# 4

# Competition & Investment

# 4. Competition & Investment

## Introduction

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

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

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

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

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

**What does this look like?**

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

Figure 3: Regulation enables Competition and Investment


# Competition in Fixed and Mobile Markets

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

## ECN / ECS and the competitive landscape of Ireland

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

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

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

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

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

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

## Competition on fixed networks

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

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

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

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

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

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

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

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

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

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

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

## Competition on mobile networks

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

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

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

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

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

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

31 Cubic Telecom is headquartered in Ireland, but does not operate as an MVNO in Ireland, and relies instead on roaming agreements for its Irish connectivity

32 Communities can also be favourable to sharing arrangements as it can reduce the number of cell-sites required to provide service or they get access to connectivity sooner due to reduced network deployment costs for the operators.

33 See https://n.vodafone.ie/network/5g.html https://www.three.ie/coverage-checker/ https://www.eir.ie/5G/

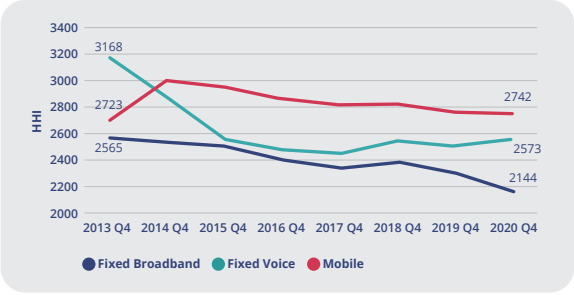
34 European Commission, Digital Economy Society Index - Connectivity

## The state of competition in retail markets

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

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

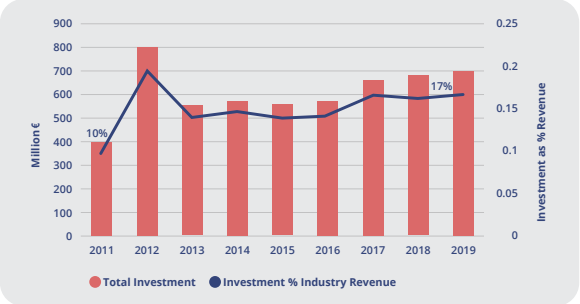
**Figure 4: Retail Concentration (HHI), 2013 – 2020[36]**




# Investment in ECN / ECS

**4.21** Private investment in the sector increased over the period 2011 to 2019, as shown in Figure 5. Over this period, total investment amounted to €5.5 billion.[37] Aside from the peak in 2012 - at 19% - corresponding to ComReg's Multi-Band Spectrum Award, the trend depicts steady or slightly increasing investment as a percentage of overall industry revenue, averaging approximately 15% over the period.

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




# Competition and Investment

## Retail Competition

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

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

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

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

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

38 Eurostat and ComReg Quarterly Key Data Report

## Goal 1.1

**There is effective and sustainable competition in retail ECS markets.**

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

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

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

- **Monitoring retail ECS and relevant OTT Markets** – ComReg will continue to monitor developments in retail ECS markets and relevant OTT markets to ensure they meet consumer needs.
- **Study of the Irish Mobile Market** – In 2020 ComReg began a study of the mobile market, which will conclude in 2021.
- **Monitoring key related/adjacent Markets** – ComReg will monitor key related/adjacent markets as these have the potential to have disruptive effects on ECS markets.

## Wholesale Markets and Access Regulation

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

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

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

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

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

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

## Access Regulation – the SMP Framework

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

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

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

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

**4.36** ComReg has not previously conducted a review of the market for Physical Infrastructure Access ('**PIA**') in its own right, mandating instead access to Eircom's duct and poles as a remedy for Wholesale Local Access. Over the coming period ComReg will review the market for PIA as it is the most upstream market that could potentially be regulated and therefore this may afford the possibility of further de-regulation downstream. The use of PIA by other operators provides a high degree of control over their product features and technology choices, for example, in comparison to the use of virtual unbundling. This has the potential to increase the dynamism of competitive forces.

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

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

**Table 3: Proposed Market Reviews**

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

## Goal 1.2

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

### Timely withdrawal of regulation

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

## Goal 1.3

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

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

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

### Investment and Regulatory Certainty

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

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

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

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

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

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

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

- Encouraging viable investment in own infrastructure by those who purchase access from other networks, particularly those who use regulated access to Eircom's network;
- Ensuring that regulated prices reflect efficient practice and that excessive recovery by the SMP operator does not happen;Ensuring that wholesale prices do not lead to price squeezes;
- Wholesale prices do not lead to excessive end user prices; and
- Wholesale prices ensure a timely and efficient migration to new infrastructure over time.

## Goal 1.4

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

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

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

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

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

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

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

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

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

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

- **Pricing Signals**: Wholesale prices imposed by ComReg in regulated markets to enable deeper infrastructure competition act as pricing signals to the SMP operator and other operators seeking to invest in ECN / ECS. Effective pricing signals should encourage an operator to invest efficiently and migrate away from legacy infrastructure.
- **Reasonable Rate of Return**: ComReg will also encourage investments by other operators in downstream markets by mandating and enforcing appropriate access to inputs controlled by the SMP operator on fair, transparent and non-discriminatory terms. In order to encourage investments by the SMP operator, including in next generation networks, ComReg shall take into account the investment made by the operator, and allow a reasonable rate of return on adequate capital employed.
- **Cost of Capital**: ComReg updated the WACC applicable to Fixed & Mobile Telecommunications and Broadcasting in October 2020[40]. Following this decision, ComReg will recalculate the WACC on an annual basis using updated parameters. The recalculated WACC values will then be used when price controls are amended or updated as part of any subsequent ComReg decision.
  Where prices have been previously set by ComReg (including in the form of maximum prices), for a defined future period, a subsequent change in the WACC will not automatically lead to any change in those prices.
- **Co-investment**: To incentivise investment further, the EECC introduces new conditions relating to co-investment agreements between operators. ComReg will consider co-investment proposals to ensure that efficient commercial investments can occur and VHCN infrastructure can be deployed to the widest extent possible.

## Legacy Networks

**Goal 1.5**

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

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

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

40 ComReg Document 20/96

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

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

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

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

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

# Essential Inputs: Spectrum and Numbering Resource

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

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

## Spectrum

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

41 ComReg Document 21/43

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

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

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

## Goal 1.6

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

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

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

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

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

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

- **MBSA2**: Completion of the MBSA2 award will see the release of 470 MHz of harmonised spectrum rights in the 700 MHz Duplex, 2.1 GHz, 2.3 GHz and 2.6 GHz Bands[45]. This represents a 46% increase in the harmonised spectrum assigned for the provision of wireless broadband services.
- **Fixed Links**: ComReg has held a consultation[46] to review the current Fixed Links licensing regime, and intends to issue a final decision in 2022, after which a number of work streams may emerge in order to open new bands, close some bands, realign uses, etc.
- **Satellites**: There has been a resurgence of interest in using constellations of small satellite in low earth orbits (LEOs) to provide internet access.
- To ensure that Ireland has an appropriate legislative framework, ComReg recently adopted a single exemption order[47] to cover all terminals for satellite services. This permits any user terminals that meet the conditions of the exemption order to be used in Ireland. Over the period of this Strategy, ComReg will review its licence regime for satellite earth stations.

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

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

**Explanatory Box 1: Licence Exempted Devices**

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

## Short Range Devices

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

## WiFi6

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

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

## Numbers

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

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

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

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

- **Completing improvements to the Non-Geographic Numbering (NGN) platform**: During 2021, three number ranges (1850, 1890 and 076 numbers) will cease to operate. From 1 January 2022, only the Freephone 1800 and Standard Rate 0818 NGN products will remain. These changes will ensure that Ireland has a fit for purpose and easy to understand NGN platform, and a competitive market for NGN services.
- **Factoring OTT services and 'cloud' numbers into updates of the Numbering Conditions of Use**: ComReg updates the Numbering Conditions of Use every 2-3 years, to take account of legislative changes, new technologies and market developments. Numbers are increasingly being used by the major online platforms, sometimes on a temporary basis, to provide 'click-to-call' features and to enhance end-user privacy. The next update in 2021 will reflect several changes to numbering legislation in the EECC.
- **Developing a strategy for promoting over-the-air (OTA) provisioning**: The EECC requires Member States to promote over-the-air ('**OTA**') provisioning to facilitate provider switching, with the emphasis on switching between M2M service providers. OTA provisioning relies on 'embedded' SIM ('**eSIM**') technology. ComReg commissioned an expert study in early 2021 to support the development of a strategy for the promotion of OTA provisioning in Ireland. ComReg is also seeking to engage with both national and international stakeholders as part of the study.