numbers to support the demands of existing and new customers and service providers. In this context it is ComReg's goal that **the management of spectrum and numbers facilitates competition, enhances connectivity, and promotes efficient investment.**

28 ComReg Document 21/43

Spectrum

3.66 Spectrum management[29] is the process of regulating the use of radio frequencies to promote their efficient use in the interests of society.

3.67 The principal activities associated with spectrum management are; spectrum **allocation**[30] and **assignment**[31] as well as the monitoring, compliance and enforcement of licence conditions and equipment standards. In relation to the assignment of spectrum rights for ECN / ECS, ComReg determines the appropriate approach on a case-by-case basis. When carrying out these activities, ComReg considers administrative, regulatory, social, economic, and technical factors amongst others.

3.68 The international harmonisation process for radio spectrum is a key driver of investment as it facilitates economies of scale in the manufacture of radio equipment. It is a key factor in determining the technology roadmaps adopted by global suppliers of radio equipment. Harmonisation activities focus on advancing the use of radio spectrum.

Goal 1.6

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

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

3.70 ComReg, together with DECC, plays an active role in international forums to ensure that, as far as possible, decisions relating to the international radio spectrum regulatory framework accommodate Ireland's specific requirements. Participation in the international harmonisation process assists ComReg in actively considering and acting upon relevant developments in the exercise of its spectrum management functions in Ireland.

3.71 In respect of international harmonisation, the 39th World Radiocommunication Conference (WRC) is scheduled to take place in Q4 2023. The agenda for WRC-23 sets the roadmap for important future technological developments and contains nineteen specific and eleven standing agenda items.

3.72 Led by DECC, Irish preparations for WRC-23 are underway and ComReg is actively engaged to meet the objectives and goals that will be established in the national preparatory process. The following are the major agenda items of interest to Ireland at WRC-23:

- Mobile Broadband and Broadcasting;
- Mobile Broadband Communications;
- Aeronautical Communications;
- Satellite Communications; and
- Scientific Use of Spectrum.

29 See ComReg's Spectrum Management Strategy for 2022 to 2024 (Document 21/136)
30 Spectrum **allocation** refers to the designation of given frequency bands for use by one or more types of radiocommunications services, where appropriate, under specified conditions. Radiocommunication services are defined by the international radio regulations
31 Spectrum **assignment** refers to those spectrum management activities which involve the issue, and authorising the use of, rights of use for radio frequencies.

3.73 There are several priority spectrum projects that ComReg is committed to, that will take place in the coming period, including fixed links and satellites services:

- **Fixed Links**: Following an extensive consultation[32] to review the current Fixed Links licensing regime, ComReg issued its draft decision and draft regulations in November 2022.[33] Following finalisation of the decision and the publication of a new Statutory Instrument, ComReg will implement the changes brought on by the decision over a three-year period.
- **Satellites**: There has been a resurgence of interest in using constellations of small satellite in low earth orbits (LEOs) to provide internet access. To ensure that Ireland has an appropriate legislative framework ComReg will consult on the authorisation of satellite earth stations below 3 GHz as well as review the current licence regime for satellite earth stations in Ireland.

3.74 The following two matters are developing and are likely to be resolved or well underway during the period of this strategy:

- **Private local-area network connectivity**: The EC have initiated a study through the CEPT to assess the use of the 3.8 – 4.2 GHz frequency band for the licensing of 'private local networks' and to develop harmonised technical conditions for the shared use of this band. ComReg has received several enquiries related to private networks and intends to monitor and input to the development of any draft EC and ECC harmonising decisions on the use of this band.
- **The UHF broadcast band**: At WRC-23 a review of the UHF broadcast band (470-960 MHz) will consider the spectrum requirements of the broadcasting, mobile services and a number of other services that use this band[34]. ComReg has taken a leading role in facilitating this discussion in the CEPT and in determining the CEPT position at WRC-23

3.75 ComReg operates Test & Trial Ireland[35] to encourage innovation and development involving new radio technologies or services. Two licence types are available, one covering technology tests and the other covering service trials involving third parties or the public. Both licences are intended to support genuinely novel research and development activities and are not intended for the commercial delivery of electronic communication services. A glance at the list of previously issued Test and Trial licences[36] will reveal some of the users of these licences and the innovative technologies and services tested or trialled in Ireland.

Numbering

3.76 ComReg is responsible for managing 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 new and existing customers and service providers. Any new conditions of use that support competition and innovation need to ensure that consumers remain protected against number misuse.

3.77 Numbers are likely to remain the most common universal identifiers until at least 2026 and likely well beyond this date. Numbers are coordinated at national level by National Regulatory Authorities, (NRAs) and at international level by the ITU.

32 ComReg Document 20/109
33 ComReg document 22/93 - Review of the Fixed Radio Links Licensing Regime - Response to Consultation and Draft Decision including Draft Regulations – published 9 November 2022.
34 Allocations made in the band 470-960 MHz for Region 1 include fixed, radiolocation, land mobile ancillary to broadcasting and programme-making, radio astronomy, aeronautical radionavigation and mobile-satellite except aeronautical mobile-satellite (R)
35 See https://www.testandtrial.ie/
36 See https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/wireless-test-trial/

3.78 Improvements to the Non-Geographic Numbering (NGN) platform were completed in January 2022, when three number ranges (1850, 1890 and 076 numbers) ceased to operate. Only the Freephone 1800 and Standard Rate 0818 NGN products now remain. A noteworthy element of the new wholesale regime is the 92% reduction in mobile origination charges for mobile calls to 1800 Freephone. Together, these improvements ensure that Ireland now has a fit for purpose and easy to understand NGN platform, and a competitive market for the provision of NGN services.

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

- **Further updates of the Numbering Conditions of Use**: ComReg updates the Numbering Conditions of Use every 2-3 years, to take account of legislative changes, new technologies and market developments. Updates completed in July 2021[37] included an in-depth analysis of numbers for cloud communications platforms. This analysis was supported by market research that demonstrated that the overwhelming majority (circa 90%) of consumers favour the assignment of geographic (landline) numbers only to businesses and individuals with premises within the area code. The 2021 update also factored new and amended numbering obligations in the EECC. ComReg will consult on further updates during 2023, with the main objectives of i) supporting the Nuisance Communications Industry Taskforce ('**NCIT**') (see Section 5.7) interventions to mitigate nuisance communications (scam calls and texts) and ii) introducing new complementary preventative measures to improve Calling Line Identification ('**CLI**') data and to improve operators' 'Know Your Customer' ('**KYC**') processes for assigning numbers.
- **Implement ComReg's published strategy for promoting over-the-air (OTA) provisioning**: The EECC requires Member States to promote over-the-air ('**OTA**') provisioning to facilitate provider switching. OTA provisioning relies on 'embedded' SIM ('**eSIM**') technology. In June 2022, ComReg published its response to consultation and final strategy[38], which sets out a work programme for mobile operators in Ireland. The strategy calls for fully digital customer sign-up and switching between operators by the end of 2023, with consumers potentially being able to switch between operators in 5 minutes or less.

  ComReg will engage with operators throughout 2023 to ensure that the full benefits of OTA provisioning and eSIM technology are delivered. For example, OTA and eSIM include the ability for consumers to download temporary local profiles when they are roaming abroad. This is particularly important when roaming beyond the EU, where Roam Like at Home (**RLAH**) obligations do not apply, and consumers often face large bills on their return home. Such temporary local profiles could ensure that consumers can benefit from more reasonable locally applicable tariffs (as evidenced by the recent launch of GoMoWorld).

37 ComReg Document 21/75
38 ComReg Document 22/48A https://www.comreg.ie/publication/comreg-strategy-to-promote-over-the-air-provisioning-2