



An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

ComReg's strategy to promote Over-the-Air provisioning - Response to Consultation

Response to Consultation

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An Coimisiún um Rialáil Cumarsáide
Commission for Communications Regulation

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Content

Section	Page
1 Introduction.....	6
1.1 Background and Purpose.....	6
1.2 Updated Information.....	7
1.3 Respondents to Consultation 21/114 and 21/114A.....	9
1.4 Structure of this document	9
2 Response to submissions received to Document 21/114 and 21/114A....	10
2.1 Introduction	10
2.2 Assessment of the Submissions	10

Annex

Section	Page
Annex 1: Relevant Legal Framework and Statutory Objectives.....	51
Annex 2: Consumer research on OTA.....	65

Table of Figures and Tables

Section	Page
Table 1: Physical retail distribution of Irish MNOs/MVNOs.....	71
Figure 1: Handset sales as share of revenues for 3 Europe's MNOs, 2014-2021	21
Figure 2: Mobile contract customer churn for 12 of Hutchinson and Vodafone PLCs European MNOs, 2014-2021	69

Chapter 1

1 Introduction

1.1 Background and Purpose

- 1.1 The Commission for Communications Regulation (“ComReg”) is the statutory body responsible for the regulation of the electronic communications (telecommunications, radiocommunication and broadcasting networks), postal and premium rate sectors in Ireland in accordance with European Union (“EU”) and Irish Law.
- 1.2 ComReg also manages the national numbering resource, among other responsibilities. Within the European Electronic Communication Code (the “EECC” or the “Code”) Articles on ‘Numbering Resources’, Article 93(6) requires Member States to promote OTA provisioning to facilitate switching between service providers. Article 106(6) of the EECC states that NRAs may establish the details of the switching and porting processes, including requiring where technically feasible relevant service providers to provide porting services via OTA provisioning, unless an end user requests otherwise.
- 1.3 In its Electronic Communications Strategy Statement for 2021 to 2023 (ComReg Document 21/70), ComReg set out its intention to:
- commission an expert study in early 2021 to support the development of a strategy for the promotion of Over-the-Air (“OTA”) provisioning in Ireland;
 - engage with both national and international stakeholders as part of this study; and
 - develop an action plan for promoting OTA provisioning.
- 1.4 ComReg commissioned WIK Consult GMBH (“WIK”) to assist in data gathering and the development of a vision and strategy for the promotion of OTA provisioning in line with both the EECC and ComReg’s objectives. As part of this work, WIK was informed by information gathered from, amongst other sources:
- Interviews conducted by WIK and ComReg with industry stakeholders¹;
 - Responses received from national regulatory authorities to a request for information²;
 - Analysis of market data and customer complaints; and
 - WIK’s own forecasts for eSIM deployment in Ireland.

¹ This includes MNOs, MNO Groups, Industry Associations, eSIM solution providers and eSIM manufacturers.

² Issued in March 2021 to members of the Independent Regulators Group.

- 1.5 On 8 November 2021, ComReg published WIK's report (Document 21/114a) (the "WIK Report") alongside a consultation (Document 21/114) (the "Consultation") on its draft strategy to promote OTA provisioning. The Consultation outlined in particular ComReg's preliminary views as to:
- the potential impact of OTA provisioning on consumers and competition;
 - the potential challenges to the full realisation of the benefits of OTA provisioning;
 - the proposed strategy for ComReg to promote OTA provisioning (the "Draft Strategy"), in line with the EECC and its statutory objectives; and
 - the proposed Guidance on OTA provisioning for Consumer Mobile (the "Draft Guidance").
- 1.6 ComReg thanks interested parties for their submissions and has published the non-confidential versions of the submissions in ComReg Document 21/48s.
- 1.7 Having carefully considered the submissions, this document, among other things, sets out ComReg's assessment of, and views in relation to the matters raised by respondents, as well as WIK's review of the submissions (Document 22/48b) (the "WIK Supplemental Report") and a consumer survey on OTA/eSIM commissioned by ComReg (Document 22/48c) (the "OTA Consumer Survey")³.
- 1.8 The revised, final strategy to promote OTA provisioning (the "Strategy") with updated *Guidance on OTA provisioning for Consumer Mobile* (the "Guidance") is published separately as Document 22/48a.

1.2 Updated Information

- 1.9 This section contains updated information on a number of factors relevant to the formulation of the Draft Strategy, which have changed and/or become available since the publication of the Consultation. This updated information is presented in this section and incorporated in the assessment below where relevant.
- 1.10 An overview on eSIM and OTA provisioning is provided in the Consultation and the WIK Report and is not repeated here.

Updated Information – impact of the delayed transposition of the EECC on the OTA Strategy.

- 1.11 The EECC was published on 20 December 2018. The transposition deadline for all Member States was 21 December 2020. As of June 2022, the transposition of the EECC has not taken place in Ireland. The Government Legislation Programme of

³ Conducted by Behaviour and Attitudes of on behalf of ComReg as part of a broader survey of consumers (the "Consumer Awareness Survey").

summer 2022 prioritises legislation transposing the EECC.

- 1.12 While the role of an NRA (e.g., ComReg) is to take steps to promote OTA provisioning (“OTA”) per Article 93(6) (since the EECC is directly applicable to Member States), ComReg does not yet have the additional powers under Article 106(6) in relation to specifying a requirement on operators to provide OTA provisioning, that will be available to it when the relevant provisions of the EECC have been transposed.
- 1.13 ComReg could await the transposition of the EECC to finalise its Strategy and to promote OTA. However, this option is less than satisfactory given the relative delay in the rollout of OTA provisioning in Ireland, which lags behind its peers in eSIM support for consumer use cases, as highlighted in the Consultation. Furthermore, WIK and ComReg identified a number of actions which ComReg could take without need for delay (not being dependent on Article 106(6)). Accordingly, ComReg publishes its revised OTA Strategy and has begun and will continue to promote OTA.
- 1.14 ComReg therefore publishes its OTA Strategy, revised in light of the submissions received, excluding certain actions as outlined in 21/114 at this time, specifically Actions 1 and 4. ComReg will instead advance the goals of these actions in collaboration with industry, primarily through bilateral engagement with MNOs:
- In relation to Action 1, the Strategy still supports target deadlines by which all MNOs would aim have introduced a fully digital OTA for consumer mobile - but having regard to submissions and that transposition is ongoing, ComReg does not seek to mandate their implementation by this date, at this stage.
 - In relation to Action 4, ComReg will discuss this matter with operators in the aforementioned bilateral meetings.
- 1.15 ComReg’s approach will be to monitor implementation and, where appropriate, in light of its role pursuant to transposition of the EECC, specify (or further specify) obligations to be complied with by providers, in relation to OTA. ComReg will review the progress of industry and the market as regards the introduction of OTA and end-user needs and protections on an ongoing basis. The progress reviews will inform ComReg’s future considerations on the necessity of further action, including possibly mandating steps to be taken by industry. ComReg may consult where necessary on issues to be addressed in light of provisions in Article 106 of the EECC as regards OTA provisioning.

Updated Information – consumer research on eSIM/OTA and mobile sign-up/switching

- 1.16 Since Document 21/114 was published, ComReg has completed consumer research into the views of Irish consumers on eSIM, OTA and mobile switching more generally. A high-level summary of the key findings as well as ComReg's assessment the survey findings is provided in Annex 2. The results of the OTA Consumer Survey are incorporated in ComReg's assessment of the responses where relevant.

1.3 Respondents to Consultation 21/114 and 21/114A

- 1.17 In response to Documents 21/114 and Document 21/114A, responses were submitted by the following interested parties:

- Competition and Consumer Protection Commission ("CCPC");
- Eircom Limited ('Eir');
- ESB Networks ("ESBN");
- Mobilise Holdings Limited ('Mobilise');
- Sim Local (Ireland) Limited ('Sim Local');
- Tesco Mobile Ireland Limited ('Tesco')
- Three Ireland (Hutchison) Limited ("Three");
- Twilio Ireland Limited ('Twilio');
- Virgin Media Ireland Ltd ("Virgin"); and
- Vodafone Ireland Ltd ("Vodafone").

1.4 Structure of this document

- 1.18 This document is structured as follows:

- **Chapter 2:** sets out the responses received to ComReg document 21/114 and 21/114A. This includes ComReg's assessment of the responses.
- **Annex 1:** provides information on ComReg's Legal Framework and Statutory Objectives
- **Annex 2:** outlines and assesses the OA Consumer Survey.

Chapter 2

2 Response to submissions received to Document 21/114 and 21/114A

2.1 Introduction

2.1 This chapter sets out ComReg's consideration of respondents' views. ComReg notes that respondents are generally supportive of the preliminary views as set out in Document 21/114 and Document 21/114A, with disagreement centred on certain actions.

2.2 The views of respondents are grouped under the following headings, with the relevant questions from ComReg Document 21/114 in brackets:

- Technical Background (Questions 1-2);
- Market trends and forecasts (Questions 3-5);
- Competitive effects of eSIM and OTA (Questions 6-7);
- Environmental effects of eSIM and OTA (Questions 8-9);
- Safety and security of SIM and OTA (Questions 10-11);
- Draft Strategy: Vision and Challenges (Questions 12-17);
- Draft Strategy: Actions 1-3 and Draft Guidance (Question 18-22)⁴;
- Draft Strategy: Actions 4-9 (Question 18-22);
- Other matters (Question 23).

2.2 Assessment of the Submissions

2.2.1 Technical Background and use cases

Summary views of ComReg in Document 21/114

2.3 For the reasons set out in sections 3.1 – 3.3 of Document 21/114 and as outlined in Section 4.1 of the WIK Report, ComReg's preliminary view was that the relevant

⁴ Actions 1-3 and the *Guidance on OTA provisioning for Consumer Mobile* are highly interrelated and for clarity are split out from Action 4-9.

existing and potential use case groupings are:

- Consumer Mobile (e.g., smartphones);
- Secondary Devices (e.g., smartwatches);
- Consumer International Mobile (e.g., roaming);
- M2M National (e.g., smart meters); and
- M2M International (e.g., automotive).

2.4 Notably, the WIK Report found “*that OTA is technically feasible for all use cases identified*”.

2.5 ComReg sought the views of interested parties on the following.

Technical Background

Q1: Does the technical background described and outlined by WIK capture all technical matters relevant and material to ComReg's promotion of Over-the-Air provisioning? What, if anything, should be included?

Use Cases

Q2: Do the Use Case groupings described and outlined by WIK capture all use cases relevant and material to ComReg's promotion of Over-the-Air provisioning? What use cases, if any, should be included?

Views of respondents to Document 21/114

Technical Background

2.6 Vodafone notes the importance of promoting OTA provisioning in a language that end-users can easily understand and promoting standards for MNO platforms that ensure interoperability.

2.7 Vodafone questions the necessity and rationale behind the integration of MNP and OTA switching described by WIK in page 54 of the WIK Report. Furthermore, Vodafone considers that SGP.31⁵ and SGP.32 will simplify some of the complexity WIK described in relation to the difficulties in M2M switching.

2.8 Three agrees with WIK's technical understanding, noting this is a new and evolving

⁵ For eSIM Consumer and IoT specifications, please see <https://www.gsma.com/esim/esim-specification/> .

area and new issues may emerge.

2.9 Mobilise agrees with WIK's description of the relevant technical matters and suggests further consideration of the following.

- Cloud Platform Systems, such as Amazon Web Service ("AWS").
- The role of OEMs in facilitating eSIM in-App provisioning.
- Electronic Know Your Customer ("eKYC") services.

2.10 Virgin submits that WIK's technical description does not take into consideration that:

- secondary device use cases are undermined by deficiencies in the current eSIM standards (e.g., a consumer requires a physical SIM to gain the benefits of multiple enabled profiles);
- standards do not yet support multiple profiles or multiple companion devices;
- operators will continue to require device entitlement servers for companion devices; and
- there will be an impact on SIM delivery processes, including coexistence of SIM and eSIM.

Use Cases

2.11 Three, Virgin, Mobilise and Vodafone agree with WIK's list of use cases. Three and Virgin additionally note that this is a new and evolving area and new use cases may emerge.

WIK's updated view

Technical Background and Use cases

2.12 WIK refers interested parties to where such matters are addressed in the WIK Report.

ComReg's Assessment

Technical Background

2.13 ComReg agrees with Vodafone on the importance of clear communications about the benefits of OTA. Furthermore, ComReg agrees there is no "necessity" for an integration of MNP and OTA processes, as was noted by WIK on page 54 of the WIK

Report⁶.

- 2.14 ComReg notes the view of the CCPC that, the potential for eSIM to reduce the number of physical stores or independent retailers selling phones may disadvantage those who prefer to find information via offline means and find information and sign up in a physical store and that ComReg consider the needs of multiple groups of consumers, including those who may be less digitally engaged. With that in mind, ComReg notes that preference for in-store sign-up is greater among consumers 65 years old or older and that operators should be cognizant of the needs of such consumers. ComReg will ensure that end-user access needs are met and support the equivalence of access provisions for end-users with disabilities envisaged by Article 111 of the EECC.
- 2.15 In relation to Virgin's views, ComReg agrees with WIK's response that such factors were previously considered and therefore no updates are required to ComReg's strategy.
- 2.16 In relation to matters raised by Mobilise, ComReg agrees that:
- Cloud Platform Systems ("CPS") can facilitate the deployment of eSIM. ComReg notes, for example, that AWS⁷ has recently acquired GSMA accreditation for Security Accreditation Scheme Subscription Management (SAS-SM) to perform certain SM-DP, SM-SR and SM-DP+ functions on its site on behalf of third parties, potentially reducing the cost and complexity of eSIM deployment for smaller players.
 - OEMs can play a role in facilitating eSIM in-App provisioning. In that regard, ComReg notes the importance of OEMs in driving eSIM adoption through manufacturing eSIM mobile devices and also in the 'Out-of-the-box' eSIM activation processes.
 - eKYC services is an important part of eSIM sign-up, especially where the process does not involve the customer visiting a store or a QR code or device being delivered to a customer's address.
- 2.17 ComReg notes WIK's referral to where this information was considered within its report and considers that the points raised do not affect the Strategy. In particular, ComReg considers that the role of OEMs and CPS in facilitating eSIM support does not remove the need for MNOs to provide eSIM support for consumers to avail of OTA. In relation to the importance of eKYC, ComReg has been clear in emphasising the importance of security to any and all eSIM related processes and made reference

⁶ As outlined in the patent of Samsung.

⁷ AWS, "AWS achieves GSMA Security Certification for Europe (Paris) Region" AWS Security Blog, 10/11/2021 link [here](#) (accessed on 14/06/2022).

to security in ComReg 21/114 in its potential mandate for fully digital OTA (Action 1) and the *Guidance for OTA for Consumer Mobile* (Action 2). While WIK did not provide an evaluation of different security systems for eSIM, it did observe that secure provisioning is possible via the means of eSIM activation being promoted (i.e., sign-up via mobile application or via digitally distributed QR code). ComReg notes that no interested party has yet provided evidence to the contrary. ComReg reminds MNOs that MNOs are responsible for the security of their networks, as well as the data and details of their customers under, among other things, GDPR and Irish data protection law.

Use Case

- 2.18 ComReg notes the general agreement with the proposed use cases as well as WIK's response and does not propose to make any changes to the list of use cases or use case groupings as identified in Document 21/114.

2.2.2 Market trends and forecasts

Summary views of ComReg in Document 21/114

- 2.19 The Draft Strategy was informed by WIK's findings in relation to current market trends in eSIM and OTA in Ireland, for both Consumer and M2M use cases. A key finding was that despite availability of eSIM devices, Irish MNOs were lagging international peers in the roll-out of eSIM support⁸. WIK forecast that eSIM and OTA would increase greatly in the Irish market, although eSIM activation could be harmed by a lack of support among operators.

- 2.20 ComReg sought the views of interested parties on the following.

eSIM deployment and activation in Ireland

Q3: Is there a reason for the lagging MNO support for eSIM have a reason of which we are not aware of from discussions with MNOs? Any technical barrier to its feasibility?

Q4: Is the deployment and activation of eSIM for M2M use cases in Ireland ahead of that in comparable countries? Why/why not?

Forecasts

Q5: Do the forecasts of eSIM deployment and activation appear sensible and to have identified the appropriate and most important drivers? What factors, if any, should be included?

⁸ See page 136 of the WIK Report

Views of respondents to Document 21/114

eSIM Deployment and activation

- 2.21 Vodafone and Three disagree that eSIM support in Ireland is lagging, with Vodafone noting that the consumer use cases are developing and that eSIM support will be adopted “*without question*”. Three qualifies that eSIM support for devices is currently limited to high-end devices. Vodafone contends that barriers could arise from regulatory actions which depart from an internationally harmonised approach and notes many international operators have had a staggered rollout of eSIM support beginning with larger markets.
- 2.22 Virgin submits that a lack of multiple enabled profiles under current standards are a barrier to adoption, and notes the investments and time required to adapt back-end infrastructure to support eSIM.
- 2.23 Mobilise submits that it is aware of no barriers to the adoption of eSIM and OTA specific to Ireland.

Forecasts

- 2.24 Three considers that the forecasts for eSIM adoption to be reasonable, noting the early stage of deployment.
- 2.25 Virgin, on the contrary, contends that the forecasts are optimistic, as they are likely to be impacted by a number of challenges identified by WIK, including a lack of eSIM support, consumer friendly OTA provisioning and low consumer awareness.
- 2.26 Mobilise contends that WIK forecasts for eSIM adoption in Ireland are conservative, given recent market developments indicating growing eSIM device penetration internationally.

WIK's updated view

eSIM Deployment and activation

- 2.27 WIK disagrees with Vodafone and Three's assertion that eSIM support in Ireland is not lagging market developments in other jurisdictions, noting that the partial support in Ireland is in contrast with more widespread support in neighbouring countries, particularly given the estimates for eSIM device penetration in Ireland.

Forecasts

- 2.28 WIK notes that the diversity of views in relation to its forecast (overly optimistic, overly conservative, appropriate) indicate that the forecasts are broadly realistic.

ComReg's Assessment

eSIM Deployment and activation

- 2.29 In relation to Three and Vodafone's view that eSIM is not lagging in Ireland, ComReg notes there has been no further developments in the availability of eSIM for Consumer use cases, since the publication of the Consultation, whereas MNOs in other European countries continue to make progress, with even more MNOs internationally adopting eSIM support for Consumer Mobile⁹ and Secondary Devices.
- 2.30 In contrast, ComReg notes that there has been no significant improvement in the level of support for eSIM for Consumer use cases in Ireland, noting that at the time of publication:
- only Vodafone offers eSIM support for Consumer Mobile (e.g., smartphones);
 - no MNO offers eSIM support for Secondary Devices (e.g., smart watches).
- 2.31 In that regard, ComReg notes WIK's unfavourable comparison of eSIM support in Ireland relative both to international peers and the prevailing level of eSIM device penetration in Ireland.
- 2.32 ComReg notes that M2M subscriptions have continued to increase in Ireland, with M2M subscriptions now exceeding 2 million, with an annual growth of 37%¹⁰. Based on its discussions with MNOs and M2M customers, ComReg expects a high share of such new M2M subscriptions to utilise eSIM.
- 2.33 In relation to Vodafone's view that, all else being equal, MNO groups would rollout eSIM support in larger markets first and smaller markets later, ComReg notes that eSIM support for consumer use cases is now available in many countries smaller than Ireland. For example, Manx Telecom recently launched BreatheSIM, a mobile app based, fully digital eSIM application¹¹ in the Isle of Man using Mobilise's Hero platform¹².
- 2.34 In relation to Vodafone's views that regulatory barriers could arise from regulations that depart from an internationally harmonised approach, ComReg notes that none of the proposed actions necessarily preclude any potential international approaches which meets the requisite standard of consumer journeys.

⁹ eSIM support for smartphone is available in 82 countries from 232 operators as of December 2021 up from 69 countries 175 operators in December 2020– GSMA "Scaling eSIM in 2022 and Beyond" 22/06/2022.

¹⁰ ComReg Quarterly Key Data Report for Q3 2021

¹¹ BreatheSIM – eSIM Travel Data available in the [App Store](#).

¹² Mobilise Insights "Digital eSIM brand – Manx (OV) case study" [Link](#)

- 2.35 In relation to Virgin's view that a lack of multiple enabled profiles could amount to a barrier to adoption, ComReg notes that eSIM adoption has progressed in other markets despite a lack of multiple enabled profiles and similar functionalities which may benefit consumers. Therefore it's unclear this amounts to a barrier to adoption presently, noting that consumer awareness of eSIM itself is still quite low.

Forecasts

- 2.36 ComReg notes that forecasting necessarily involves some level of uncertainty. ComReg agrees with WIK's view that the variety of views from respondents indicates no obvious flaw in WIK's forecasts.

2.2.3 Competitive effects of eSIM and OTA

Summary views of ComReg in Document 21/114

- 2.37 The Draft Strategy was informed by WIK's findings on the likely impact of OTA on competition in mobile markets. Importantly, WIK found that OTA could lead to faster and easier switching, leading to greater competition and benefit consumers and M2M customers in several ways (e.g., convenience, innovative services, lower prices).
- 2.38 ComReg sought the views of interested parties on WIK's findings on the following.

Competition

Q6: Do you agree with the analysis of the competitive effects of eSIM and Over-the-Air on competition in mobile markets? If not, how do your views differ?

Q7: Does the description of the competitive effects of eSIM and Over-the-Air consider all relevant impacts? If not, what should be included?

Views of respondents to Document 21/114

- 2.39 The CCPC agrees that faster, easier switching can enable consumers to avail of better deals, enable more effective competition, and facilitate entry or expansion of smaller providers.
- 2.40 ESNB notes that OTA can reduce the cost of "truck-roll" (i.e., the cost of swapping SIMs when switching provider). ESNB notes that this cost can be prohibitive and reduces the bargaining power of M2M customers.
- 2.41 Twilio submits that OTA improves the competitiveness of MVNOs and/or enables the entry of new MVNOs relying upon the support of host MNOs.
- 2.42 Vodafone submits that delayed rollout of OTA is not itself an indication of a

competition issue and any competitive assessment should consider the role of the MNO and the need for “*a fair return on investment*”. Vodafone cites greater network resilience and improved deployment of global solutions as a key competitive benefit of OTA.

2.43 Mobilise notes that OTA has the potential to increase churn and thereby increase competition between MNOs. Mobilise cites a number of potential distortions which do not negate the benefits of OTA:

- OTA could enable the entry of new service providers, specifically “hyperscalers”, such as Amazon and Google, that could distort competition in mobile markets through their control of mobile application stores. Mobilise claims that this has already occurred in certain markets with handset OEMs, in particular Apple, who Mobilise claims distorts consumer choice through its in-App provisioning policies.¹³
- The competitive role of MVNOs may be undermined if MNOs with eSIM support do not enable eSIM support for their partner MVNOs, thereby reducing MVNOs’ ability to compete on price.
- OTA/eSIM may bring short term price reductions, but MNOs’ ability to reduce prices in the long run is reduced because less revenue streams are available over which to recover costs. For example, Mobilise contends that with lower handset revenues, MNOs would have less revenues over which to spread the cost of investment. Mobilise also submits that MNOs may have to realise a return on investment on 5G and other network investment over a longer period or through higher prices¹⁴.

2.44 Virgin is concerned that OTA could result in a competitive disadvantage for MVNOs if MNOs delay eSIM support to MVNOs. Virgin submits that smaller MNOs or MVNOs could be disadvantaged if MNOs secure more favourable support and/or promotion from OEMs in mobile sign-up¹⁵.

2.45 Virgin also submits that OTA is a threat to the relationship between mobile providers and consumers, which could reduce choice and competition. Virgin agrees with WIK’s finding that “Out-of-the-box” offering could result in competitive issues where consumers are unable to switch mobile service providers.

¹³ Mobilise contend that Apple only share such policies with a small number of MNOs which have a wireless carrier agreement with Apple and permission to resell Apple devices.

¹⁴ Mobilise argue this loss will not be compensated by revenue growth from M2M/IoT, as most devices are purchased directly from vendors, use little data, or where data usage is high it is unclear MNOs will be the provider (e.g., private mobile networks).

¹⁵ Virgin provide as an example the inferior listing of MVNOs as a connectivity partner in the device activation process.

- 2.46 Tesco is also concerned that smaller MNOs or MVNOs could be disadvantaged should they secure from OEMs more favourable support, promotion or listing as an option in the mobile sign-up customer journey. Tesco observes that OEMs could exclude MVNOs altogether, noting for example that Apple in the US appears to offer a limited number of mobile providers and that OEMs may not wish to deal with smaller MNOs or MVNOs.

WIK's updated view

- 2.47 WIK's response to concerns relating to MVNOs are set out in response to Action 6 in Section 2.2.8 below.

ComReg's Assessment

- 2.48 ComReg notes the general concurrence on the competitive benefits of OTA from respondents such as the CCPC, ESNB and Twilio.
- 2.49 In relation to Vodafone's view that delayed eSIM does not constitute a failure of competition, ComReg reiterates that any mandate would be precautionary in nature as explained in Document 21/114 (i.e., related to the implementation of a minimum standard of OTA by a future date, at which time competition should have delivered OTA for consumers). As Vodafone itself notes, OTA for the consumer use case should be expected to occur. ComReg's proposals therefore aim to ensure that OTA is delivered over a reasonable period and in line with expectations for a competitive well-functioning market. However, that is not currently the case and the level of eSIM support available to Irish consumers is behind that in comparable markets.
- 2.50 In relation to Vodafone's view that ComReg needs to consider a fair return on investment, ComReg notes again that as any mandate would be precautionary in nature and therefore should not impose any unfavourable returns on investment for operators.
- 2.51 In relation to the entry of "hyperscalers"¹⁶ into the provision of mobile services, ComReg notes that entry by hyperscalers could drive greater competition in the Irish mobile market and provide new or innovative services based on their unique business models (e.g., Google Fi).
- 2.52 In relation to Mobilise's concern that reduced revenue from handset sales will harm MNOs, ComReg notes that consumers will purchase their connectivity and handsets however best suits their needs, (e.g., separately, together from either a MNO, retailer or OEM). Mobilise's concern rests on consumers preferring and choosing offerings by OEMs over those of MNOs: it is for MNOs to decide how best to react to such

¹⁶ Mobilise provides AWS, Google, Microsoft as examples.

competition.

2.53 ComReg does not find persuasive Mobilise's view that OTA could reduce an MNO's ability to invest and/or drive cost savings for consumers as a result of a loss of handset revenues. This view appears to depend on MNOs' handset revenues reducing the cost of investing in networks. ComReg has identified a number of potential efficiencies from handset revenues that could reduce the cost of investment could include:

- cross-subsidising network investment (e.g., higher margins in handset sales finance network investment);
- generating economies of scale in investment (e.g., higher total revenues lower the cost of capital); or
- diversifying MNOs' revenue streams (e.g., potentially lowering the risk of lending to MNOs).

2.54 However, ComReg notes with respect to these potential efficiencies that:

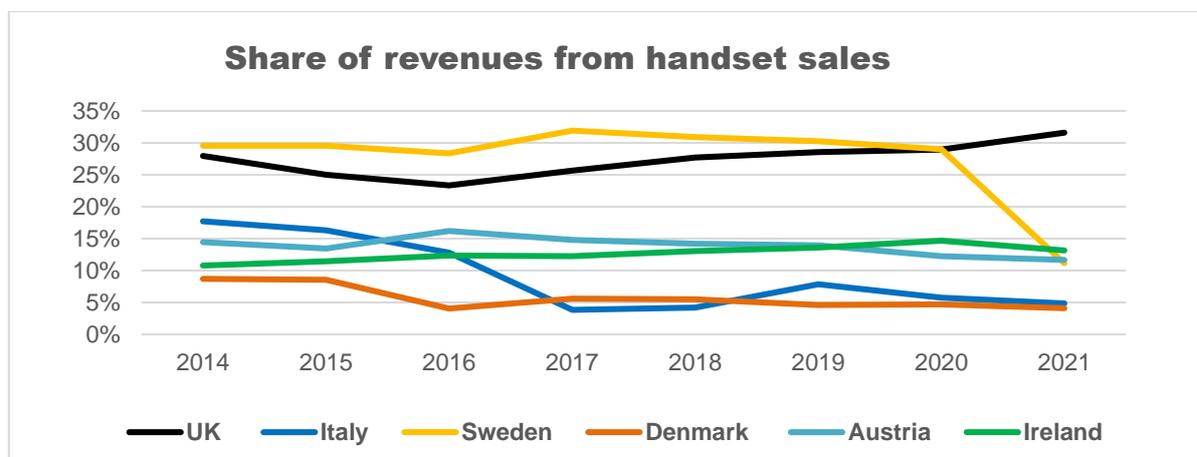
- Cross subsidisation implies that consumers are paying a higher relative margin on handsets at present, which appears at odds with the subsidised handset model which operators promote.
- It is not obvious, prima facie, that handset revenues account for a such a large share of revenues to generate large economies of scale in lending.¹⁷ As far as ComReg is aware¹⁸, revenues from handset sales account for a minority of revenues for MNOs. Revenues from handset sales account for 13% and 15% of the total revenues of Three Ireland, Ireland's only mobile-only MNO¹⁹ and 3 Group Europe, as shown in in **Figure 1** below.²⁰
- MNOs' revenues from handset sales and revenues from connectivity services are likely correlated, as MNOs typically bundle handsets with subscriptions, therefore handset revenues are unlikely to lower the risk of lending to MNOs.

¹⁷ For example, Three Ireland appears to take handset revenues €87 million per annum, broadly negating its customer acquisition costs of €89 million. See page 29 of Hutchinson Group "2021 Annual Report" [link](#). To the best of ComReg's knowledge, comparable figures are not publicly available figures are not available for Eir or Vodafone Ireland.

¹⁸ ComReg does not have information on handset revenues of MNOs internationally besides that which MNO Groups publish publicly.

¹⁹ Noting that mobile handset sales will likely account for a lower share of national and/or revenue for MNOs that also operate a fixed network.

²⁰ ComReg notes that the share of revenues from handset sales have decreased for most, but not all, of Three's European MNO since 2014.

Figure 1: Handset sales as share of revenues for 3 Europe's MNOs, 2014-2021

Source: Annual accounts of CK Hutchinson Holdings Limited

- 2.55 Furthermore, ComReg notes that increasing consumers' ability to switch OTA will incentivise operators to offer more competitive deals in the short and long run. In that regard, ComReg notes recent empirical research by Ofcom that finds that competition drives network investment²¹.
- 2.56 Further, in relation to concerns that hyperscalers and OEMs could act as gate keepers and foreclose smaller MNO and/or MVNOs, ComReg notes that control or influence over consumers' choice of mobile provider could impact competition, where particular device OEMs and/or app stores held market power in the supply of devices or means to install connectivity (e.g., an application store). However, OEMs may have objective justification for such pre-selection in terms of ensuring a good consumer experience²². Ultimately, allegations of anti-competitive conduct would be assessed under ex-post competition law²³. Therefore, ComReg does not prejudge any findings on this matter, noting that OEMs should be aware of their obligation under Irish and European Competition law. In order to raise awareness of this issue among competent regulatory authorities, ComReg presented its findings and the views of respondents at a regulatory working group focusing on competition issues in telecommunications markets²⁴.

2.2.4 Environmental effects of eSIM and OTA

Summary views of ComReg in Document 21/114

²¹ Ofcom (2020) "Market structure, investment and quality in the mobile industry"

²² For example, when the iPhone 1 launched in Ireland O2 Ireland was preselected by Apple to provide connectivity due to O2's greater 3G coverage.

²³ While there has been no investigation of such conduct at the time of writing, a number of recent competition cases have centred on mobile application stores.

²⁴ This meeting was attended by the European Commission, National Competition Authorities, and National Regulatory Authorities.

- 2.57 The Draft Strategy was informed by WIK's findings in relation to the likely environmental impact of eSIM on OTA. Importantly, WIK found that eSIM-based OTA provisioning is more environmentally friendly than existing provisioning processes which rely on plastic removable SIM cards.
- 2.58 ComReg sought the views of interested parties on WIK's findings in relation to the following.

Environment

Q8: Do you agree with the analysis of the environmental effects of eSIM and Over-the-Air?

Q9: Does the description of the environmental effects of eSIM and Over-the-Air consider all relevant environmental impacts?

Views of respondents to Document 21/114

- 2.59 Vodafone notes the benefits of eSIM in reducing the use of plastic and carbon emissions.
- 2.60 Three considers that eSIM will bring environmental benefits, though it argues that much of those benefits identified by WIK are incidental.
- 2.61 Mobilise agrees with the environmental benefits of eSIM, as outlined by WIK. Mobilise notes that other solutions such as ECO SIM can bring some benefits, but that integrated or embedded SIMs (such as eSIM) bring the greatest reduction in emissions.
- 2.62 Virgin Media notes that the analysis demonstrates the environmental benefits of eSIM and OTA.
- 2.63 WIK's updated view**
- 2.64 WIK considers the comments to be consistent with the findings in the WIK Report.

ComReg's Assessment

- 2.65 ComReg notes the general agreement on eSIM and OTA resulting in environmental benefits.

2.2.5 Safety and security of SIM and OTA**Summary views of ComReg in Document 21/114**

- 2.66 The Draft Strategy was informed by WIK's findings in relation to the safety and security of eSIM on OTA based provisioning. Importantly, WIK found that all available evidence indicates that eSIM-based OTA provisioning is safe and secure and may resolve a number of security concerns with SIMs.
- 2.67 ComReg sought the views of interested parties on the following.

Security

Q10: Do you agree with the analysis of the security of eSIM and Over-the-Air provisioning standards and processes?

Q11: Does the analysis of the security of eSIM and Over-the-Air provisioning standards and processes?

Views of respondents to Document 21/114

- 2.68 Three broadly agrees with WIK's analysis of security.
- 2.69 Vodafone notes that the sector will need to be vigilant to any new forms of fraud and collaborate to address promptly.
- 2.70 Virgin notes that some security issues associated with physical SIMs are remedied by eSIM, but new forms of fraud and security issues may arise in the future.
- 2.71 Mobilise notes that a physical SIM requires in-store collection or delivery, which enables security checks either in-person or via confirmation of the customer's address. Mobilise considers that such means of identity confirmation are not applicable to fully digital OTA and that robust security checks are required in their absence to confirm device ownership, such as electronic Know-Your-Customer (eKYC).
- 2.72 Mobilise acknowledges that the wider importance of mobile security given its use as backup confirmation by other industries such as banking. For example, if a user's online mobile account is compromised, an eSIM could be issued and a number ported potentially providing access to a victim's banking. Mobilise label this a new form of "SIM swap". Mobilise seek further clarification and regulatory input in order to protect consumers trust in mobile security and banking.

WIK's updated view

- 2.73 WIK agrees on the importance of ID verification to fully digital OTA provisioning as well as in the context of two factor authentication. WIK notes that it addressed the potential security risks in Table 5-1 of the WIK Report, including a number of those

mentioned by respondents.

ComReg's Assessment

- 2.74 ComReg notes the general agreement in relation to the analysis of security of eSIM and OTA.
- 2.75 In relation to Mobilise's views on the importance of eKYC for OTA, ComReg agrees on the importance of the security for OTA processes²⁵. Mobile operators must develop secure identification processes for OTA consumer sign-up and switching. There may be a number of electronic identification processes which enable secure sign-up and switching, and operators may have to adapt such solutions to their own OSS/BSS systems²⁶. However, this is for operators to consider as part of the design of their OTA processes. ComReg therefore does not prescribe specific means of customer verification or their design. ComReg will however monitor and stay abreast of and contribute to discussions in the appropriate regulatory fora (e.g., ENISA).

2.2.6 Draft Strategy: Vision and Challenges

Summary views of ComReg in Document 21/114

- 2.76 Chapter 5 of Document 21/114 outlined the Draft Strategy for ComReg to promote OTA. As outlined in Section 5.1.1, WIK undertook a number of conceptual exercises to develop the Draft Strategy.
- 2.77 First, WIK developed a Vision for OTA (i.e., the best-case scenario in relation to consumer and competition), informed by the technical, economic and legal background. WIK identified eight principles each of which would need to be fulfilled in order to unlock the benefits of OTA provisioning to society and these principles inform ComReg's overarching vision.
1. Consumers and M2M customers should have the ability to use OTA for mobile activation, switching and porting.
 2. OTA activation and switching for mobile devices should be as fast and as easy as possible.
 3. Consumers should be provided with all information necessary to complete a successful switch, supported by clear contractual terms in the case of M2M customers.
 4. Switching should continue to be recipient-led for consumer use cases,

²⁵ For ComReg and WIK's discussion of security, see Section 4.3.1 and of 21/114 and Section 5.4 of 21/114a. Furthermore, security features in the *Vision and Guidance on OTA provisioning for Consumer Mobile*.

²⁶ WK Report, page 31.

while collaboration will often be needed between the transferring and recipient provider in M2M OTA switching.

5. Consumers should have the ability to use MNP in conjunction with OTA, including:
 - The principles for Porting via OTA should extend to any amended version of the MNP (e.g., maximum 2 hours).
 - Need to retain porting by SIM.
6. OTA provisioning should be safe and secure.
7. OTA provisioning should enable new business models and not foreclose existing business models (e.g., MVNOs).
8. OTA provisioning should enable new forms of eSIM devices and a greater number of devices.

2.78 Second, WIK identified a list of potential challenges to the realisation of the Vision identified above.

1. Delayed eSIM support by Irish MNOs for consumer mobile.
2. Potentially sub-optimal OTA processes.
3. Low consumer awareness of eSIM and/or OTA.
4. Barriers to M2M OTA switching should contracts not adequately enable switching.
5. MVNO barriers to compete.
6. Future or international challenges.
7. Lack of information about developments in market.

2.79 ComReg sought the views of interested parties on the following.

Vision

Q12: Do you agree with the Vision for Over-the-Air provisioning proposed by ComReg?

Q13: Do you consider the 8 factors to be well specified?

Q14: Are there further factors ComReg should consider in its Vision for Over-the-Air provisioning?

Challenges

Q15: Do you agree with the potential challenges identified to the realisation of the Vision identified by WIK? Are there any further challenges which should be considered?

Q16: Do you consider the 8 factors to be well specified? If not, please explain how your views differ.

Views of respondents to Document 21/114

Vision

- 2.80 Mobilise agrees with ComReg's Vision for OTA and considers the eight factors are appropriate.
- 2.81 Vodafone broadly agrees with ComReg's vision for OTA but provides the following additional comments:
- Existing regulations (i.e. the EECC) and operator incentives should be sufficient to deliver the Vision.
 - MNP should not apply to M2M and that the Vision should align with ComReg's views in Document 18/46.
 - The vision must support sustainable industry investment and cost recovery by MNOs.
- 2.82 Vodafone also consider the Vision to be highly focused on OTA processes and considers that customer experience is unrelated to OTA.
- 2.83 Virgin broadly agrees with ComReg's vision for OTA but notes that security could be strengthened given its importance, noting that the wording of the Vision states

“should” rather than must. Virgin submits that the unfinished standards comprise a barrier to the vision.

Challenges

- 2.84 Mobilise agrees with the challenges outlined in the Consultation.
- 2.85 Three notes consumer processes that are more difficult with eSIM compared to existing SIM processes and may cause some consumers to prefer physical SIMs over eSIM (e.g., such as switching an eSIM between devices when replacing a damaged device).
- 2.86 Vodafone considers these to be potential challenges, with OTA established for M2M and launched in consumer.
- 2.87 Virgin Media notes the challenges have various causes, citing the cost of investment as a reason for the lack of eSIM support among mobile providers.
- 2.88 Virgin submits that low consumer awareness of OTA and eSIM will be remedied once MNOs offer eSIM support.
- 2.89 Virgin submits that mobile providers are unlikely to deliver sub-standard OTA processes given the availability of guidelines and solutions for delivering user-friendly OTA processes. Virgin notes that SIM based provisioning is functioning well and consider it will serve customers well until eSIM can deliver its full benefits (e.g., standards enabling multiple enabled profiles).

WIK's updated view

Vision and Challenges

- 2.90 WIK did not consider that any submission raised issues that required a response on their part.

ComReg's Assessment

Vision

- 2.91 ComReg notes the broad agreement of the respondents with the eight factors of the Vision.
- 2.92 ComReg agrees with and adopts Vodafone clarification that MNP does not apply to M2M. Therefore ComReg amends the text of objective 1 as follows:

“Consumers and M2M customers should have the ability to use OTA, for mobile activation, switching and (in the case of consumer mobile) porting.”

2.93 ComReg agrees with and adopts Virgin's suggested change of wording to the objective on security, noting that security is a paramount objective of ComReg's Vision for OTA. In addition there are pre-existing legal obligations on all data controllers in respect of personal data processed by them under the Data Protection Act 2018. Therefore ComReg amends the text of objective 6 as follows:

*"OTA provisioning ~~should~~ **must** be safe and secure."*

2.94 In addition, ComReg reworded objective 5 of the Vision for greater clarity.

2.95 In relation to Vodafone's view that operators' incentives and the EECC should deliver the Vision and Three's view that mandating eSIM support could result in the exit of operator, ComReg notes that it would only impose a mandate on a precautionary basis, and any costs that may arise from such a mandate would be in line with what operators would expect to incur in a well-functioning competitive market. Three provides no evidence, analysis or examples to support its view that mandating OTA could result in an MNO exiting the Irish market.

Challenges

2.96 ComReg agrees with Three's view that consumer confusion could pose a challenge, and accordingly this is covered in the Vision and is highlighted in the Draft Guidance.

2.97 In relation to Vodafone's view that the challenges outlined by ComReg have yet to arise, ComReg notes that the strategy is necessarily forward-looking, and in any event, certain challenges already exist, including delayed adoption of eSIM support by Irish operators.

2.98 In relation to Virgin's view that MNOs are unlikely to deliver sub-standard OTA processes, ComReg notes that it provided actual examples of same in Document 21/114 which included eSIM distribution that did not meet Principle 1 (fully-digital) or Principle 2 (speed) such as that based on postal delivery or in-store collection²⁷.

2.99 In relation to Virgin's view that SIM based provisioning works well, ComReg notes the many benefits of OTA outlined in Document 21/114 and Document 21/114A and notes that most of these are not dependent on further updates to the standards, noting that eSIM standards are updated regularly. It is expected that service providers will ensure accessible products and services and information for all end-users so that the benefits of OTA are obtained by all end-users and end-user rights as regards changing providers are upheld.

²⁷ See Section 5.3 of ComReg 21/114.

2.2.7 Draft Strategy: The proposed Actions 1-3 and Draft Guidance

2.100 WIK identified and assessed actions ComReg could undertake to overcome the identified challenges. The proposed actions and their envisaged timelines will form the basis for ComReg to promote OTA.

2.101 Actions 1-3 are for ComReg to:

1. Require fully-digital OTA customer journeys for consumer mobile.
2. Develop guidance on OTA provisioning for Consumer Mobile.
3. Require the industry MNP Committee to review existing MNP processes.

2.102 ComReg also sought the views of interest parties on the following.

Actions

Q18: Do you agree with each of the Actions proposed by WIK which ComReg is minded to adopt?

Q19: Do you agree with the justification given by ComReg for each of the Actions proposed by WIK which ComReg is minded to adopt?

Q20: Do you agree with the envisaged timeline for each of the Actions proposed by WIK which ComReg is minded to adopt?

Q21: Are there further actions which ComReg should consider?

Guidance

Q22: Do you agree with the Guidance for Over-the-Air provisioning proposed by ComReg?

Q22: Are there any additional matters relating to Over-the-Air switching which ComReg should provide Guidance on?

2.103 For simplicity, ComReg summarises the responses and ComReg's assessment of responses to each individual action in turn, as well as high-level comments that do not pertain to an individual action.

High-level comments

Views of respondents

2.104 Mobilise and ESNB agree with the Actions proposed by ComReg and Eir supports

ComReg's ambition to promote fully digital OTA customer journeys.

- 2.105 The CCPC suggests accompanying the OTA actions with other initiatives enabling consumers to effectively compare and change providers.

ComReg's Assessment

Rationale

- 2.106 ComReg notes the broad agreement with the Draft Strategy expressed by Mobilise and ESNB.
- 2.107 In relation to the CCPC's suggestion that the Draft Strategy be supported by complementary actions to enable consumer switching, ComReg refers to its related work on IAS switching and its on-going compliance work on Mobile Handset Locking. ComReg notes the CCPC comments that speeding up the process of switching for the consumer while welcome, will not improve the context for the consumer in terms of another key impediment to obtaining the best value in switching – comparison of different packages. ComReg notes in that context, the CCPC suggests accompanying the OTA actions with other initiatives enabling consumers to effectively compare and change providers. ComReg's consumer website (www.comreg.ie/consumer) provides consumers with easy-to-understand and accessible information on topical issues which might impact their choice or use of mobile market offers. ComReg provide a value comparison tool on our website (www.comreg.ie/compare) to assist consumers when switching, choosing offers and in enhancing their understanding of mobile market offers, handsets and bundled products and their associated rights. Our comparison tool allows consumers to compare costs for mobile phone, home phone, broadband & TV market offers. This tool also includes information on attributes such as total cost, contracted speeds, data allowances and other important information consumers need when selecting a service.
- 2.108 The availability of transparent, accurate and timely information on the switching process should increase consumer confidence in switching and make them more willing to seek out new market offers. In addition, consumers are entitled to receive a Contract Summary, including in an accessible format for disabled end-users, to ensure their access needs are met and in view of the equivalence of access for disabled end-users that is envisaged by the Code. When entering into a contract for both stand-alone and bundled services, the Contract Summary sets out the main terms of the service offer in a clear and understandable form and is intended to enable consumers to more easily compare services offered by different providers. Providers may also include information on switching in the Contract Summary. The Contract Summary also helps consumers to consider offers in their own time and prior to entering into a contract.

2.109 As regards, end of Contract Notification and Best Tariff Advice, ComReg's Regulatory Guidance²⁸ highlights that:

- (a) Before a contract is automatically prolonged, providers are required to inform a consumer in a prominent, timely manner, and on a durable medium, of the end date of the fixed term contract and how to terminate the contract (the "End of Contract notice").
- (b) At the same time, Best Tariff Advice relating to their services should be provided. After a contract has been prolonged and during the prolonged period of the contract, such Best Tariff Advice, should be provided at least annually. ComReg has set out its initial policy considerations and views on best practice as regards how to provide Best Tariff Advice and will consider if further intervention is needed to ensure the objectives of the EECC are met.

Action 1 – Require fully-digital OTA customer journeys for consumer mobile.

Views of respondents

2.110 For ease of the reader, ComReg summarises responses to Action 1 in the following groupings:

- Rationale
- Implementation period
- Scope
- Impact on MVNOs

Rationale

2.111 Mobilise and SIM Local support this action. However, a number of respondents expressed concerns regarding ComReg's proposal to mandate fully-digital OTA consumer journeys at this time.

2.112 Eir queries the legislative basis for such an action, noting the delays in transposition of the EECC. Eir is of the view that ComReg must publish a further consultation and draft Decision Instrument in advance of the adoption of any decision instrument.

2.113 Both Vodafone and Eir submits such a mandate unnecessary as OTA will be driven forward by market developments (e.g., increased device availability, competition and

²⁸ ComReg 20111R.

consumer demand). Vodafone and Three both contend that it is too early for ComReg to implement a mandate, given the early stage of eSIM deployment in the market.

- 2.114 Eir submits that, in its view, there has been inadequate consideration of the proportionality of this Action. Eir posits that there is no evidence of market failure and slow adoption alone is not a market failure, that barriers to switching are low and WIK has previously found Irish mobile markets to be competitive. Eir further contends that, in its view, the consultation is light on information in relation to the short-term consumer benefits of OTA (e.g., compatible device penetration).
- 2.115 Vodafone maintains that a mandate could limit Ireland's ability to avail of group solutions, noting that requirements may differ from country to country (e.g., more onerous eKYC processes). Vodafone consider that it already provides fully digital OTA provisioning for consumer mobile.
- 2.116 Three submits that operators have an incentive to use OTA once it is compatible with its business model, that economic and technical feasibility of OTA are not separable and that where OTA is not economically feasible an operator forced to use it may instead exit the market. Three contends that a Regulatory Impact Analysis is necessary to examine the proportionality of any costs imposed on operators.
- 2.117 Virgin contends that ComReg's Draft Guidance should be finalised in advance of any mandate to mitigate the risk that a MNO design a fully-digitised OTA customer journey that does not adhere to the guidance.
- 2.118 Mobilise queries the absence of an explicit reference to the adoption of the GSMA eSIM standards as the de facto standard and interoperability to conform with the "Digital Single Market".
- 2.119 Twilio maintains that virtualisation of numbers by cloud service providers already offers customers a completely digital journey while Vodafone considers that it already offers a "fully digital" OTA customer journey.

Implementation period

- 2.120 SIM Local considers the proposed 12 months period for implementation of this action is achievable, as it offers eSIM support solutions that are deployable within that timeframe.
- 2.121 However, a number of parties considered this timeframe to be too short.
- 2.122 Vodafone, Eir and Virgin state the proposed 12-month timeframe could result in sub-optimal OTA processes and therefore result in less desirable customer journeys. Vodafone, Eir and Virgin claim this timeline could raise the total cost of the investments and result in higher costs. Vodafone and Eir both claim that this

timeframe would interrupt the planned investment cycle and could result in knock-on effects on other projects.

- 2.123 Eir claims this timeframe effectively forces MNOs to adopt external solutions to support OTA. Eir consider there to be no reason for WIK to contradict the views of interviewees that such a process would take 18-24 months. Virgin states that the 18-24 months period aligns with its own experience in other markets.

Scope

- 2.124 Three states further work is required to understand the implications of introducing eSIM across all markets and device segments (which ComReg understands to refer to Secondary devices and M2M).
- 2.125 Twilio recommends defining what constitutes a consumer for the purpose of Actions 1 & 2 specifically whether this applies to business and non-business customers.

Impact on MVNOs

- 2.126 Virgin queries whether MVNOs were subject to this Action, which it contends would disadvantage MVNOs given the level of investment necessary, especially in the absence of a requirement on host MNOs to provide eSIM support to their MVNO partner.
- 2.127 Vodafone maintains that such a mandate could act as a barrier to entry to MVNOs and smaller operators. Twilio believes that if MVNOs are unable to offer fully digital OTA consumer journeys, it could amount to a competitive disadvantage vis-a-vis MNOs.

WIK's updated view

Rationale and scope

- 2.128 WIK reiterates the benefits of eSIM support and adoption and recommended that any mandate should apply only to smartphones at present and not specify a standard or solution at this time.

Implementation period

- 2.129 WIK notes that 18 months could allow operators more flexibility in implementing in-house solutions.

ComReg's Assessment

- 2.130 The transposition of the EECC has been delayed and ComReg does not propose to mandate OTA at this time. As previously noted, ComReg has identified alternative

means of pursuing its OTA Strategy, primarily through bilateral engagement with MNOs. ComReg will therefore advance these actions in collaboration with industry and will review the progress of this collaborative approach on an ongoing basis. When the EECC has been fully transposed in Ireland, the progress reviews will inform ComReg's future considerations on the necessity or otherwise for further action, including mandating steps to be taken by industry. Therefore, while ComReg may progress these actions in collaboration with industry in the meantime, any decision on mandating these actions would only be made when ComReg's anticipated powers are available.

- 2.131 Notwithstanding, ComReg assesses respondents' views on Action 1 to provide transparency, noting that this would be revisited in the future in the event of any assessment of a mandate for fully-digital OTA.

Rationale

- 2.132 ComReg notes the support of Mobilise and SIM Local for Action 1.
- 2.133 In relation to the views of Vodafone and Eir that the mandate is "unnecessary", ComReg notes that any such mandate would be precautionary in nature and used in circumstances to prevent an outcome where Irish consumers cannot avail of OTA support in a reasonably timely manner that would be in line with what would be expected of a well-functioning competitive market.
- 2.134 ComReg rejects the view of Vodafone and Three that the market may be at "too early" a stage of development to warrant a mandate, noting that MNOs did not provide reasons that Ireland should expect slower rollout of eSIM support. A key motivating factor for this action was the finding that Ireland was, relative to its international peers, a laggard in eSIM support for consumer devices. There has been no improvement in Irish consumers' abilities to avail of OTA for Consumer use cases since the publication of ComReg 21/114, as outlined in Section 1.2 above. As eSIM support is progressing internationally, it appears Ireland may be falling further behind.
- 2.135 In relation to Three's view that mandatory requirement for eSIM could present a barrier to entry, ComReg notes the measure was intended for MNOs and not MVNOs and notes the finding by WIK that OTA should be expected to lower barriers to entry.
- 2.136 In relation to Eir and Three's view that ComReg did not adequately examine the proportionality of such an Action, ComReg reiterates that it is not adopting a mandate at this time and would assess proportionality as part of any future review of a potential mandate.
- 2.137 Nevertheless, ComReg notes that contrary to Eir's views, both the Consultation and the WIK Report did examine compatible device penetration, including an estimate of current eSIM device support and a forecast for eSIM deployment over the relevant

period²⁹.

- 2.138 In relation to Vodafone's concern that the concern that a mandate could potentially prevent group-wide solutions, ComReg notes that this would only be the case where a group-wide solution did not meet the requisite standard. ComReg notes that any mandate would not specify the means of OTA support at this time (e.g., in-App or QR Code activation), only the quality of the consumer journey (e.g., speed and simplicity). Therefore, the only solutions that would be precluded would be those that deliver sub-par consumer journeys.
- 2.139 In relation to Vodafone's view that it already offers fully-digital OTA, ComReg notes that this would be assessed at the conclusion of the implementation period.
- 2.140 In relation to Virgin's view that any guidance should be finalised in advance of a mandate, ComReg refers to the Guidance in the 22/48a.
- 2.141 In relation to Mobilise's query as to why ComReg would not specify the GSMA eSIM standard in any mandate, ComReg has focused on ensuring the best possible OTA consumer journeys. ComReg would allow operators to determine how to achieve this. While the GSMA eSIM standard is the sole means of achieving OTA for consumer mobile presently, there may be rival standards (e.g., iSIM) in the future and ComReg will not preclude such alternatives.
- 2.142 In relation to Twilio's views that virtualised numbers offer customers fully-digital journeys, ComReg disagrees noting that most mobile consumers presently use SIM cards which necessitate physical steps when switching mobile providers and often choose to retain their existing mobile phone number. Therefore, virtualised numbers do not represent an alternative to eSIM for allowing fully digital consumer journeys.

Implementation Period

- 2.143 ComReg notes SIM Local's view that OTA provisioning for consumer mobile should be implementable within the proposed 12 month timeline.
- 2.144 In relation to the views of Vodafone, Eir and Virgin that the proposed 12 month period could result in sub-optimal processes and/or higher cost to investment, ComReg notes that such risks would have to be balanced against the foregone benefits to consumers from any delay in OTA provisioning.
- 2.145 ComReg agrees that a longer implementation period is favourable where it may ultimately result in improved OTA provisioning and services. This is because the benefits of a shorter implementation period accrue in the very short term (e.g., when eSIM device penetration is lower), and the benefit of any improvement in OTA

²⁹ See page 124 of the WIK Report and page 7 of Document 21/114

processes would accrue over many future periods (in which eSIM device penetration is greater).

- 2.146 Virgin suggest 18 months as a minimum implementation period, providing MNOs with an additional 6 months to implement the necessary tasks to implement OTA consumer journeys for consumer mobile. This aligns with the views of WIK and exceeds the minimum implementation time considered sufficient by SIM Local. Therefore, in order to safeguard against the potential negative impacts outlined by Vodafone, Eir and Virgin, ComReg will adopt 18 months from present as the target date for the voluntary implementation of fully-digital OTA³⁰.

Scope

- 2.147 In relation to Three's views regarding a mandate for eSIM across all device segments, ComReg notes that the scope of the proposed mandate related to Consumer Mobile use cases only.
- 2.148 In relation to Twilio's views regarding the definition of "consumer", ComReg clarifies that for the purpose of Action 1 & 2 consumers refers to all end-users of mobile phones and smartphones, including business customers. However, ComReg notes that business customers' mobile provisioning needs differ from that of non-business customers (e.g., controls on MNP, batch MNP). In that regard, ComReg's mandate and Guidance was intended to apply to consumers attempting to switch individual devices, noting that multiline switches may take longer. ComReg has added text to this effect to the Guidance.

Impact on MVNOs

- 2.149 In relation to the concerns relating to the mandate imposing costs on MVNOs, ComReg reiterates that MVNOs are excluded from the scope of the proposed mandate. Therefore, MVNOs would not be foreclosed or harmed by the cost of investment, nor should any such mandate act as a barrier to entry for MVNOs.
- 2.150 Furthermore, Twilio's view that the mandate could result in MVNOs operating at a competitive disadvantage assumes that OTA support would immediately be required for MVNOs to compete effectively. As outlined in 21/114, this would only occur once eSIM device penetration has increased and/or eSIM only devices become more widespread. Action 6 addresses this concern.

³⁰ Noting once again that ComReg does not impose a mandate at this time.

Action 2 - Develop guidance on OTA provisioning for Consumer Mobile

Views of respondents

2.151 ComReg summarises responses to Action 2 in the following groupings:

- Rationale;
- Scope; and
- The Draft Guidance.

Rationale

2.152 Vodafone, Three, Virgin and Sim Local support this action.

2.153 Virgin requests clarification on whether there will be further consultation on the Guidance.

2.154 Eir states that further information is required on compliance in order that MNOs might design compliant processes. Eir also state further information is required on the potential burden of the guidance in order to assess proportionality.

Scope

2.155 Twilio advocates that ComReg defines what constitutes a consumer for the purpose of Actions 1 & 2, and whether this applies to business and non-business customers.

2.156 Vodafone contends that matters such as mobile handset locking (“MHL”) should not be in the scope of the Guidance and should be consulted upon separately. The CCPC and Tesco both consider that ComReg should review MHL in light of OTA and Tesco outlines a number of concerns. Three submits that MHL is justified because handsets are subsidised, and unlocking can result in arbitrage of devices. Three contends that ComReg should not mandate operators to sell subsidised handsets without a means of recovering the subsidy. Three submits that consumers have a choice between locked and unlocked devices, and a ban on MHL would prevent consumers from buying devices.

2.157 Three agrees that the secondary devices should be excluded, noting the difficulties in relation to switching.

Draft Guidance

2.158 Both Mobilise and Eir support the principles of the Draft Guidance.

2.159 Mobilise contends that mobile app provisioning would enable even simpler OTA

switching, with porting initiation and the pre-population of MSISDN possible from within the app. Mobilise consider that Mobile app provisioning would enable even faster OTA switching and could take as little as 20-40 seconds.

- 2.160 Mobilise queries how a divergence between OTA and non-OTA provisioning would be managed.
- 2.161 Three submits that it is too early to specify a “hard” target for speed of OTA switching, noting that the speed of a switch depends on actions on the part of consumers. Three submits that the five minutes stated could be suitable as a “best case” target.
- 2.162 Eir seeks further clarification on what steps must be undertaken and the associated timeframes. Eir submit that a reasonable approach may be to set a target for the share of OTA switches completed in a set time (e.g., x% within y minutes). Eir queries whether this would apply only to handset manufacturers that make entitlement servers available on a reasonable basis.

WIK's updated view

Scope

- 2.163 In relation to Tesco's views on SIM Locking WIK notes that SIM locking policies were discussed in detail within the WIK Report within its report and refers Tesco to same, noting that SIM locking as an issue predates eSIM. Given the early stage of eSIM deployment internationally it is unclear what additional issues, if any, SIM locking of eSIM will present.

ComReg's Assessment

Rationale

- 2.164 ComReg notes the support of Vodafone, Three, Virgin and Sim Local for this Action 2.
- 2.165 In relation to Virgin query on the Guidance, ComReg has consulted upon the Guidance which is now published in 22/48a. The Guidance has been drafted following consultation with interested parties, a full review and evaluation of the submissions received from stakeholders and the findings of WIK, in particular in relation to the technical feasibility of OTA provisioning. ComReg will review MNOs' progress in adopting OTA provisioning and, on foot of same, then assess the necessity or otherwise for further regulatory actions to ensure fully-digital OTA customer journeys within a reasonable period, or to ensure clear contractual terms empowering switching for M2M customers. Any such assessment will consider the necessity of using statutory powers to mandate industry action and would necessarily involve revisiting the Guidance.

- 2.166 In relation to Eir's query regarding compliance, ComReg notes the Guidance is voluntary at present but sets the performance standards that ComReg expects MNOs' OTA processes to deliver.

Scope

- 2.167 To provide further clarification, ComReg now addresses business customers explicitly in its Guidance on OTA for Consumer Mobile.

- 2.168 In relation to the submissions of respondents in respect of MHL, ComReg notes that both the current legislation³¹ and the EECC oblige service providers to ensure that their conditions and procedures for contract termination do not act as a disincentive to changing service provider. ComReg considers that conditions and procedures for contract termination which cause unnecessary delays are a disincentive to changing service provider, and this is independent of the technology (whether OTA or not) and is separate to number porting. ComReg has issued regulatory guidance in respect of this matter. ComReg will update this guidance as necessary. ComReg has also taken compliance action in respect of conditions and procedures involving locked handsets. ComReg will continue to monitor compliance by service providers, to ensure that the rights of end-users are upheld including as regards ability to exit their contract and changing provider when in their interest to do so. In addition to monitoring and enforcement in respect of existing obligations, ComReg may consider available policy options in the context of the EECC when transposed. In that regard, ComReg may review MHL in a separate consultation to be conducted at a future date³².

- 2.169 ComReg agrees with Vodafone that MHL is a separate but related issue and would be considered separate from OTA. Nevertheless, ComReg considers that operators should understand and mitigate as much as possible the impact of complementary processes such as MHL on the ability of OTA to deliver faster, easier mobile switching.

Draft Guidance

- 2.170 ComReg agrees with Mobilise that in-app provisioning results in even faster and easier customer sign-up and switching. ComReg notes that this may be a means for competitive differentiation in the future. However, should QR Code activation deliver on the consumer journeys outlined in the *Guidance*³³, the improvements of in-App provisioning versus QR Codes will likely moderate at best (e.g., reducing switching

³¹ Article 25(6)(b) of the Universal Service Regulation 2011 - facilitating change of service provider.

³² Though a separate project, any future review of MHL could consider the interaction between MHL and OTA.

³³ The views of WIK and industry support this view, however ComReg reserves its right to revise this view should operators fail to achieve OTA journeys in line with the OTA Guidance by means of QR Code activation.

from 5 minutes to a few minutes)³⁴. Internationally, MNOs appear to favour the QR Codes as a means of initial eSIM activation on the basis that this allows for faster and cheaper deployment. Therefore, ComReg remains of the view that specifying the means of activation could unduly delay the introduction of eSIM support, noting that QR Codes can also deliver fast and easy OTA sign-up and switching.

2.171 ComReg notes that operators must retain existing, SIM based provisioning services under Article 106(6) and it is for operators to manage this.

2.172 In relation to the assessment of the compliance of service providers' OTA processes with the maximum duration for OTA activation and switching, Three and Eir suggest different approaches for assessment, which are:

- whether a hypothetical consumer would complete OTA activation or sign-up within the timeframe (Three's "Typical Consumer Approach"); or
- the number of consumers actually completing all steps within a certain timeframe (Eir's "Target Approach")

2.173 OTA activation and switching, unlike MNP³⁵, contain a number of steps on the part of consumers (e.g., to input details and/or upload documents). Therefore, the duration of any given activation/switch depends not only on the operator but on the consumer, and consumers' unrelated actions will likely result in some share of journeys in excess of the 5 minutes through no fault of the operator (e.g., where a consumer did not have all details at hand at the initiation of a switch). Consumers may delay the process through their own actions unrelated to the quality of the process (e.g., not having necessary information at hand at the outset). The share of consumer journeys in excess of the target may therefore fluctuate due to factors beyond operators' control, unrelated to the quality and design of the OTA process.

2.174 The Typical Consumer Approach therefore appears both more practical and more accurate approach to assessing MNOs' compliance with the principles of the *Guidance*. This approach would however require ComReg to directly assess compliance through conducting OTA activation and switching for simulated consumer profiles.

2.175 To this end, ComReg could, for example, activate and switch a number of consumers' profiles for each operator, assuming reasonable consumer behaviour³⁶. ComReg could then estimate the time it would take for a reasonably well prepared

³⁴ The *Guidance* limits the duration of a typical switch at 5 minutes duration. Should QR Code based sign-up and switching typically take less than 5 minutes, there is limited scope for time saving, even in the case of Mobilise's example of sub-1 minute sign-up.

³⁵ Where operators control each necessary task to port the number, after the consumer initiates the process.

³⁶ For example, having information at hand, inputting data and uploading files at a reasonable speed.

consumer to sign-up and/or switch via OTA with a given operator within the maximum duration³⁷ given the operator's OTA process. In any event, ComReg may nevertheless request data from operators on the actual share of consumers completing activation/switching within the target for monitoring purposes.

- 2.176 In relation to Eir's query regarding entitlement servers, any requirement would likely only apply to handset manufacturers that make entitlement servers available on a reasonable basis, and ComReg would consider this point in the event that it reviews this matter.

Action 3 - Require the industry MNP Committee to review existing MNP processes.

Views of respondents

- 2.177 Vodafone, Three and SIM Local support this action.
- 2.178 Vodafone and Three both support the MNP Committee taking this forward and ComReg's engagement in this workstream. Three note that a specific sub-group could be established to examine such issues.
- 2.179 Vodafone submits that a 12 month timeframe for review is more appropriate as industry groups are working in parallel on related matters (e.g., IAS switching, ECAS).
- 2.180 Virgin contends that this action is unjustified given the evidence that MNP operates well and that, in its view, MNP is "OTA-ready".
- 2.181 Twilio contends that the scope of the proposed MNP review is not OTA-specific and contains questions relating to MNP more broadly. Twilio believes that the MNP review should be OTA specific, and any changes could impact all mobile providers, not only MNOs. Twilio further contends that if ComReg has broader concerns relating to MNP it should be considered in a separate public consultation.
- 2.182 Mobilise requests that ComReg provide further clarification regarding the interoperability of the processes for MNP and OTA.

WIK's updated view

- 2.183 WIK notes that MNP in Ireland appears efficient but reaffirms that that it may be prudent to review MNP in light of eSIM.

ComReg's Assessment

³⁷ For example, ComReg could conduct 10 sign-ups and 10 switches with each operator.

- 2.184 ComReg notes the support of Vodafone, Three and SIM Local for this action.
- 2.185 ComReg agrees that the MNP Committee should take this forward with a dedicated sub-group, with ComReg attending as an observer and providing support, as required.
- 2.186 ComReg notes Vodafone's suggestion that a 12 month timeframe for the meeting is more appropriate, in light of industry working groups examining related matters. ComReg agrees and therefore revises its timeframe, so that the final meeting of the MNP Review be held no later than Q3 2023. ComReg notes that this should leave sufficient time for tackling any issues identified in advance of the target date for implementation of OTA, noting the revised target date for fully digital OTA.
- 2.187 In relation to Twilio's view that the proposed MNP review is not solely OTA-specific, and Virgin's view that no MNP review is required, ComReg considers that this is a timely and appropriate opportunity for industry to assess the performance of Irish MNP more generally. MNP is highly relevant to consumer switching and the Irish MNP system has been in existence for over 20 years.

2.2.8 Draft Strategy: The proposed Actions 4-9

Summary views of ComReg in Document 21/114

- 2.188 Actions 4-9 are for ComReg to:
4. Develop guidelines/ rules on minimum contractual conditions to better facilitate M2M switching processes.
 5. Launch an awareness campaign promoting eSIM to industry, organisations and consumers.
 6. Monitor engagement between MVNOs and their hosts concerning eSIM support.
 7. Gather information and data on eSIM adoption and activation.
 8. Promote consideration of OTA by BEREC/CEPT
 9. Return to review and evaluation of developments in OTA provisioning in the future, as required.
- 2.189 ComReg sought the views of interest parties for each of the Actions.
- 2.190 For convenience, ComReg here groups the responses in the following individual action in turn.

Action 4 - Develop guidelines/ rules on minimum contractual conditions to better facilitate M2M switching processes.

Views of respondents

2.191 SimLocal support this action.

Standardised process for OTA switching

2.192 Vodafone and Twilio both submit that switching for M2M is too complex for a standardised approach. Furthermore, Vodafone states that country-specific rules can stifle innovation (e.g., local SIM requirements delaying eSIM deployment). Vodafone contends that porting should not be extended to M2M, noting that the number is of no use to the end consumer and M2M use cases may use extra territorial numbers.

2.193 Vodafone maintains that ComReg should not depart from the position outlined in ComReg 18/46

Clearer contractual terms

2.194 Vodafone contends that contracts are provided for under the EECC and do not consider further regulatory intervention necessary.

2.195 Three supports action to ensure clear contractual terms, but not the mandating of eSIM for all use cases via contractual terms.

2.196 Twilio queries the benefit of an action on contractual terms. Twilio contends that the cost or duration of a M2M switch would be difficult to estimate in advance, depending on unknown factors such as the number of devices at the time of the switch or the portion of devices which may be switched. Twilio submits that any such estimate would entail uncertainty and therefore require caveating. Twilio notes that ComReg has not provided a draft of how this requirement would be drafted.

2.197 Twilio enquires whether this action would only apply to MNOs that voluntarily offer M2M services, and only to national M2M use cases (e.g., smart meters).

WIK's updated view

2.198 WIK agrees with operators regarding the complexity of M2M switching but notes the potential for regulatory action to support OTA switching for M2M nevertheless.

ComReg's Assessment

2.199 The transposition of the EECC has been delayed and ComReg does not propose to mandate OTA at this time. As previously noted, ComReg has identified alternative means of pursuing its OTA Strategy, primarily through bilateral engagement with

MNOs. ComReg will therefore advance these actions in collaboration with industry and will review the progress of this collaborative approach on an ongoing basis. When the EECC has been fully transposed in Ireland, the progress reviews will inform ComReg's future considerations on the necessity or otherwise for further action, including mandating steps to be taken by industry. Therefore, while ComReg may progress these actions in collaboration with industry in the meantime, any decision on mandating these actions would only be made when ComReg's anticipated powers are available.

- 2.200 Notwithstanding, ComReg assesses respondents' views on Action 4 to provide transparency, noting that this would be revisited in the future in the event of any assessment of need for regulatory support for OTA switching for M2M.

Standardised OTA switching for M2M

- 2.201 In relation to standardised OTA process for M2M, ComReg broadly agrees with the views of Vodafone and Twilio that that M2M does not appear amenable to either a standardised OTA provisioning process or MNP, noting the examples of cited by both respondents. While Vodafone may be correct that country-specific rules may have the potential to stifle innovation, ComReg notes that this is a general comment and that such rules would require case-by-case assessment. ComReg notes that a number of countries appear to have rules relating to M2M switching³⁸.

Minimum contractual requirement for OTA switching for M2M

- 2.202 ComReg agrees with the views of Three that any requirement for clear contractual terms should not mandate eSIM in all cases.
- 2.203 In relation to Vodafone's view that the EECC already provides for minimum contractual requirements, ComReg notes that such provisions may not necessarily capture the specific factors relevant to M2M switching (e.g., M2M contracts may last longer than the typical term). Therefore, ComReg considers it appropriate to consider specific rules for M2M where justified and proportionate.
- 2.204 ComReg agrees with the points raised by Twilio in relation to an estimate for duration and/or cost of M2M OTA switching being impractical, and therefore would exclude these from further consideration.
- 2.205 However, ComReg remains of the view that the following information could be gathered at little or no cost:

"1. The actions to be taken by parties (customers, transferring and donor

³⁸ See BEREC (2019) "Report on Terminating Contracts and Switching Provider"

provider) in the event of a switch.

2. The “best efforts” expected of the donor or transferring provider.”

- 2.206 Such information could enable M2M customers to switch in a timely and cost-effective manner, enhancing switching in M2M market segments. Unlike the cost/duration estimates, which did contain a high degree of uncertainty and were highly-customer specific, this information only requires a contract to capture the steps to be undertaken by both the M2M customer and the MNO in the event of a switch. The ability to port and switch without undue delay and with minimal loss of service is a legal requirement under Article 106 of the EEC (see Annex 1).

Action 5 - Launch an awareness campaign promoting eSIM to industry, organisations and consumers.

Views of respondents

- 2.207 Vodafone, Three, Mobilise and SIM Local all agree with this action.
- 2.208 The CCPC recommends that in promoting OTA provisioning, ComReg considers how to capture the needs of multiple groups of consumers, including those who may be less digitally engaged.
- 2.209 Vodafone notes that not all consumers are “tech-savvy” and therefore adoption will be slow.
- 2.210 Virgin welcomes this action, but only once both MNOs and MVNOs have eSIM support. Virgin considers that promoting eSIM earlier could give a competitive advantage to MNOs that have launched eSIM support.

WIK's updated view

- 2.211 WIK does not consider that any issue raised affects their findings or recommendations.

ComReg's Assessment

- 2.212 ComReg notes the general support for this action.
- 2.213 ComReg agrees with and takes on board the comments of the CCPC in relation to the promotion of OTA to different groups of consumers. As noted by the CCPC, certain consumers may struggle with digital devices. ComReg notes that Article 106(6) indicates that existing porting should be retained. This has been reflected in both ComReg's Strategy, which expects SIM based porting to be retained while a significant share of consumers use SIMs.

- 2.214 Relatedly, since the publication of the Draft Strategy, ComReg has met with its Consumer Advisory Panel (“CAP”) to discuss the implications of mobile provisioning for disabled consumers. The CAP highlighted the importance of being aware of the impact of mobile provisioning on the ability and ease of switching for disabled consumers. The CAP noted that OTA provisioning may benefit in particular those consumers that face difficulty in transport and/or using the phone, by providing an alternative to switching in-store or via phone. Conversely, some disabled consumers may prefer existing distribution models. ComReg notes that the introduction of eSIM support should enable easier switching for many consumers relative to the status quo, through increasing the choice of distribution channels.
- 2.215 In relation to Virgin's view that ComReg should only promote OTA provisioning when all MNOs and MVNOs have eSIM, ComReg considers this impractical. MVNOs are under no requirement to adopt OTA by a certain date. Therefore, were one or many MVNOs to decide to delay eSIM support, ComReg would then be prevented from promoting OTA for an indefinite amount of time.

Action 6 - Monitor engagement between MVNOs and their hosts concerning eSIM support

Views of respondents

- 2.216 Vodafone agrees with this action.
- 2.217 SIM Local agrees with this but expects ComReg to begin this monitoring soon, in time for the introduction of an eSIM-only handset by a major device manufacturer.
- 2.218 Three states that MVNOs operate their own SIM provisioning and therefore a requirement for eSIM support to be extended to MVNOs is not required. Three considers that eSIM support is not yet required for a MVNO to effectively compete in the market, noting that eSIM-only devices are not widespread.
- 2.219 Virgin states that it is unclear what Action 6 entails, and dispute whether this fits within the monitoring described by WIK and whether WIK's report indicates no MVNO requirement is necessary. Virgin considers that the proposed actions do not address the challenges faced by MVNOs in relation to the cost of eSIM adoption nor an MVNO's dependency on its host. Virgin contends that implementing eSIM support could impose costs on MVNOs and that an outline of the technical infrastructure and associated cost necessary to deliver a minimal “viable” eSIM solution would be useful.
- 2.220 Mobilise consider monitoring to be insufficient and that regulation is necessary to ensure no distortion to competition from delayed access for MVNOs to eSIM support. Mobilise contends that any benefits from digital MVNOs will be delayed due to a lack

of timely support.

- 2.221 Twilio posits that there is a contradiction between ComReg's expectation of greater competition between MNOs and MVNOs and ComReg's view that market forces alone should ensure the extension of eSIM support to MVNOs and that ComReg has not provided sufficient examples.

WIK's updated view

- 2.222 WIK observes both risks and opportunities for MVNOs in connection with the introduction of eSIM and OTA provisioning and refers to readers to Section 5.2.2 of the WIK Report.
- 2.223 WIK repeats that eSIM support will become essential for MVNOs once key consumer devices are launched without a physical SIM option. In that regard, WIK reiterates the role for ComReg to monitor the ability of MVNOs to access eSIM in a timely manner.

ComReg's Assessment

- 2.224 ComReg notes the support of Vodafone for this action.
- 2.225 In relation to Virgin's view that this does not address the cost of eSIM support for MVNOs, ComReg notes that MVNOs were excluded from the proposed OTA mandate. In relation to the likely costs and minimum viable eSIM solution ComReg recommends MVNOs discuss this with their host MNOs and/or potential eSIM solution providers.
- 2.226 In relation to SIM Local's view that such monitoring should begin shortly, ComReg notes that it will begin shortly, as outlined in the Strategy.
- 2.227 In relation to Mobilise and Virgin's view that this action does not address the challenges relating to a MVNO's dependency on host MNOs, ComReg does not set the terms of the contracts between MNOs and MVNOs. ComReg refers to Document 21/114, which explained that ComReg would monitor the provision of eSIM support for MVNOs, which may be of importance to the functioning of competition in mobile markets once eSIM support is critical for MVNOs to compete effectively. It is evident that eSIM support will not be critical to competition until the use of eSIM devices becomes more widespread. Hence, ComReg will monitor the situation for the time being. In that regard, ComReg agrees with Three that MVNOs do not yet require eSIM support to compete effectively.
- 2.228 ComReg believes that Twilio is mistaken to consider there to be any contradiction between ComReg's views that OTA could enable greater MNO-MVNO competition and that commercial considerations could result in host MNOs enabling eSIM support

for MVNOs. MNOs may offer MVNOs access to new technologies where the expected benefits outweigh the costs and MNOs may offer improved terms to MVNOs where this may improve the competitiveness of the MVNO downstream, generating further wholesale fees. For example, see the extension of access to successive generations of mobile technology (2G, 3G, 4G) by host MNOs to their MVNOs to support their competitiveness downstream. ComReg notes further recent examples of this, with the Optus, an MNO in Australia, extending eSIM support to its MVNOs this month³⁹. Furthermore, ComReg notes certain MVNOs may operate their provisioning independently and could acquire eSIM support without the need of their host MNO, as noted by Three.

Action 7 - Gather information and data on eSIM adoption and activation

Views of respondents

- 2.229 Vodafone, Three, Sim Local and Virgin agree with the action. The support of Vodafone and Virgin is subject to how reasonable data collection requirement and its ultimate intended use. Vodafone contends that the M2M market is now very separate from the standard consumer mobile market and the quarterly report should be updated to reflect both markets separately.

WIK's updated view

- 2.230 No matters were raised for WIK to consider.

ComReg's Assessment

- 2.231 ComReg notes the support of Vodafone, Three, Sim Local and Virgin in relation to this action.
- 2.232 In relation to eSIM/OTA, ComReg considers the following to suffice for its purposes of monitoring eSIM deployment:
- Total numbers of active eSIM profiles, by type (e.g., smartphone, wearable, car, smartmeter) or sector (e.g., automotive, utilities)
 - Quarterly activations and ports via OTA
- 2.233 ComReg will engage with operators in relation to the collection of this data as part of its broader review of the data collected in relation to the mobile market.

³⁹ See itwire.com, "Optus extends eSIMs to MVNOs" 22 June 2022. <https://itwire.com/business-telecoms/optus-extends-esims-to-consumers.html>

- 2.234 As previously noted, ComReg has conducted surveys to better understand consumers' views of eSIM and OTA, and may do so again periodically, as required.

Action 8 - Promote consideration of OTA by BEREC/CEPT

Views of respondents

- 2.235 Vodafone, Three, Virgin and SIM Local agree with this action.
- 2.236 Vodafone and Virgin consider that this would be helpful if it helped promote a standards-based approach and promote the continued development of standards to support other beneficial functionalities.

WIK's updated view

- 2.237 No matters were raised for WIK to consider.

ComReg's Assessment

- 2.238 ComReg notes the support of Vodafone, Three, Sim Local and Virgin for this action.
- 2.239 The intention was to complete this action following the publication of the finalised strategy, however as a result of interest among NRAs, ComReg has presented or expects to present the preliminary findings to the relevant working groups of CEPT, BEREC and European Competition Network and engaged bilaterally with individual NRAs.
- 2.240 ComReg will engage further with BEREC and CEPT on this following the publication of the strategy. Indeed, ComReg has further engagement planned and will continue to raise awareness of potential issues in this area.

Action 9 - Review and revise strategy and developments, as required.

Views of respondents

- 2.241 Vodafone, Three and SIM Local agree with this action.
- 2.242 Virgin considers that more information on this action would be helpful.

WIK's updated view

- 2.243 No matters were raised for WIK to consider.

ComReg's Assessment

- 2.244 ComReg notes the broad support with this Action.

2.245 In relation to Virgin's query regarding the focus of any future review, ComReg reiterates that should it review OTA in the future, the focus would be guided by whatever issues are apparent at that time. As explained in Document 21/144 this cannot be known at this time.

Annex 1: Relevant Legal Framework and Statutory Objectives

- A 1.1 On 20 December 2018, Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications EECC (“EECC”) entered into force. While legislation transposing the EECC has not yet been enacted in Ireland, the date for the transposition of the EECC passed on 21 December 2020. ComReg has therefore taken account of the EECC, in particular Articles 93 and 106 thereof, in its preliminary consultation on OTA provisioning (ComReg Document 20/114), in this Response to Consultation and in ComReg’s Strategy for OTA provisioning, published in tandem with this Response to Consultation. Articles 93 and 106 of the EECC are detailed further below in this Annex.
- A 1.2 The Communications Regulation Act 2002 as amended by the Communications Regulation (Amendment) Act 2007 (together the “2002 Act”) and the EU Common Regulatory Framework set out, amongst other things, ComReg’s functions and objectives that are relevant to the management of numbering resources, number portability, switching, and the provision of electronic communications and services in Ireland. These functions and objectives are largely continued under the EECC.
- A 1.3 This annex is intended as a general guide as to ComReg’s role in this area, and not as a definitive or exhaustive legal exposition of that role. Further, this annex restricts itself to consideration of those functions, objectives powers, and duties of ComReg that appear most relevant to the matters at hand and generally excludes those not considered relevant. For the avoidance of doubt, however, the inclusion of particular material in this annex does not necessarily mean that ComReg considers same to be of specific relevance to the matters at hand.
- A 1.4 All references in this annex to enactments are to the enactment as amended at the date hereof unless the context otherwise requires.

Primary Functions and Objectives and Regulatory Principles under the 2002 Act and Common Regulatory Framework

- A 1.5 ComReg’s relevant functions pursuant to Section 10 of the 2002 Act as amended include:
- (a) to ensure compliance by undertakings with obligations in relation to the supply of and access to electronic communications services, electronic communications networks and associated facilities and the transmission of such

services on such networks;

(b) to manage the radio frequency spectrum and the national numbering resource, in accordance with a direction under section 13;

(e) to ensure compliance, as appropriate, by persons in relation to the placing on the market of communications equipment and the placing on the market and putting into service of radio equipment.

It's primary objectives in carrying out its statutory functions in the context of electronic communications, pursuant to Section 12 of the 2002 Act are:

(a) in relation to the provision of electronic communications networks, electronic communications services and associated facilities—

(i) to promote competition,

(ii) to contribute to the development of the internal market, and

(iii) to promote the interests of users within the Community,

(b) to ensure the efficient management and use of the radio frequency spectrum and numbers from the national numbering scheme in the State in accordance with a direction under section 13.

Promotion of Competition

A 1.6 Section 12(2)(a) of the 2002 Act requires ComReg to take all reasonable measures which are aimed at the promotion of competition, including:

- encouraging efficient use and ensuring the effective management of radio frequencies and numbering resources;
- ensuring that there is no distortion or restriction of competition in the electronic communications sector; and
- ensuring that users, including disabled users, derive maximum benefit in terms of choice, price and quality.⁴⁰

⁴⁰ In so far as the promotion of competition is concerned, Regulation 16(1)(b) of the Framework Regulations also requires ComReg to: ensure that elderly users and users with special social needs derive maximum benefit in terms of choice, price and quality

Contributing to the Development of the Internal Market

A 1.7 Section 12(2)(b) of the 2002 Act requires ComReg to take all reasonable measures which are aimed at contributing to the development of the internal market, including:

- removing remaining obstacles to the provision of ECN, ECS and associated facilities at Community level;
- encouraging the establishment and development of trans-European networks and the interoperability of transnational services and end-to-end connectivity; and
- co-operating with electronic communications national regulatory authorities in other Member States of the Community and with the Commission of the Community in a transparent manner to ensure the development of consistent regulatory practice and the consistent application of Community law in this field⁴¹.

Promotion of Interests of Users

A 1.8 Section 12(2)(c) of the 2002 Act requires ComReg, when exercising its functions in relation to the provision of electronic communications networks and services, to take all reasonable measures which are aimed at the promotion of the interests of users within the Community, including:

- ensuring that all users have access to a universal service;
- ensuring a high level of protection for consumers in their dealings with suppliers, in particular by ensuring the availability of simple and inexpensive dispute resolution procedures carried out by a body that is independent of the parties involved;
- contributing to ensuring a high level of protection of personal data and privacy;
- promoting the provision of clear information, in particular requiring transparency of tariffs and conditions for using publicly available ECS;

⁴¹ In so far as contributing to the development of the internal market is concerned, Regulation 16(1)(c) of the Framework Regulations also requires ComReg to co-operate with the Body of European Regulators for Electronic Communications ("BEREC") in a transparent manner to ensure the development of consistent regulatory practice and the consistent application of EU law in the field of electronic communications.

- encouraging access to the internet at reasonable cost to users;
- addressing the needs of specific social groups, in particular disabled users; and
- ensuring that the integrity and security of public communications networks are maintained.

A 1.9 In so far as promotion of the interests of users within the EU is concerned, Regulation 16(1)(d) of the Framework Regulations also requires ComReg to:

- address the needs of specific social groups, in particular, elderly users and users with special social needs, and
- promote the ability of end-users to access and distribute information or use applications and services of their choice.

Technological Neutrality

A 1.10 Unless otherwise provided for in Regulation 17 of the Framework Regulations, take the utmost account of the desirability of technological neutrality in complying with the requirements of the Specific Regulations in particular those designed to ensure effective competition.

Regulatory Principles

A 1.11 In pursuit of its objectives under Regulation 16(1) of the Framework Regulations and section 12 of the 2002 Act, ComReg must apply objective, transparent, non-discriminatory and proportionate regulatory principles by, amongst other things:

- promoting regulatory predictability by ensuring a consistent regulatory approach over appropriate review periods;
- ensuring that, in similar circumstances, there is no discrimination in the treatment of undertakings providing ECN and ECS;
- safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure-based competition;
- promoting efficient investment and innovation in new and enhanced infrastructures, including by ensuring that any access obligation takes appropriate account of the risk incurred by the investing undertakings and by permitting various cooperative arrangements between investors and parties seeking access to diversify the risk of investment, while ensuring

that competition in the market and the principle of non-discrimination are preserved;

- taking due account of the variety of conditions relating to competition and consumers that exist in the various geographic areas within the State; and
- imposing ex-ante regulatory obligations only where there is no effective and sustainable competition and relaxing or lifting such obligations as soon as that condition is fulfilled.

BEREC

A 1.12 Under Regulation 16(1)(3) of the Framework Regulations, ComReg must:

- having regard to its objectives under section 12 of the 2002 Act and its functions under the Specific Regulations, actively support the goals of BEREC of promoting greater regulatory co-ordination and coherence; and
- take the utmost account of opinions and common positions adopted by BEREC when adopting decisions for the national market.

Other Obligations under the 2002 Act

A 1.13 In carrying out its functions, ComReg is required, amongst other things, to:

- seek to ensure that any measures taken by it are proportionate having regard to the objectives set out in section 12 of the 2002 Act.⁴²

Regulation 25 Universal Service Regulations

A 1.14 Regulation 25 of the Universal Service Regulations *Facilitating change of service provider* sets out as follows (emphasis added):

25. (1) “Undertakings shall ensure that a subscriber with a number from the national numbering scheme can, **upon request, retain his or her number** independently of the undertaking providing the service— (a) in the case of geographic numbers, at a specific location, and (b) in the case of non-geographic numbers, at any location. This paragraph does not apply to the porting of numbers between networks providing services at a fixed location and mobile networks.

(2) Undertakings to which paragraph (1) relates shall ensure that pricing between operators or service providers related to the provision of number

⁴² Section 12(3) of the 2002 Act.

portability as provided for in paragraph (1) is **cost oriented** and that **direct charges to subscribers, if any, do not act as a disincentive** for subscribers changing service provider.

(3) The Regulator shall ensure that undertakings comply with their obligations under paragraph (2) and the **Regulator may issue directions** to an undertaking to which paragraph (2) relates to require that there shall be no direct charges to subscribers for number portability. Where retail tariffs for porting of numbers are permitted, the Regulator shall ensure that such tariffs may not be imposed in a manner that would **distort competition** and for this purpose may specify obligations to be complied with by an undertaking.

(4) Undertakings referred to in paragraph (1) shall ensure that—

(a) the porting of numbers and their subsequent activation shall be carried out within the **shortest possible** time, (b) in the case where a subscriber has concluded an agreement to port a number to a new undertaking, that number shall be activated **within one working day**, and (c) loss of service during the porting process **shall not exceed one working day**.

(5) Without prejudice to paragraph (4), the **Regulator may establish the global process** of porting of numbers, taking into account provisions on contracts, technical feasibility and the need to maintain continuity of service to the subscriber. These procedures shall specify that loss of service during the process shall not exceed one working day in accordance with paragraph (4). The Regulator shall also take into account, where necessary, measures ensuring that subscribers are protected throughout the switching process and not switched against their will.

(6) (a) An undertaking providing electronic communications services shall **not conclude contracts with consumers which mandate an initial commitment period that exceeds 24 months** and shall offer users the possibility to subscribe to a contract with a maximum duration of 12 months. (b) Without prejudice to any minimum contractual period the undertaking shall ensure that conditions and procedures for contract **termination do not act as a disincentive** to a consumer to changing service provider.

(7) The obligations referred to in this Regulation apply to all undertakings with a role in facilitating change of provider, including the operator to which the subscriber is porting and the operator from which the subscriber is porting and any wholesale operator with involvement in the process.

(8) An undertaking that fails to comply with— (a) the requirements of paragraph (1), (b) a direction of the Regulator under paragraph (3), or (c) the requirements

of paragraph (2), (4) or (6) commits an offence.

(9) In proceedings for an offence under paragraph (8) it is a defence to establish that— (a) reasonable steps were taken to comply with the relevant requirement or direction, or (b) it was not possible to comply with the relevant requirement or direction.

(10) Undertakings shall **compensate subscribers in case of delay in porting or abuse** of porting by them or on their behalf. The Regulator may specify requirements to be complied with by undertakings in relation to this obligation including, but not limited to, arrangements for the payment of compensation to subscribers. Any dispute in relation to compensation payable under this paragraph shall be subject to Regulation 27.”

Article 93 of the EECC

A 1.15 Article 93 (6) *Numbering Resources*, provides as follows (emphasis added)
“Without prejudice to Article 106, **Member States shall promote OTA provisioning, where technically feasible, to facilitate switching** of providers of electronic communications networks or services by end-users, in particular providers and end-users of machine-to-machine services.”

Article 105 of the EECC

A 1.16 Article 105 of the EECC “*Contract duration and termination*” provides (emphasis added)

1. Member States shall ensure that conditions and procedures for **contract termination do not act as a disincentive** to changing service provider and that contracts concluded between consumers and providers of publicly available electronic communications services other than number-independent interpersonal communications services and other than transmission services used for the provision of machine-to-machine services, **do not mandate a commitment period longer than 24 months**. Member States may adopt or maintain provisions which mandate shorter maximum contractual commitment periods. This paragraph shall not apply to the duration of an instalment contract where the consumer has agreed in a separate contract to instalment payments exclusively for deployment of a physical connection, in particular to very high capacity networks. An instalment contract for the deployment of a physical connection shall not include terminal equipment, such as a router or modem, and shall not preclude consumers from exercising their rights under this Article.

2. *Paragraph 1 shall also apply to end-users that are microenterprises, small enterprises or not-for-profit organisations, unless they have explicitly agreed to waive those provisions.*
3. *Where a contract or national law provides for automatic prolongation of a fixed duration contract for electronic communications services other than number-independent interpersonal communications services and other than transmission services used for the provision of machine-to-machine services, Member States shall ensure that, after such prolongation, end-users are entitled to **terminate the contract at any time with a maximum one-month notice period**, as determined by Member States, and **without incurring any costs except** the charges for receiving the service during the notice period. Before the contract is automatically prolonged, providers shall inform end-users, in a prominent and timely manner and on a durable medium, of the end of the contractual commitment and of the means by which to terminate the contract. In addition, and at the same time, providers shall give end-users best tariff advice relating to their services. Providers shall provide end-users with best tariff information at least annually.*
4. *End-users shall have the right to terminate their contract without incurring any further costs upon notice of changes in the contractual conditions proposed by the provider of publicly available electronic communications services other than number-independent interpersonal communications services, unless the proposed changes are exclusively to the benefit of the end-user, are of a purely administrative nature and have no negative effect on the end-user, or are directly imposed by Union or national law. Providers shall notify end-users at least one month in advance of any change in the contractual conditions and shall simultaneously inform them of their right to terminate the contract without incurring any further costs if they do not accept the new conditions. The right to terminate the contract shall be exercisable within one month after notification. Member States may extend that period by up to three months. Member States shall ensure that notification is made in a clear and comprehensible manner on a durable medium.*

5. Any significant continued or frequently recurring discrepancy between the actual performance of an electronic communications service, other than an internet access service or a number-independent interpersonal communications service, and the performance indicated in the contract shall be considered to be a basis for triggering the remedies available to the consumer in accordance with national law, including the right to terminate the contract free of cost. 6. Where an end-user has the right to terminate a contract for a publicly available electronic communications service, other than a number-independent interpersonal communications service, before the end of the agreed contract period pursuant to this Directive or to other provisions of Union or national law, no compensation shall be due by the end-user other than for retained subsidised terminal equipment. Where the end-user chooses to **retain terminal equipment bundled** at the moment of the contract conclusion, any compensation due shall not exceed its pro rata temporis value as agreed at the moment of the conclusion of the contract or the remaining part of the service fee until the end of the contract, whichever is the smaller. Member States may determine other methods to calculate the compensation rate, provided that such methods do not result in a level of compensation exceeding that calculated in accordance with the second subparagraph. The provider shall lift any condition on the use of that terminal equipment on other networks free of charge at a time specified by Member States and at the latest upon payment of the compensation.

7. As far as transmission services used for machine-to-machine services are concerned, the rights mentioned in paragraphs 4 and 6 shall benefit only end-users that are consumers, microenterprises, small enterprises or not-for-profit organisations.

Article 106 of the EEC

A 1.17 Article 106 Provider switching and number portability, provides as follows (emphasis added)

1. In the case of switching between providers of internet access services, the providers concerned shall provide the end user with **adequate information before and during the switching process and ensure continuity** of the internet access service, unless technically not feasible. The receiving provider shall ensure that the activation of the internet access service occurs within the **shortest possible time** on the date and within the timeframe expressly agreed with the end-user. The transferring provider shall continue to provide its internet access service on the same terms until the receiving provider activates its internet access service. **Loss of service during the switching process shall not exceed one working day. National regulatory authorities shall ensure the efficiency and simplicity** of the switching process for the end-user.

2. Member States shall ensure that all end-users with numbers from the national numbering plan have the **right to retain their numbers, upon request**, independently of the undertaking providing the service, in accordance with Part C of Annex VI.

3. Where an end-user terminates a contract, Member States shall ensure that the end-user can retain the right to port a number from the national numbering plan to another provider **for a minimum of one month after** the date of termination, unless that right is renounced by the end-user.

4. National regulatory authorities shall ensure that pricing among providers related to the provision of **number portability is cost-oriented**, and that **no direct charges** are applied to end-users.

5. The **porting of numbers and their subsequent activation shall be carried out within the shortest possible time** on the date explicitly agreed with the end-user. In any case, end-users who have concluded an agreement to port a number to a new provider shall have that number **activated within one working day** from the date agreed with the end-user. In the case of failure of the porting process, the transferring provider shall reactivate the number and related services of the end-user until the porting is successful. The transferring provider shall continue to provide its services on the same terms and conditions until the services of the receiving provider are activated. In any event, the loss of service during the process of provider switching and the porting of numbers **shall not exceed one working day**. Operators whose access networks or facilities are used by either the transferring or the receiving provider, or both, shall ensure that there is no loss of service that would delay the switching and porting process.

6. *The **receiving provider shall lead the switching and porting processes** set out in paragraphs 1 and 5 and both the receiving and transferring providers shall **cooperate in good faith**. They shall **not delay or abuse** the switching and porting processes, nor shall they port numbers or switch end-users without the end-users' **explicit consent**. The end-users' contracts with the transferring provider shall be terminated automatically upon conclusion of the switching process. **National regulatory authorities may establish the details of the switching and porting processes**, taking into account national provisions on contracts, technical feasibility and the need to maintain continuity of service to the end-users. This shall include, where technically feasible, a requirement for the **porting to be completed through OTA provisioning, unless an end-user requests otherwise**. National regulatory authorities shall also take appropriate measures ensuring that end-users are adequately informed and protected throughout the switching and porting processes and are not switched to another provider without their consent. Transferring providers shall refund, upon request, any remaining credit to the consumers using pre-paid services. Refund may be subject to a fee only if provided for in the contract. Any such fee shall be proportionate and commensurate with the actual costs incurred by the transferring provider in offering the refund.*

7. *Member States shall lay down rules on penalties in the case of the failure of a provider to comply with the obligations laid down in this Article, including delays in, or abuses of, porting by, or on behalf of, a provider.*

8. *Member States shall lay down rules on the compensation of end-users by their providers in an easy and timely manner in the case of the failure of a provider to comply with the obligations laid down in this Article, as well as in the case of delays in, or abuses of, porting and switching processes, and missed service and installation appointments*

9. *In addition to the information required under Annex VIII, Member States shall ensure that end-users are adequately informed about the existence of the rights to compensation referred to in paragraphs 7 and 8 Article 105 of the EECC*

Article 107 of the EECC

A 1.18 Article 107 *Bundled offers*, provides as follows (emphasis added)

1. *If a bundle of services or a bundle of services and terminal equipment offered to a consumer comprises at least an internet access service or a publicly available number-based interpersonal communications service, Article 102(3), Article 103(1), **Article 105 and Article 106(1)** shall apply to all elements of the bundle including, **mutatis mutandis**, those not otherwise covered by those provisions.*

2. *Where the consumer has, under Union law, or national law in accordance with Union law, a right to terminate any element of the bundle as referred to in paragraph 1 before the end of the agreed contract term because of a lack of conformity with the contract or a failure to supply, Member States shall provide that the consumer **has the right to terminate the contract with respect to all elements of the bundle.***

3. *Any subscription to additional services or terminal equipment provided or distributed by the same provider of internet access services or of publicly available number-based interpersonal communications services shall not extend the original duration of the contract to which such services or terminal equipment are added, unless the consumer expressly agrees otherwise when subscribing to the additional services or terminal equipment.*

4. *Paragraphs 1 and 3 shall also apply to end-users that are microenterprises, small enterprises, or not-for-profit organisations, unless they have explicitly agreed to waive all or parts of those provisions.*

5. *Member States may also apply paragraph 1 as regards other provisions laid down in this Title”.*

Policy Directions

A 1.19 Section 12(4) of the 2002 Act provides that, in carrying out its functions, ComReg must have appropriate regard to policy statements, published by or on behalf of the Government or a Minister of the Government and notified to the Commission, in relation to the economic and social development of the State. Section 13(1) of the 2002 Act requires ComReg to comply with any policy direction given to ComReg by the Minister for Communications, Energy and Natural Resources (“the Minister”) as he or she considers appropriate.

A 1.20 The Policy Directions which are most relevant in this regard include the following:

A 1.21 **Policy Direction No.3 on Broadband Electronic Communication Networks**

ComReg shall in the exercise of its functions, take into account the national objective regarding broadband rollout, viz, the Government wishes to ensure the widespread availability of open-access, affordable, always-on broadband infrastructure and services for businesses and citizens on a balanced regional basis within three years, on the basis of utilisation of a range of existing and emerging technologies and broadband speeds appropriate to specific categories of service and customers

A 1.22 Policy Direction No.4 on Industry Sustainability

ComReg shall ensure that in making regulatory decisions in relation to the electronic communications market, it takes account of the state of the industry and in particular the industry's position in the business cycle and the impact of such decisions on the sustainability of the business of undertakings affected.

A 1.23 Policy Direction No.5 on Regulation only where necessary

Where ComReg has discretion as to whether to impose regulatory obligations, it shall, before deciding to impose such regulatory obligations on undertakings, examine whether the objectives of such regulatory obligations would be better achieved by forbearance from imposition of such obligations and reliance instead on market forces.

A 1.24 Policy Direction No.6 on Regulatory Impact Assessment

ComReg, before deciding to impose regulatory obligations on undertakings in the market for electronic communications shall conduct a Regulatory Impact Assessment in accordance with European and International best practice and otherwise in accordance with measures that may be adopted under the Government's Better Regulation programme.

A 1.25 Policy Direction No.7 on Consistency with other Member States

ComReg shall ensure that, where market circumstances are equivalent, the regulatory obligations imposed on undertakings in the electronic communications market in Ireland should be equivalent to those imposed on undertakings in equivalent positions in other Member States of the European Community.

A 1.26 General Policy Direction No.1 on Competition (2004)

ComReg shall focus on the promotion of competition as a key objective. Where necessary, ComReg shall implement remedies which counteract or remove barriers to market entry and shall support entry by new players to the market and entry into new sectors by existing players. ComReg shall have a particular focus on:

market share of new entrants;

ensuring that the applicable margin attributable to a product at the wholesale level is sufficient to promote and sustain competition;

price level to the end user;

competition in the fixed and mobile markets; and

the potential of alternative technology delivery platforms to support competition.

Annex 2: Consumer research on OTA

A 2.1 Since Document 21/114 was published, ComReg has completed the OTA Consumer Survey, which elicited information in relation to OTA and/or eSIM⁴³. ComReg's preliminary view⁴⁴ is that the key findings of this research support the findings of WIK which ComReg has outlined in 21/114, namely that OTA can:

1. improve consumer switching journeys;
2. promote switching; and
3. reduce barriers to entry.

A 2.2 Below, ComReg highlights and assesses the key findings of each item listed above, in turn.

1. OTA can improve consumer switching journeys

Survey finding

A 2.3 The OTA Consumer Survey finds that approximately 1 in 8 of consumers consider switching in a 12 month period, of which approximately half choose not to switch. In particular, the OTA Consumer Survey finds that:

- 7% of consumers switched in the past 12 months; and
- 6% of consumers considered, but did not, switch within the past 12 months.

A 2.4 Approximately 75% of total consumers signed-up in-store, with 60% of consumers that switched in the past 12 months having visited a store.

ComReg Assessment

A 2.5 ComReg considers that this supports the finding in the WIK Report,⁴⁵ reflected in the Consultation, that OTA⁴⁶ can save consumers time and effort when switching mobile providers.

A 2.6 The level of switching found in the OTA Consumer Survey aligns with operators

⁴³The forthcoming Mobile Consumer Experience Survey will include further research on consumers and eSIM/OTA.

⁴⁴ The analysis of the OTA Consumer Survey represents preliminary views, which ComReg provides for the purpose of providing transparency. The OTA consumer survey, its finding and any estimates based on same is without prejudice to any analysis to support potential future regulatory actions.

⁴⁵ See Section 5.1.1 of the WIK Report.

⁴⁶ See Section 4.1 of Document 21/114.

reported churn (approximately 8%)⁴⁷ as well as the level of switching implied by annual MNP (approximately 6%)⁴⁸.

A 2.7 These figures indicate that in 2021, Irish consumers made approximately 160,000⁴⁹ trips to retail stores to switch providers⁵⁰, not including those that visit a store but did not switch (e.g., a first-time consumer).

A 2.8 Although a majority of consumers (68%) that sign-up in store cite a preference for physical interaction⁵¹ as a motivating factor for in-store sign-up, a minority of consumers cite either dissatisfaction with alternative distribution channels (online, over-the-phone) or a need for same day sign-up (35%)⁵². The value of the time saved⁵³ to this subset of consumers from OTA provisioning could range between €640,000 - €1,720,000⁵⁴ per annum⁵⁵.

2. Fully-digital OTA provisioning can promote switching

Survey finding

A 2.9 While consumer awareness of eSIM is low, at 21%, there is evidence that

⁴⁷ See paragraph A 2.13 for the contract churn of Vodafone Ireland and Three Ireland.

⁴⁸ Approximately 6% based on 307,312 mobile number ported in the last 12 months of a total of 5,414,091 mobile subscriptions (excl. MBB and M2M) as of Q1 2022 (see Quarterly Key Data Report Q1 2022).

⁴⁹ This estimate is based on the finding that 7% of consumers switching annually, 60% of whom visit a store. For the purpose of this calculation, ComReg estimates that there 3,609,941 Irish mobile consumers (93% of Irish citizens aged 13 and above), as of Q4 2021. The estimate for trips appears credible and may even be a conservative estimation, recalling that there are approximately 400,000 mobile ports per annum (noting that this includes businesses also). Figures on citizens above the age of 13 taken from CSO:

<https://www.cso.ie/en/releasesandpublications/ep/p-cp3oy/cp3/>

⁵⁰ Leading operators' websites indicate that there are at least 274 dedicated telecoms stores in Ireland. Ignoring non-dedicated stores of smaller players (Tesco, Lycamobile and An Post) this implies 547 switches per dedicated store annually, an average of 10-11 switches per store per week, which again seems credible.

⁵¹ In response to the Question 5.A "You have indicated that you signed-up to your current provider in store. Which of the following reasons best describes why you chose to sign up in store, rather than online or over the phone?", 68% of respondents answered "I prefer to speak to someone in person" or "I wanted to see or test the service or goods (e.g., handset) in store"

⁵² In response to the Question 5.A "You have indicated that you signed-up to your current provider in store. Which of the following reasons best describes why you chose to sign up in store, rather than online or over the phone?", 35% of respondents answered, "I wanted the item or service immediately", "I had a question or needed information that was not available on my provider's website", "I had difficulty navigating my provider's website" or "I could not get through on the telephone/takes too long"

⁵³ Based on an estimated time saved per consumer of 1 hour (including travel and time in-store), and estimated number of store visits avoided of 50,000 (33% of 150,000).

⁵⁴ These estimates are based on the value of time used by the Department of Transport, Tourism and Sport when calculating the monetary value of time saved as a result of transport projects. ComReg has not calculated an updated value of time using the methodology, but rather applies the values most recently published by the department (of which ComReg is aware). This assigns a value of €12.75 to an hour of leisure time and €34.33 to an hour during work hours. In the event that ComReg were conducting a regulatory impact analysis it would revisit this. <https://www.gov.ie/en/organisation-information/800ea3-common-appraisal-framework/>

⁵⁵ Noting that many more consumers may ultimately elect to sign-up or switch via OTA when available and derive similar benefits from time saved.

eSIM/OTA could promote switching, as:

- a) 39% of consumers report they would be “*more likely*” to switch were it possible to use OTA/eSIM among certain consumers, for example;
- b) 35% of consumers report that they would be “*more likely*” to switch were it possible to complete all necessary steps within 5 minutes; and
- c) 48% of consumers would be “*more likely*” to switch were it possible to use OTA/eSIM and/or complete all necessary steps within 5 minutes.

ComReg Assessment

A 2.10 ComReg considers that this supports the finding in the WIK Report,⁵⁶ reflected in the Consultation, that fully digital OTA⁵⁷ can promote switching.

A 2.11 The OTA Consumer Survey indicates that eSIM/OTA could promote greater switching among consumers that did not consider switching in the 12 months prior (87% of total), with many such consumers stating they would be “*more likely*” or “*much more likely*” to switch operators using fast, fully-digital OTA.⁵⁸

A 2.12 Were even a minority of this large group to consider switching as a result of the availability of fast, fully-digital OTA provisioning, this could result in large increase in annual consumer switching. For illustration, using some simplifying assumptions, ComReg estimates⁵⁹ that this could be as high as 110,000-220,000⁶⁰ additional switches annually⁶¹.

A 2.13 The potential for OTA to improve switching is important given that inter-operator

⁵⁶ See page 84 of the WIK Report.

⁵⁷ See page 35 of Document 21/114.

⁵⁸ In line with ComReg's *Guidance on OTA provisioning for Consumer Mobile*.

⁵⁹ Ultimately, this is an illustrative exercise to demonstrate the potential scale of switching depending on the response of consumers. Any such estimation involves a high degree of uncertainty. Nevertheless, ComReg has attempted to estimate the increase in switching to better understand the impact of OTA on competition, noting the uncertainty inherent in such a forecast. ComReg has used consumers views as a guide to the potential reaction and notes the uncertainty inherent in any attempt to predict consumers behaviour to a new technology.

⁶⁰ This assumes that consumers that did not consider switching but answered that they would be “much more likely” to switch (13% answered this at least once) or “somewhat more likely” to switch (30% of all consumers excl. those that answered more “much more likely”) would now consider switching, and that a similar proportion would ultimately switch as do at present (c. 50%). ComReg assumes 25%-50% of consumers that answered “much more likely” to either question, and 12.5%-25% of consumers that answered “somewhat more likely” consider switching.

⁶¹ ComReg notes that this does not include the potential impact of increased switching by businesses as a result of fully-digital OTA, which could further increase switching rates.

switching in Irish mobile markets appears low.⁶²

A 2.14 First, the OTA Consumer survey indicates that the majority of (87%) Irish mobile consumers did not switch or consider switching in the past 12 months. In light of recent declines in mobile plan prices⁶³, a large number of consumers could potentially be forgoing offers that represent better value,⁶⁴ noting research by the Economic and Social Research Institute (“ESRI”) that has previously found inertia among Irish mobile consumers⁶⁵.

A 2.15 Second, although publicly available data on international switching rates is limited⁶⁶, switching in the Irish mobile markets appears low in an international context, as:

- Vodafone⁶⁷ reports annual churn of 8.4% in Ireland vs. 13.6% for the European Group for contract customers, which operates across 11 markets;
- Hutchinson’s reported⁶⁸ monthly churn gives an annualised churn of 8.4% vs. 14.4% for the European Group, which operates across 6 markets; and
- Vodafone Ireland and Three Ireland both report among the lowest churn of their respective parent company’s European MNOs (for which data is publicly available), as shown in **Figure 2** below.

⁶² Switching rates are not an end in themselves but may serve as an indicator of the level of competition in a market. Low levels of switching may reflect a market lacking in competition. Any assessment of switching therefore requires a holistic approach.

⁶³ See discussion of GoMo in 20/122 – “Multi Band Spectrum Award - Response to Consultation and Decision” in particular paragraph 6.130.

⁶⁴ While switching rates, as measured by MNP, rose immediately following the introduction of GoMo, switching reverted to previous levels shortly thereafter. ComReg does regularly gather data on intra-operator switching, which may have also increased as consumers switched from their MNOs to their sub-brands.

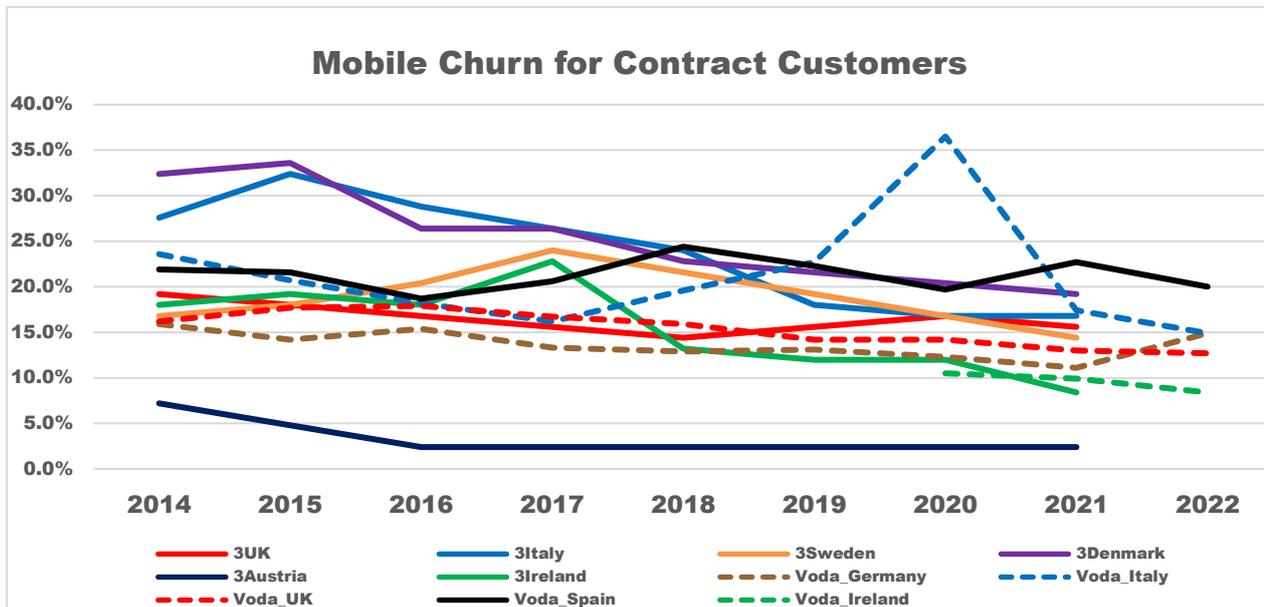
⁶⁵ Lunn & Lyons (2017) “Consumer switching intentions for telecoms services: evidence from Ireland” Economic and Social Research Institute, Dublin and Department of Economics, Trinity College Dublin.

⁶⁶ ComReg is unaware of any publicly available, comparable statistics either Eir or Iliad, Eir’s parent company.

⁶⁷ Vodafone “Vodafone Group Plc : FY22 Preliminary results” pages 3 and 12 [link](#).

⁶⁸ Hutchinson Group “2021 Annual Report” page 43 [link](#)

Figure 2: Mobile contract customer churn for 12 of Hutchinson and Vodafone PLCs European MNOs, 2014-2021



Source: Accounts of Vodafone Group PLC and CK Hutchison Holdings Limited

3. OTA can reduce barriers to entry to mobile markets

Survey finding

A 2.16 The OTA Consumer Survey found consumers reporting a high reliance by Irish consumers on in-store retail distribution channels for mobile sign-up, with:

- 75% of consumers signed-up in-store;
- 16% of consumers signed-up online; and
- 5% of consumers signed-up via the phone.

A 2.17 Similarly, consumers were highly reliant on bricks-and-mortar retail distribution channels for SIM delivery, with:

- 75% of consumers collecting their SIM card in-store; and
- 18% receiving their SIM card by post.⁶⁹

A 2.18 In-store sign-up is lower among consumers that received a SIM more recently, with only 60% of consumers that switched in the past 12 months having visiting a

⁶⁹ The remaining 7% of respondents did not remember how they received their SIM card.

store.

ComReg Assessment

A 2.19 ComReg considers that this finding supports the view in the WIK Report,⁷⁰ and reflected in the Consultation, that OTA⁷¹ can reduce barriers to entry to mobile markets.

A 2.20 These findings highlight the continued importance of physical stores to mobile consumers signing-up to or switching mobile provider, given the high number of customers that choose to sign-up or switch mobile provider in-store⁷².

A 2.21 This is notable given changing trends in how consumers purchase devices and connectivity, leading to the closure or conversion of physical retail outlets. Irish mobile retailers, operators, and their parent groups have not been immune to such trends:

- Independent mobile retailer Carphone Warehouses cited the unbundling of mobile devices and connectivity as a challenge to its business model following the closure of its 81 stores in 2019.⁷³
- Three refurbished its 60 Irish retail stores to pivot to “lifestyle connectivity” and consumer IoT in 2021.⁷⁴
- Vodafone Group CEO Nick Read cited the need to pivot to digital sales as a motivator following the closure of 15% of its 7,700 European stores in 2019.⁷⁵:

A 2.22 In spite of such trends, physical retail outlets will likely remain important to competition in the Irish consumer mobile market as long as a significant share of mobile consumers choose to sign-up/switch in-store. Notably, all major Irish MNOs/MVNOs have some physical retail presence, as shown in **Table 1** below.

⁷⁰ See page 84 of the WIK Report.

⁷¹ See page 35 of Document 21/114.

⁷² Though the share signing-up in-store is lower among consumers that switched in the past 12 months, it's unclear whether the recent decline in in-store sign-up reflects a declining preference for in-person sign-up or a temporary response to Covid-19.

⁷³ Message to Carphone Warehouse Ireland customers on Currys website [Link](#) “Customers are changing the way they buy mobile devices and connectivity, replacing their handsets less often and buying them separately or as part of more flexible bundles.”

⁷⁴ <https://www.three.ie/media-centre/three-lifestyle-store-launch.html>

⁷⁵ RTE News, 09/10/2019, “Vodafone to close more than 1,000 shops in Europe” - Nick Read CEO, “If you believe that 40% of your transactions are going to be digital, then how does that impact why someone goes to a store. The journeys and the purpose of the store changes,” (That) means that we will have more ‘experience’ stores, less standard format stores (and) more convenience, and kiosk and click-to-collect stores.”

Table 1: Physical retail distribution of Irish MNOs/MVNOs

MNO/MVNO	Physical retail outlets
Vodafone	100 telecom stores
Three	70 telecom stores
Eir	79 telecom stores
Virgin	8 telecom stores
Sky⁷⁶	17 telecom stores
LycaMobile	Many 3rd-party retail stores
Tesco	Many of 152 retail grocery stores
An Post	Many of approximately 1,110 post offices

Source: Based on operators own websites

- A 2.23 MNOs may even operate physical retail stores for no or little profit, or even at a loss, given the importance of physical retail outlets to reach a significant share of mobile consumers and to drive mobile service revenues.
- A 2.24 Traditional entrants need to reach a large number of potential consumers to increase its subscriber numbers quickly to recover fixed costs⁷⁷. The investment required to establish a retail presence and declining or low profitability of such retail stores could amount to a significant, albeit declining, barrier to entry to any entrant MVNO or MNO with a traditional business model⁷⁸. OTA provisioning can therefore reduce barriers to entry to MVNOs or MNOs through facilitating fully-digital business models, reducing the need for physical retail outlets to reach consumers.
- A 2.25 OTT service providers or OEMs entering the supply of connectivity services as a MVNO could rely upon OTA. Increased familiarity with OTA and use of OTA provisioning would also benefit such innovative entrants, through increasing the reach of their non-physical distribution channels also. In this way, the widespread adoption of OTA provisioning can facilitate the entry of operators with new, innovative business models, such as OTT players and OEMs.⁷⁹

⁷⁶ Included in this list as SKY has announced its intention to launch a MVNO in 2023. The Irish Times 04/04/2022 “Sky will enter Irish mobile market in 2023 using Vodafone network” [Link](#)

⁷⁷ As noted by the European Commission in paragraph 266 of M.6992 HUTCHISON 3G UK / TELEFONICA IRELAND.

⁷⁸ Many MVNOs and MNOs adopt strategies to avoid such costs, through a pre-existing retail footprint (e.g., Tesco, An Post), through agreements with retail chains (e.g., Lycamobile) or through shifting to kiosks (Vodafone Group). Such strategies may still incur certain costs relative to OTA provisioning, which vary with achieved reach (forgone shelf space, fees and/or training staff).

⁷⁹ Thales markets the reach of eSIM to potential MVNO clients, see Thales “Thales eSIM Essentials” 10 June 2020.